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**MULTIPLE DIMENSIONS OF UNIVERSITY
GOVERNANCE AND PERFORMANCE:
THE CASE OF UK HIGHER EDUCATION**

Faisal Hani H Basha

**A thesis submitted to the University of Huddersfield
in partial fulfilment of the requirements for the
degree of Doctor of Philosophy**

The University of Huddersfield Business School

August 2020

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ABSTRACT

This study is a unique systematic quantitative effort to decipher and interpret the complex multi-dimensional associations and trade-offs between university governance and performance in the UK. It is unprecedented in its scope and breadth and breaks with traditional discourses in corporatised university governance that are the extant paradigm. A seven element multi-theoretical framework is used to investigate the large decade-long collated empirical data set of university-year governance-performance metrics in the country. Five distinct subsumed research objectives are targeted in the study. These are used to explicate empirical insights about the trade-offs involved in the four inter-related aspects overlooked by the current corpus of governance performance research here, i.e., the multiple dimensions in either construct, the quality assurance/cultural connotations therein, the embedded process like elements and longitudinal relationships. The study, thus, richly expands the body of knowledge in university governance and performance.

Singularly in the thesis 31 variables capturing varied dimensions of university governance and performance for the eleven years between 2005 and 2015 are collected mixing hand written means with other standard approaches. Across this data horizon, in a sample consisting of 132 UK universities, these variables are extensively analysed, resulting in a variegated, comprehensive and distinctive panoply of triangulated findings. From a methodological perspective the research is largely knit using eclectic and advanced regression analysis. However, it is not limited to this. The project splices the empirical UK data set in innovative ways and coalesces critical discussions and narratives across univariate, bivariate, multivariate pooled and panel analyses. While GLS Fixed Effects regressions are the base model chosen, a series of five other sensitivity-assessing regressions and a battery of related tests are done to achieve full academic rigour.

The thesis uncovers strong robust evidence for the multi-dimensional and complex links between UK university governance and performance. In six different complex models of multivariate regressions it finds a range of nuanced complex yet highly tractable and explainable relationships between multidimensional governances and performances of the UK university.

These findings allow for novel contributions to the body of knowledge. Thus, uniquely the thesis conceptualises university governance and performance crafting holistic definitions of either construct. It expands the vocabulary of the discourse using theory to identify five new missing dimensions of university governance. By analysing the rich panel data set of several governance performance variables, it establishes an inflexion point to differentiate the future research trajectory in this area. Providing a robust basis for the existing normative and argumentative policy literature it assesses the credibility of the many scholarly critiques. The thesis also formally tests the validities of many existing and recent policy changes introduced in UK HEI and uncovers trade-offs and complexities that may have been missed by regulators. Finally, it provides an empirical basis for key concepts in governance such as culture/quality assurance concerns, process like characteristics and teaching/learning regimes. These novel contributions result in a highly original set of recommendations to university governors, HEI regulators and future researchers.

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ABBREVIATIONS

AR	Auto-regression
CUC	Committee of University Chair
DWH	Durbin-Wu-Hausman Test
FE	Fixed-Effects
GMM	Generalised Methods of Moments
GLS	Generalised Least Square
HEFCE	Higher Education Funding Council England
HEI	Higher Education Institution
HESA	Higher Education Statistics Agency
LT	Legitimacy theory
MPOC	Managerial Power and Optimal Contracting
MLE	Maximum Likelihood Estimation
NSS	National Student Survey
OC	Optimal contracting theory
OfS	Office for Students
OLS	Ordinary Least Squares
PA	Public Accountability
QA	Quality Assurance
QAA	Quality Assurance Agency
RE	Random-Effects
RAE	Research Assessment Exercise
REF	Research Excellence Framework
RDT	Resource dependence theory
RGF	Research Grant Fraction
RPI	Research Performance Index
RQ	Research Quality
ST	Stakeholder theory
S&A	Stewardship & Agency perspective
TEF	Teaching Excellence Framework
TGF	Teaching Grant Fraction
TLR	Teaching and Learning Regimes
TPI	Teaching Performance Index
2SLS	Two Stage Least Squares
UCU	University and College Union
VIF	Variance Inflation Factor

1. Chapter One: Introduction

This research aims to critically evaluate the multi-dimensional links between a university's governance and its performance in the UK. The university occupies a unique status among the knowledge institutions of any economy. It is charged with the vital and complex task of generating and transmitting knowledge across society. This task has many inter-related dimensions and levels that make it difficult. A university has to necessarily satisfy the conflicting requirements of large sets of diverse stakeholders. These impose trade-offs within the governance of this institution, especially at its various levels and in its multiple dimensions. If calibrated optimally, such trade-offs result in a sustained improved performance of the institution. However, such calibrations are far from easy or straightforward. This explains the need for an integrated and systematic effort to study multi-dimensional university governance and its effects on performance.

In what follows the rationale for this research is comprehensively explained debated and justified. Section 1.1 presents a background and context for university governance and performance. It is neatly divided into two sub-sections: Section 1.1.1 presents a brief annotated history of reforms in university governance in the UK. The main focus here is to provide the reader with an up-to-date understanding of how and why UK university governance remains conflicted despite several waves of reforms. Section 1.1.2 presents the current status of the regulatory landscape in UK university governance and performance. From this the reader can obtain a grasp of the many dimensions of university governance in the UK, the complexities of the overseeing apparatus and the nature of governance-performance trade-offs.

Section 1.2 builds on this background and context to rationalise the multiple motivations underlying this research. In Section 1.2.1, UK universities are shown to be multi-dimensional entities. This is illustrated in the complex trade-offs they face in almost every dimension of governance and performance. In the process, this sub-section shows how and why the research is topical and interesting. In Section 1.2.2, the need for new insights into

university governance and performance in the UK is established. Finally, Section 1.2.3 presents the principal research motivations of the thesis. This is followed by Section 1.3, which elucidates the main research question and related research objectives. From this, a wider understanding of the overall scope of the research project is obtained. This is then expanded upon in Section 1.4 where the proposed methodology is also briefly enumerated. Section 1.5 then concludes this introductory chapter to the thesis with a detailed elaboration of the novel contribution to knowledge that is intended here.

1.1 Background and Context

Universities are on the cusp of rapid and transformative change. As the global economy integrates and expands, knowledge has become the most important currency of exchange; it is also the source of competitive advantage among nations (Collini, 2005; Collis, 2004; Shattock, 2013a, b). Universities as the repositories, creators and transmitters of this knowledge have come to occupy centre stage in economic development. A country's status is increasingly being linked to the international rankings of its institutions of higher education. Inevitably, however intractable questions are being asked about the multi-dimensional governance and performance of these institutions in society (Parker, 2011; Parry, 2011; Rowlands, 2013; Hordern, 2013). Academics, researchers, practitioners and other interested constituencies are voicing important conflicts about the way universities govern themselves, transmit/generate knowledge and assess/examine competences (Gornitzka & Maassen, 2014; Vukasovic et al., 2018). It is within this context that studying university governance and its impact on performance has become vital.

The UK has traditionally been at the very forefront of higher education reform (Ntim et al., 2017; Shattock, 2013a, b). Given its important historical role as an engine of enlightenment and scientific development this is hardly surprising. The best-known universities of the country remain at the cutting edge of teaching and research featuring regularly on the lists of the top 100 institutions in the world (Times Higher Education, 2016; 2017). The country is also among the countries with top rankings in research and development (R&D). On paper, the Government has always accorded the highest priority to university funding and governance reform. Yet despite this the university sector in the UK remains one of the

deeply contested areas in popular and academic discourse. Academics researchers and teachers alike raise contentious issues about the way universities are governed in the country and how this affects their performance (Parker, 2011; Ntim et al., 2016).

There is an added geographical context within the UK higher education sector that makes university governance highly complex. The UK is, after all, a federal union of four disparate regions, i.e., England, Wales, Scotland and Northern Ireland. Universities in each region differ significantly in their governance processes and mechanisms. They imbibe and articulate cultural, social and intellectual beliefs of each different regional part of the UK (Bruce, 2012; Shattock, 2006; Shattock & Horvath, 2019: 2020; Brennan et al., 2018; Gallacher, 2009: 2014; Riddell et al., 2015). England and Scotland are notable here. The two regions, although comparable, differ significantly in research/teaching emphases in higher education pedagogy and political perspectives on student fees and commercialisation of higher education. To compound these differences in line with the growing decentralisation of political governance in the country the regulatory apparatus and funding bodies for higher education were also devolved across each region. Especially after 1992 this has led to four distinct regulatory and governance-based regimes in the country (Shattock & Hovrath, 2020; Cremonini et al., 2015). Studying UK governance and performance therefore does needs vital and explicit consideration of its geographical context.

However, the only way to fully appreciate the background and context of UK HEI is through a deeper understanding of its historical and regulatory evolution. Sub-section 1.1.1 historically analyses the many waves of governance reform in UK HEI and how these complicated the university landscape in the country. The next sub-section 1.1.2 details the regulatory landscape on governance in the country showing the more recent changes and examine their problematic aspects.

1.1.1 The history of UK Higher Education Reform

There has been a definitive change within UK higher education in the last few decades. Highly elitist traditional universities have metamorphosed into publicly accessible institutions charged with the task of ‘educating and skilling the masses’. Table 1, below, maps out the main changes in the UK Higher Education Sector during the past century.

Table 1: UK Higher Education Reports-Acts and Key Recommendations

Reports and Acts	Key Recommendations
Robbins Report (1963)	<ul style="list-style-type: none"> • Expansion of the Higher Education sector by upgrading former technical institutes. • Introduction of new types of vocationally oriented Higher Education Institutions such as polytechnics and colleges. • Introduced and encouraged mass education. • Higher level of external governance and scrutiny of existing institutions • Neoliberal ideas of universities as serving a global, corporate and economic benefit that need to be exploited to support economic development • Formed the main backbone for the development of the university sector until present.
Jarratt Report (1985)	<ul style="list-style-type: none"> • Focused mainly on improving efficacy in Universities and that they should run as normal profit making businesses or commercial enterprises. • Argued that old traditional university’s two-tier governance with excessive academic authority tended to be slow and bureaucratic in decision-making. • Suggests a one-tier governance with a majority of lay members who are responsible and accountable for the governance of the institution. • Lay members should be supported by corporate-like sub-committees, such as audit, remuneration, and nomination, etc. • Wanted to weaken the influence of academics in university governance, while strengthening lay members and those with commercial experience and success. • Board size to be between 12-25, and Vice-Chancellor’s position and authority should be elevated to that of a CEO. • Passed in 1988 into law.
Education Reform Act (1988)	<ul style="list-style-type: none"> • Established University Funding Council (UFC) to replace the long-standing University Grant Committee. Also established the Polytechnics and Colleges and Funding Council (PCFC) • Ended academic tenure rights • Introduced stricter accountability measures for universities.
Further and Higher Education Act (1992)	<ul style="list-style-type: none"> • Allowed polytechnics and colleges to assume university status. A total of 35 institutions become universities in the first year. These are often referred to as new or post-1992 universities.

	<ul style="list-style-type: none"> • Removed Colleges and Further Education from local authority government control. • Effectively ending/abolishing the binary system divide in higher education. • Created a national unitary funding council - Made changes to the funding of Higher Education Institutions by creating new funding bodies for each country, HEFCE, HEFCW, NIHEC (advised by HEFCE), and Scottish Higher Education Funding Council SHEFC (now Scottish Funding Council) to replace the UK-wide University Funding Council (UFC) and PCFC. Setting into motion the devolution of UK HE that became more marked in 1999. • Created a quality assurance arrangement, QCA and HEQC, that set the stage for the emergence of the QAA in 1997. • The privy council was awarded sole power to grant degree-awarding powers and the title of university on the advice of the QAA until 2017.
Nolan Report (1996)	<ul style="list-style-type: none"> • focused on governance structures in the ‘new’ post-1992 and ‘old’ pre-1992 universities. • Mainly supported the separate governance arrangement between the two.
Dearing Report (1997; 2004)	<ul style="list-style-type: none"> • Focused on reforming governance and funding in the HE sector. • Dearing was more critical than Nolan (1996) and argued that board size for pre-1992 universities of “34” on average were too large and recommended that it is to be reduced to “25”, as with the post-1992 universities. • It proposed a code of governance for HEI which is heavily influenced by the Cadbury (1992) report. • With regard to funding, it recommended a fundamental change in tuition fees from being funded only by free government grants to a mixed system of government grants and student fees, supported by low interest government loans. Effectively ended free HE system in the UK leading to a rapid decline in public funding.
Teaching and Higher Education Act (1998)	<ul style="list-style-type: none"> • Influenced by the Dearing 1997 recommendations, the Government published its response in 1998. Changes have been made in how universities are run, e.g. smaller and clearly identified governing bodies. • The title of ‘university college’ is available not only to colleges that are fully part of a university but also to higher education institutions with the power to award taught degrees. • Allowed universities to charge tuition fees up to £1,125. • Introduced the student loan system and the creation of the Income Contingent Loan (ICL) student plan which was later modified in 2004.
Lambert (2003)	<ul style="list-style-type: none"> • Included a code of governance for all HEIs, with financial penalties for non-compliance; this included pre-1992 universities. • CUC incorporated the report into its 2009 guide. • Bringing internal governance of pre-1992 and post-1992 in line.
The Higher Education Act (2004)	<ul style="list-style-type: none"> • Made adjustments to the student loan arrangements to allow students to only repay their loan after graduating and when they

	<p>were earning a yearly income above £15,000 rather than pay it yearly during the course.</p> <ul style="list-style-type: none"> • Creation of Office For Fair Access (OFFA) • Replace the fixed fee of £1,125 with a new system that enables universities to set the level of fees for each course up to £3,000
Browne Report (2010)	<ul style="list-style-type: none"> • Focused on reforming HE funding, including student finance, especially after the banking crisis that led to UK government budget cuts. • The introduction of full-tuition fees with maximum cap of £9,000. • Removal of control caps in terms of the number of students that the UK HEI can admit. • The report has introduced a quasi-market economy in the HE sector with the aim of improving quality and reducing costs by increasing competition among UK HEIs. • Governance and funding reforms led to greater demand for public accountability transparency and performance, mainly through regulatory scrutiny and funding conditions.
Higher Education & Research Act (2017)	<ul style="list-style-type: none"> • Widely viewed as the most important legislation for the sector in 25 years and a replacement for the Further & Higher Education Act (1992). • Established Office for Students (OFS) that is responsible for regulating the HE sector. This super regulator has replaced: <ul style="list-style-type: none"> - Hefce as the funding body for the sector; - Privy Council - Royal Charter as the body with granting degree awarding powers i.e. university status; - Office For Fair Access (OFFA). • OFS has been given authority to make grants, loans, payments and might attach any terms and conditions. • Amended prior legislation on student financial support/compliant procedure. • Establish UK Research and Innovation (UKRI) that is responsible for regulating and funding research. Ultimately merging seven existing research councils into one. • Address various issues such as data sharing.

Source: (Brwone, 2010; Watson, 2014; Shattock, 2004; Buckland, 2004; Du & Lapsley, 2019; Scott, 2014)

As shown in Table 1 above it is quite obvious why the UK has been widely perceived to be at the forefront of Higher Education policy reforms. Scholars such as Toma (2007), Vidovich & Currie (2011), Parker (2012) and Rowlands (2013) concur that the changed focus on sound financial management through good internal governance arrangements, greater public accountability/transparency and stronger performance is at the base of this perception. However, just a few decades earlier at the start of the last century UK universities were elitist institutions. The traditional view that characterised these

institutions was that ‘university education is not for everyone’. It was felt that only the crème de la crème needed to go to university and higher education was an “earned privilege” (Parker, 2011; Collini, 2005; Ntim et al., 2017). Knowledge acquisition was for its own sake and university education did not have a utilitarian objective. Supporting this notion were the core ideas of academic freedom and university autonomy. The oft-quoted argument was that the university needed to be autonomous in its governance arrangements if it was to preserve its role as the ‘pure’ knowledge generator and transmitter to future generations (Bennett, 2002; Shattock, 2002; Middlehurst, 2004). Therefore, for almost six decades universities in the UK remained self-governing institutions. A collegial form of internal governance evolved where the academic faculty populated all major governance and performance committees, and took all major decisions.

This went largely unchallenged until the influential Robbins report (1963), which recommended a significant expansion of the higher education sector and a higher level of external governance and scrutiny of existing institutions. Based on the neo-liberal notion that directly challenged the then existent view of ‘knowledge for its own sake’, Robbins argued that for the large majority of students there were instrumental outcomes such as obtaining a range of work-related skills that required them to acquire a higher education (Salter & Tapper, 2002; Knight, 2002; Kim, 2008; Trakman, 2008). Greater coverage of the student population was thus important. Therefore, he recommended new types of vocationally orientated higher education institutions such as polytechnics/colleges that gave students the option to acquire vocational and professional skills. This was the first major change in the HEI sector in the UK, and introduced economic instrumentalism and mass education within the country’s HE sector.

The next major change in the sector came with the Jarratt report (1985), which questioned the efficiency of the existing universities. Jarrat’s overriding emphasis was to change the way universities were structured by incorporating them into public corporations so that they could be run to generate a profit as with Public Sector entities (Sizer & Howells, 2000; Hordern, 2013; Parry, 2013). At the board level he recommended a one-tier governance , and a big increase in the numbers of lay and independent board members with experience

of running commercial enterprises and a reduction in the number of academics. The aim was to make the board less bureaucratic and more responsive to changes in higher education. For the first time these, changes introduced a commercial orientation into the HEI sector in the UK. The Jarratt report proved so influential that it was enacted into law through the Educational Reform Act, 1988 (ERA, 1988). Universities in the UK now exhibited a two-tier structure, i.e., the Polytechnics (the corporations) and the older established universities (Royal Charter) (Dearlove, 2002; Shattock, 2002, 2004; Middlehurst, 2004: 2013). While the Jarratt report has helped to improve efficiency, access and quality, it coincided with a rapid influx in the number of students in UK HEIs. It quickly became apparent that mass HE is expensive, leading to an increase in public funding, stretching UK governments' public budgets (Watson, 2014; Jarrat, 1985; McGettigan, 2013; Deem et al., 2007; Brown & Carasso, 2013).

Beset by these problems, after just four years of the two-tier functioning institutions, the UK government once again reformed the structure of UK universities with the Further and Higher Education Act of 1992. The immense pressure on the Government to remove the divide in the higher education between traditional higher education institutions and the polytechnics was a major motivation here. A second important concern was the need to achieve good governance and value for money in the sector which was increasingly viewed as a costly white elephant for the Government. The UK Privy Council was authorised to issue new Royal Charters to the polytechnics to function as universities. As a consequence, in waves new universities from among these institutions began joining and complicating the structure of UK HEI. Not all polytechnics became universities and, in many places, arbitrarily enforced mergers combined existing universities with selective polytechnics or two or more such institutions were amalgamated into one. Nevertheless, these changes created a fierce and acrimonious debate (Collini, 2012; Molesworth et al., 2011; McGettigan, 2013; Halsey, 2000) in the university sector about how these newly constituted post-1992 universities differed from their pre-1992 counterparts. The nomenclature stuck and this explains why so much university governance and performance research in the empirical literature uses the divide to neatly segregate the UK university sector. To date there are significant differences between the internal governance structures

in pre-and post-1992 universities that suggest the polarisation of UK HEI along this divide. Undoubtedly the newer universities have been at the forefront of shouldering the burden of mass higher education, welcoming large numbers of students who would not otherwise have had access to university education. Yet there continues to be widespread perception at least within the conservative academic community, that post-1992 universities continue to be vocational institutions with low levels of higher education pedagogy (Scott, 2012: 2014). At least one future governance policy paper, i.e., the Nolan Report (1997) continued to stress these divides to the detriment of UK HEI although this has now been reversed by Dearing.

Meanwhile some of the most exclusive, powerful and research rich universities of the UK formed an exclusive alliance much in the nature of the Ivy league in the US (Fitzgerald & Petermam, 2005; Havergal, 2015). Feeling a strong need to emphasise their own distinctly superior pedagogical ambience 24 such universities formed the Russell Group in 1994. This elite grouping soon became the touchstone of academic excellence in the UK commanding a significant 60% of all lucrative research projects in the country (Boliver, 2015; Scott, 1995; Tight, 1996; Russell Group, 2012: 2014; Corbyn, 2008; HCSTC, 2010; pg. 30, REF, 2014; Ball, 2017). To date there seems to be an expectation that these exclusive elite institutions are invariably the superior academic performers in UK HEI. In recent times, however, there is growing anecdotal evidence that non-Russell group universities are outperforming at least some of their peers in the Russell group. However, the post-1992 universities faced a very difficult challenge soon after their incorporation. In the era of still free higher education in 1990s while the government continued to reduce funding to the sector, these institutions lacked the credibility to be self-financing. Therefore, they began to search for alternative research-based funding opportunities. This meant striking alliances and partnerships with peer institutions with higher research profiles. A range of exclusive alliances and advocacy fronts were formed as shown in table 2 below and these further complicated the institutional landscape in the sector (Scott & Callender, 2013; Brock, 2015; Boliver, 2015)

Table 2: Higher Education Institution Alliances

Group Alliance:	Description
Russell Group	A self-selected association of 24 major research intensive universities in the UK that are committed to high research standards.
Million+ Group	An association made up of former polytechnics and Scottish central institutions that claim to have educated over a million students hence the name. Traditionally focused more on vocational work-related education, prioritize teaching, and have low research resources.
1994 Group	A group of smaller research orientated pre-1992 universities – disbanded in 2013 after losing members to Russell Group.
GuildHE	An Association of 28 smaller and specialist post-1992 universities & colleges that was formed in 2006 and has 28 members – It represents institutions specialising in arts & design, teaching training music and drama
University Alliance	A group of non- aligned universities became which became the largest post-1992 university group. It was formed in 2006 and has 26 members – With a focus on science technology, links with industry, and research environment in partnership with industry/profession.

Source: (Morgan, 2014; Fazackerley, 2013; Watson, 2014)

Most of these post-1992 alliances were formed with the intention of improving the academic credibility of these institutions. By joining one or other of these formations, the former polytechnics had an even chance of sharing and building on research and teaching expertise and collaboration. In recent times there is anecdotal and argumentative evidence that many of these '92 universities have been successfully collaborated and partnered globally in higher education. In addition, a range of new subject disciplines, multi-disciplinary courses and world class research has emerged from amongst these institutions (Tatlow, 2012; Scott, 2012).

Many of these changes made the UK higher education sector much more responsive to the economy's needs by improving access, quality and efficiency. However, several other developments in UK HEI made these improvements pale into insignificance. Rapid increases in higher education student enrolment from 8% in 1960 to nearly 43% in 2000

meant that funding for institutions became a critical constraint. This put severe pressure on UK Government finances. Universities became increasingly dependent on Government funds to support their larger student cohorts. The proportion of Government funding in university budgets climbed from a mere 33% in 1930s to over 90% in the 1970s (Dearlove, 2002: 259; Kim, 2008).

Such difficulties led to three different important investigations into the sector initiated by the UK Government in 1997, 2003 and 2010. The Nolan report (1996) largely recommended the continuation of separate Governance mechanisms for both pre-and post-1992 institutions and the post-1992 ones. On the other hand, the Dearing report (2003) suggested fundamental changes in board level governance, student fees/support and Government grant assistance. Dearing advocated smaller university boards with sizes not exceeding 25: he also suggested a code of governance for all UK universities. In the area of student fees, Dearing, for the first time in UK history argued for a mixed approach of student fees and government bursaries combined with improved access to subsidised student loans (Shattock, 2013a; 2004). Acceptance of these recommendations led to dramatic declines in Government funding of nearly 37% per student and the era of free higher education in the UK came to an end (Kim, 2008; Trakman, 2008).

The Lambert report (2003) and the Browne report (2010) constitute some of the latest initiatives in the UK Higher Education Sector. The latter in particular introduced a quasi-market in higher education by espousing the core principle that students are allowed flexibility to choose between universities. In 2010, it also expanded the principle of student fees by allowing universities to charge domestic students up to a ceiling of £9,000 per annum through legislation (Browne Review, 2010; DBIS, 2011). Caps on student enrolment were ended and universities were freed to decide on student strength, i.e., student population. All in all, market-based reforms were made the bedrock of the Higher Education Sector.

While these radical reforms were initiated, simultaneously public accountability concerns about universities and their functioning became widespread (FSSG, 2011; UUK, 2011; CUC, 2006a, b; Prondzynski, 2012; Havergal, 2015a; 2015b). In response, the Government increased regulatory oversight by setting up a bewildering variety of institutions aimed at overseeing the multiple dimensions of university governance and performance. Some of these institutions and their different and sometimes overlapping roles have recently been amalgamated into the institution of a super regulator for the sector named the Office for students (OFS).

The 2017 UK Higher Education Act and associated regulatory reforms have ushered in some badly needed regulatory changes; however, these are still insufficient and more importantly not backed by rigorous empirical research (Ntim et al., 2017). Reforms have been pushed through on the notion that universities are institutions similar to corporate firms. therefore, corporate governance norms should necessarily apply to them. This is flawed reasoning. Universities are unique multi-dimensional institutions with role complexities. There are complex trade-offs involved in their governance and performance. This explains why several scholars (See Ntim et al., 2017; Schofield, 2009; Knight, 2002; Trakman, 2008; Parker, 2011) call for empirically driven governance reforms in the sector. The current research project answers this call and aims to provide a sound rationale for data driven university governance reforms.

1.1.2 UK Higher Education Regulatory Landscape

Having examined the historical progression of university governance and its inadequacies, this section presents the current complex state of regulation in higher education in the UK, consisting of a rapidly changing panoply of institutions playing complementary, supplementary and overlapping roles that characterises the UK Higher Education Sector. Universities, 164 at last the count (HESA, 2016; Universities UK, 2016) comprise the main players while several different regulators and policy-making bodies constitute other parts of this maze. The latest piece of legislation, namely the Higher Education and Research Act 2017, proposed the regulatory framework shown in Figure 1 below.

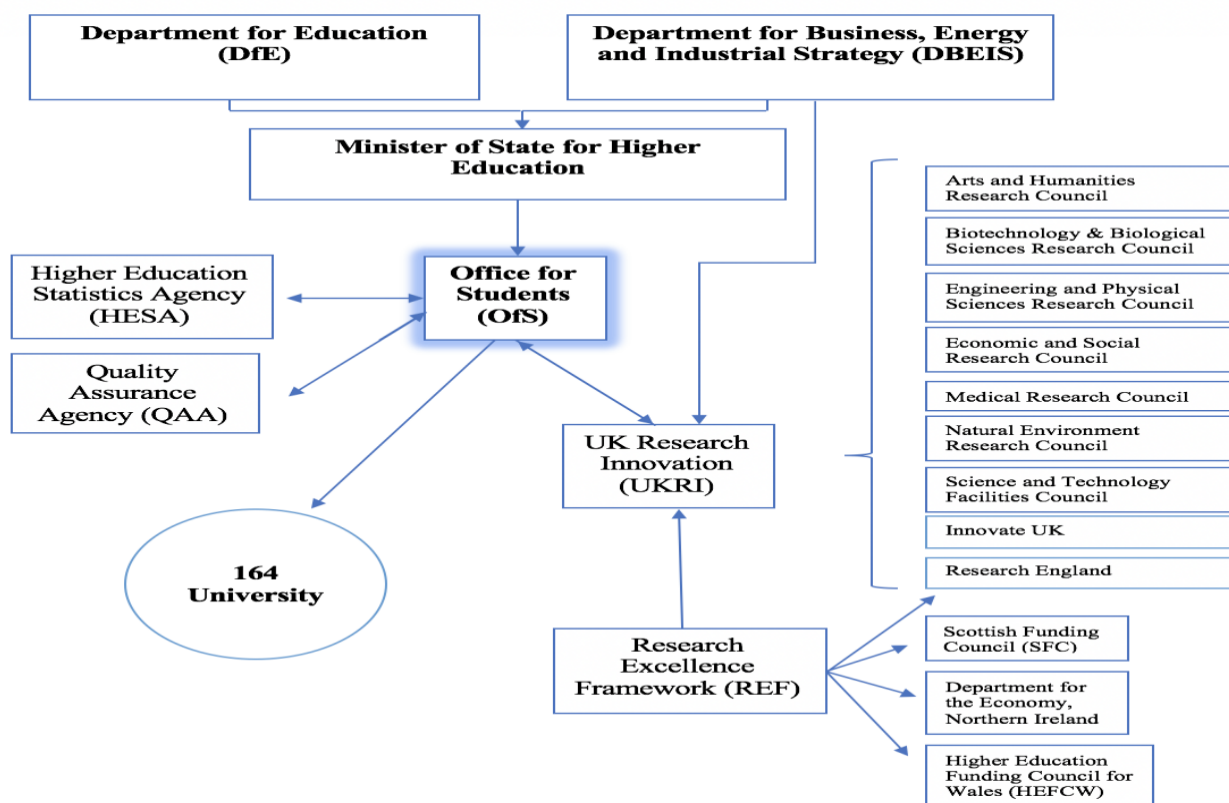


Figure 1: The UK Higher Education regulatory Landscape

Source: McGettigan, 2013; Collini, 2012; DBEIS, 2017

As is evident from figure 1 above, it appears that the last two decades of intensified regulation and oversight of the sector has now culminated in this new legislation. The act creates two newly established and recently amalgamated agencies namely the OfS and the United Kingdom Research and Innovation (UKRI). The OfS seems to be a super regulator that has taken over the regulatory and funding responsibilities of HEFCE as well as the University Title and Degree awarding powers of the Privy Council. The UKRI is the institution that has amalgamated the seven research funding councils, INNOVATE UK and Research England but seems to be designed as more of an advisory/consultative body. Two separate quality related institutions, the Higher Education Statistics Agency (HESA) and Quality Assurance Agency (QAA) continue to exist as independent institutions tasked with monitoring the universities and advising the OfS. The OfS emerges from this act as the core body establishing rules, guidelines and best practice in the sector. A complex

regulatory picture therefore emerges with one nodal super-regulator, OFS and, three other important agencies, i.e., the UKRI, HESA and QAA, jointly monitoring, evaluating, and calibrating universities and other institutions in the Higher Education sector.

Obvious inter-institutional linkages exist between these regulatory bodies. This is illustrated in figure 1 by the many lines drawn between these bodies. For example, although the Secretary of State is the formal statutory authority licensing and certifying degree awards, this power is governed by the formal advice given by the OFS which on its part is mandated to consult with HESA, QAA and UKRI in the process. Similarly, although the quantum and timing of research grants and funds to various institutions are largely determined by the UKRI, this institution has to take account of the ratings and metrics developed by HESA and the QAA while making these. These inter-institutional linkages and consultations in many ways reflect and substantiate the multi-dimensionality of a university's governance and performance. They can also be inferred to imply the need for robust and comprehensive research into the relationships if any between university governance and performance (Hordern, 2013; Parry, 2011; Rowlands, 2013; Collini, 2008; Middlehurst, 2013). Undoubtedly this is why scholars like Ntim et al (2016) stress the need for such comprehensive empirical research.

1.2 Motivation for the Study

The repeated and often drastic changes in the UK higher education regulatory landscape suggest the complexity and multi-dimensionality of university governance and performance. Governing a university is neither simple nor easy. There seems to be several dimensions along which a university's governance needs to be assessed and aligned. The institution also performs in different ways and at different levels and their performance has many complex trade-offs embedded within it. Therefore, universities face unique challenges in calibrating their internal governance that then have manifold and complex impacts on their performance.

Three distinct aspects of these challenges within UK HEI motivate this research and are detailed in the three sub-sections that follow. Sub-section 1.2.1 shows the significant

difficulties in identifying parameters for university governance and performance. Clarifying a reasonably complete set of definitional parameters is a crucial need for the sector and represents a prime motivation here. In sub-section 1.2.2 the unique multi-dimensional role of the UK university and the complex trade-offs it imposes on this institution are delineated. These very difficult trade-offs need rigorous empirical investigation if the UK HEI sector is to be intelligently governed and regulated. Therefore, this is a second important motivation here. Finally, sub-section 1.2.3 shows how UK HEI is significantly under-researched especially from the perspective of governance performance relationships. The need for new insights for university governance reform are most pressing in the country especially within the context of several piece-meal reform efforts being undertaken in the sector. This is the third and final important motivation driving the research. Each of these sub-sections feed into the overall research motivation for this project and thus enable the formulation of its principal research question which follows.

1.2.1 The Parameters of University Governance and Performance

University governance and performance are hard to identify and measure. There is significant ambiguity in what constitutes a university's governance (Huisman et al., 2008; Amaral et al., 2009; Neave & Van Vaught, 1994; De Boer et al., 2007; Findkli, 2017). This is because as a knowledge institution the university does not fully resemble either corporate or public entities: It stands apart in a class of its own. Governance processes and mechanisms in the university pervade it and are rarely located in a single institutional location. Several different actors in the university including staff, students, governors and external commentators play an intricate and interlinked part in developing these processes and mechanisms. There are complex trade-offs in each process and mechanism (Quyen, 2014; Wise et al., 2020; Shattock, 2004a, b; Taylor, 2013a, b; Buckland, 2004). At the same time university academic and non-academic performance itself is unusual. Research and teaching performance are separate and yet inter-related with there being trade-offs as well as conformance aspects within them. The university is also a financial entity and its sustainability is crucial.

The difficulties in defining the parameters of university governance and performance are two-fold. First, the usual board level and audit related governance common to the corporate and public sector are also present in universities too (Armstrong et al., 2005; Dahya et al., 2002; Cadbury, 1992; Bhagat & Black, 2002). However, such governances itself do not fully capture many other dimensions of this entity's governance challenge. These include crucial governance policies related to its academic and non-academic functions in which the institution often displays a wide range of discretionary decisions (Jongbloed et al., 2018; Gayle et al., 2003; Buckland, 2004; Gohari et al., 2019; Vukasovic, 2018). These policies are not solely framed by the board but are actually are the result of complex interactions across the institution. Therefore, to effectively identify university governance, a much wider set of parameters may be needed than what is currently common in the empirical literature (Ntim et al., 2017; Olson, 2000; Lokuwaduge, 2011; Lokuwaduge & Armstrong, 2015; Harris, 2014; Tarbert et al., 2008; Johnes & Virmani, 2019).

Second university performance itself is a composite of research, teaching and financial performance. However, research and teaching performance are hard to identify and measure by themselves (De Boer et al., 2015; Abubakar et al., 2018; Taylor, 2001; Ball & Wilkinson, 1994; Kells, 1992; Asif & Searcy, 2014). Researchers' performance can be measured from the perspective of the institution's ability to sponsor and win approval for new research ideas. It can also be measured from the quality of the university's published output. Finally, research performance can also be identified with the institution's ability to help research students complete their PhDs (Cave, 1997; Asif & Searcy, 2014; Jongbloed et al., 2018; Parker, 2012: 2011; Neuman & Guthrie, 2006; Pollitt, 1990; Linke, 1995; Dario et al., 2015). Each of these three different perspectives may only be partial and have to be combined to obtain a full picture of the university's research performance.

Similarly, teaching performance is even more difficult to assess because the student consumer of teaching services is an uninformed consumer of what is often classed as a "credence good". This makes student satisfaction levels a poor indicator of university teaching performance (Van Vught & Ziegele, 2012; Bonroy & Constantatos, 2008; Dulleck & Kerschbamer, 2006; Brown, 2015; Yorke, 2009a, b). Once again there are at least two

other measures that can be used here namely the students' graduate prospects/completion rates and independent teaching grant provider assessments of the institution. All these teaching performance measures may have to be combined to effectively define its parameters.

The difficulties in identifying university governance and performance parameters have propelled extant scholarship to measure both constructs in different ways. A large number of scholars have used the existing corporate template to identify the usual board and audit related governance antecedents and associate them with academic and non-academic performance of universities. Notable examples here include Harris (2014) and Olson (2002). Lokawaduge (2011) represents the first systematic attempt to study the two constructs and their associations in detail using a fine division between the institution research, teaching and financial performance. Once again, the author replicates the usual board level and audit related corporate governance templates in her analysis.

As such, the present thesis adopts a singular attempt to effectively identify and define the parameters of university governance and performance in UK HEI. It does so by carefully defining either construct, theorising each using seven selected theories and operationalising the two constructs using a wide range of carefully chosen parameters for each (See Chapter 5, table 4).

1.2.2 The Multi-dimensional Role of the University in the UK HE sector

A University is a unique multi-dimensional institution with myriad roles and functions that often conflict with each other and create unique and difficult trade-offs (Gayle et al., 2003; Shattock, 2010; Kim, 2008; Melville-Ross, 2010; Hordern, 2013). This is one major reason why a university has traditionally been a bastion of independence free from governmental or bureaucratic oversight. A range of scholars (See Toma, 2007; Parker, 2011; Trakman, 2008; Christensen, 2011) advocates that UK universities should retain these independent and special governance arrangements. Their argument is that academics alone have the experiential expertise to calibrate the difficult trade-offs that permeate every dimension of

a university's governance and performance and integrate them together. Many of their arguments reflect the multi-dimensional and complex nature of university governance and performance. At this stage therefore it seems fruitful to engage with these strands in this scholarship discourse and analyse them.

Authors such as Furedi (2002) and Kreysin (2002) ask a series of inter-related questions. For example they seek to resolve if governance structures and mechanisms should encourage universities to pursue 'knowledge without fear or favour' or instead create incentives for it to become an 'applied knowledge portal' content with developing incremental technical knowledge? Should governance emphasise the university's role as a 'skilling class' with the limited objective of developing the managers and leaders of the future? Or should these institutions be encouraged to embrace an holistic vision of themselves both as creators of radically new scientific knowledge as well as the related professional scientists? These questions are not easy to answer. Inter- and Intra-departmental governance, interdisciplinary coordination, teaching and research protocols and intra-organisational culture are all strongly implicated here. It is fairly obvious that complex trade-offs need to be fine-tuned at many levels of the university to resolve such dilemmas.

Others, such as Barnet (1994:22) and Apple (1988:120) have questioned if good governance will only result in the university becoming a 'metric driven academic factory' rather than a transformational institution'? This raises difficult questions for teaching and research priorities, fund raising strategies and assessment criteria. In relation to each of these governance aspects, a university has multiple aims and objectives and the above questions underline how the achievement of one may conflict with that of another.

Elsewhere, Collini (2012: 198) draws attention to the fact that universities are complex organisms fostering an extraordinary variety of intellectual, scientific and cultural activity. He avers that these **multiple performance** criteria cannot and should not be seen from the perspective of a single nation, generation or academic discipline. For instance, a university cannot narrowly focus on the achievement of just national competitiveness, the needs of

current generations of knowledge users, or the requirements of one subject. It has to achieve an incredible balance between conserving, understanding, extending and handing on to subsequent generations the intellectual scientific and cultural heritage of mankind. Such a balance implies that a university must necessarily be multi-dimensional in its governance approach and strategy (Collini, 2012; Furedi, 2002; Christensen, 2011).

The university's fundamental trade-off between **Teaching and Research** further illustrates this multi-dimensional nature. Both are core functions of a University. Doing both well is difficult although there is much evidence (RAE results, 1996-2008; League tables of Times, Guardian, Sunday Times, Independence League; cited by Shattock, 2010:13-15) that each complementarily supports the other in a virtuous cycle especially within the better performing university. For the average university, however, time, money and skilled human resources are limited. It is quite plausible that a university that focuses on world-class research ends up compromising on teaching efficiency and *vice versa*. This explains why improving the governance structures of a university from just the teaching perspective by designing teaching protocols that take up much of the time and effort of the faculty might reduce the research quality of the institution (Shattock, 2013a; Gayle et al., 2003; Foskett, 2010). More significantly many universities that are considered research intensive tend to neglect teaching, a fact that has been stressed by surveys undertaken in the UK by the HEA in 2009 (HEA, 2009; Shattock, 2013a: 111). The trade-off between research and teaching is, therefore, another illustration of the multi-dimensional nature of university governance and performance. An holistic combined view of both functions is essential in the governance of the institution, and yet this delicate calibration is challenging to apply.

The classic conflict between **basic and applied research** illustrates yet another aspect of the multi-dimensionality of university governance. Basic fundamental Science and Arts research is difficult, expensive, and time consuming; such research is difficult to finance or justify economically (Collini, 2012; Shattock, 2013). On the other hand, applied research is commercially viable, finding easy sponsors among the myriad corporate and charitable foundations. A university could very easily ignore its primary responsibility to expand the realms of fundamental knowledge, preferring to create incremental technological

knowledge that is commercially viable. In fact, this is exactly what scholars (Collini, 2012; Moriarity, 2011) claim the UK university funding and governance reform is currently doing. This would not show up in the short run but may harm the competitiveness of universities and, in turn, the country in the long run. Making decisions on the *inter se* priority between applied and basic research is not easy. It would require a level of domain knowledge and expertise that is often simply unavailable outside academia. Clearly, establishing effective governance protocols for research would need to take account of these types of complexities.

A rapidly emerging recent discourse in European university governance (Vukasovic et al., 2018; Hooghe & Marx, 2003; Piattoni, 2010; Braun, 2008; Chou & Gornitzka, 2014; Chou et al., 2017; Eitken, 2015; Peters, 2015) focuses on the multi-level, multi-actor and multi-issue dimensions of such governance. The three governance aspects highlighted in this discourse are highly relevant to the discussion here. They expand on many of the concerns. For instance, there is the *multi-level* aspect, implying the many different levels (national, regional, state, local, top and middle) of university governance and its regulation. Then there is the *multi-actor* aspect involving different state and non-state stakeholders including student/parent bodies, research/teaching funding councils and quality assessment agencies in this sector. Finally, there is the *multi-issue aspect*, encompassing a range of complex trade-offs including those between research and teaching, basic and applied research, different generations of higher education students, and many others as discussed above. Clearly each of these aspects is yet another confirmation of the multi-dimensional role of university governance.

Elsewhere Jongbloed et al (2018) identify an emerging perspective in **transparency related aspects of university governance**. The authors show how information disclosure about university learning and research outcomes is becoming more important. This importance stems from the growing realisation that higher education can be inferred to be either an ‘experience good’, i.e., one whose quality consumers can only judge after consuming it, or a ‘credence good’, i.e., one whose quality is largely a matter of trust and may never be truly assessable (Bonroy & Constantatos, 2008; Dulleck & Kerschbamer,

2006; Van Vught et al., 2012). This makes the quality assurance of higher education multi-layered complex and multi-dimensional. A student might never know the true value of this education yet there is even more need here for full information disclosure, credence evaluation and independent rating of the university to enable him or her to make an informed choice. Therefore, there is a rapidly growing body of literature (Stoker, 2006; Provan & Kenis, 2007; Benington & Moore, 2011; Jongbloed et al., 2018) that emphasises networked governance structures and mechanisms in the higher education sector where a central government authority intermeshes with lateral and independent specialised agencies to regulate it. This complex networked external governance in the higher education sector is nevertheless a primary reflection of its multi-dimensional nature.

The above discussion makes clear the fact that universities, both in general and in the UK, are expected to perform at different levels and in different dimensions. There are complex trade-offs inherent in many of these multiple governance and performance aspects. To achieve optimal multi-dimensional performance, universities must necessarily design internal governance mechanisms at different levels and in different ways. Therefore, empirical university governance research needs to study the university in relation to these different dimensions.

1.2.3 University Governance and Performance: the need for new insights

Universities are multi-dimensional and complex institutions. They need to be governed across many inter-related dimensions and their performance needs to be assessed holistically combining many different aspects (Shattock, 2010: 105). Yet there is a dearth of analytical studies that examine these different dimensions and levels of governance within a university or their impacts on performance. Worryingly, despite the several recent changes including the institution of a super-regulator in the OFS, there is growing evidence of empirically unsubstantiated policy and regulatory action in the higher education sector (Ntim et al., 2017; Bradshaw & Fredette, 2009; Helms & Price, 2005). Universities are still being viewed as ‘knowledge factories’ charged with producing voluminous research and graduating large student populations with small regard for quality or long-term outcomes (Shattock, 1998; Parker, 2011; Middlehurst, 2013; Parry, 2013). Despite growing public

accountability pressures and an increasing worry about the quality of higher education in the UK (Frankel, 2011; Taylor-Gooby & Staker, 2011; DOE, 2018) the Government has continued to focus on greater university coverage of the student population by expanding existing universities, licensing new ones and remaining obsessed with just creating a level playing field for entry into the sector (DOE, 2017; 2018).

Simultaneously, given the limits to government finances, universities have borne the brunt of almost every public austerity initiative. They have been left to find means to finance themselves through private tuition fees and other commercial and quasi-commercial arrangements. This has led to declining public university funding, falling research and teaching quality, expanding student populations, growing private/corporate involvement in fundraising, and growing numbers of “independent” watchdogs and regulators aimed at enforcing a modicum of quality assurance in the sector (Ntim et al., 2017; Brown, 2011a; Foskett, 2010; Hemsley-Brown, 2011). A raft of reform measures in the UK has been driven through within a short span of two decades (Robbins, 1963; Jarratt, 1985; ERA, 1988; FHEA, 1992; Nolan, 1995; 1996; Dearing, 1997; THEA, 1998; Lambert, 2003; HEA, 2004; Browne, 2010; DOE, 2016, 2017, 2018) without any empirical evidence that these actually work. Extensive bureaucracies with wide ranging powers to certify check and make policy recommendations have been set up, each with its own separate agenda and goals.

Although the recent move to simplify the regulatory landscape by amalgamating several institutions into the OFS and the UKRI seems to be a step in the right direction, yet scholars have problematised these moves. Many of them have located these initiatives within a broader market-based reform initiative in the UK intended to commercialise and professionalise the university and introduce a quasi-market for both universities and students. This has naturally led to a large body of critical literature (Mintzberg & Rose, 2003; Minor, 2003; Campbell, 2003; Meyer, 2002; Sora, 2001; Collini, 2005; Parker, 2011; McGettigan, 2013; Ntim et al., 2017; Jongbloed et al., 2018) questioning the implications of these reforms for the complex multi-dimensional aspects of university governance and performance.

1.2.4 Overall Research Implications

University governance and performance and the likely multi-dimensional links between them have been under-researched in extant research (Lamm, 2003; Larner & Le Heron, 2005; Ntim et al., 2017). Given a university's unique nature, neither its governance nor its performance can be easily assessed, monitored, reformed or recalibrated. At the same time each of the myriad aspects and dimensions of university governance potentially affect this entity's multi-dimensional performance. Studying these complex inter-linkages and trade-offs in a rigorous manner is essential. The universities, their varied stakeholders and multifarious regulators need such empirical research. Without this, neither will the task of setting the right governance/performance standards for the sector be accomplished, nor will such standards be monitored or evaluated effectively (Salter & Tapper, 2000).

This explains the fundamental research motivation underlying this research project. It directly leads to the following principal research question.

1.3 Research Question and Objectives

What are the missing multiple dimensions of university governance in the UK? How does multi-dimensional university governance impact upon its performance?

These research questions encapsulate at least five different yet inter-related research objectives as listed below:

1. To identify and uncover missing dimensions of university governance in the UK.
2. To evaluate how all dimensions of university governance impact on its research, teaching and financial performance.
3. To critically unpack the trade-offs and interrelationships within each dimension of university governance.
4. To analyse how the governance trade-offs and interrelationships identified in objective 3 impact upon a university's research, teaching and financial performance.

5. To assess the role played by external governance regulators within the UK HEI upon university governance.

1.4 Research Scope and Methodology

This research provides a rigorous evaluation of a range of quantitative governance and performance metrics in the higher education sector of the UK. The use of these metrics is primarily in the shape of a longitudinal dataset covering ten years of university functioning. It is only through such a dataset that the governance-performance relationship may be explored across time and entity simultaneously. This is vital due to the very nature of such inter-relationships that change across universities as well as across years.

The scope of the empirical data used in the thesis is derived from a range of secondary sources such as the HESA and university financial/annual reports. It must be stressed that many key metrics have been framed out of the extensive policy-based changes implemented in the sector across the period 2005 to 2015. This is why the thesis chose this decade as the most appropriate for the analysis.

The overall geographical scope of the project encompasses all 132 universities licensed to operate in the UK (See Appendix 9). A very large list of firm-year governance and performance variables is targeted in the project (See Chapter 5, Tables 4 and table 5). These include standard board composition governance variables such as board size, board independence, and board diversity. They also include audit related ones such as the use of a BIG4 auditor firm or the size of the internal audit committee. However, the research also evaluates a range of multi-dimensional governance variables including entry standards, student-staff ratios, pedagogical orientations in student body diversity, research/teaching/gender staff level diversities, and unique asset revenue structures reflected in endowment and tuition fee dependences. In addition, university performance, both academic and non-academic, is subsumed in the study. Within academic performance a range of research and teaching metrics including research quality, research grants,

teaching grants, student satisfaction, graduate prospects, completion rates, good honours proportions are used, while non-academic performance is measured through the asset turnovers of universities. The larger list of governance and performance variables used, it is hoped, will decipher the many dimensions of these constructs as well as the complexities and trade-offs inherent in them. From a methodological perspective it will also enable a thorough parametrisation of the governance performance linkage in the chosen UK HEI sample.

The thesis adopts a rigorous methodology (see Chapter 4). To uncover the many dimensions of the academic performance of a university, it begins with a factor analysis. Research and teaching performance are each measured by a composite of individual variables and index variables. The indices are based on the factor analysis while the individual research and teaching measures selected are those with a potential for capturing unique dimensions of either performance (see Chapter 5, Tables 7 and 10). In the independent governance variables, the research begins with a descriptive uni/bivariate analysis and cross-correlation analysis of all the collated variables (see Section 5.2.1). A battery of tests is implemented to identify heteroskedasticity, autocorrelation, abnormalities in distributions, multicollinearity and endogeneity (see Appendix, 2, 3, 4, 5 and 6). This is done to carefully examine all peculiarities of the dataset including errors, assumptions and biases. Theoretical indications are then used to identify the most appropriate set of independent (governance) variables that span the research gap of the thesis. This results in three models in research performance, two models in teaching performance, and one model in financial performance, respectively. Each model is first estimated in GLS fixed-effects. This is primarily done to adjust for the abnormalities evident in most variables in the dataset. However, robustly a set of additional regressions are estimated using GLS Maximum Likelihood, GLS Auto Regression, and two instrumental regressions the 2-stage least squares (2SLS) and the 2-stage Generalised Method of Moments (2SGMM) (Sections 6.1.1.2, 6.1.2.2, 6.1.3.2, 6.2.1.2, 6.2.2.2, and 6.3.2). To show the biases inherent in simple estimations, a panel OLS regression is also implemented and shown for reference (see Appendix 7).

Overall, it is hoped that the rich and expanded data set and robust set of methods employed will enable the thesis to answer its main research objectives outlined earlier.

1.5 Novel Research Contribution

The thesis intends to contribute to the body of knowledge in university governance in the UK in at least six distinct ways. First and foremost, it seeks to depart from the extant emphasis on corporate style governance in Higher Education. A central contention of the thesis is that universities are unique knowledge entities that are significantly different from firms. Although they deliver a service the very process of education delivery is unlike any other service delivery in the economy. Research and teaching are highly interactive complex services. The first creates original knowledge while the second transmits and applies it: it also feeds into the first. This knowledge creation and dissemination loop is what helps these higher education institutions to expand and enrich societal understandings in different subject domains. Governance and performance at this institution cannot be like ordinary economic institutions such as firms. Therefore the thesis aims to expand the contours of debate in higher education towards a more holistic conception of the university.

Second, it seeks to construct and define university governance and performance in the best possible way so that the full scope of parameters underlying each are fully captured. This thesis also aims to move away from an over reliance on corporate-centric definitions. Instead it combines a range of definitions to craft an holistic one here. It is hoped that the very creation of a non-corporate definition of university governance and performance would expand the lexicon of the debate and enable greater clarity for the sector as a whole.

Third, the research intends to operationalise a multi-theoretical framework to study UK university governance and performance. It is anticipated that this conjoint use of different theoretical perspectives will allow a deeper and richer uncovering of multi-dimensional university governance and performance. The four core theories and the three ancillary ones used should expand the field of investigation and act as a fundamental template for all future theoretical exploration. At another level, it is anticipated that many new theoretical

indications would become available through this. These indications would prove invaluable in framing a range of different research trajectories in the future.

Fourth, the research targets an institution-wide approach in the higher education governance performance debate. Instead of focusing on just the university board-level or audit-based governance antecedents, it intends to dig deeper into this unique knowledge institution. To do so it uses a much wider range of variables in a rich panel dataset of UK HEIs covering a recent full decade of governance performance metrics (i.e., 2005-2015). It is expected that this will help the thesis uncover not only many hidden dimensions of university governance but also the complex nature of interrelationships between such governance and the institution's performance. In that sense it should provide a rich and robust source of empirical proof for what has worked and what has not in the UK HEI sector. A fuller field level picture is intended here that could both corroborate or contradict normative, qualitative and argumentative voices in extant literatures.

Fifth, the research's longitudinal aspect has another intention. Governance and performance relationships in a university are blurred. Where governance ends and performance begins is difficult to identify. They are both processes as well as outcomes. By its use of many new governance metrics of UK universities recently made available, the study aims to unpack these process-like characteristics and demonstrate a set of complex trade-offs that exist here. It is hoped that this will detail the true significance and enormity of the challenge facing university governors.

Finally, the robust and rigorous analysis intended by the research is expected to inform regulatory reform in UK HEIs with hitherto missing empirical elements. By evaluating currently prescribed statutes/mandates in the country within the governance performance data of the universities, it expects to add credible empirical evidence to substantiate regulatory reform. It is hoped that a sensible and appropriate blueprint for effective UK university regulation will thus emerge here.

1.6 Conclusions

This introductory chapter has presented and contextualised the core problem of university governance and performance. It begins with Part one, which is a detailed background and context for the study. In the main this part discusses the rich and varied historical background of the higher education landscape in the UK. The features and differentiated patterns of universities in the UK and how they have changed over time are the key focus here. The chapter then presents the changing contours of the regulatory landscape in the country showing the complexities embedded in them. The next section of the chapter discusses the main motivations underlying the research. The section divides into four main parts. Part one articulates the parameters of university governance and performance. This then leads to a rich discussion of the multi-dimensional role of the university in UK higher education in Part two. From this discussion, Part Three pulls together themes that reflect why there is a need for new insights in associating university governance and performance. Having justified this need for new insights part four draws them into the overall research implications relevant to this research.

Drawing on the last two parts of the previous section, the third section of the chapter formulates the central research question for the thesis. It then fleshes out this question into five research objectives that constitute its core. The section then moves to outline the unique research methodology sample and scope intended to unravel the complex multi-dimensional association between university governance and performance in UK HEIs.

The final section of this introduction presents the six important novel contributions targeted by the thesis. It gives a bird's eye view of what the reader can expect in terms of the addition to the body of knowledge in this domain.

2. Chapter Two: Literature Review

2.1 Overview

This Literature review is structured into two main parts presented in Chapters 2 and 3 respectively. Part one presented in this chapter is the theoretical literature review. It can broadly be divided into two segments. The first segment comprising Sections 2.2 and 2.3 is definitional in its scope, while the second segment in Section 2.4 is a multi-theoretical framework underpinning university governance and performance.

The first section starts by critically searching extant definitions of university governance and performance with a view to framing the most optimal definition of both constructs. Without such definitional clarity it would be impossible to shed light on the multiple missing dimensions of university governance and performance. Linking governance with performance through well-defined parameters would also prove intractable if such governance and performance themselves were ill-defined. The second section analyses the multi-theoretical framework underpinning both constructs.

Part two is presented in Chapter 3 and establishes the empirical research gap motivating the thesis. It then develops a range of inter-linked hypotheses evaluating the many aspects of the research question. Read jointly, these two chapters theoretically and empirically define this multi-dimensional investigation of the links between university governance and performance.

This chapter defines university governance and performance and then critically evaluates a multi-theoretical framework underpinning the links between them. Sections 2.2 and 2.3 review the extant definitions of university governance and university performance respectively. Each section then frames an operational definition for each construct that is most appropriate to the objectives of this thesis. Section 2.4 first justifies why a multi-theoretical framework composed of seven different theories is essential for any detailed study of university governance and performance. It then critically evaluates each of these seven different theories that arguably encompass the theoretical underpinning for this research. The chapter then concludes in Section 2.5 with the contours of a full-fledged theoretical framework to evaluate the research question of the thesis.

2.2 University Governance

2.2.1. Definitions of University Governance

Defining university governance is fraught with contradictions and pluralities. Governance of such a multi-dimensional entity such as a university works at different levels of its hierarchy, is constituted by complex combinations of structures/policies and has both internal as well as external aspects. Ironically such multi-level multi-tier governance has not really been adequately or comprehensively defined in the extant literature. Scholars have assumed that either corporate governance or public sector governance literature will provide definitions that apply. This is a fallacy. Universities are very different from either corporate or public firms and transcend either entity due to their unique knowledge creation and dissemination function. In what follows this is shown explicitly. Many such narrow definitions from both discourses are compared and analysed before an optimal operational definition is framed. This carefully crafted optimal definition of university governance helps to better articulate both the missing and multiple dimensions of the theoretical construct and its, therefore, a logical foundation for all the theoretical analysis that follows..

2.2.1.1 The Corporate Governance-Based Paradigm

Universities are unique entities but they still provide a service to the students who populate them. In that they are much like corporate service providers, and so the logical place to start the search for a definition of university governance must begin with corporate governance literature. This is why many HEI scholars define university governance on templates developed in the corporate sector.

Armstrong, Jia & Tonkidis, (2005), Spiller (2002), Dahya et al. (2002), Williamson, (2005) and Shore and Wright (2004) collectively argue that University Governance like Corporate governance can be defined as “the organizational structures and processes for decision-making, accountability, control and behavior at the top of its organizational pyramid”. Clearly such a definition ignores not only the several ways in which a university decides its governance structures and processes, but also misses the many dimensions in which university governance is reflected. Decision-making, accountability, and control within such an institution are not always displayed at its top, and are often collegial and decentralised. The university board is

not the sole focus of governance processes unlike its corporate counterpart. In every committee or sub-committee on academic affairs including salary structures, audit aspects, marking schemes, subject syllabi, and staff contracts, governance decisions are taken severally and jointly. Financial and administrative governance likewise pervades the institution as students and staff interact to make the university campus a fulfilling and creative learning environment. This explains why Jongbloed et al. (2018) and others argue that unlike the corporate firm, governance in a university is multi-dimensional, multi-actor and multi-issue (Jongbloed et al., 2018). Therefore it is very definitely not governed solely from the top.

Similarly, Morin and Jarrell (2001), Bhagat and Black (2002), Kahan and Rock (2003), Alawattage and Wickramasinghe (2004), Babic (2003), and Chowdary (2003) jointly aver that university governance “is the framework that controls and safeguards the interests of the relevant stakeholders of this institution”. However, university governance cannot just control and safeguard the interests of its “relevant stakeholders”. There are several other multiple actors and issues with which universities are inevitably linked. For example, while deciding teaching and research governance the interests of future generations of stakeholders might need to be accounted for. As usual there are complex trade-offs here; between the interests of current students and future students, current instructors and future instructors, current researchers and future researchers and so on. Governance might similarly have to trade-off commercially viable applied research against much needed fundamental research. Different constituents of society have multifarious expectations from a university and it has an important function to establish a sustainable balance against these many competing stakeholder claims.

Cadbury (1992:15) and OECD’s (2004) simple yet effective definition of corporate governance as “the system by which companies are directed and controlled” is entirely inapplicable to universities. A university’s multi-dimensionality implies that there can never be a single unitary governance system exerted from the top of the organisational pyramid by which it may be directed or controlled. Research and teaching, the core functions of a university, need direction and control in some aspects from board level but in many other aspects independently at the departmental or sub-departmental level. Such governance is also subject to a range of complex trade-offs that go far beyond the confines of neatly definable operational parameters so characteristic of the governance of the corporate firm. For instance, Quality assurance concerns permeate the governance of teaching and research in a university in multi-dimensional ways. These are not always directed or measured from the top or even in a given

standardised way. In contrast firms' quality assurance is much simpler and easier to operationalise.

It is therefore evident that the single unitary system of firm governance espoused by Cadbury and others is a complete misfit in university governance. Yet it is surprising to find a fairly large set of university governance scholars (Armstrong, Jia & Tonkidis, 2005; Dahya et al., 2002; Bhagat & Black, 2002; Kahan & Rock, 2003) subscribing to definitions derived from the corporate governance paradigm. This is highly unfortunate and is arguably the artifact of the growing prominence of right-of-centre managerial and utilitarian discourses in university literature.

2.2.1.2 The Public Sector Governance Paradigm

Even when privately run, a university is often based on a public purpose. Like public sector firms, a university is also entrusted with public funds and it too is required to demonstrate its competence to balance the competing governance needs of widely disparate knowledge function stakeholders such as staff, students, parents, researchers, firms and the Government. This is why some strands of university governance scholarship (Nelson, 2003b; Fredrickson & Smith, 2003; Edwards, 2000; Fielden, 2007; Coaldrake Stedman & Little, 2003, Dixon & Coy, 2007; Shattock, 2004a, b; Bennett, 2002) have based their definitions of public sector governance templates. This also explains why scholars like Buckland (2004) contend that university-governing bodies should shoulder their top policy level responsibilities instead of representing and advocating the narrow interests of their diverse stakeholders. After all they are like the public sector firm and must first and foremost earn an adequate return for the taxpayer who has entrusted them with public funds. However, such a stand once again conflicts with the very idea of a multi-dimensional governance definition for a university. A university is clearly unlike a public firm and has responsibilities to a much larger, more diverse set of societal constituents. It does not merely exist to earn a return on invested public funds. Even a public sector firm's expanded notion of governance falls short of encompassing this institution's multi-dimensional governance.

This is why it is difficult to accept Nelson's (2004b; 2004) view that Vice-Chancellors' should be referred to as "CEOs of public entities" or Dixon & Coy's (2007) opinion that they must exert managerial power and be accountable to the public exchequer. The VC's role is much

broader and wider, and they need to deliver multi-dimensional governance and performance. Improved definitions within these strands see university governance as:

“the set of responsibilities and practices, policies and procedures exercised by an agency’s executive to provide strategic direction, ensure objectives are achieved, manage risks and use resources responsibly and with accountability” (ANAO, 2006: 6; ASX, 2007: 3).

There is still no mention, however, of the range of different stakeholders, their differing concerns, research and teaching functions or multi-dimensional trade-offs here.

2.2.1.3 A definition that is partially encompassing

Gayle et al. (2003: 1-10) arguably present the first contours of an expanded definition of university governance. The authors opine:

“University Governance refers to the structure and process of authoritative decision making across issues that are significant for external as well as internal stakeholders within a university. Effective University Governance provides institutional purpose clarifies strategic direction identifies priorities and exerts sufficient control to manage outcomes. The attitudes and values of individual leaders together with the underlying organizational culture are at least as important for governance as institutional structure.”

This definition effectively engages with the multi-dimensional nature of the university. For example the fact that it refers to how university governance deals with external as well as internal stakeholders recognises the multiple stakeholders in this institution and the scope for potential conflict and trade-offs between them (Gordon et al., 2002; Coy and Dixon, 2004). Similarly it rightly underlines that university governance clarifies strategic direction and identifies priorities. Such emphases presages and subsumes within itself the likelihood that university governors will most likely debate conflicting strategies and disagree on the ranking of different organisational priorities (Donaldson & Preston, 1995; Michelon & Parbonetti, 2012). Finally, a unique contribution of this definition is that it implicates organisational culture as an important determinant of university governance. The very nature of a university as an institution of knowledge creation and dissemination makes it vitally dependent on the attitudes and values fostered by its organisational culture. To illustrate universities imbued with a culture that encourages “knowledge for its own sake” and prefers “students who challenge the status quo” will potentially govern themselves in very different ways from counterparts that

are more focused on “contributions that are directly relevant and useful”. There are those like Wilmott (1993) and Trowler (2008: 114) who patently argue that universities should be like the former, i.e., be dialogical rather than mono-cultural. Strands in the literature on socio-cultural approaches to learning, teaching and research in universities (Ashwin, 2008; Trowler, 2008:19) often decry how the current psychological approaches completely neglect institutional cultural context. Entwistle (2007) suggests that student learning outcomes, teaching protocols and research routines at universities are critically dependent on how syllabi are defined and assessed. These are governance policies rooted in the organisational culture and so must not be ignored. Similarly, universities with a multi-ethnic orientation might view internal and external governance processes in different ways. Overall, by placing organisational culture in the centre of the debate on university governance, this definition correctly extends its breadth and scope.

2.2.1.4 Operational definition of Multi-dimensional University Governance

Despite these ameliorating features, the definition still falls short on at least three counts in terms of the research objectives of this thesis. First and foremost it fails to account for the many dimensions of governance structure processes and mechanisms within a university. As argued earlier, the university as an institution is unique. Its larger societal purpose and function creates needs for multi-dimensional governance that pervades this institution, unlike a corporate firm. Complex trade-offs are inherent in such governance and need to be explicitly accounted for in any definition. Second the definition does not even refer to teaching and research. These are the major functions of a university and have inter-related dimensions that are complex and synergistic: University Governance has to be defined with specific reference to these. Finally the definition falls significantly short when it suggests that Universities only need “sufficient control to manage outcomes”. This is not true since much empirical literature (Hordern, 2013; Parry, 2013; Shattock, 2010; Middlehurst, 2013; Rowlands, 2013) has already shown how universities have shown declining levels of governance and performance precisely because they have focused on just adequate or sufficient control rather than studied and optimal control. Given their multi-dimensional nature universities are more in need of studied and optimal control. For these reasons three adaptations are made to Gayle, et al.’s (2003) definition as follows:

*“University Governance refers to the structure and process of authoritative decision making across both issues that are significant for its **diverse** external/internal stakeholders **as well as***

in multiple dimensions that exhibit complex inter-related trade-offs. University Governance provides institutional purpose, clarifies strategic direction and identifies teaching/research/administrative priorities. In all of these functions it exerts studied optimal and effective control at different levels within the organization. The attitudes and values of a university's leaders and its organizational culture are importantly implicated in its governance."

This revised and adapted definition is operationalised in this thesis.

2.3 University Performance

2.3.1 Definition of University Performance

Performance in a tertiary education institution like a university is contentious. Scholars often criticise the use of any performance indicator in a university; The argument made is that universities perform in so many different dimensions for their diverse sets of stakeholders (Braun, 2008; Piattoni, 2010) that measuring these in an integrated way is almost impossible. In this vein, Linke (1995) suggests that performance indicators can rarely if ever can reflect the "true purpose of higher education", and are therefore are irrelevant. Similarly, Pollitt (1990) and Neumann and Guthrie (2006) aver that the considerable confusion that often exists over even the definitions of different organisational performance indicators makes their usefulness in universities doubtful. Cave et al. (1997) argue that the inherent complexity of university performance makes the use of surrogate proxy variables here inevitable. The true performance of the institution consequently tends to get distorted in the varying interpretations of these proxies. Despite these fundamental objections, defining the performance of a university, in all its complexities and trade-offs is important. Such a vital societal institution cannot be allowed to remain subjectively determined. The following section critically evaluates a range of proposed definitions of university performance from the extant literature. From this, and a review of historical developments in UK higher education a relevant definition of multi-dimensional university performance is forged here.

Some strands of the literature forward narrow definitions of university performance. Worthington and Lee (2005) aver that the university is primarily an institution that generates and transmits original knowledge. It is in these two core functions i.e. one of generating new knowledge (which is research) and the other of transmitting it (which is teaching), that it must

demonstrate originality and innovation. Performance here must therefore be solely measured in terms of teaching and research innovation. Such innovation requires the university to invest significant time, effort, and resources into these functions. Abbott and Doucouliagos (2003b) and Warning (2007) even show how high-performance universities differ significantly from their peers precisely on these metrics. Therefore, this strand suggests that university performance must necessarily focus entirely on a large set of research and teaching related metrics (Flegg et al., 2004; Askiran, 2001; Izadi et al., 2002). However, this restricted definition of university performance clearly fails to capture the many complexities and dimensions of a university's performance. For example, although teaching and research constitute the primary functions of a university there are still a range of other functions such as student recruitment, staff training, career placement and so on that are nevertheless extremely important. Similarly, administrative and financial support functions, without which teaching and research will not get delivered cannot be ignored as they play a vital role in the delivery of these functions.

Therefore, a large group of scholars agrees that a university delivers a range of different services to its widely disparate stakeholders. They underline that plural definitions of university performance should be used. These must be directly linked to the entire range of output levels of the many different services the institution provides to different salient stakeholders. A few such definitions are highlighted below. Crowther (1996) suggests that different dimensions of university performance must each be defined with respect to some relevant stakeholder grouping. For students, for example, university performance would be reflected in graduation rates, student satisfaction scores, job placement rates and starting salary levels. In research, however, output, its quality, number of citations and ability to attract research funding is what would constitute performance. Marketing performance would have to measure the university's ability to attract students, researchers, highly skilled lecturers and professors, while administrative performance would have to assess the value-for-money of staff and facilities employed in many different parts of the institution. Therefore, defining university performance is decidedly complicated from such a multiple stakeholder perspective.

To add to this complexity, Vidovich (2002), Currie and Vidovich (2000) and Vidovich and Slee (2001) raise the intractable question of quality. The authors argue that any appropriate definition of university performance must necessarily capture the quality of the multi-dimensional services that the institution provides. The authors convincingly show that the

quality of the myriad university performance dimensions exhibit “chameleon like” characteristics changing in synch with the background environment.

A large measure of personal subjectivity and reliance on indirect symbolic proxies such as prestige (McGettigan, 2013: 60) is inevitable when assessing the quality of a university’s performance. Warning (2007) suggests that much of the intractability of resolving questions of quality while defining university performance stem from the fact that a large part of the institution’s output tends to be tacit knowledge. Such knowledge is intangible making it both difficult to quantify and measure. This argument clearly resonates within the latest European university scholarship, referred to in the previous chapter (Bonroy & Constantatos, 2008; Dulleck & Kerschbamer, 2006; van Vught et al., 2012). These scholars contend that universities provide “experience” or “credence” goods that are difficult to rate before during or often even after their consumption. The so-called objective measures of teaching quality at a university often fail to capture what students have actually obtained from a course. Mcgettigan (2013: 59) convincingly shows how such measures of university service quality have to be based on “inputs” rather than “ouputs”. The selectivity of the institution/course, the type of students who attend it, the money spent per student and so on are used to determine intra-university differences in quality.

Laband and Lentz (2004) raise the related issue that research and teaching performance are processes rather than outcomes. Teaching and learning are painful and intricate processes for both the teacher and the student. They teach and learn from each other in iterative cycles. It remains extremely difficult to quantify this process or ever compare it across peer groups. Similarly research is an open-ended, highly creative and innovative process that does not fit within the straight jackets of measurement. How does one ever fully assess the quality of research output objectively, or even compare it amongst colleagues? This is why relevant proxies of process measurements have to be incorporated into any sensible definition of teaching or research performance; this remains a considerable challenge.

At another level, process measurement in university performance may actually conflate with university governance. For example, while measuring teaching processes, such as part-time to full-time staff, and ranking them across universities, it would be important to consider that this ratio is also discretionary and does indeed also reflect intra-university governance priorities. Similarly, staff to student ratio at a university is a clear indicator of the quality of teaching and

research processes in a university. At the same time, however, it is also a key governance variable that is often targeted and calibrated by a university's governors. This perhaps explains why Abbott and Doucouliagos (2003a) and Rutherford (1983) contend that performance indicators at universities must be derived from within the institution and not imposed from without.

Overall, it is evident that there is no easy consensus within the literature about what constitutes university performance and how it ought to be measured. Yet within this unsettled context, UK regulators and policy framers have pushed a reform agenda that has recently taken a highly metricised view of university performance. This is briefly reviewed in the next sub-section.

2.3.1.1 Historical developments in defining UK university performance

Historically the UK policymakers began by defining university performance in terms of ideal stereotypes derived from the insular elitist tradition of universities, as noted earlier. Pre- 1980s, the traditional perspective was that universities were homogenous and should necessarily operate in the Oxbridge style of academic mystique and opacity. Any performance differences were an aberration and these should be actively stamped out through affirmative regulatory action (UGC, 1975; Robins, 1963; Shattock, 2002, 2010). This approach was bound to fail and it did so, spectacularly, when departmental and other funders of university research started making the case for funding only a small group of high performance institutions (RAE, 1985-86; Shattock, 1994). Gradually under the influence of the US Higher Education sector and the fast emerging neo-liberal paradigms the idea that it was vital to distinguish the performing universities from the non-performing ones gained currency (DEFS, 2003; Shattock, 2001: 2010).

A range of teaching and research related metrics were hurriedly designed and universities coerced to report on them. An overactive higher education press took this up and a range of performance league tables started being provided by so-called independent analysts like the Times Good Universities guide. These lists were and are intended for the student who is now increasingly being considered a consumer with specific rights. However, even within these detailed lists of performance metrics there is evidence that university performance is not fully defined or categorised in its complex and comprehensive shape (Kelly, 2002; Financial Times,

1999; Shattock, 2010). Although countries like Australia have developed monitoring and reporting requirements for universities across financial, non-financial, academic and non-academic performances (Guthrie and Neumann, 2006; McMillan and Chan, 2006), these remain somewhat superficial. There is still a dearth of metrics that enable critical analysis of the complexities/trade-offs that characterise these performances, the potential endogenous relationships between them and the university's governances and the problems of quality assurance or processes that permeate them (Ntim et al., 2017; Brown & Carasso, 2013; Brown, 2004).

It is within this historical policy context that definitions of university performance such as “the output of the university relative to some predetermined benchmarks linked to its stated objectives” Nelson (2003a, 2004) are singularly objectionable. There is no mention of the range, multi-dimensionality or complexity of the myriad outputs of the university here. Elsewhere even the definitions of Rashid, Islam & Anderson (2008), Warning (2007) and Worthington and Lee (2005), who jointly integrate university performance to be “the total amount of utility or benefits derived from its functioning by its diverse stakeholders” remain unconvincing. The complexity of trade-offs and competing priorities deeply embedded in every aspect of the universities' performance in the UK (Neumann & Guthrie, 2006; Worthington & Lee, 2008) are overlooked here. There is a clear need to calibrate and forge a definition of university performance that engages with its breadth, diversity and complexity.

2.3.1.2 A suitable operational definition of university performance

In order to erect a suitably comprehensive definition of university performance it is important to remember that a university performs both academically and non-academically. Within the academic function a clear division can be made between teaching and research. Similarly in the non-academic function financial and non-financial performances can be clearly distinguished. These divisions are shown in the figure 2 below.

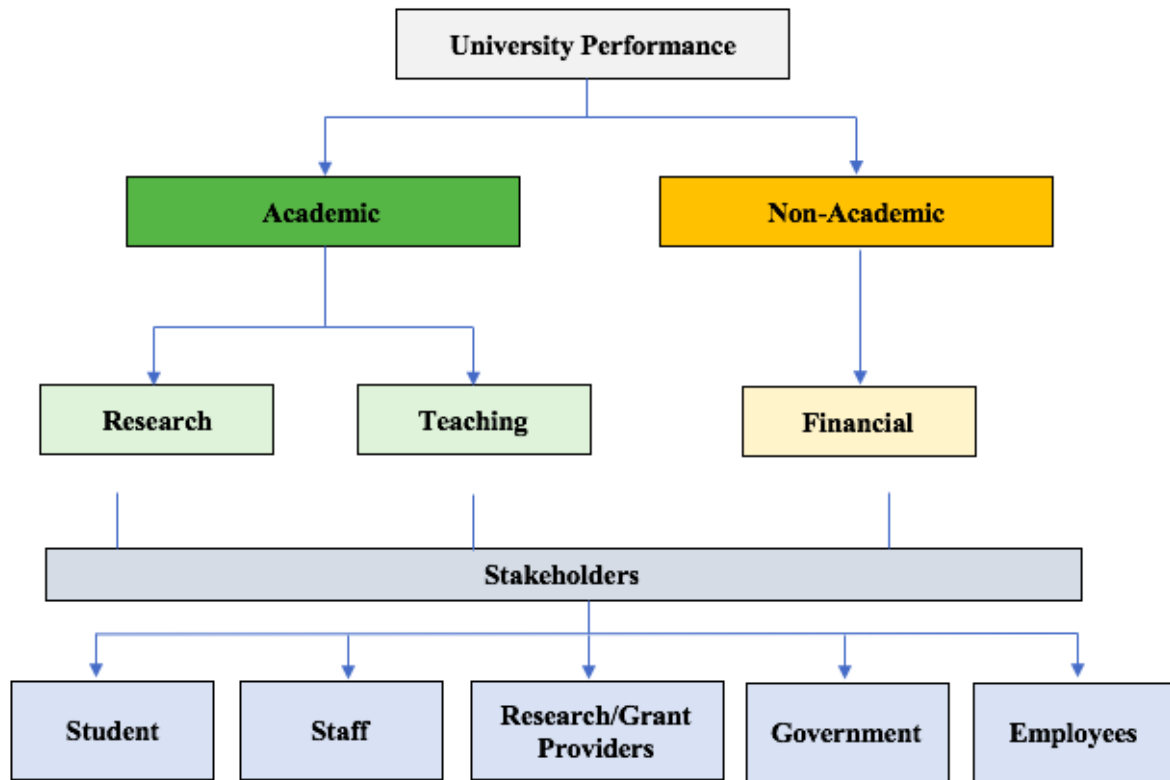


Figure 2: University Performance Divisions

Any comprehensive definition of university performance should partake of these broad divisions: combine and contrast different types of performances; engage with the critical trade-offs between these performances and resolve the vexed problems of quality assurances and process like characteristics of such performances. It should also take account of the fact that its diverse stakeholders perceive each of the different performances of a university in conflicting ways. The different interpretations of university performance by students, staff, research sponsors, employers and Government are graphically illustrated in figure 2 above. Any definition should necessarily allow for the rich expression of these conflicting interpretations and reconcile them. Therefore, for operational purposes the thesis defines university performance as follows:

“University Performance is the total amount of academic and non-academic utility or benefits derived from a university by its diverse stakeholders. Good university performance recognizes and accounts for the entire range of complex trade-offs characterizing each of its teaching, research, and financial and non-financial functions. Such performance also needs to be benchmarked in terms of its quality vis-à-vis peer universities. Finally the performance of a

university might need to be measured in terms of process rather than output. Doing so sensibly may need to adjust for potential endogenous governance implications.”

The above definition clearly brings out the expanded reach of university performance and its several complexities, dimensions and trade-offs. It therefore establishes that research, teaching and financial performances of these institutions are multi-dimensional in themselves and in need of such interpretation.

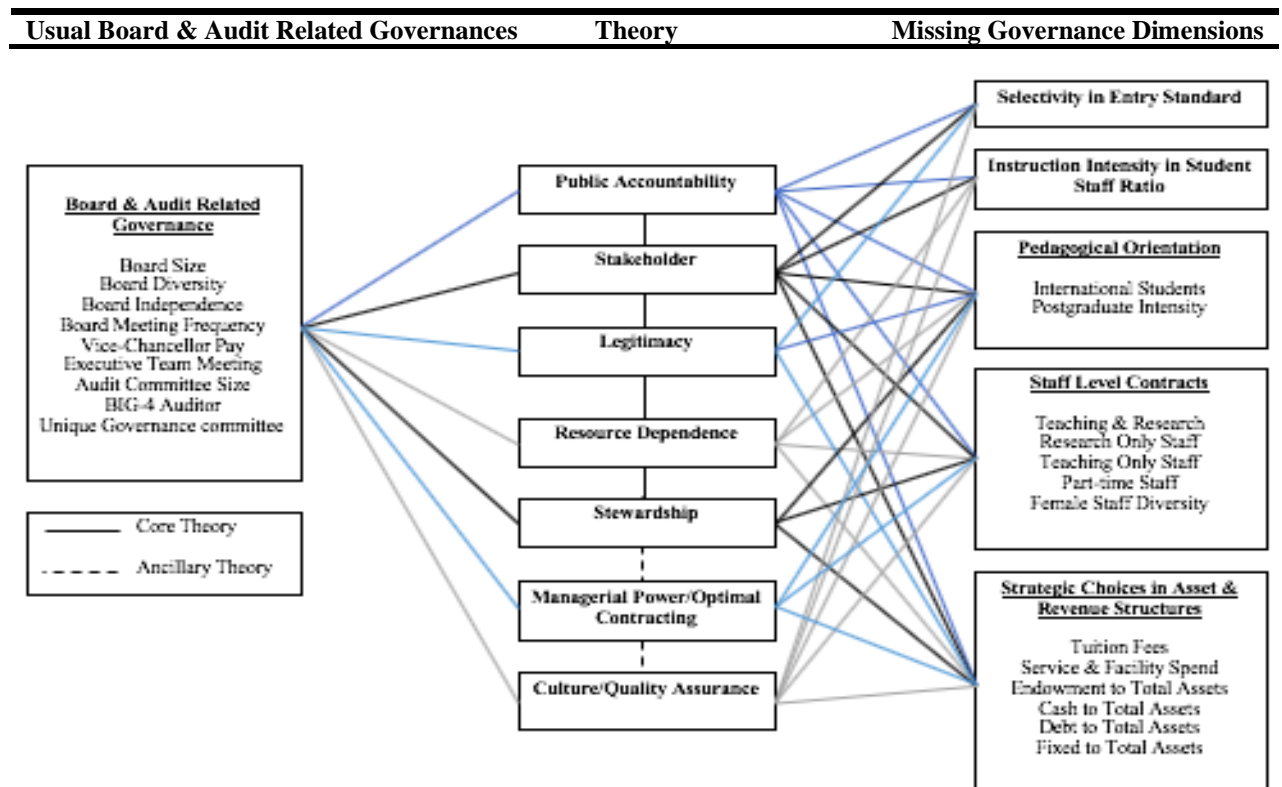
2.4 Theoretical Underpinning for University Governance and Performance

Having defined university governance and performance in a comprehensive and multi-dimensional sense, this section critically analyses the theory underlying both constructs. The principal purpose here is to erect a complete theoretical understanding of how a university governs itself and the implications of this for its performance. In what follows section 2.4.1 first justifies why a multi-theoretical framework is essential here. The section establishes that, given the multi-dimensional nature of university governance and performance, the use of just one or two theories runs the real risk of missing vital explanations. Next section 2.4.2 critically links the choice of seven different theories for this research are critically linked to the research question and justifies them. Finally the chapter ends with section 2.4.3 where each chosen theory is debated and critically analysed. Elements of each theory that are pertinent to the multiple dimensions of university governance and performance and their inter-linkages are elucidated. Theoretical expectations of relationships between university governance and performance are therefore established here.

2.4.1 Justifying the multi-theoretical framework for University Governance

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Figure 3: Multi-Theoretical Framework



University governance is under-researched. The governance of firms by contrast has been extensively studied over the years. Corporate governance scholars have used several theories jointly and severally to explain and link firm governance and performance. Scholars such as Lino et al (2015) Low et al (2015) Mallin (2013) and Ntim et al (2015) have used theories as diverse as Agency, Stakeholder, Resource dependency, Optimal contracting, Transaction Cost Economics and managerial power to explain and debate it. This explains meta scholars Zattoni et al.'s (2013) strong argument that corporate governance cannot be studied without the use of a multi-theoretical framework. Without the complementary and supplementary perspectives of these different theories, the predictive power of corporate governance research would be difficult to improve (Christopher, 2010; Pugliese et al., 2014; Zattoni et al., 2013).

If corporate governance, which is more straight forward requires such a combination of theories (Bebchuk & Weisbach, 2010; Christopher, 2012; Letza et al., 2008) so must university governance that, after all is far more complex and multi-dimensional (Jongbloedet al., 2018; Dario et al., 2015; Van Vught, 2009) in nature. It plays out at different levels and in different ways within the institution and so needs the rich complementarity of perspectives stemming

from multiple theories. This is why extant scholarship here has often used a combination of theories (See Ntim et al., 2017; Lokuwaduge, 2011; Lokuwaduge & Armstrong, 2015). The former shows how public accountability, legitimacy, resource dependence and stakeholder theories have direct relevance to the university and its governance. These four different theories provide the rich panoply needed to establish how and why university governance affects its voluntary disclosure standards. The latter further extends this multi-theoretical framework to include stewardship, neoclassical and institutional paradigms. However, both scholars agree that such a wide theoretical framework is crucial to the university sector. Elsewhere, many other empirical studies (Dnes & Seaton, 1999; Soh, 2007; Tarbert et al., 2008; Lee & Watson, 2008; Bachan & Reilly, 2015) invariably discuss university governance aspects using more than one theory.

There is however, another important policy-based reason for the inclusion of so many theories. A large policy-based normative scholarship in HEI studies (Brown et al., 2011; Parker, 2011; Taylor, 2013a, b; Toma, 2007; Browne, 2010) avers that universities need to be investigated from several different plural perspectives. Without these different lenses the rich range of trade-offs and complexities embedded in the multiple dimensions of university governance and performance will remain hidden and unexplored.

The public and multi-dimensional role of a university in society makes the use of at least four different theories of Stakeholder, Legitimacy, Resource Dependence and Public Accountability directly relevant to it. A university is uniquely accountable to the public as it is a knowledge institution with several multiple roles. The legitimacy of this institution is also complex with many outstanding questions about its valid interface with society. A wide range of disparate stakeholders have interests in this higher education institution, which are often at conflict with each other. Finally, resource dependences remain an important factor that motivates the governance conundrums facing the university. The use of these four theories is therefore uniquely appropriate to a study of university governance and performance. More importantly, however, at least three other theoretical lenses are vital for this public institution. Stewardship, Culture/Quality Assurance and Managerial Power/Optimal Contracting have many important implications here. A public institution like a university has a 'good steward' role in society. The institution is culturally rich and each of its functions has quality connotations for different segments of the public. Finally, managerial power relationships and search for optimality in its public roles are critical to decipher the validity of this institution. A seven-theory framework

is therefore advanced here as an important group of lenses to study the governance-performance question in universities.

However, it is important to note that the seven chosen theories of university governance and performance have crucial interlinkages that further justify their inclusion here. For example, Public Accountability theory (Coy et al., 2001; Coy & Dixon, 2004; Deem & Bird, 2019; Banks et al., 1997; Kreysing, 2002; Shore & Wright, 2004) stresses accountability university in all its governance and performance aspects to the general public and this obviously includes both the salient and non salient stakeholders of the university. Similarly, Resource dependence theory (Verbruggen et al., 2011; Verschuere & De Corte, 2014; Fowles, 2014; Pfeffer, 1987; Pfeffer & Salancik, 1978) argues that a university's governance policies will be crucially dependent on its resource dependences but such resource dependences include the staff, the students, the board and the executive teams in the institution all of whom are stakeholders here. At another level, chasing resources, whether they be in assets, revenues or academic expertise may impose negative burdens on student coverage and other such socially relevant and morally legitimate objectives of the university. Culture and Quality Assurance (CQA) concerns (Vidovich, 2002; Salter & Tapper, 2002; Brown, 2004; Kim, 2008; Trowler, 2008; Trevino, 1990; Alvesson, 2012; Filippakou & Tapper, 2008) pervade the entire institution and determine whether or to what extent a university optimally contracts outwards.

Clearly then each of the seven chosen theories are interlinked in many ways. More importantly, however, such interlinkages help further enrich and illustrate the main objectives of this research. Whether it be to uncover missing dimensions of university governance or to understand the multi-dimensional associations between such governance and the performance of the institution or even to explicate the complexities and trade-offs characterising such associations, the inter-meshing of the seven theories could prove invaluable. These inter-linked explanations could help decipher patterns that defy straightforward interpretation and therefore enrich the overall debate.

To summarise a seven theory framework is advanced here to uncover missing dimensions of university governance and then decipher how the multiple dimensions of such university governance affects the performance of the institution. Both these objectives can only be achieved if the many dimensions of the two constructs of governance and performance can be theorised effectively. The seven theoretical lenses used here are essential to unravel the

complexities and trade-offs in the multi-dimensional associations between university governance and performance. This is what will throw in to sharp relief which dimensions are missing. It will also unpack the richly different trade-offs that exist in governance-performance relationships. Each perspective views the multi-dimensional associations between university governance and performance in unique ways. Without these rich and differing perspectives, the many complexities and trade-offs will remain unsolved. What follows justifies each of the seven theories separately and shows how they may help unpack the research objectives and richly add to the overall theoretical underpinning for university governance and performance.

2.4.2 Selected theories and their relevance

The four core theories of Public Accountability, Stakeholder, Resource Dependence and Legitimacy theories are undoubtedly the primary means to understand and explain university governance and performance. This is why they are extensively used in the extant university governance literature (Ntim et al., 2017; Lokuwaduge, 2011; Ayoubi & Massoud, 2012; Bachan & Riley, 2015; Tarbert et al., 2008). The theories are essential to any multi-dimensional understanding of how university governance affects its performance. In what follows the choice of each of these core theories in this research is justified.

Public Accountability

Universities have a higher public purpose that cannot and should not be limited to the private entrepreneurial motive. Authors (See Parker, 2011; Middlehurst, 2013; Parry, 2013; Rowlands, 2013; Bleiklie, 1998) therefore opine that universities must hold themselves accountable to the wider public and their legitimate concerns. There is a sense in the debates of university governance that in a morally advanced society, higher education cannot be confined to the few and the privileged. Governance at an institution has to be held accountable to overall public purpose (Collini, 2005; Ntim et al., 2017; Bleiklie, 1998). Its subsequent performance must also be investigated from such an overall stance. Studying university governance and performance has to account for the public purpose.

Uncovering and explaining the multiple dimensions/associations of university governance and performance requires active engagement with this public gaze. Almost every governance decision taken by a university has a wider impact in society. Research, teaching and financial performances of an institution need to account to the country's tax paying public. Additionally,

higher education and its positive externalities imply that a strong public orientation is inevitable in all university governance processes. Finally, there is a need to guard the non-utilitarian sacred dimensions of university governance and performance from a crass commercial mindset. This is only possible if the rich public motivations of an institution are made explicit and emphasised at every stage.

Stakeholder Perspective

Universities even more than firms, have disparate stakeholders with divergent and complex concerns. The interests of current researchers, professors, parents, students and administration have to be traded off against each other. The tricky question of which stakeholder is most salient and whose interest is paramount has undergone drastic change in universities in recent decades. Student and staff interests and their conflict will never really emerge if stakeholder perspectives are ignored. Inter-generational and abstract societal concerns have also to be met (Collini, 2005; Michelin & Parbonetti, 2012; Gordon et al., 2002; Coy and Dixon, 2004). The potential generations of future students, scholars and staff have a valid claim on the university. The institution cannot ignore the fact that current research may foreclose options for future research. Similarly, society may have a distinct need for today's research which may have unfortunate unintended consequences on generations to come. Such a complex balancing acts in governance and performance that are so unique to the university, need the enriching gaze of stakeholder theory.

Stakeholder theory naturally accommodates divergence in views and perspectives (Donaldson & Preston, 1995; Freeman et al., 2004). Staff organisation, student recruitment targets, student body diversity targets, syllabi/subject offers and balance between income sources are perceived differently and voiced by the many stakeholders of a university (Wise et al., 2020). Understanding and unpacking these differences effectively is what will help determine many missing dimensions of university governance. Stakeholder theory is crucial to this. Similarly, governance impacts on research teaching or financial performance are not perceived uniformly. Students might view such impacts in a very different way from staff or governors. Such conflicting perspectives on governance-performance associations will remain unidimensional without the enlightening sweep of stakeholder theory.

Resource Dependence

A university has several resource dependences. This unique knowledge institution is importantly dependent on good leaders i.e. governing board, skilled teaching/research staff and students, and a very effective governance leadership. Resource Dependence (Pfeffer, 1987; Pfeffer & Salancik, 1978; Callen et al., 2010) as a theory focuses attention on the wide range of human resource in an organisation and the dependencies created by them (Adams et al., 2005). By unmasking these competing concerns, the theory creates space for the many missing elements of the university governance puzzle (Fowles, 2014; Taylor, 2013a, b, c; Parker 2013). From another perspective, however, resource dependence theory also suggests how university research, teaching and financial performance are artefacts of competing resource dependencies in different parts of the organisation (Festo & Nkote, 2007; Ferry & Eckersley, 2011; Toutkoushian, 2001). The theory sheds unique light on these trade-offs between various resource dependencies and in the process clarifies important aspects of the governance performance link.

At the same time, a University needs to be financially sustainable to face up to its multi-dimensional objectives. In the fast-changing landscape of higher education, an institution is already at great risk of losing traditional sources of funding from the Government and Public sector (FSSG, 2011; UUK, 2011; Brown, 2011a; Foskett, 2010; Hemsley-Brown, 2011). Its increasing dependence on other non-traditional resource providers to bridge the gap constrains its governance and performance in many ways. Any investigation of how university governance affects performance must necessarily consider the complex trade-offs involved in an institution's resource dependence.

Legitimacy

Finally, complex trade-offs in legitimacy pervade both university governance and performance (Hordern, 2013; Melville-Ross, 2010; Zeghal, 2008). For example, universities have to appear legitimate to different constituents in society by encouraging age/class/ethnicity/gender diversity in various governance processes mechanisms. At the same time they must also demonstrate legitimacy in research, teaching and financial performance; this would imply employing the best talent without regard to age/class/ethnicity/gender. Therefore, these two opposing legitimacy objectives may and do often clash. Understanding and unpacking these does require a direct consideration of the legitimacy perspective.

However, in the increasingly marketised HEI, new constituents have become the focus of attention. These include fee-paying students, both international and domestic, and research and teaching grant providers with their deep pockets (Molesworth et al., 2010; Hemsley-Brown, 2011; Brown & Carasso, 2013; Brown, 2015; Shattock & Hovath, 2019). There is a concern that UK universities might bend over backwards to appear legitimate to those players. As a theory, legitimacy balances out these considerations and enriches the debate here. Without it, many such hidden governance aspects and their performance distortions would remain unexplored.

The multi-dimensionality of university governance and performance demand the use of at least three other ancillary theories, namely the stewardship precepts, culture/quality assurance tenets and managerial power/ optimal contracting paradigms. Each of these is separately justified in the following sections.

Stewardship precepts

It should be stressed that stewardship tenets in university governance are the equivalent of agency theory in corporate governance (Donaldson & Davis, 1991; Davis et al., 1997; Clarke, 2004). The unique nature of the university, the inter-relationships between departments and its collegial atmosphere imply that governance here is less an agency conflict and a more a holistic balance. After all, Agency conflicts are natural within any organization run on behalf of others. In corporate firms these conflicts between managers and owners have to be considered central to their governance. By contrast universities are collectivistic and not solely profit orientated. Their governance and performance have to account for this. Agency conflicts within them have to reflect a stewardship perspective. Here principals i.e. the VC and the Board need to empower agents rather than merely control or monitor them. It is this positive interaction between the two that needs primary consideration here (Donaldson, 1990; Donaldson & Davis, 1994). This is why stewardship precepts are so important to the university sector. The positive role of governance stressed by the theory nevertheless recognizes that such governance might need to be unpacked in terms of several dimensions some known and other hidden. Otherwise the complex checks and balances idea might not be implementable. Amongst extant scholarly work in university governance and performance Lokuwaduge (2011) recognizes this need and incorporates stewardship precepts in her analysis. This thesis follows her lead and does likewise.

Culture/Quality Assurance Tenets

The principles underlying culture and quality assurance are widely emphasized in university governance (Shattock & Hovath, 2019; Gayle et al., 2003; Trowler, 2008, 2009; Vidovich, 2002; Salter & Tapper, 2002; Brown, 2004; Kim, 2008; Alvesson, 2012; Filippakou & Tapper, 2008; Cremonini et al., 2015). These interlinked perspectives have a unique relevance to Higher Education. Universities are distinctly cultural entities and their cultural differences importantly influence their governance and performance (Gayle et al., 2003; Trowler, 2008, 2009; Wilmott, 1993). Two aspects of culture make it indispensable to university governance. First universities are knowledge institution delivering both teaching and research. Crucial to this delivery are the teaching and learning regimes developed by such institutions over a long period of time. TLRs are cultural and play a central role influencing many hidden and interlinked antecedents of both functions. Second, universities are geographically dispersed. Their locations act as a significant cultural influence on how they craft their governances. Culture is thus an underlying aspect that needs to inform any debate on multiple dimensions of university governance and performance.

Quality assurance is a key guiding principle of university governance and performance (Filippakou & Tapper, 2008; Brown, 2004; QAA, 2006). These institutions have an even greater need than corporate firms to meet tangible and intangible quality aspects of their internal governances and performances. For instance, the internal and external audits of such an institution might uncover serious quality defects in all the multiple dimensions of its governance and performance (Bachan, 2017; Jones & Soo, 2013). Similarly, superficially higher academic performance may actually hide serious plagiarism and liberal marking concerns. At a second and even more serious level university governance is multi-dimensional and there are several indications that there are hidden aspects within these dimensions that may exhibit quality-based trade-offs. Staff organisation, student recruitment, income and revenue sources all impose quality limits on the university governance performance challenge. Therefore, the principles of quality assurance have a direct relevance to university governance and performance.

Managerial Power and Optimal Contracting

A managerial perspective is essential in university governance studies due to this institution's special power structure as compared to a corporate firm, and for the growing trends to run the university like a corporate firm (Parker, 2012; Deem et al., 2007; Collinson, 2004; Lambert,

2005; Middlehurst, 2013; Rowlands, 2013; Parry, 2013). The Vice Chancellor's executive team, the university board and the heads of departments wield different levels of power with respect to the many tacit and explicit governance elements here. This is why collegiality is the theme stressed across the HEI sector. Power dynamics within universities are a complex combination of cooperation and conflict. None of the many governance decisions are taken in isolation. There is a large amount of give and take across the many managerial power centers in the university. These power dynamics need to be critically unpacked. Managerial power theory incorporates and analyzes such dynamics in different ways and from different angles (Bebchuk et al., 2002; Van Essen et al., 2015). Hence it must be a part of any theoretical framework for university governance and performance.

University Governance and performance are both constituted by many contractual relationships between different parties. It is obvious that the university must necessarily seek optimality in such relationships if it is to improve both internal governance and performance. What makes this much more challenging here is the fact that these relationships are multi-dimensional and one governance decision may have ramifications for other governance as well as performances. Optimal contracting as a framework (Edmans & Gabaix, 2009; Mallin et al., 2015) is extremely suitable to such multi-dimensional trade-offs and complexities providing keen multiple understandings of the problem. This is why it is an essential component of the tool kit to decipher university governance performance associations.

2.4.3 Theories explaining University Governance & Performance

Having justified the choice of seven different theories to this research the chapter delves deeper into each theory and its implications for the university governance performance question. Each sub-section here deals with one theory. First the theory's implications are carefully and critically enumerated. Second limitations of the theory are briefly discussed. Finally the theory's relevance to UK university governance and performance is delineated.

2.4.3.1. Public Accountability (PA)

Firms are accountable principally to their owners. Hence corporate governance primarily assesses whether a firm accounts fairly to its shareholders. Although in recent times a wider accountability to diverse stakeholders has been stressed, private firms are not considered to be

accountable to the general public. Public accountability (PA) as a theory contradicts such a perspective. According to this theory institutions especially those in the public sector like universities are directly responsible and accountable to broader societal concerns. Such institutions cannot afford to be opaque even in dimensions of governance and performance that would be considered legitimately private in corporate firms. This is why PA scholars like Coy et al (2011) argue that universities should exhibit transparency of institutional process and mechanism to constituents of the general public even those that are not salient to them. Others like Nelson et al (2002) stress that good stewardship of public entities like universities is “rights based” and not “utilitarian” like firms. Hence they should demonstrate fairness, accessibility and distribution in all internal governances and performances.

2.4.3.1.1 Implications of Public Accountability to university governance and performance

Three principal implications of the theory to university functioning must be stressed. First, PA requires that the university remains open and responsive to legitimate public interests. Such openness implies transparency in both governance and performance. University board and lower level compositions, internal governance protocols, and performance standards need to be seen to be fair and equitable by all the diverse constituents of society. Not only in the board but also in various other parts of the institution the university must reflect a careful trade-off incorporating the plural interests of different segments of society. Academic and non-academic performance must also take account of this trade-off.

From an accountability perspective the public also has a right to know that their university is fair in its admissions, teaching, research, grading and staffing (Nelson et al., 2003; Coy et al., 2011). Its governance structures and mechanisms should reflect such fairness. Here then are clear indications from the theory that tacit aspects of student recruitment, teaching/research efficacy and staff organisation at a university are its most important governance priorities. It is in these that a clearer picture of how the university responds to its public role becomes manifest. But PA also requires the university to transparently demonstrate its compliance to public interest (Coy et al., 2001; Coy & Dixon, 2004; Bleiklie, 1998; Banks et al., 1997; Deem & Baird, 2019). In this, the theory seems to highlight the entire range of governance processes from admission protocols to grading accuracies to overall academic and non-academic integrity. So the theory seems to be arguing for larger numbers of lay members on the board,

board diversity, effective internal and external audits to be dovetailed with independence, diversity and auditory control in all the other dimensions of the university.

Second public accountability implies that a larger societal purpose other than narrow accountability to resource or grant providers or powerful corporate interests should characterize universities (Kreysing, 2002; Coy & Dixon, 2004; Parker, 2013; Shore & Wright, 2004; Toma, 2007). Society needs to know that the university does not pander exclusively to sectarian, commercial or even single generational interests. This institution must deliver a balanced knowledge function that caters to all segments of society even those that are yet to come. Research must be undertaken with an objective and neutral mandate and not merely to comply with corporate grant provider interests. Teaching should be conducted in a manner that improves outcomes for the average student not just the privileged one. So, the theory seems to imply that the university's endowment choices, its levels of research grants and tuition fees, its pedagogical orientation towards certain types of students or courses and its adherence to a strict protocol of staff student interaction levels should matter. After all, by choosing or not choosing certain levels of endowments or fee-paying students the university shows its desire to balance corporate/non-corporate research interests and monetary/societal goals. Similarly, by choosing certain types of staff student interaction levels it flags its governance priorities in the coverage versus teaching efficacy trade-off.

Finally, Public interest changes as societies advance and develop. PA requires universities to be alive and adapt rapidly to these changes. A university's internal governance should adapt quickly to changes in external regulation. Regulatory mandates must be rapidly complied with and the university should exhibit a pro-active stance here. Similarly the institution's research and teaching performance must closely corroborate and tie-in with the country's changing academic goals. It's internal governances must help attain such performance. In all of this Public Accountability seems to highlight the important influence of external governance regulation. The implication seems to be that regulatory changes are an important influence on governance performance links in higher education. Tacitly it seems to emphasize the importance of empirically derived and substantiated regulatory change.

Overall Public Accountability flags important themes in the way a university governs itself. The theory underlines the university as an important public institution tasked with the extremely important role of nurturing the intellectual and knowledge base of a society. Such a

public institution must be run in the public interest and the public should be able to see this (Toma, 2007; Shore & Wright, 2004; Bleiklie, 1998; Allen & Allen, 1998; Kim, 2008). Transparency of this kind needs effective governance across many board level and audit related aspects. But PA also enjoins that university governance and performance in all its dimensions must exhibit fairness and distributive justice. A whole new range of missing aspects of university governance and performance are thus implicated here. It is these that will enable good governance and also allow for easy dissemination of enhanced disclosure of information to the general public. Finally, PA suggests that a university's governance structures must flexibly respond to changes in external governance mandates. Effective external regulation based on robust empirical research is a key requirement of the theory (Kim, 2008; Power, 1994; Ntim et al., 2017).

2.4.3.1.2 Limitation of PA

Important limitations however characterize Public Accountability theory. There are important questions about what a university must do when faced with inevitable conflicts between the different segments of society. Further recent trends to corporatize the university and manage it like a firm downplay the role of public accountability. It is also clear that PA is not the only or even the most important consideration driving internal governance or performance priorities of the university. The theory remains rather peripheral to the day-to-day functioning of this institution. In fact empirical work by Mitchell et al (1997) and Roberts (1992) suggests that universities do prioritize the governance needs of important instrumental stakeholders and neglect the larger and amorphous public interest. Similarly universities often prioritize strongly salient employer interests over abstract public concerns when faced with situations of student bargaining in on-campus placements. Can this be avoided and what must be the theoretical implication? PA has no answer. Accounting to the public interest is therefore definitely not the most important priority for a university. Ntim et al's (2016) suggestion that universities might neglect public interest and promote private or salient corporate interest remains a troubling research concern.

2.4.3.1.3 Public Accountability's Relevance to UK Higher Education

Nevertheless, the tenets of public accountability are extremely relevant to the UK higher education environment. The introductory chapter has mentioned a number of contextual issues that underline this. Historically traditional UK universities started life as unbridled autonomous institutions accountable largely to only themselves (Dearlove, 2002, Kim, 2008; Trakman, 2008). Their internal governance structures and mechanisms were largely collegial and faculty dominated. Senior academics took all the important administrative and academic decisions and the university was held out as a model of academic freedom and democracy although it was necessarily exclusionary and elitist (Middlehurst, 2013; Parry, 2013; Taylor, 2013a, c). This changed with the influential Robinns report in 1963 when stricter external regulation of universities, expansion of the sector and a direct emphasis on economic development were initiated. For the first time this introduced the concept of public accountability of the university and this institution was made a channel for achievement of national goals (Knight, 2002; Salter & Tapper, 2002; Shattock, 2004a, b). Subsequent regulatory developments in the sector including the Jarratt report, the Educational Reforms Act (ERA), the Lambert and Browne reviews introduced mass higher education, the idea of a fee-paying university student and consequently much greater public accountability (Melville Ross, 2010; Taylor, 2013b, c).

UK's waves of higher education reforms have led to demands for public scrutiny of university budgets and academic outcomes through a range of specialist public institutions such as the Quality Assurance Agency, the Research Assessment Framework, the Higher Education Statistics Agency, the Postgraduate Taught Experience Survey and the Postgraduate Research Experience Survey (Ntim et al., 2017). Such external scrutiny has naturally curtailed any idea of autonomous academic freedoms at these institutions. But important philosophical questions remain and this explains why PA tenets are contextually relevant in UK higher education. For example there is the important debate that continues to rage about public accountability expressed as corporatized performance outcomes against the need for academic creativity and innovation (Parker, 2012; Middlehurst, 2013; Shattock, 2004a, b; Bennett, 2002; Kim, 2008; Burrows, 2012). This is closely related to the left-center-right debate that cuts across all the literature on higher education (McGettigan, 2013; Newfield, 2008; Smith, 2011). Similarly there are other voices in the literature (Toma, 2007; Collini, 2012; Oxholm, 2005; Havergal, 2015a) that question the wisdom of PA imperatives for universities already saddled with government funding restrictions and private sector style competition dynamics. The Overall, it

is apparent that Public Accountability is a theory that squarely applies within the UK Higher Education context. The many trends highlighted above such as growing marketisation, reduced government funding, greater scrutiny of the institution's financial practices and sustainability have meant that the spot light of even regulators like the CUC has firmly been on the financial health and well being of the university. The UK University has become a vehicle for the Government's oft quoted objective to transition towards a knowledge economy retaining the UK's top economic position. A carefully crafted and calibrated public accountability must pervade this institution if it is to deliver this challenging goal of financial sustainability. The governance of this institution must embrace and resolve many non-academic concerns and trade-offs to imbibe this public accountability.

2.4.3.2 Stakeholder Theory (ST)

Corporate governance has long recognized that stakeholder interests apart from those of just owners or shareholders are important to a firm (Donaldson & Davis, 1991; Freeman, 1984). In fact as early as 1999 Freeman opined that even a firm that wishes to maximize shareholder value can only do so if it aligns with the interests of wider stakeholders. These wider stakeholders include those like suppliers, employees and customers who have a direct stake in the firm and others like the wider community or Government with mainly indirect stakes in it (Polonsky, 1996; Schilling, 2000). Thus stakeholder theory (ST) postulates that governance structures within the firm must align with the interests of not just owners and managers but also these larger constituencies of stakeholders who have broader indirect but reasonable interests in it (Freeman, Wicks & Parmar, 2004; Gunasekera & Reed, 2008).

However this postulation in itself implies that the theory has to necessarily embrace a diverse and complicated approach to firm governance. Each stakeholder's interests are naturally different. The governance structures and mechanisms must achieve the complex optimal trade-offs between those interests and those of other stakeholders. ST consequently calls upon firms to erect governance structures and mechanisms that allow suppliers, customers, employees, communities, managers and shareholders to jointly achieve the best win-win solutions (Freeman, Wicks & Parmar, 2004; Phillips et al., 2003). Such a win-win goal, can only be achieved if this internal governance takes full account of potentially normative (i.e. value driven) or instrumental (i.e. output driven) or somewhat unpredictable managerial behaviors of

such diverse stakeholders (Donaldson & Preston, 1995; Freeman, Wicks & Parmar, 2004). At the same time it must also fully engage with differing powers and influences of different stakeholder groups stemming from their different legal or formal authorities (Donaldson, 1990; Mintzberg & Waters, 1985; Gomes & Novaes, 2005). Overall it is undoubtedly clear that ST is highly relevant to the governance of any corporate firm that wishes to achieve sustained performance in the long run.

2.4.3.2.1 Implications of Stakeholder Theory to university governance and performance

University Governance has to contend with an even wider set of stakeholders than the corporate firm. Stakeholder Theory is therefore highly relevant to it. Managing the diverse interests, behaviors, values and powers of academics, administrators, students, researchers, regulators and employers requires an even greater balancing role (Michelon & Parbonetti, 2012; Gordon et al., 2002; Coy and Dixon, 2004). Yet that is not all. University Governance pervades its many levels and dimensions as pointed out earlier (Gayle et al., 2003). There are necessarily many more complex trade-offs here than in the case of the corporate firm. For example, how a university prioritizes between academic and non-academic functions, chooses its subject offers and syllabi and calibrates its teaching/research staff contracts have wildly different impacts on each stakeholder. Teachers may like flexible contracts but students would not. A wider set of courses on offer at a university might enable students interested in one discipline but hurt the quality of teaching or instruction in other disciplines. Similarly the effective design of internal/external audit or choices of VC or his pay may need to be governed addressing the differing stakeholder interests. Merely ensuring that the board membership is representative of different stakeholders or that board convention and protocol take account of the salience of these stakeholders may not be sufficient for a university as it is for a corporate firm. Thus, stakeholder surely has an expanded significance for university governance.

Stakeholder diversity has an important implication for diversity across the university not just in its board as well. ST suggests that ensuring adequate representation to ethnic and gender groups in different parts of the organization especially within the staff and students would enhance its performance (Donaldson & Preston, 1995; Freeman, 1984; Freeman & Reed, 1983). It is ST's contention that by doing so the voice and opinions of these underrepresented gender/ethnic groups would be heard and incorporated into the governance process leading to a more rounded performance of the institution (Mitchell et al., 1997; Polonsky, 1996; Wise et

al., 2020). This would modulate conflict, encourage pluralism and enhance the institution's ability to grow. But ST also has implications for another type of diversity in its student population coverage. The theory raises concerns that universities if left unchecked could become elite and exclusive academic clubs (Woodward, 1996; Wise et al., 2020; Mitchell et al., 1997). Its emphasis on invoking all stakeholder interests not just those of the elite, suggests how detrimental this could be for the overall academic purpose of this institution.

At another level certain instrumental versions of ST as underlined by Ntim et al (2016) bear a direct relevance to multi-dimensional university governance and performance. After all Roberts (1992), Mitchell et al (1997) and Nelson et al (2003) demonstrate how a university might target its voluntary disclosure levels to only assuage important salient and instrumental stakeholders such as resource/grant providers. In the process it may alienate other wider yet concerned parties. This argument could surely be extended to both internal governance mechanisms as well as performance. For example, in a given university fee paying student concerns may be over emphasized. Not only would such universities encourage certain types of pedagogical ambience but also prioritize better teaching functionalities which could lead to poor research. Similarly, in other universities an over emphasis on staff welfare due to union pressures could result in poor teaching or research efforts or even badly implemented teaching/research staff contracts. ST would surely help dissect such governance and performance trends and identify crucial associations.

Overall, it is quite obvious that ST presents an important tool to study different university governance mechanisms and their impact upon performance. The theory in itself provides an important fundamental perspective to dissect multi-dimensional university governance and performance. By flagging the competing interests of the diverse stakeholders in such an institution the theory ensures that complex trade-offs that are inevitable here are fully accounted for.

2.4.3.2.2 Limitations of Stakeholder Theory

Yet the theory itself is not without limitations. First and foremost is the singular concern that ST might not necessarily prioritize the core teaching and research function of a university correctly. For a university its governance and performance must necessarily emphasize academic achievement over all other achievements. A broad and dissipated focus on a wide

range of diverse stakeholders might undermine such important academic goals. Second stakeholder concerns cannot always be balanced. There will surely arise events and circumstances in a university's life that force its governors to have to choose one or a group of stakeholders whose needs have to be prioritized and justified over others. ST does not always have a compelling insight about how this is to be done. Similarly at different levels in a university such as board levels versus intra-departmental levels, stakeholder interests, play out in different ways. Governance structures and mechanisms at these different levels may have to accommodate these differences while still remaining consistent with the overall organizational mission. Apart from discussion, dialogue and negotiation among the interested stakeholders ST does not have any concrete suggestions here.

2.4.3.2.3. Stakeholder Theory's Relevance to UK Higher Education

Recent university literature (Jones et al., 2001; Toma, 2007; Vidovich & Currie, 2011; Rowlands, 2013) has highlighted the substantial changes that have been wrought in the UK. These include changes in university recruitment guidelines leading to a quasi-market in student places, tuition fee introduction for domestic students, extensive changes to government grants and funding and a complete overhaul of the regulatory framework (Ntim et al., 2017; DOE, 2017; 2018). In this changed market-based scenario university governance need a different emphasis. The balance between international and domestic students, the need to appease research/teaching fund granters and a market orientated student emphasis has become vital. Elsewhere radical governance changes have emphasized salient stakeholders such as parents and students over others such as resource providing public agencies and funding bodies in universities. ST is therefore extremely topical to such a rapidly changing UK university governance context.

In a similar vein the UK Government's oft expressed objective to stay at the forefront of the rapidly emerging global knowledge economy has put the spotlight on the ability of the higher education sector to deliver the world class skills sought by employers everywhere (Michelon & Parbonetti, 2012; Hordern, 2013; Taylor, 2013a, c). This has fundamentally transformed the way teaching and research governance is seen at leading universities. Trade-offs inherent in stakeholder management lie at the heart of such a transformation. Thus ST is crucially relevant to any governance-performance research amongst UK universities.

2.4.3.3. Resource Dependence Theory

Kessner and Johnson (1990), Pfeffer & Salancik (2003) and Hillman & Dalziel (2003) posit that corporate boards are important not just for monitoring managers but also to connect the firm to the resources and networks crucial to its existence and competitive advantage. The Board of directors of any given firm make three important objectives achievable namely, the attainment of knowledge and expertise (Haniffa & Cooke, 2002), acquisition of social and business networks to improve reputation (Borgatti & Foster, 2003; Udayasankar, 2008) and the gain of legitimacy to reduce environmental uncertainty (Hillman et al., 2000; Nicholson & Kiel, 2007). It must be stressed that resource dependence theory (RDT) underlines how the corporate governance structures and mechanisms within a firm should be strategically used to acquire and maintain resources and thus improve the firm's longitudinal performance.

RDT avers that board of directors especially those who are independent and from outside the firm bring varied expertise to it. Such expertise can complement that already existing within the board. Using this the firm would be able to enhance its marketability, financial viability, legitimacy and reputation (Amran et al., 2014; Branco & Rodriguez, 2008). RDT is complementary and supplementary to both PA and ST theories of corporate governance. For instance achieving public accountability (PA) in itself would be made easier by the presence of distinguished directors on the board with a wider appeal in the community. Government departments, regulatory institutions and public bodies would all be more approachable and amenable to a board constituted by distinguished independent directors. Similarly, expert directors with expanded reach and social capital would enable easier maintenance of good relations with important stakeholders, crucial for the maintenance of networks or resources of the firm (Christopher, 2010; Bouwman, 2011).

Resources are an even more important consideration for a university. This institution has definite limits to the amount of resources that it can generate whether from fee paying students or from the Government budget. It has to definitely rely on the board as well as other reputed faculty members to enhance its resource generating capabilities. Therefore the university scholarship resonates with calls to use RDT as a theoretical lens to decipher the complexities and intricacies of university governance and performance (Callen et al., 2010; Verbruggen et al., 2011; Verschuere & De Corte, 2014).

2.4.3.3.1 Implications of RDT to university governance and performance

A university's governance and performance is enacted in different dimensions unlike a corporate firm. Consequently within a university resource dependence takes on an extremely different and expanded connotation. Board composition, independence and expertise are undoubtedly important. But there are many other aspects in a university that might need to be decoded using the tenets of RDT. For example faculty expertise and networks are resources that are crucial for a university. Even when a university board boasts some of the best names in higher education it might still be unable to attract the right talent among staff, students and researchers simply due to its lack of certain critical professors in its faculty. The theory thus seems to be making the case that staff organization is important. University staff choices could reflect both a current resource and a future liability and must therefore constitute an essential ingredient of governance performance investigations. From another angle how well the university calibrates its staff to student ratio to prioritize staff workload considerations will surely have budgetary resource implications. By choosing very high students to staff ratio the university would not only jeopardize its own business model but also reduce available resources for other equally important knowledge generating cutting edge research.

Gender and ethnic diversities in a university matter at various levels not just at the board. But RDT implies that such diversities across the university would surely have resource implications. For example a university with a good ethnic and gender balance in staff, and student populations would find it easier to attract women and ethnic minorities in the future. Such staff would be able to better identify and exploit research opportunities in gender/ethnic research and achieve higher rated research simply because of their innate talent and ability to advocate and implement it.

Many RDT scholars (Amran et al., 2014; Branco & Rodriguez, 2008; Christopher, 2010; Bouwman, 2011) argue that the theory implies that organisations should calibrate their governance to achieve the financial resources that are needed. Naturally this would mean that in a marketized HEI environment the fee-paying student would be an important focus for this institution. The theory thus seems to signal that governance processes dealing with pedagogical balances in student bodies on the one side and those dealing with financial balances among university income sources may both be crucial to the institution's performance.

But at another level RDT also implies an overriding concern in relation to the effective use of existing resources and budgets. After all resource dependence ought to mean an equally important focus on resource conservation. Thus, the theory might be construed to suggest that the university should take steps to properly utilize its existing academic staff and their talents in the best possible way. At the same time the institution must ensure that its asset base is rich enough to support the entire range of its research and teaching functions.

Some important strands of RDT scholarship like Callen et al. (2010); Verbruggen et al. (2011) and Verschuere & De Corte (2014) use the theory to uncover the tendencies of large not-for-profit institutions to design governance mechanisms or manage performance to exclusively meet certain vested resource provider concerns. This is particularly worrisome and relevant for universities since they too share a disproportionate resource dependence on research/teaching grant providers. Typically internal governance or performance could reflect an exaggerated research or teaching emphasis. This would be easily deciphered, if RDT is used within the theoretical framework.

Overall RDT stands out as an essential lens with which to unpack complex and multi-dimensional university governance and performance. Resources are one of the vital considerations that drive various internal governances of the organization. Simultaneously the complex trade-offs that characterize multi-dimensional university performance stem directly or indirectly from resource considerations.

2.4.3.3.2 Limitations of Resource Dependent Theory

RDT has clear limitations. The resource dependence perspective is often not the sole or even important guiding consideration in universities. For example it is often seen that a university motivated by PA or ST considerations ignores the RDT. Some resource rich board, faculty members or even VC may not be recruited simply because they do not fit with the prevailing ideology (PA) or salient stakeholders (ST) of a given university. Similarly despite explicit directives from an important research grant provider a given university might conduct research in controversial areas of a given subject and risk losing the grant in future simply in a bid to enhance its neutral reputation. Therefore, the use of RDT does not assure the researcher of a comprehensive view of multi-dimensional university governance and performance.

2.4.3.3.3 Resource Dependence Theory's relevance to the UK Higher Education

UK higher education is rapidly changing in terms of its resource providers. The growing squeeze on public sector budgets has meant that universities need to search for other sponsors such as fee-paying domestic students, international students, corporate bodies and even philanthropic individuals for balancing their budgets. Naturally these new resource providers are now acquiring greater importance. To appease the concerns of these resource providers it is but natural that not only university boards but also departmental heads and even lecturers are co-opting governance protocols and mechanisms tailored to their concerns. But the nagging question in current policy-based literature remains whether such a focus on high fee paying domestic and international students or corporate bodies is necessarily salutary for the UK university.

Parker (2011; 2012; 2013), Nagy & Robb (2008) and Taylor (2013a, b) underline how university dependences on resource providers has led to both subtle and not-so-subtle shifts in governance. The consequent impacts on university performance have attracted widespread criticism both in the popular press as well as the academia. For example board level appointments and even Vice Chancellor selection at some universities in recent times has been aimed to generate goodwill among research sponsors. Similarly, Questions and fingers have been pointed at large sums of money donated by philanthropic trusts and consequent changes in research priorities of departments or subtler changes in syllabi of social sciences disciplines at certain institutions. Although in the increasingly marketized environment of UK HEI many institutions can hardly be faulted for chasing resources wherever they find them still external governance of regulation must provide the checks and balances to ensure the greater good. RDT is thus increasingly implicated within a UK HEI context and can hardly be ignored.

2.4.3.4. Legitimacy Theory

The legitimacy theory (LT) contends that any given organization exists and thrives only because it is perceived as legitimate by society as a whole or at least those constituents of society that depend on it. LT avers that a university can only survive, sustain and flourish in any given society if its value systems and structures are congruent with those considered legitimate in that society (Lindblom, 1994; Suchman, 1995; Ashforth & Gibbs, 1990). All the governance practices of such an institution have to be considered desirable, proper or

appropriate within the socially constructed system of norms, values and beliefs (Suchman, 1995; De Villiers & Van Staden, 2006). Similarly the institution must perform in such a way as to meet those very same norms values and beliefs.

2.4.3.4.1 Implications of Legitimacy Theory to university governance and performance

Legitimacy theory implies that a university's internal governance and performance should be deemed legitimate by society. Given its public role and its sanctioned tax funded status it is even more imperative that a university is seen to be legitimate by all important societal constituents. Only then will this institution be considered credible neutral impartial and fair.

Yet Legitimacy itself can be pragmatic, moral or cognitive. Legitimacy theory argues that moral and cognitive legitimacy must be prioritized (Suchman, 1995). But often it is the case that institutions prioritize pragmatic legitimacy over the others. For example in the growing quasi market for higher education in the UK universities have focused directly on the immediate concerns of grant providers and fee-paying students (Soobaroyen & Ntim, 2013). Sensitive information has only been exclusively disclosed to such constituencies while other interested parties have been neglected. Internal governance and performance targets have also been calibrated to meet the needs of important fee payers such as international students as opposed to their domestic peers. Legitimacy theory as a critical lens seems to be strongly advocating that universities must step up to the task of expanding their concepts of governance and unravel ways in which the different legitimate concerns of a range of societal constituents may be traded off optimally against each other.

In a different vein Legitimacy theory implies that generating, expanding and sustaining legitimacy is a direct performance goal for any university. Every aspect of a university's performance may have a positive, neutral or negative impact on its legitimacy among its diverse constituencies (Hordern, 2013; Melville Ross, 2010; Zeghal, 2008). The trade-offs here would naturally create conflict. For example a university's superior performance in corporate sponsored research would generate legitimacy among funders and sponsors but its exclusive focus on corporate research would surely lose it credibility among other constituencies. Similarly, when a university allows higher grades to its graduates based on its easy assessment criteria the benefited graduates would undoubtedly recommend it to potential students. But when later the very same graduates are seen to lack vital skills then it would lose credibility

with employers and arguably with those students as well. In all of these implications one is able to infer a range of different trade-offs in the many governance aspects of the institution. The theory itself seems to be drawing attention to these and highlighting missing narratives and perspectives.

Legitimacy theory has an overweening gaze on the top of the organisational pyramid. Especially with regard to audit, LT strongly avers that independent audit and appraisal mechanisms should form a mandatory part of internal governance of a university. This would check or at least shed light on any such tendency by the board or other powers that be prioritize pragmatic legitimacy. At the board level the theory obviously implies greater diversity and independence. A diverse or independent board would be more likely to balance expedient pragmatic legitimacy concerns with a moral compass.

Moral or cognitive legitimacy by contrast is targeted at no one constituency but aimed to demonstrate a general adherence to moral beliefs and values. Legitimacy theory argues that by remaining true to moral or cognitive legitimacy a university balances various societal interests in its functioning. Suchman (1995), Lindblom (1994) and De Villiers & Van Staden (2006) decompose moral legitimacy into three different types namely consequential, procedural and structural forms of legitimacy. Consequential legitimacy implies that universities must appear generally credible to society at large in terms of a well-defined set of financial performance and governance metrics. Legitimacy theory thus suggests that metrics like number of graduates, student employability ratios, NSS research/teaching excellence scores and value of research funding among many others might need detailed analysis (Ntim et al., 2017). Peer comparisons and benchmarks in terms of these consequential outcomes of university functioning are important parameters by which to assess the governances and performances of this institution. These are theoretical indications that LT at least in its moral version is strongly evoking pictures of unconventional governance performance relationships and related trade-offs.

Procedural legitimacy on the other hand implies that universities must be seen to be neutral independent and unbiased creators and purveyors of knowledge. A strict and rigorous academic and ethical orientation would therefore need to be demonstrated by a university in both its internal governances and performances. Clearly then Legitimacy theory implies a robust external and internal audit protocol as well as an independent and diverse board. Finally structural legitimacy requires universities to maintain moral superiority in the way they

structure themselves. In this Legitimacy theory argues that the organizational pyramid, staff hierarchies and board-executive relations must demonstrate a fine balance of power. Such checks and balances also strongly imply that the governance performance debates should engage with tacit dimensions of governance that reflect in the different parts of the university.

2.4.3.4.2 Limitations of Legitimacy Theory

Legitimacy theory has its own limitations. Appearing legitimate may not be as much of a necessity for the university as the theory would like to infer. In fact often public accountability, stakeholder or resource dependence concerns intervene to change university strategy. This is exactly why pragmatic legitimacy often predominates. Moral legitimacy is often the first to be sacrificed on the altar of expediency as the university chases funds, sponsors, fee-paying students or regulatory compliance. Legitimacy theory does not advance any structural or policy recommendations to correct such expediency. At another level appearing legitimate is often costly as the university needs to invest in various communication channels and structure itself in many different ways. This may prove economically unviable to the institution. Yet Legitimacy theory has no recommendations about how to achieve a correct trade-off between legitimacy and viability.

2.4.3.4.3 Legitimacy Theory's Relevance to the UK Higher Education

Pragmatic and strategic legitimacy concerns have become widespread in UK Higher Education (Soobaroyen & Ntim, 2013; Suchman, 1995). The introduction of "Quasi market" conditions in the form of full-tuition fees, competition for students and other reforms aimed at improving the governance and performance of universities (FSSG, 2011; UUK, 2011) has led to an external discourse. This discourse has focused on issues of accountability and transparency within universities in the UK. Appearing legitimate as per these socially constructed systems of norms, values and beliefs has thus acquired primacy. Institutions have begun to change governance structures and mechanisms to appear legitimate to all the powers that be in higher education on these terms. Nagy and Robb (2008) and Parker (2011) show how UK universities like their counterparts elsewhere have calibrated internal governance, disclosures and performances to appear legitimate in terms of financial metrics such as value-for-money and teaching/research efficiency. The theoretical lens of Legitimacy theory is therefore a highly

relevant tool to unpack and criticize many of these developments and their links to university performance. Legitimacy Theory's contextual relevance to UK HEI has grown enormously in recent times but more importantly this relevance has thrown in to sharp relief the fact that norms, values and beliefs may hide certain aspects of the governance-performance puzzle. The challenge seems to be to include as many of these aspects within the debate and unpack them.

2.4.3.5 Stewardship and Agency perspectives (S&A)

As mentioned earlier at least three other ancillary theoretical constructs bear direct relevance to university governance and performance. Among these it is useful to begin with the stewardship variant of agency perspectives. The governors of a corporate firm view its agents i.e. the CEO and his/her specialist team with suspicion because the latter are considered to be motivated by personal ambitions and vested self-interests. Therefore, the principal-agent conflict is given central attention in corporate governance literature. But university governance is different. This institution is often run for collectivistic purposes and subsumes within itself a range of non-utilitarian objectives connected to societal welfare. Smallman (2004), Donaldson & Davis (1991) and Davis, Schoorman and Donaldson (1997) stress how in collectivistic organisations agents must be viewed more as stewards whose utilities are only maximized in the collective utility of the institution. It is not agency conflict that is central here. Therefore one has to accept the argument of university governance scholars like Saltman et al. (2000) that university executives are leaders who must work to instill a common set of values and understanding within the organization. Stewardship precepts apply squarely to university governance and performance.

2.4.3.5.1 Implications of Stewardship and Agency perspectives to university governance and performance

University governing boards entrust conduct of administration to administrative officers i.e. the general administration and day-to-day management of the institution to the vice-chancellor and his/her executive team and the conduct of teaching and research to the heads of department and senior faculty but maintain a general overview. This complex yet nuanced balance of powers and delegations is best deciphered using stewardship precepts (S&A). S&A stresses that universities should try to attain a delicate balance between the board, the VC and his executive team and the heads of department in different faculties (Marginson & Considine,

2000; Swansson, Mow & Bartos, 2004; Lazerson, 1997). Such a delicate balance is undoubtedly difficult to attain and maintain but nevertheless essential in a university. Unlike as with the CEO in a corporate firm the VC cannot and indeed must not purport to be the single focal point of power in a university. Different levels in the hierarchy of a university would necessarily share power and responsibility and this delicate balance would have to be carefully fostered. S&A therefore implicates the entire sets of checks and balances at different levels in the university hierarchy and in particular the Board versus VC executive team dynamics . it advocates appropriate self-limitation and power sharing at different levels and in different dimensions of university governance and performance (Seyama, 2015; Lazerson, 1997; Swansson, Mow & Bartos, 2004). Thus, the theory itself stresses the importance of good stewardship. In doing so it invoke the need to sustain multiple dimensions of university governance and performance.

The independence of the board is another key concept emphasized by S&A. After all It is only a university board populated by independent directors that will play an active interventionist role. Such directors with no executive role in the university will act without fear to engender the complex sets of balances of power across the university (O'Meara & Petzall, 2007; Trakman, 2008). This is what will provide different alternate centers of power lower down in the university hierarchy the ability to vent differences and ensure that the VC and executive team do not arrogate more than their fair share of power. Such a balanced perspective seems to highlight the role of the entire range of internal audit mechanisms and their crucial need in universities.

The twin aspects of power balance and independence have another very important implication. The good steward in the form of the Vice Chancellor must ensure effective balance in staff organisation, student body diversity and asset/revenue stream choices. In this the theory seems to stress a holistic concept of the Vice-Chancellor. As the head of a knowledge institution tasked with a complex and unique objective it is his/her duty to ensure a rounded perspective in all these missing dimensions of university governance and their impacts on performance.

2.4.3.5.2 Limitations of Stewardship and Agency perspectives

Yet S&A does have its limitations. The theory is normative and fails to consider that stewards are real people with vested self-interests. The VC and executive team would naturally stress their narrow interests over and above broader multi-dimensional organizational goals (Clarke, 2004; 2007). Self-limitation by a powerful VC is certainly a laudable goal but the theory is quiet on how this can be structurally achieved. After all unfettered power once obtained is very difficult to relinquish (Smallman, 2004; Davis, Schoorman & Donaldson, 1997).

The theory is also silent on how power sharing may be achieved especially in a complex multi-layer multi-dimensional university setting (Davis et al., 1997; Saltman, 2000). In particular there is no specific advice on how the VC's executive team, heads of department, academic affairs committees or the board are to share power. S&A has little concrete recommendations other than normative prescriptions.

2.4.3.5.3 Stewardship and Agency perspectives' relevance to the UK Higher Education

The good steward argument has been repeatedly contested in UK HEI (Coy et al., 2011; Nelson et al., 2003; Ntim et al., 2017; Shattock, 2006; Perez & Ode, 2013). Vice-Chancellors have proven themselves to be extremely inept in some post-1992 universities paying themselves very high salaries (Bachan & Reilly, 2015; Hubble & Bolton, 2019). This has invited the wrath of the university press which has highlighted the huge conflict of interest in the pay determination of the top most executive in the university. This has raised the issue of university boards not really being independent and effective to act as a check or balance on the steward. External regulation of UK HEI in recent times has initiated some action here in the form of CUC mandates prescribing higher levels of board independence (CUC, 2009; Dearlove, 2002; Schofield, 2009; Shattock, 2002: 2004).

Elsewhere a series of poor governance scandals in the Higher Education sector in the UK emerged during the decade of the 90s. These set into motion debates focusing on whether boards and other governance mechanisms in universities were "fit for purpose" (Shattock, 2004a ,b; 2013 a, b). Concerns have repeatedly surfaced regarding whether boards are independent enough and take account of wider public concerns. The good steward concept has been challenged especially within the context of the many Vice Chancellors drafted from the private sector in the post-1992 universities (Middlehurst, 2004; 2013; Bennett, 2002; Knight,

2002). There have been repeated calls for more representative boards with larger proportions of lay members to ensure that errant steward VCs are kept in check. This vibrant context makes S&A highly topical to any analysis of governance reform and university performance in the UK.

2.4.3.6 Culture and Quality Assurance (CQA)

A university's governance is rooted in its prevalent culture. Geertz (1983), Kuh & Whitt (1988) and Trowler (2008: 1) stress that the multiple levels and dimensions of this institution are each significantly impacted by the socio-cultural milieu in which it is located. Importantly teaching and research regimes, subject and syllabus choices and the priority given to academic attainment by a university are each a direct function of its culture (Peter & Waterman, 1982; Handy, 1993). At a different level universities with predominantly left leaning departments dominated by social science disciplines can be expected to resist managerial and private sector style governance reforms. On the other hand right leaning business orientated instrumental universities might embrace such reforms. Therefore a large set of university governance scholars (Bess, 1992; Cole, 1993; Terenzini, 1993; Gayle et al., 2003) argue for incorporation of culture.

University governance and performance are subject to quality concerns. A university that shows high graduation rates might be doing so on the back of high rates of plagiarism and relatively easy marking schemes. Similarly a university may mask its lack of academic rigor by marketing an informal friendly internal environment. Thus, Quality assurance is inevitably an important dimension that ought to form part of any study of governance and performance in a university.

2.4.3.6.1 Implications of Culture and Quality Assurance to university governance and performance

Culture and quality assurance concerns are important axes in the university governance performance debate. The university is a knowledge institution that delivers two important complex functions of research and teaching. But the process of delivery of these functions crucially depends on protocols developed over time in the institution often termed Teaching & Learning Regimes (TLRs). The theory implies that TLRs show up in different ways across the

institution (Trowler, 2019, 2008; Gayle et al., 2003; Trowler and Cooper, 2002). Academic staff involved in pedagogy both research and teaching are constantly calibrating their inputs based on the existing and continuously evolving TLRs of the institution. TLRs are academically influenced. Universities with a high research orientation exhibit a different type of TLR when compared with peers who are more teaching or vocationally focused. Yet TLRs show up in the different range of academic staff contracts, the selectivity of students and choice of student staff interaction levels at any given university. The theory thus implies that these facets of governance will surely matter to the institution's academic performances.

Culture in CQA has important implications for university governance and performance (Bess, 1992; Cole, 1993; Terenzini, 1993; Gayle et al., 2003; Alvesson, 2002). At one level it suggests that university location would have a deep and abiding cultural influence. For example an Irish university might have very different cultural norms for board size, diversity or independence than its English counterpart. Extant empirical research in Ntim et al. (2017) confirms that this is indeed the case. Similarly direct collaboration in research with corporate entities may be culturally acceptable in English universities but frowned upon among Scottish counterparts. The latter might insist that academic research be neutral and independent of corporate commercial bias. Thus, university location must be used as an important factor in any analysis of governance in this institution.

At a second level Culture is necessarily implicated in teaching and research governances designed by universities. Scholars like Kezar & Eckel (2004), Alvesson (2002), Trowler (2008), Kochan & Useem, (1992), Gilmore (1997) and Altbach et al. (2005) cite several case studies to demonstrate how the culture of a given university impacts upon teaching, research and administrative and recruitment processes and thus improves or declines its academic and non-academic performance. Therefore, culture and quality assurance has two fold-implication for University governance and performance; First, it implies that relations between governance mechanisms such as training spends or administrative staffing priorities and academic and non-academic performance in a university would be strongly influenced by its culture. Second, it gives an expanded scope to the cultural considerations embedded in university governance and performance suggesting there could be complex trade-offs and interactions here that may need consideration. Teaching and Learning Regimes driven by the academic culture at a university could result in certain types of staff contracts or student staff interaction levels that although

producing research or teaching performance desired may harm the university's mission in its totality (Trowler, 2008: 2019; Mouwen, 2000; Kim, 2008; Rowley, 1996).

From another perspective culture of a university would surely limit its ability to recruit and retain the best talent on offer at all levels of its hierarchy and particularly in its VC. Culture and Quality Assurance (Parker, 2011; Nagy & Robb, 2008; Altbach et al., 2005) both imply that VC remuneration levels would critically affect the performance of the institution. On the one hand the pay itself would be limited based on cultural notions of what each university board felt was justified. But on the other hand, quality assurance concerns would highlight that a high-quality candidate might not even consider an offer that does not value his/her contribution. Thus, internal governance at the university would face a challenging trade-off here and the theory seems to imply this.

Culture and Quality Assurance avers that both university governance and performance are strongly subject to quality considerations. Large swathes of argumentative scholarship (Canado in Blessinger & Anchan (eds), 2015:55; Eurydice, 2010:24; Brown & Carasso, 2013: 144-163; Attwood, 2008b; Yorke, 2009a, b; Allen, 2011; Jack, 2008; Palfreyman, 2010; Ehrenberg & Zhang, 2006; Himanen et al., 2009) here emphasize the rapid decline in academic standards, dumbing down of research/teaching assessment protocols, rising use of part-time staff, increasing incidences of plagiarism/grade inflation, lowered access of students to teaching/research input and consequent drop in teaching/research quality across Higher Education. All of these suggest that Quality assurance might have complex and non-linear impacts on the governances of research teaching or administration in a university. Culture and Quality Assurance therefore stresses effective internal and external audit mechanisms, independence and diversity in different levels and dimensions of governance and a careful calibration of teaching research and administrative priorities. This is what will improve the quality of the multi-dimensional performance of a university.

2.4.3.6.2 Limitations of Culture and Quality Assurance

Culture and Quality Assurance has its own set of drawbacks. First and foremost is the fact that both culture and quality assurance are complex constructs and difficult to proxy or operationalize. They might need a level of detail that is out of the scope of this research. Second

is the fact that both constructs are prone to different interpretations. Different constituencies and stakeholders in a university would construe quality assurance or culture differently and generalization of findings would not be easy. Finally, culture and quality assurance may also interact and depend on each other making it difficult to unpack their interactive influence on the university governance performance relation. Yet despite these shortcomings there is no escaping the fact that university governance performance studies necessarily must incorporate both culture and quality assurance or risk ignoring vital mechanisms at work here.

2.4.3.6.3 Culture and Quality Assurance' relevance to the UK Higher Education

Recent events in Higher Education in the UK underline how culture and quality assurance concerns are becoming widespread here. Scholars such as Middlehurst (2013), Nagy & Robb (2008) and Parker (2013) underline a shift in university governance in the UK with the rise of the corporatized university. In particular these authors decry the “top down management style and culture” increasingly being promoted at these institutions. It seems fairly obvious that university cultures are changing rapidly and the staid conservative university of the past is giving way to a vibrant open entrepreneurial organization. There is thus a greater need to incorporate cultural considerations in university governance performance studies.

Regional disparities are an important theme of UK HEI and there has been growing evidence of this in recent policy and empirical literatures here (Ntim et al., 2017; Brennan et al., 2018; Brock, 2015; Huisman et al., 2007; Croxford & Raffe, 2015). For example, Scottish universities have very different ideas of gender diversities, staff contracts and student fees than their English peers. Such universities also seem to be less focused on distinguishing between research and teaching arguing for a holistic approach where either function robustly complements the other. These cultural differences have been growing across the decade and making it more and more difficult to integrate UK HEI in all the regions of the country (Scott, 2012; Shattock & Horvath, 2019; Bruce, 2012; Trench, 2008). There is little doubt that region and culture are becoming vital to governance performance studies.

Recently governance policy scholarship both generally and in the UK (Canado in Blessinger & Anchan (eds), 2015:55; Eurydice, 2010:24; Brown & Carasso, 2013: 144-163; Attwood, 2008b; Yorke, 2009a, b; Allen, 2011; Jack, 2008; Palfreyman, 2010; Ehrenberg & Zhang, 2006; Himanen et al., 2009; Bachan, 2017; Jones & Soo, 2013; Barron, 2006; Anyanwu, 2004)

emphasize the rapid decline in academic standards, dumbing down of research/teaching assessment protocols, rising use of part-time staff, increasing incidences of plagiarism/grade inflation, lowered access of students to teaching/research input and consequent drop in teaching/research quality across Higher Education. All of these suggest that Quality assurance is at the heart of governance performance debate in UK HEI. Now more than ever effective internal and external audit mechanisms, independence and diversity at board level is increasingly focused on delivering quality in university performance (Salter & Tapper, 2002; Brown, 2004; Shattock, 2006; Pollitt, 1990; Kim, 2008; Middlehurst, 2013). Yet the debate is now highlighting the many other processes within academic governance that have a crucial quality connotation. These include the way staff teaching/research contracts are calibrated or how part time staff levels are chosen or whether students have adequate interaction times with supervisors (Rowley, 1996; Patrick & Stanley, 1998; Yorke, 2000; Locke, 2016; Bradley et al., 2008). The theory is thus centre stage in the debates of UK HEI.

Elsewhere self-financed students are on the rise and Government aid to higher education is on the decline. Students and their financiers are increasingly asking more probing questions about the quality of university education that they receive (Mcgettigan, 2013; Browne, 2010). Firms are questioning whether incoming university graduates really represent value for money (Shattock, 2013a; Taylor, 2013a, b, c). University research is being criticized widely in terms of its independence, worth and effective contribution to knowledge (Hordern, 2013; Rowlands, 2013). Regulation of the sector especially the recent introduction of the OFS and amalgamation/rationalization of different agencies has been driven in large part by the quality of university governances and performances (DOE, 2017; DOE, 2016; Shattock, 2013a, b; Mcgettigan, 2013). Undoubtedly quality assurance in university governance and performance is now at the center of the debate in UK Higher Education.

2.4.3.7 Managerial power and Optimal Contracting (MPOC)

Managerial power is reflected in the many dimensions of University Governance and performance. Teaching/Research staff and members of the VC's executive team exercise different degrees of power vis-à-vis the board and therefore the tenets of Managerial power theory apply squarely here. Extant scholarship (Bebchuk & Fried, 2003; Schleifer & Vishny, 1997; bebchuk et al., 2002; Van Essen et al., 2015; Kalyta & Magnan, 2008; Byrd et al., 2010)

therefore emphasizes that governance studies should examine the modalities and dynamics of these power relations in the different dimensions of university governance and performance.

The university, like a firm contracts with a wide range of intermediate institutions and individuals to fulfill its complex and multi-dimensional mandate. Many trade-offs need to be effectively managed by university governors and powers that be if the institution is to deliver on its multiple objectives. (Edmans & Gabaix, 2009; Mallin et al., 2015; Murphy, 2012). Therefore, the tenets of optimal contracting theory must necessarily be applied within any governance performance study of a university.

The two separate theories have a joint impact on university governance and performance. Governance structures and mechanisms in a university are radically different from the corporate firm. Collegiality is the way it has often been described in the university governance literature (McNay, 1995: 2011a, b; Elton, 2008; Tapper & Palfreyman, 2010; Meyer, 2007; Bess, 1992). The amorphous manner in which governance and managerial decisions are taken across this institution emphasize debate, coordination and collaboration across many levels. The divide between the board and the executive is not sharp but fuzzy. Therefore, managerial and strategic power combine in different ways across the organisation. This is why it makes sense to combine the use of managerial power theory with optimal contracting here. How a university contracts outward is essentially intricately linked to the balance between strategic powers vested in the board and managerial powers vested in the VC and his team.

2.4.3.7.1 Implications of Managerial Power & Optimal Contracting to University Governance and Performance

Managerial Power (MP) has direct and indirect implications for university governance and performance. There is the direct inference that academic subject domain managers such as heads of departments have a vital balancing role to play in several hidden dimensions of university governance. Whether it be how staff are organised or which courses are prioritised or even what income sources are predominantly courted these academic managers exert very powerful vested influence. The theory suggests that this academic power might be hard to counteract especially given the specialist status of these subject domain expert managers (Bebchuck et al., 2002; Exworthy & Halford, 1999). From a different angle there are indications that managerial power complicates the complex trade-offs that might exist in these

missing dimensions of university governance and how they impact the institution's performance (Meyer, 2002; Deem et al., 2007).

But MP also has an important indirect implication for the debate. Academic managers at universities often act as robust checks. They are the advocates of academic integrity contesting even a so-called independent board or external audit from distorting the academic focus. The theory seems to thus imply that managerial influence even within an academic institution could play a complex role in balancing executive or board level excess.

Strongly linked to this balancing role of Managerial Power there is the question of how well a university contracts with its many stakeholders across its multi-dimensionality. Optimal contracting implies that this contractual efficiency should matter to both governance and performance at the institution. The university faces trade-offs in many tacit aspects of its governance particularly how it selects students, recruits' staff, organises assets and prioritises income sources. In each of these dimensions the theory suggests that an important optimality criterion should be applied. Universities should consider and balance out the many competing demands on every dimension before deciding on it. In this Optimal Contracting (OC) is much like MP exposing the complex trade-offs that exist in each governance dimension. But there are other aspects of the optimality criterion that apply even to board and audit related dimensions of university governance. The theory (OC) implies that VC pay levels, board and audit committee compositions are challenges in themselves. In each of these governance dimensions the university's ability to effectively optimize would make a significant difference to its performance (Ehrenberg et al., 2001; Soh, 2007; Tarbert et al., 2008).

2.4.3.7.2 Limitations of Managerial Power & Optimal Contracting

Managerial power and optimal contracting have their limitations. Both theories are limited in terms of their insights into how complex multi-dimensional aspects of university power relations and/or contractual structures can be remedied or optimized (Cambini et al., 2015; Carver et al., 2013; Luo, 2015). They do not advance models of power relations or optimal contracts specifically aimed at universities or non-profit institutions. In that sense the theories are too rooted in neoclassical and neoliberal paradigms to afford any holistic insights that incorporate plural non-corporate ideologies. Therefore a University Governance Performance

study should only apply MPOC in a balanced and critical manner and this is what is intended in this research.

2.4.3.7.3 Managerial power and optimal contracting's relevance to the UK Higher Education

In recent years managerial power and particularly its excess has attracted much attention in university governance discourse within the UK. Three illustrations must be advanced here. First is the growing regulatory pressure on university boards to include more lay members in order to impose checks on the growing unfettered powers of the Vice Chancellor and his/her executive team (Xiao et al., 2004; Cheng & Courtenay, 2006; Lim et al., 2007; Chan & Gray, 2010; Gisbert & Navallas, 2013). Clearly the implication here is that independent board members will act as a critical balancing force that corrects the excessive executive power at least at the top of the university governance pyramid. Recent investigations by Ntim et al. (2016) reveal that most UK universities have complied. At least half of their board is now indeed composed of non-executive members. Clearly universities at least on the surface seem have realized the importance of fostering checks and balances in their internal governances.

Second, there is much evidence that universities especially the research intensive world class institutions are singularly resisting pressures to implement the “top-down” corporatized styles of internal governance being advanced by regulators. Shattock (2017) cites much evidence to show how in the period between 2000 and 2016 world class research institutions in the UK have indeed successfully resisted calls to corporatize themselves. Consensual and collegiate governance continues to be remarkably robust here. Managerial power theorists would thus argue that academics at least in these institutions do indeed seem to be demonstrating the power to remain impervious to external pressures.

Finally detailed guidelines have been issued recently with regard to internal and external audits of university finances (CUC, 2008; 2009; Pearson, 2009; DOE, 2016; 2017). The idea here too seems to be to ensure that executive power is kept under surveillance. Narrow spending agendas or empire building tendencies of the VC and his powerful team are intended to be subject to external independent scrutiny. Such moves illustrate how balancing managerial power is increasingly becoming relevant in the UK university sector.

On the other side the value for money debate in UK university governance (Lambert, 2003; 2005; FSSG, 2011; UUK, 2011; CUC, 2006a, b) is rooted in optimal contracting ideologies. It is hard not to see it as a direction to the university to optimally contract. The underlying implication seems to be that the institution must achieve efficient calibration of its contracts with students, staff and other stakeholders. In each of its many contracts with diverse parties the university is now expected to deliver a compelling return on its invested financial and social capital (Browne, 2010; Dearlove, 2002; Shattock, 2013; Ntim et al., 2017). Whether in staff teaching/research contracts, student body compositions or even in its resource contracts the university is increasingly expected to be as astute if not more astute than a corporate firm. Optimality seems to be the main concern in the context of increasing corporatization of the UK HEI. Growing incidences of universities chasing research grants, fee paying international students, larger endowments, and leverage have raised concerns about their financial sustainability. Clearly an expanded range of tacit governance dimensions and the optimality elements in them need explicit consideration. In particular there are so many questions being asked now about universities and their optimal balance between academic integrity and financial sustainability. External regulation seems to be veering round to a more holistic view of this institution. Universities must not just chase research grants, student fees, endowments or loans without recognising the dangers and risks that could potentially derail their performances here. Optimal contracting tenets are thus now-more-than-ever infallibly expected to inform university governance and performance policies.

2.5 Conclusions

This Chapter has conducted a systematic theoretical review of university governance and performance. It began by searching for the best taxonomical definitions for each construct. Recognising that governance and performance in higher education are both multi-dimensional and complex, the Chapter successfully crafted an expanded yet internally consistent set of definitions for each. These not only captured their multiple dimensions but evoked important missing governance proclivities/discretions and performance variants. The Chapter therefore established a sound foundation for the development of a theoretical framework for a governance performance study in higher education.

Directly stemming out of the newly crafted definitions, the second part of the Chapter identified and justified the use of a seven-theory framework to study university governance and performance. It showed that this mesh of seven theories with their interrelationships were vital to unpacking the multi-dimensional associations between the two constructs. This was then followed by a detailed discussion of each selected theory's implications for the governance performance debate. In each narrative here, theoretical indications were marshalled to show that university governance and performance are far from straightforward with many tacit and explicit elements. Simultaneously these theoretical narratives were threaded together to demonstrate their relevance to several recent and critical policy-based debates in UK HEI.

On the whole then, the Chapter theoretically framed the conundrum of multi-dimensional governance and its association with performance in the university sector. It clarified the theoretical boundaries of this puzzle highlighting its many missing parts. By doing so, it helped to justify why this research is topical, relevant and highly appropriate at this juncture.

The next Chapter builds on this theoretical foundation. It reviews empirical literature to reveal the existing gaps in the body of knowledge and formulates a set of important hypotheses and sub-hypotheses.

3.Chapter Three: Empirical Literature Review & Hypothesis Development

The primary purpose of this Chapter is to critically review the empirical literature in university governance and performance in such a way as to derive important hypotheses regarding the likely links between these two constructs. In the process of this derivation there is a natural elucidation of the primary research gaps that constitute the fundamental research objectives of this thesis. Therefore, the chapter begins with section 3.1, which describes the main empirical gaps in the extant literature in university governance and performance. This is then followed by Section 3.2 which derives a range of inter-linked hypotheses that emerge from these debates and gaps in the empirical literature. Finally, Section 3.3 concludes the chapter.

3.1 The principal empirical gaps in extant literature

As discussed in the introductory chapter university governance and performance are multi-dimensional complex and interlinked. Unlike the corporate firm, the university is governed in a range of complex dimensions and its performance too needs to be interpreted in various inter-linked ways (Vukasovic et al., 2018; Hooghe & Marx, 2003; Piattoni, 2010; Braun, 2008). Its multi-dimensional societal role and myriad obligations to wider sets of constituencies and stakeholders are at the root of this (Chou & Gornitzka, 2014; Chou et al., 2017; Eitken, 2015; Peters, 2015).

This is why seven-theory framework proposed in Chapter 2 was shown to be highly relevant to deciphering such multi-dimensional university governance and performance. But in the very process of analysing and justifying this framework several indications became available that the current lexicon of university governance and performance is far from sufficient to investigate such complex constructs and their associations. There is a need to expand the scope of empirical investigations beyond the extant paradigm.

Be that as it may extant empirical scholarship has not engaged with this multi-dimensionality or complexity especially in a rigorous quantitative way. While many argumentative and normative papers exist on the subject the discussions in them have remained largely theoretical and speculative. There is a distinct lack of investigative work operationalizing the many

hypotheses linking university governance and performance (Ayoub & Massoud, 2012; Bachan & Riley, 2015; Maingot & Zehgal, 2008; Coy et al., 2001; Olson, 2000; Ntim et al., 2017; Gordon et al., 2002; Gray & Haslam, 1990; Banks et al., 1997; Nelson et al., 2003). The few quantitative studies that do exist simply extend the corporate governance paradigm to the university (Ntim et al., 2017; Olson, 2000; Lokuwaduge, 2011; Lokuwaduge & Armstrong, 2015; Harris, 2014; Tarbert et al., 2003; Jones & Virmani, 2019). This overlooks important key aspects of this complex institution, and is one of the main reasons for lack of empirical substance in the existing debates in higher education.

In what follows the three main empirical gaps that exist in the university empirical literatures are identified. But more importantly in the analyses of each empirical gap an expanded range of university governance is identified that are missing and need to be actively incorporated here.

3.1.1 Extant research missing the multiple dimensions of university governance and performance

Discussions in chapters 1 and 2 have cogently argued how and why universities are unlike other public or private organizations. The unique multi-dimensional nature of these institutions makes their governance more complex and unusual. Studying governance and performance in a corporate firm can afford to take on a narrow view based on one or two dimensions (Cadbury, 1992:15; Armstrong, Jia & Tonkidis, 2005; Shore & Wright, 2004; Dahya et al., 2002). Even in a public utility or charity governance and performance may be conceptualized simply and easily.

By contrast university governance and performance are multi-dimensional and pervade the institution (Gayle et al., 2003; Collis, 2004; McGettigin, 2012). The theoretical underpinning here seems to strongly suggest that existing governance and performance variables originating in corporate governance may be insufficient to map out several missing dimensions. For example there is a need to capture how teaching regimes and protocols get created and innovated in universities (Shattock, 2010; Rowlands, 2013; Gayle et al., 2003). This might need variables that demonstrate a university's teaching ambiance and priorities. Similarly, research agendas are significantly fine-tuned in a range of different ways that reflect governance priorities or research and knowledge specializations of a given university (Collini,

2012; Gayle et al., 2003; Locke & Bennion, 2011). Even ranking teacher or student performance could be department or subject specific and may not have a universal basis (Middlehurst, 2013; Shattock, 2010).

Yet extant scholarship has largely treated university governance just like corporate governance (Middlehurst, 2013; Parker, 2011; 2013; Nagy & Robb, 2008; Trakman, 2008; Collis, 2004). There has been an inordinate focus on a small set of governances mostly focused within the board. Performances of this multi-dimensional institution too have been coalesced into single measures of academic and non-academic performance. Most studies either investigate a smaller subset of governance performance relationships in the university or conflate missing dimensions of governance with performance (Olson, 2000; Boliver, 2015; Ntim et al., 2017; Lokuwaduge, 2011; Lokuwaduge & Armstrong, 2015; Bachan & Reilly, 2015; Dolton & ma, 2003; Ayoubi & Masoud, 2012; Asif & Searcy, 2014). In what follows, some important sets of existing studies are highlighted to underline this missing multi-dimensionality.

Among the university governance performance literature there is one significantly large quantitative study i.e. (Lokuwaduge, 2011; Lokuwaduge & Armstrong, 2015). The author evaluates the governance performance link in the Australian Public University Sector. Her sample consists of just 37 public universities across Australia representing only a slice of the higher education sector in the country. Time horizons are restricted to the three years between 2005 and 2007. Further even across these 3 years the author only uses averages thus treating the 3-year panel as just a cross section. But to her credit she compares and contrasts a wider range of governance and performance variables than before and finds complex relationships between different governance and performance variables. Her study is also the first one to decompose university performance in to research teaching and financial performances. The author is also among the first to accept that university performance may be multi-dimensional and so study it using more than one variable.

Yet in her study dimensions of governance beyond board level composition are ignored. Even where the author rightly identifies the student staff ratio as an important indicator in HEI studies she uses the ratio as one of her teaching performance measures. At another level many of her findings remain unresolved because her sample is too small and is only a cross section. Overall, then there is a distinct impression that Lokuwaduge's impressive study still does not carefully distinguish between university governance i.e. a discretionary policy variable and university

performance i.e. an outcome variable determined by the chosen set of governances. In addition, despite her trailblazing effort to include at least some dimensions of university performance the author still misses hidden governance discretions at this complex institution.

An important rigorous quantitative study in the university governance - voluntary disclosure literature bears mention. Ntim et al. (2017) find many interesting relationships between the two constructs in their UK sample. For the first time the authors use governances related to the VC's executive team as a likely interacting influence on voluntary disclosure. Nevertheless, important staff, student, academic and non-academic governances are overlooked even here. Therefore, there are many indications in the paper that a richer picture of multi dimensional university governance might be lurking beneath the surface. To their credit the authors recognize this fact and themselves recommend that there is a need for expanded studies of university governance and performance.

Elsewhere, empirical quantitative studies within the Vice Chancellor pay, origin and tenure literatures examine some of the multi-dimensional aspects of university governance and performance. For example Dalton & Ma (2003) link VC pay with financial and research performances while Soh (2007) uncover a significant negative size effect on VC pay. Elsewhere to their credit, Tarbert et al. (2008), Bachan & Reilly (2015) and Mcmanus et al. (2017) do investigate hidden governance discretions displayed in total numbers of students, change in post graduate students, change in overseas students and change in research income but do so only in relation to VC pay. But invariably the focus of all these studies remains narrow and focused around the remuneration question of the top executive of the university.

Other studies of university financial performance like Olson (2000) expand the concept to include a range of measures such as total revenue, total gift income, endowment gifts and total number of gifts but correlates these with only board level compositions. Similarly, Festo & Nkote (2013) and Harris (2014) do add some variables to both university governance and performance. But their efforts remain focused on board effectiveness, board roles or board diversity respectively. similar narrowly focused studies here include Sherer & Zakaria (2016), Rossi (2010), De Boer et al. (2010), Safavi & Hakanson (2013), Braun et al. (2015), Montondon & Fischer (1999), Vidovich & Currie (2011) and Meyer (2007); Ayoubi &

Massoudi (2012) all of which either investigate small subsets of the governance performance association or remain normative/argumentative in scope.

However, several pointers to tacit dimensions of university governance emerges individually in key strands of empirical work in the HEI literature. Notable here are (Boliver, 2015; 2013; Ayoubi & Massoud, 2012; Gorard et al., 2019; Jerrim & Vingoles, 2015; Johnes & Soo, 2013; Bachan, 2017; Chowdary, 2008; 2013) who study how universities develop entry standards for student recruitment; (Nyamapfene, 2018; Locke, 2014; 2016; Metcalf et al., 2015; Santos & Van Phu, 2019; Blake & La Valle, 2000; McFarlane, 2001; Skelton, 2012; Brew et al. 2017) who examine the diversity of university staff contracts; who investigate the role played by student body compositions in universities and (Sawir, 2013; Marshall & Chilton, 1995; Anyanwu, 2004; Morrison et al., 2005; Angell et al., 2008; Donaldson & McNicholas, 2004) who evaluate university endowments and their impact on research and teaching at the institution. Yet invariably each of these studies is focused on its narrow theme. A single missing dimension is explored and investigated on its own and no attempt is made to relate it to other missing or multiple governance dimensions or even university performance. Thus, the debate about the larger question of multi-dimensional university governance performance linkage remains unresolved.

While this serious gap in the empirical literatures remains unfilled it is indeed ironic to find large swathes of policy and argumentative scholars such as Shattock (2010), Middlehurst (2013), Jarvis (2013), Parker (2011), Collini (2012) Bennett (2002), Davies (2001), Gayle et al. (2003) criticizing the “top down” corporate approach being adopted in governance reform in the higher education sector in the UK. Using anecdotal evidence these authors concur albeit for different reasons that the governance and performance in universities cannot and should not be regulated from single perspectives like those in corporate firms. For example, Shattock (2010: 195) shows the distinct irrelevance of corporate style regulation in universities where collegial internal governances and holistic integrated management should necessarily be the order of the day. In a similar vein Parker (2011), Bennett (2002), Davies (2001) and Jarvis (2013) question many of the trends to corporatize teaching and research through metricized governance and performance directives. According to them these do not take account of the multi-dimensional trade-offs faced by universities in research and teaching. Using a theoretical model Gayle et al. (2003) demonstrate university governance as a series of overlapping circles.

These circles each representing one different element of university governance intersect at various points. There is thus the clear implication in the author's arguments that university governance is multi-dimensional and any study of it must incorporate this.

In totality this section has established a primary gap in the empirical investigations in university governance and performance to date. Studies have overlooked important missing dimensions of either construct that have crucial ramifications for the interrelationships between them. Most studies have simply treated the university like a firm and used the standard template of board and audit related governances and associated them with the institution's performance. Even where some scholars have discovered tacit governances in universities they have not systematically or comprehensively evaluated them to decipher the larger connections and associations. This is clearly misplaced and needs to be redressed. This thesis intends to expand the range of university governance and performance to include all relevant dimensions of either construct and evaluate their interconnections with the express purpose of filling this gap.

3.1.2 Missing cultural and Quality Assurance aspects in extant university research

In the theoretical review conducted in Chapter 2 and in several discussions in the introductory chapter (1.1, 1.1.1 & 1.2.3) mention has been repeatedly made of important culture and quality assurance elements in a university's governance and performance. While these two elements remain important in the governance and performance of a corporate firm yet they can afford to be treated as distinctly secondary level influences. By contrast in a university cultural differences and quality concerns play a more central role (Shattock & Hovarth, 2019; Trowler, 2008; Alvesson 2002; Gayle et al., 2003; Boliver, 2015; Salter & Tapper, 2000; Yorke, 2002). Both aspects are two central dimensions of the several that constitute the multi-dimensional governance and performance at this institution. Therefore, they need active and primary consideration.

The culture/quality assurance connection to university governance and performance is widely referred to in a large theoretical normative and anecdotal literature that harps on its importance. For example, Harvey & Williams (2010) summarize rich and copious theoretical and normative literature on quality assurance concerns in university governance. Many of their collated studies argue how quality issues critically modify and constrain internal governances and have

consequent impacts on university performance. In a similar vein a large theoretical literature (Bonroy & Constantatos, 2008; Dulleck & Kerschbamer, 2006; van Vught et al., 2012) is presented by Jongbloed et al. (2018) that puts quality assurance concerns at the very heart of the governance performance debate. The primary contention of this strand is that universities are providing a credence or experience based good to student consumers whose quality is very difficult to assess upfront.

Culture is likewise an important influence on both university governance and performance and this is stressed by a large set of normative scholars. Scholars like Kezar & Eckel (2004), Trowler (2008), Kochan & Useem, (1992) and Gilmore (1997) argue about how culture of a university defines limits and modifies teaching/research routines, assessment protocols and administrative mechanisms. Many of them provide interview-based case studies or other qualitative evidence to show this. Alvesson (2002) and Altbach et al. (2005) on the other hand develop theoretical paradigms to illustrate these culture-based influences on university governances and performances.

Surprisingly extant empirical research in university governance and performance largely ignores these aspects. Lokuwaduge (2011) in her detailed analysis of 37 public universities in Australia does not consider their different locations. While it is to be anticipated that universities are both influenced by and active influencers of their regional communities and localities and their cultures the author does not incorporate any regional variables in her analysis. Additionally, the author does not introduce any other culture or quality assurance related variable to moderate the test of her primary hypotheses in any way. Elsewhere in the empirical literature (Sherer & Zakaria, 2016; Rossi, 2010; De Boer et al., 2010; Safavi & Hakanson, 2013; Harry, 2013) board level gender diversity, board roles and board effectiveness are evaluated in many ways within universities but once again the authors miss a valuable opportunity to analyse how culture or quality assurance might moderate these aspects. Even Ntim et al. (2017) in their university voluntary disclosure study include some elements of quality assurance in their computation of an index but do not really unpack it in any great detail. Neither do they examine cultural influence within the governance voluntary disclosure link.

VC pay empirical scholarship likewise does not pay detailed attention to the culture of a university or its quality assurance imperatives in their discussions. For example, Soh (2007)

classify universities based loosely on governance types but fail to draw explicit connections to cultural differences embedded therein. Similarly, Tarbert et al. (2008) conduct several investigations using different performance variables but do so in line with their narrower objectives of mapping the effects on VC pay. Again although they segregate universities by governance types they do not discuss cultural or location based differences in any detail. Quality assurance concerns are very briefly hinted at but there is no attempt to draw out the obvious implications for VC pay. Elsewhere similar oversights are spotted in Bachan & Reilly (2015) and Macmanus et al. (2017).

All in all, this section has confirmed how culture and quality assurance elements have been insufficiently explored in extant university governance and performance empirical research. Yet it is obvious that these two elements are crucial influence of the governance performance linkage. It is this gap that this research wishes to squarely address. This is done in two principal ways. First Chapter 2 has already included Culture & Quality Assurance as one of the seven theories included in the theoretical underpinning of this research. The intention behind this is to explicate culture and quality assurance aspects in all of the empirical explanations attempted by the thesis. Second as mentioned earlier a diverse set of university governance performance and control metrics are included in this research. Many of these are intended as proxies of quality, region, and culture aspects within the governance performance relationship.

3.1.3 Missing Longitudinal Analysis

Longitudinal analysis is missing in extant university governance studies (Lokuwaduge, 2011; Ntim et al., 2017; Harris, 2014; Lokuwaduge & Armstrong, 2015; Olson, 2000). Three closely related problems emerge out of this. First, the fact that most studies use a cross-section of governance and performance variables implies that year to year and university to university comparisons are difficult. If the sample of analysis only includes a large set of university-based governance and performance variables in one year then the dynamic time relationships and changes in them cannot be studied. This makes inferences about the impacts of changes in governance policies by universities on their performances difficult. Second, university governance and academic performance are both processes as well as outcomes. . It is difficult to distinguish where one begins and the other ends. For example, entry standards are a discretionary governance choice that a university may determine at one point of time. But

across time this governance may also be viewed as the outcome of the academic quality and reputation of the institution accrued over previous periods. Similarly student staff ratio can be viewed as a governance process but also an outcome and this is why Lokuwadge (2011) associates it with teaching performance. Elsewhere this process like characteristics of university governance are highlighted in the post graduate intensity of institutions that have been used as a measure of academic performance by (ref) despite the fact that universities do have discretion over the numbers of post graduate places offered. Therefore, they need to be studied across a time horizon. Cross sections are unable to do justice to the process like characteristics embedded in either construct. Finally, endogeneities between university governances and performances are strongly indicated by almost all theories included in the seven-theory framework developed in Chapter 2. Without a sufficiently wide panel of data such endogeneities cannot be studied.

Among the most detailed university governance performance studies is Lokuwaduge (2011). But the author collects all her governance and performance variables across Australian universities for only three years of 2005, 2006 and 2007. Even more puzzlingly she averages the three years and uses the dataset only as a cross-section. This clearly limits her analysis. None of the year to year changes in governances or performances in universities across her sample are revealed. The process like characteristics of university governance and performance remain hidden as the author is unable to examine the interlinkages between the two constructs across time. Finally, she is unable to shed any light on likely reverse causal relationships that might be interfering or moderating the governance performance associations in her sample.

Elsewhere Olson (2000), Festo & Nkote (2013) and Harris (2014) study even smaller cross-sectional samples and once again are constrained to ignore yearly variations, process-like characteristics and endogeneities in them. Although Ntim et al. (2017) do control for endogenous relationships in their cross-sectional sample their voluntary disclosure study is too narrowly focused to generate any insights about the larger constructs of university performance and its governance antecedents. This is why the authors recommend that future researchers use longitudinal datasets to measure the university governance problem. To their credit a few VC pay investigations such as Tarbert et al. (2008), Bachan & Reilly (2015) and McManus et al. (2017) do analyse longitudinal samples within the UK. All these papers do in fact study inter-year variations in VC pay and connect them with variations in types of governance and other performances. But given the narrow nature of their research there is very limited analysis of

the larger problem of year to year linkages between the many other dimensions of university governance and performance.

Having identified three important research gaps that exist in the empirical literature in university governance and performance the next section 3.2 uses the seven-theory framework identified in Chapter 2.4 to develop key hypotheses that answer the research objectives formulated in Chapter 1.4.

3.2 Hypothesis Development

Having established the principal research gaps in the previous section the thesis now moves to the important task of hypothesis development. The theoretical indications from the seven-fold theoretical framework already analysed in Chapter 2 form the core here. Every theoretical tenet and debate is marshalled to develop a set of key hypotheses that answer the different facets of the multi-dimensionality problem of university governance and performance identified in the distinct research objectives of Chapter 1. With this intention sub section 3.2.1 establishes the need and justification for five singular missing dimensions of university governance and their likely performance associations. A principal hypothesis is advanced in respect of each association but the subsequent discussion fleshes out key expectations for several linked sub-hypotheses within each dimension. Sub-section 3.2.2 advances other key hypotheses in the extensively studied board level and audit related university governances. Finally sub-section 3.3 presents a concise summary of Chapter 3 and its links to the analytical work in the Chapters that follow.

3.2.1 Missing dimensions of Governance based Antecedents of University Performance

As discussed in the previous chapters the rare studies of university governance and performance that do exist in the empirical literature study the links between the two constructs predominantly at the top levels of the institutional pyramid. Be that as it may it is fairly clear that the university's governance extends far beyond board compositions or audit peculiarities. Unlike a corporate firm a university is a knowledge institution. It is governed in many different ways and dimensions and performs for a far wider range of stakeholders (Buckland, 2004; Middlehurst, 2013; Parker, 2011; 2013; Nagy & Robb, 2008; Trakman, 2008; Kim, 2008;

Taylor, 2013a, b). This is why the university's governance extends far beyond the confines of just its board level compositions. It percolates to the nooks and crevices of the institution and expresses itself in different ways. Therefore, it needs to be investigated through new hitherto rarely defined or discussed variables and constructs.

The knowledge creation and dissemination functions of the university are crucially dependent on these types of new variables and constructs. Invariably in each of these the university is faced with complex inter-linked trade-offs. The decisions made here make the crucial difference to research, teaching and financial performances of the university. In fact it is these discretionary governance proclivities that express the institution's chosen pedagogical market position in the overall higher education market.

The new variables and constructs identified here are concrete governance choices of the institution. They are abstract yet have important implications for the teaching, learning and research here. But they all are invariably decided not in one location or body within the university but instead collegially across the entire institution. At one level this represents a challenge in itself but at another level it is the reason why university governance is so unique and multi-dimensional.

To map each of the missing dimensions five different sub-sections follow. Each presents the theoretical basis for a missing dimension of university governance followed by the empirical work done to date in that dimension. This is then followed by the formulation of an ex ante key hypothesis with regard to the dimension and a discussion of any related important sub-hypotheses.

3.2.1.1 Selectivity in Entry Standards

Three core theories of university governance stress the need for wider student population coverage. Public Accountability, Stakeholder and Legitimacy scholars (Blanden, & Machin, 2004; Coy et al., 2011; Nelson et al., 2002; Parker, 2012; Middlehurst, 2013; Boliver, 2013; Burrows, 2012; Gunasekerage & Reed, 2008; Wicks & Parmar, 2004; De Villiers & Van Staden, 2006) aver that universities should have wider student representation by recruiting students from all socio-economic backgrounds. The scholars argue that this would fit within the neo-liberal narrative of higher education and give equal opportunities to all students. It would

avoid creating pockets of exclusion and elitism in the higher education (Adnett, 2006; Freeman, 2015). The interests of all relevant stakeholders in public universities would be served by such an approach. The legitimacy of the institution in society would also be enhanced.

Yet this is not as straightforward as it seems. Academic attainment and the systematic work needed to achieve it is equally important. If the university does not have a fair filter to winnow its student applicants, it might seriously compromise its academic integrity. Such an argument underlies Quality assurance concerns (Eurydice, 2010:24; Brown & Carasso, 2013; Allen, 2011; Jack, 2008; Palfreyman, 2010; Yorke, 2009a:2000; Boliver, 2013) with the dilution of entry standards. An important part of the student preparation for academic life at the university is the attainment of an established academic standard. If universities do not emphasize this, they risk a compromised academic ambience in the incoming cohort. The quality of pedagogy whether it be in teaching or research will suffer due to inclusion of unqualified non-meritorious students. This would imply a suboptimal knowledge creation and dissemination function at the institution (Bachan, 2017; Bright 2004; Anyanwu 2004; Barron 2006; Furedi 2004).

Thus, the theoretical framework of university governance seems to highlight the important challenge faced by universities in establishing their student entry standards. Neither can the university entirely ignore its public role of inclusion nor can it be blind to its moral imperative of improving the quality of higher education (Schwartz, 2004; Baker, 2008; Waller et al., 2017). This is the difficult to resolve governance trade-off that these institutions face. Entry Standards once chosen are not easily reversible and are likely to have severe repercussions on research teaching and financial performances of the institution. Consequently, this thesis proposes that selectivity in Entry Standards is a missing dimension of university governance that merits detailed investigation.

Argumentative and normative strands of literature in university governance have recognised the importance of Entry Standards as a discretionary governance policy (Warning, 2007; Laband & lentz, 2004; Schwartz, 2004; Murdoch, 2002; OFFA, 2004). But most of the scholars here locate this governance as an important policy parameter within the context of a rapidly changing higher education landscape especially in the UK (Shattock, 2000; Meek, 2000; Brown & Carasso, 2013; Scott & Callender, 2013). Once again just as among the theories there is a strong policy divide among experts and commentators here. One set of scholars argue against dilution of entry standards suggesting that this is at the base of a rapidly deteriorating

quality of mass higher education in the country (Furedi, 2004; Bright, 2004; Bachan, 2017; Johnes & Soo, 2013). The other set point to exclusivities in student selection at high performing universities and decry this trend of retaining elitism here (Zimdars, 2016; Reay, 2018; Boliver, 2013; Chowdry et al., 2008; Zimdars et al., 2009). Clearly this challenging trade-off in crafting an appropriate entry standard is pulled in opposite directions by each set of scholars.

One strand of policy scholarship identifies the dilution in entry standards at some institutions as a direct attempt to bolster student recruitment/fees while a second strand see it as a means to attract international students with their deeper pockets (Bekhradnia & Beech, 2015; Mouwen, 2000; Eurydice, 2010:24; Brown & Carasso, 2013; Allen, 2011; Jack, 2008; Palfreyman, 2010; Yorke, 2009a). Yet others here argue how dwindling government funding to universities is the single most important factor motivating universities to lower their entry standards (Raffe & Croxford, 2013; Coy et al., 2011; Nelson et al., 2002; Parker, 2012; Middlehurst, 2013) and thus generate greater tuition fees. Invariably all these scholars concur that a diluted ES will lead to a reduced quality in the academic function of the university.

In direct contrast significant sets of authors (Zimdars et al., 2009; Glennerster, 2001; Chowdry et al., 2008; 2013; Harrison, 2011; OFFA; Harris, 2010) argue that fair access issues are increasingly the most important consideration in higher education in the UK. According to these scholars many universities in the UK are becoming elite and constraining access to even deserving students from underprivileged backgrounds. The ever-higher entry requirements stipulated year after year at the top universities makes these portals inaccessible to large segments of the student population. This is detrimental to the development of a fair and balanced higher education sector in the country and so regulatory attention too has been focused on this trend.

Quantitative investigations in to ES and its links with a university's performance have been few and far between (Ayoubi & Massoud, 2012; Bachan, 2017; Jones & Soo, 2013). Most empirical studies have studied ES as a discretionary governance within the university highlighting its importance. There is no attempt to link it to university performance.

For example, in a meta analysis of existing research Gorarad et al. (2019) find that entry standards defined in terms of previous academic attainment are a better selection tool than the omnibus recruitment interview. But interestingly the authors find robust evidence that older

and established universities are less likely to recruit students from under privileged socioeconomic backgrounds than their newer peers. In a similar vein Jerrim & Vignoles (2015) in their across country study of 4-english speaking countries (England, Canada, Australia and USA) find that selectivity in student recruitment is more pronounced in the UK than in the other developed countries. Such a pronounced selectivity in top UK universities especially within the Russell Group creates distinct fair access issues and this is further evidenced in Bolivar's (2013) ten-year longitudinal sample. The author strongly avers that this exclusivity and elitism creates a distorted HEI sector in the country that detracts from holistic academic growth. Elsewhere Chowdry et al. (2008; 2013) corroborate such trends but show other complexities in their UK sample. The authors find that students from highly educated neighbourhood pockets are more likely to enrol in established universities than their peers from working class neighbourhoods. But this exclusivity in their sample is hardly monotonic. Controlling for academic attainments of the candidates the same sample reveals that certain types of minority ethnicities are more likely to attend such universities than even their white british peers.

Yet some strands of empirical work do associate entry standards with academic and non-academic performance of universities. A noteworthy example here is Ayoubi & Massoud (2012). These scholars use a single cross section of 100 UK universities to investigate whether there is a link between entry standards and research and teaching performances. The authors find a strong positive association between the published research quality of an institution and entry standards. Interestingly they also uncover evidence for reverse causality and cycles of reinforcement in this link i.e. higher entry standards raises research performance which in turn improves the reputation of the institution allowing it to raise standards further. Bolivar (2015) uses a cluster analysis of UK universities to show how Russell group and pre-92 universities differ in terms of both research/teaching functionalities and their respective entry standards. The author finds strong evidence once again for selectivity in ES contributing to research and teaching performances in older well-established universities. In similar explorations in the UK Bachan (2017) uncover positive associations between entry standards and the level of good honours degrees awarded by a university while Johnes & Soo (2013) evidence positive linkage between degree outcomes, student satisfaction and entry standards. On the whole then the previous scholarly work robustly confirms that entry standards is an important university governance discretion. Not only is this variable an important mechanism to express the

university's chosen internal governance priorities but also has well defined impacts on research and teaching performances. Therefore, a key ex-ante hypothesis is advanced here.

H1: Entry standards are positively associated with the academic performances of the university.

H1a: There is a positive association between entry standards and the research performance of a university.

H1b: There is a positive association between entry standards and the teaching performance of a university.

3.2.1.2 Instruction Intensity in the Staff to Students Ratio

Universities are knowledge institutions. The academic process of knowledge creation and dissemination at the university is crucially dependent on how effectively the institution marshalls its staff resources to deliver instruction and make interaction possible in research and teaching. Of the seven theories included in the underpinning for university governance in Chapter 2 at least four reference and substantiate this argument. Optimal contracting focuses on deriving the best value for money in the knowledge function. The theory suggests that the student to staff ratio must be high enough to ensure the largest student coverage but not too high so as to lose the quality of academic instruction and interaction (Trowler, 2008; Gayle et al., 2003; Parry, 2013). Resource dependence views the student staff ratio from an effective staff resource utilization perspective. Scholars (Shattock, 2013a, b; Parry, 2012; Rowlands, 2013) suggest that university governance must ensure that its existing staff are fully engaged and enabled to contribute with their academic resources to instruction and interaction across the institution. Stakeholder perspectives (McDonald, 2013; Hagenauer & Volet, 2014; Koenig et al., 2015) detail the likely conflicts between staff work life balance concerns, student/parent academic quality requirements and the university's need to balance its budgets. A likely triangular trade-off here is often expressed in these stakeholder conflicts and the theory suggests that these need careful mitigation by the university. Finally, Quality Assurance (Yorke, 2009a, b; Varouchas et al., 2018; Salter et al., 2000; Parker, 2011; Collini, 2012; Collis, 2004) adds to this theme by suggesting the direct association between higher student staff ratios and lower quality of the academic pedagogy. Theorists here argue that institutions should aim to prioritize quality in the academic function and so avoid an overloading of the staff function.

From a purely theoretical angle it is apparent that university governance is crucially dependent on this tacit dimension of student staff ratio. However, what is more interesting is that most of the theoretical debates in the literature treat the variable as though it is just one governance decision whereas it clearly has separate student and staff recruitment decisions embedded within it. Either decision is a complex governance discretion that is decided collegially across the institution. Both decisions are characterized by the triangular trade-offs already highlighted by theory. Neither can a university simply expand student population coverage without paying attention to the dwindling research/teaching quality and/or drop in work/life balance amongst its academic staff. Nor can it simply improve the latter but ignore its vital and important student population coverage mandate (McDonald, 2013). This is the singular challenge of crafting an optimal instruction ratio that faces every university. Therefore, this thesis identifies the SSR as an important missing dimension of university governance and includes it as a vital antecedent of university academic performance.

SSR debates are rife in the extant governance normative and policy related literatures in both UK HEI and around the globe. This focus has grown in recent times especially after concerns recorded by the official Deering report in 2002 that emphasized how student learning outcomes were being adversely affected by larger class sizes. Many normative scholars (Shattock, 2013a, b; Parry, 2012; Rowlands, 2013) have criticised the immense pressure on universities to achieve value for money at the expense of quality in higher education delivery. Similarly (Cui et al., 2019; O'leary et al., 2019; Collini, 2012; Collis, 2004; Yorke, 2009a) have decried the poorer quality of teaching standards achieved in the classroom due to unrealistic work burdens placed on teaching staff. Elsewhere there have been arguments made suggesting that the increasing need for universities to conserve financial resources in an environment of dwindling government support for universities have forced an increase in SSRs and this has lowered the quality of academic instruction and interaction in the UK university (Trowler, 2008; Parry, 2013; Middlehurst, 2013; Hagenauer & Volet, 2014; Lampert, 1993; Denzine & Pulos, 2000). Such narratives have received robust support from data in the university sector that shows how in the last decade alone student numbers in universities have increased by 30% while staff numbers have remained more or less static. A large number of questionnaire surveys (Palmer et al., 2009; Halawah, 2006; Pascarella & Terenzini, 2005; Cuseo, 2007; Davern et al., 2006; Dillon et al., 2002; Harfitt & Tsui, 2015) explore this theme among staff and students and find evidence for this lowered quality of academic interaction in larger classes. Similar arguments

are stressed in other Government sponsored reports especially in Australia and the US. Bradley et al. (2008) stress how high levels of SSR jeopardize the quality of teaching at universities and thereby threaten the student learning experience.

Due to this increased policy focus on SSR the empirical work in relation to this dimension of university governance is large and needs some organisation. Three broad strands of literature can be identified here. First there are studies that conflate SSR with teaching performance and/or teaching standards. Notable here are Lokuwaduge (2011), Ayoubi & Massoud (2012) and Lokuwaduge & Armstrong (2015). Each of these authors in their different samples seem to have assumed the perspective of the student consumer of higher education who does use SSR as a forward-looking indicator of the likely teaching performance he/she would likely receive. But this confuses the university governance-performance association. While SSR does have process like characteristics that make it seem like an outcome for some stakeholders (Bandiera et al., 2009) it is nevertheless truly a governance discretion for the university and should be modelled as such.

The second strand consists of two large meta studies Glass & Smith (1979) and McDonald (2013) that examine large sets of previous studies on the class size problem. The first study collates 77 empirical studies in university governance across the globe and finds overwhelming evidence that teaching and learning occurs best in smaller class rooms. According to the authors, the higher level of one to one interaction in such classes improves the learning environment and creates a higher quality academic ambience overall. Both staff and students feel more motivated with either side adapting better to the learning at hand. On the whole they seem to suggest on the basis of their large sample of earlier studies that more is learned in smaller classes. The second study is more recent and collates large numbers of Australian and international studies. While the author too finds lots of evidence in his sample for the negative teaching performance impact of higher SSRs, he makes at least two other important and related observations. First, he suggests that there is growing resource burdens on universities that force them to consider utilizing staff without regard to their work-life balance and motivation. Second, he points to the overall evidence that higher SSRs reduce teaching and learning quality which must not be lost sight of especially in higher education. In totality this strand of meta studies confirms inter-alia the importance of SSR and its negative impact on university teaching performance.

The final and largest strand of studies explicitly models the impact of class sizes on academic/teaching performance at the university. The findings are rather mixed and complex here. The first important study here is by Edmonson & Mulder in 1924 and it finds that SSR's association with academic performance is ambiguous. Many other studies that follow this study corroborate this finding. The growing evidence for such mixed associations (Kennedy and Siegfried, 1979; Zietz and Cochran, 1997; Lopus and Maxwell, 1995) forced Johnson (2010) to prove how the intriguing problem of obtaining different associations in the variable despite using the same sample was entirely due to changes in methods of data analysis chosen. Therefore, the author addresses these problems of data methods and sample in his study and robustly finds that higher SSRs have a significant and non-linear negative impact on student learning and achievements.

Scholars in other longitudinal samples across the globe and in the UK (Bandiera et al. 2009; Bedard & Kuhn, 2008; Shane, 1961; Gannaway et al., 2018) have continued in this vein to find evidence for non-linear negative impacts of SSR on teaching quality and performance. Important US based studies here include Kokkelenberg et al. (2008) which has over 760,000 observations from 1992 to 2004, and Arias & Walker (2004) both of which are longitudinal in scope and uncover a negative association between SSR and student achievement. At least one study in Australia (Gannaway et al., 2018) and another one in Munich (Mandel & Sussmuth, 2011) from 1998 to 2004 find similar evidence for a negative and non-linear association here. Finally, within a UK context, from 2000 to 2004 Bandiera et al. (2009) confirm the existence of a significant non linear association between the variables.

Overall, then, there seems to be enough evidence that the instruction intensity of student staff ratio is an important missing dimension of university governance with likely negative impacts on the academic performance of the institution. Therefore, it is appropriate to advance the following key hypothesis.

H2: There is a negative association between student to staff ratios and the academic performance of a university.

H2a: There is a negative association between student to staff ratios and the research performance of a university.

H2b: There is a negative association between student to staff ratios and the teaching performance of a university.

3.2.1.3 Research, Teaching & Gender Modalities in Staff Contracts

Universities are primarily research and teaching institutions. Unlike other public or private entities, the university is distinguished by its delivery of these highly complex intertwined functions. This is why the operational definition of university governance framed in Chapter 2 specifically mentions the two functions as important constituents of the governance construct. Despite this most university governance theorization does not explicitly include research or teaching antecedents of performance. There is a complete lack of engagement with the likely discretionary governance challenges that this institution faces in this respect.

Yet the seven different theories of university governance underpinning this research have distinct under and over tones that emphasize important research/teaching discretionary challenges facing this institution.

First, it is important to draw attention to the cultural governance imperatives embedded in universities. As a unique knowledge institution, the university is characterized by teaching and learning regimes (TLRs) that constitute a core aspect of their research and teaching functions (Gayle et al., 2003; Trowler, 2008, 2009; Trowler and Cooper, 2002; Alvesson; Albatch et al., 2005). These TLRs develop over long periods and impact many teaching and research governances subliminally. Such influence is not overtly discernible. Instead it works behind the scenes to force universities to prefer prioritize and calibrate certain staff contracts over others. Such staff contract choices then have important ramifications for the performances of the institution. Cultural considerations in university governance thus highlight staff contracts as a very important governance choice emerging from TLRs but impacting all of research teaching and financial performances (Mouwen, 2000).

Second, the staffing decision is more critical to universities than firms due to key differences in quality assurance considerations in the two entities (Vidovich, 2002; Salter & Tapper, 2000; Shattock, 1999; 2001; 2008; Yorke, 2000). While human resource contracts are important in both, in universities, they singularly determine whether the institution will even be able to deliver both original knowledge as well as help its dissemination in society. This is why if the

governance implications of culture & quality assurance theories are correctly interpreted in higher education, staff contracts have to be seen as an important likely antecedent of research and teaching performances.

Third, Resource Dependence (Pfeffer & Salancik, 2003; Nelson, 2000b; Flowes, 2014; Verchuere & De Corte, 2014) as a theory is primarily concerned with the institution's resources. But in higher education it is staff resources that are at the very heart of the institution's knowledge creation and dissemination. The nature and types of staff contracts and the incentives they create for staff incumbents naturally play a vital part in their eventual academic interventions that show up in the performance of the institution. This is why a key narrative that can be extracted from this theory is that the different types of staff resources that a university employs should reflect its chosen research and teaching emphases (Thewlis, 2003; Metcalf et al., 2005; Whitchurch & Gordon, 2013). Choosing single function part time or other types of contracts would flow from these differing research and teaching emphases. It is in these choices of different staff contracts that a university faces complex resource-based trade-offs (Shelton et al., 2001; Brennan et al., 2007; Kogan, 1994; Parker, 2013).

Fourth, the core concept of optimality in all external contracts is a vital tenet of the theory of optimal contracting (Collinson, 2004; McLeod & Malcomson, 1998; Raff & Summers, 1987; Banker). But when one takes this core concept and applies it to a university's singular functions of research and teaching an important theorization emerges. Staff contracts and embedded incentive/penalty structures in them are a governance choice (Gunn, 2018; Vajoczki et al., 2011; Oxford, 2008; O'leary et al., 2019; DBIS, 2015:8). The principle of optimality should form the central plank on which such choices are made. Fifth, as a good steward the university should seek and achieve the effective husbanding of all its resources. But given the unique importance of staff resources here these concerns must be even more central to the stewards of this institution.

Public Accountability, Stakeholder and Legitimacy evoke other university governance angles with regard to staffing. To be truly accountable to society, Public Accountability argues that a university should demonstrate an effective balance between pedagogical concerns and student coverage aspects in its staffing choices (Coy et al., 2011; Coy & Pratt, 1998; Horden, 2013; Blackmore, 2016; Locke et al., 2016). Stakeholder theory maintains that gender diversity should be fully acknowledged across a university, an institution that is characterized by a

multiplicity of stakeholders and particularly salient ones such as the academic staff (Donaldson & Preston, 1995; Mitchell et al., 1997; Bryson, 2004; Sutherland & Gilbert). Legitimacy in its pragmatic and moral versions implies that while crafting staff contracts universities must simultaneously trade-off utilitarian concerns of value for money/academic specialization with moral concerns of staff morale and motivation (Suchman, 1995; Ashforth & Gibbs, 1990).

On the whole then the inter-mesh of seven theories makes it amply clear that staff contracts and their research, teaching and gender modalities are an important overlooked dimension of universities. There are discrete choices facing university governors here that would have far reaching implications for the academic performances of this institution. Therefore, departing from existing scholarly trajectories this thesis posits that staff contracts and their diverse patterns represent a key missing dimension of university governance.

H3: There are significant associations between the university's staff contractual structures and its academic and financial performances.

3.2.1.3.1 Teaching Only Staff, Research Only Staff and Teaching & Research Staff

Despite this, theoretical significance of research/teaching modalities expressed in staff contracts empirical quantitative work associating academic divisions of staff contracts with university performances are non-existent. Most of the empirical work here is either anecdotal and qualitative survey based or policy based and normative. Although the Higher Education Statistics Agency (HESA) has recently made available longitudinal data about the divisions of academic staff into teaching only (TONLY), research only (RONLY) and teaching and research (TRST, the old tenure track) scholars have been slow to recognize and use these directly in their work. Nevertheless, the earlier empirical work here has important insights that must not be overlooked. These would need to inform the formulation of any hypothesis or sub-hypotheses regarding likely associations here.

Although the traditional TRST tenure track contract remains one of the most popular type of academic staff contracts accounting for more than 45% of all university staff there are several indications that it is problematic (Locke et al., 2016). The lack of incentives in a life long academic contract that is secure and pensionable is obvious. Given the onerous nature of the twin academic burdens of research and teaching it is probably likely that such a contract will prove suboptimal to the latter. Staff will privilege research tasks and teaching might be

neglected (Bexley et al., 2011; Probert, 2013; Geschwind & Brostorm, 2015). This might then raise concerns that the university is not adequately tending to its more important public goal of knowledge transmission (Norton, 2013; Oancea et al., 2010; Sikes, 2006; Nyamapfene, 2018). At another level as an important stakeholder in the university the average staff member employed as an omnibus TRST contractee may lose motivation in the face of the excessive academic workloads in this contract (Bryson & Barnes, 2000a, b; Locke, 2012; MacFarlane, 2011; Bexley et al., 2011). This could then evolve into a staff morale problem with obvious resource implications. These are the many trade-offs of TRST that are often discussed normatively in the empirical literature. Scholars point towards the incentive and motivational problems in this contract with the implicit suggestion that the contract might actually prove harmful to the university's academic performance.

The many problems of the TRST contract have not gone unnoticed among university governors. A large argumentative strand within policy and normative studies (Whitchurch, 2016; AUT, 2005; Sikes, 2012; Chalmers, 2010; Elton, 2008; Locke, 2012; Macfarlane, 2011: 2007) observes how the staff divisions of TONLY and RONLY are recent innovations in human resources management of universities arising largely out of the dissatisfaction with the TRST. Oxford (2008) suggests that universities under the pressures of staff rationalizations due to dwindling resources have further resorted to single function contracts. The author highlights two other trends in UK HEI that may have fortified these tendencies namely the research assessment exercise and the rise of the student as a fee-paying consumer. Regardless of the source of these changes many scholars agree that this RONLY, TONLY divide only further polarised research and teaching roles among university staff.

As a consequence, teaching was neglected and the regulators stepped in with a Teaching Excellence Framework (TEF). The TONLY contract emerged and several universities began creating many teaching-only roles (Blackmore, 2016; DFE, 2017). Locke (2014) shows evidence that over the years this contract has become a standard and popular arrangement in most UK universities with more than 30% of staff hired without research requirements in their job descriptions.

Notwithstanding the growing popularity of single function academic contracts, the governance problems associated with them are numerous. Student stakeholders might not like to be taught by staff without proven research expertise (Neves & Hillman, 2016; Healey, 2005; Blackmore,

2016). Research grant providers might need to see a university give priority to research positions among its faculties before it accepts research proposals from it. Teaching grant providers might consider RONLY contracts as a poor indication that the university supports or facilitates teaching (Fung & Gordon, 2016; Blackmore, 2016; Oxford, 2008; PREST, 2000). The lack of career progression in TONLY roles would surely dampen morale among these types of staff and thus reduce cohesion and integration in the university academic environment.

H3a: There is a negative association between teaching and research staff and the research performance of a university.

H3b: There is a negative association between teaching and research staff and the teaching performance of a university.

Just as with TRST empirical work does not directly associate the single function contracts with university academic performance. Instead most scholars make anecdotal, argumentative and descriptive inferences about RONLY and TONLY contracts that are nevertheless insightful. For example, Vajoczki et al. (2011), Oxford (2008), Blackmore (2016), Locke & Bennion (2011), Nyampfene (2018), and Harley (2002) suggest that TONLY roles are only a device to either rein in staff costs or re-classify underperforming researchers with a view to comply with regulatory requirements. From the perspective of the academics themselves TONLY remains a much despised and less sought-after contract. Dyer et al (2017) and Peters & Turner (2014; 2327) here draw the link between such contracts and trends within UK HEI to casualize academic staff. After all, reduced Government support has meant that these institutions have to conserve their finances and what better way to do this than to employ larger numbers of fixed term teaching only staff who do not impose large future financial burdens.

In other strands of the empirical work two key aspects of TONLY contracts are stressed. First is the fact that most UK universities populate such positions predominantly with women. Gender based discrimination is the theme here (Clegg, 2008; Marchant & Wallace, 2013; Thornton, 2013; Santos & van Phu, 2019; Barrett et al., 2011; O'Brien & Hopgood, 2012). Second is the fact that these positions are generally considered to be "non-academic" in scope. Brew et al (2017) suggest that TONLY roles are academically untenable because research has to constitute an integral part of even the teaching function. This is why Oxford (2008) maintains that students themselves seek out academics that have a passion for their subject reflected in

active research credentials. The general narrative in UK HEI continues to be that a teaching only role is insufficient and not worthy enough (Bryson, 2013; Locke, 2014: 23).

By contrast the research only contract remains a very important means used by universities to fortify their academic reputation as centres of research excellence. It is in this vein that Macfarlane (2011) argues that para academics who specialize in one academic function are relieved of the burdens of a heavy workload or having to swim against the tide of specialism and its rewards. Elsewhere many scholars (Probert, 2013; Shelton et al., 2001; Locke, 2012; Blackmore, 2016) show how this contract remains much sought after especially even among free lance researchers due to its lucrative nature and prestige. Others argue that research has often been seen to be the rich cousin of teaching with most academic processes privileging this function (Nyamapfene, 2018; DfES, 2003: 19; DBIS, 2015: 8). Academics are naturally drawn towards research due to its ability to cement their reputations as scholars allowing greater access to funds and grants.

Overall, then although TONLY and RONLY contracts have become an increasing academic standard in UK HEI there are widespread academic disapprovals of the use of such contractual forms especially the former. Scholarly evidence and arguments seem to be suggesting that such single function contracts while supporting one academic function may harm the other while also interfering with the systemic integrity of the institution as a whole. At least two likely associations between these contracts and the university's performances are discernible. The TONLY contract would likely fortify some aspects of teaching performance standards but might reduce the research and financial performances of the institution. On the other hand, the RONLY contract might improve some aspects of research while generating more finances but harm the teaching efficacy of the university.

H3c: There is a negative association between research only staff and the teaching performance of a university.

H3d: There is a positive association between research only staff and the financial performance of a university.

H3e: There is a negative association between teaching only staff and the research performance of a university.

H3f: There is a negative association between teaching only staff and the financial performance of a university.

3.2.1.3.2. Part-Time Staff

Another key division within university staff contracts is the part-time/full-time distinction. Public calls for higher student coverage in the UK have grown in recent times. There has been strident criticism of the elite nature of universities and repeated calls to throw open the portals of these institutions and expand student coverage (Kim, 2008; Dearlove, 2002; Williams, 1997; Hamsley-Brown, 2012). At the same time the introduction of a quasi-market in UK HEI with reduced government budgetary support has placed enormous financial burdens on university finances (Taylor, 2013a,b; Rowland, 2013; Horden, 2013; Parker, 2013). So, on the one hand student populations have more than doubled but faculty sizes have remained stagnant (Rosen, 2003:82; Bryson, 2004; Burgess et al., 2006). Universities have been left with no choice but to embrace more and more adhoc staffing arrangements to meet growing academic/administrative workloads (Bryson & Blackwell, 2001; Locke, 2012; Whitchurch & Gordon, 2013; Husbands and Davies, 2000). Yet public policy scholars have continued to demand resource thriftiness and value for money from an already strained university (Middlehurst, 2013; Parry, 2013; Rowlands, 2013; Taylor, 2013a). Other theorists have continued to maintain that it was only legitimate for a university to meet the needs of societal constituents fully irrespective of the strains on its finances. All of this has meant further adhocism in the university staff contracts.

But there has been growing concern among the Cultural/quality assurance literature (Brown & Carasso, 2013; Eurydice, 2010:24; Attwood, 2008b; Yorke, 2009a, b; Allen, 2011; Palfreyman, 2010) that the overall quality of the academic work is being seriously harmed by such adhocism. These scholars suggest that too many part timers would ultimately denigrate the university's academic performance. Whether in the idea generation and refinement of research or repeated engagement and empathetic learning of teaching part time staff do not have the continuity to contribute to the academic functions of a university. Further, there is undoubtedly significant merit in scholarly contentions that ad-hoc contractual arrangements destroy the quality of academic work. Good research depends on repeated and continuous engagement with ideas and their refinement (Holliman, 2017; Saunders et al., 2009). This would surely suffer in an academic environment where there are too many staff with short limited

engagements with the institution. Continuity in thought processes would not prevail and this would impact upon the quality of research done.

Optimal contracting and resource dependence theorists (Williamson. 2000; 2005; Chizema & Buck, 2006; Jacobson & Andreosso-O'Callaghan, 1996; Pfeffer & Salancik, 2003; Marginson, 2006) suggest a different angle. They argue that like with all other staff decisions, much depends on how a university chooses its part time staff. For example, a university that is unable to afford faculty with "high academic reputation" might achieve a beneficial compromise through employing them on part time basis. This would not only save it resources but also prove optimal in terms of its long-term academic sustainability. Such a strategy would also undoubtedly be invaluable in a highly competitive higher education market like the UK with limited Government funding (Williamson. 2000; 2005; Chizema & Buck, 2006; ; Jacobson & Andreosso-O'Callaghan, 1996).

Scholarly work in university governance seems to echo many of these theoretical narratives yet extend them richly in different directions. The insecurities generated by the contract and its deeply demotivating nature is a major cause of concern for large strands of the literature (Collinson, 2004; Purcell et al., 1999; Bryson & Blackwell, 2006; Ackers & Oliver, 2007; Rowley; 1996). For example, Collinson (2004) finds that although UK universities have been employing larger numbers of part time staff to cope with the increased student intake such staff have continued to be treated as marginal. Similarly, Thewlis (2003) finds that part time contracts reduce researchers' productivity, and that staff on such contracts are constantly concerned about job insecurity which distracts from focusing on their current job. Elsewhere Ackers & Oliver (2007) corroborates this finding of part-time staff being treated as marginal and "second class citizens", and extends this argument further by showing how universities are often reluctant to invest in the training and development needs of such staff, constraining them to perform at a far lower level of competence than their full-time peers. At another level the authors find evidence supported by Purcell et al. (1999) and Allen-Collinson (2004) that part time employees face isolation from the wider academic community and also lower access to libraries, experience, useful information and other knowledge infrastructure thus reducing their productivity

The part time contract is seen from the perspective of the gender question by several empirical papers. At least three studies (Blake & La Valle, 2000; Metcalf et al., 2005; Thornton, 2013)

highlight how an unusually large proportion of part time employees at universities are female. This fits within the unconscious gender bias narrative that is ubiquitous in higher education.

In other literature the student angle is stressed. Locke et al. (2016) find that part time staff are rarely if ever available to students for interaction and instruction. Out of class interaction, mentoring and informal advice is thus significantly reduced and the author points to the disastrous impact this has had on teaching and learning at the institution. The inference is unmistakable that growing part-time staff are denigrating the academic experience of university students which shows up in NSS scores (Gunn, 2018; Yorke, 2009a). The Author also highlights the demanding workload that part-time staff face, and how often they often need to work over hours or risk underperforming. Therefore, Bryson & Blackwell (2006) raises the topical question of why so many academic staff continue to be employed via the part time contract despite its well-known inadequacies. The author makes the valid empirical observation that such employees, who constitute a much smaller fraction of other sectors of the economy nevertheless constitute a very large and growing proportion 49.9% of higher education. (HESA, 2018). According to him this is a travesty in a sector that aims to be a knowledge creating and disseminating hub.

On the whole the above discussion seems to suggest two important likely associations. The use of part time contracts by a university on the one hand should lead to conservation of resources thus improving its financial performance. But on the other hand, this contract should reduce the academic ambience of the institution leading to lowered academic performance.

H3g: There is a negative association between part-time to full-time staff and the research performance of a university.

H3h: There is a negative association between part-time to full-time staff and the teaching performance of a university.

H3i: There is a positive association between part-time to full-time staff and the financial performance of a university.

3.2.1.3.3 Female Staff Diversity

Of the core theories of university governance at least two namely Stakeholder and Public Accountability have straightforward arguments about the benefits of gender balance in both research and teaching functions of a university. The former highlights that higher levels of diversity in staff will guarantee different ideas, unique insights and alternative perspective in both academic functions (Roberts, 1992; Mitchell et al., 1997; Ullman, 1985; Roberts, 1992). While the latter suggests that a fair balance between males and females in academic staff is a public necessity driven by societal cohesion considerations. Both genders can and should contribute to the idea generation/refinement in research as well as the debate/dialogue of teaching. This is what any civilized society composed of gendered stakeholders would expect. But other theories have more nuanced arguments about the gender impacts on research and teaching. Resource dependence suggests that universities can gain access to a wider talent pool by having a gender diverse staff population. This would ensure access to a workforce with varied skillsets, experience and networks (Pfeffer, 1987; Verbruggen et al., 2011). But the theory does not necessarily suggest that having more female staff will enhance teaching or research. Similarly Legitimacy scholars argue that universities with a well-represented female staff population would gain a reputation for gender equality that would give them an advantage in obtaining diversity related research grants (Metcalf et al. 2005). The theory does not have a normative prediction on gender diversity and research/teaching performances. Culture & Quality Assurance seems to underline that female staff have a natural proclivity for teaching due to their higher empathy factor (Ferber & Huber, 1975; Mestre et al., 2009; Kaschak, 1978; Ackers, 1994; Mackie, 1976). The theory seems to imply that teaching performance at institutions with higher fractions of female staff should improve. Yet there is no such normative prediction with regard to research.

Within the context of this complicated and mixed theoretical picture it is unsurprising to see empirical and policy scholars highlighting a range of tangential but important aspects in relation to staff level gender diversity. Santos & Van Phu (2019) argue that despite several UK universities largely adhering to CUC regulations (2009) and employing larger numbers of female staff this is only superficial. In their surveys of more than 3000 academic staff employed in the 24 Russell Group universities the authors find that such staff are employed in roles that do not allow them to contribute fully. In particular, the authors suggest that women are generally employed in teaching-based roles and are rarely allowed to contribute to the research

function. Elsewhere a set of scholars such as Huang et al. (2019) and Metcalf et al. (2005) and find that women are generally employed in part time roles which are twice as common among them as in their male counterparts. Similar findings of female staff being largely employed in single function, teaching only roles with very low opportunities for career advancement are supported in Metcalf et al. (2005), Nyamapfene (2019), Clegg (2008), Moss-Racusin et al. (2012) and Barrett et al. (2011). The authors suggest that this is indicative of a deep-seated unconscious gender bias in UK HEI which privileges men over women. Another study by (Bornmann et al., 2007) shows that, even if women and men were generally equally successful at all career stages, still men with previous experience would obtain higher application and funding rates than women at similar career points. The studies conclude that there is an unconscious bias in review or selection, especially as men with enhanced social networks tend to receive more favourable treatment from reviewers who are part of their network. (Pohlhaus et al., 2011; Perna, 2005; Mason et al., 2013).

Elsewhere Dearden et al. (2012), Blackaby & Frank (2000), Duflo (2012), and Moss-Racusin et al. (2012) show that women face severe challenges in promotions and remain significantly underrepresented in higher levels of academia. Many such scholars including Marsh et al. (2009) Mutz et al. (2012) echo the arguments of the House of Commons Science and Technology Committee (2002) that suggest that a key reason behind the lower promotion rates of women have to do with the singular lack of research content in their job descriptions. The narrative among most of these scholars seem to hint at strong evidence of systemic and circular bias against women in the sector. In other words, women do not get academic positions that involve research due to their unsuitability but then this lack of research credentials once again denies them promotion in the next round.

Undervaluation of the women's work in academia is another theme that finds robust support across the literature. Barabasi et al. (2019) conduct a longitudinal survey of gender differences in more than 1.5 million higher education research publications in 83 countries between 1955 and 2010. The authors find rising participation rates but much lower research impacts among women when compared to their male counterparts. Interestingly men received 30% more citations than women. This theme is extended by Astegiano et al's (2019) meta-analysis, Dion et al. (2018) study of several journals from 2007 to 2016, Helmer et al., (2017) and Gewin (2017).

Wenneras (1997) and Witteman (2019) found some evidence of bias in awarding research grants to females stemming from their work being evaluated less favourably than their male peers. The author cites a study by Budden et al. (2008) of gender-blind testing of research grant applications and highlight how a large majority of applications accepted were those of women. Yet the two largest studies from the UK Blake & La Valle (2000) Santos & Van Phu (2019) also coalesce findings about research grant applications in UK HEI. The Authors show how despite largely proven gender neutrality in research grant processes women remain significantly less likely to even apply for such grants. It does seem that such surveys and studies underline a deep-seated reluctance among women to even engage with the research grant process assuming that they will fail anyway. This aligns with normative and policy-based voices like Hewitt (2020), Booth et al. (2000), and Carter et al. (1999) that have oft argued that women face a growing and systematic academic gap in higher education. The deep-seated fear of research grant rejection is suggestive of an underlying confidence problem stemming from years of neglect and bias.

Elsewhere even historically there have been indications of gender divides in higher education learning with women preferring female instructors (Ferber & Huber, 1975). In a slightly different vein, Bozeman & Gaughan (2011) and Abramo et al. (2014) show that women generally spend much higher proportions of their working day on teaching related activities than their male counterparts. This seems to suggest a natural inclination towards teaching a fact that is often stressed in the behavioral literature. This has also to do with the higher empathy that women naturally have to facilitate, foster and nurture learning. There is thus the normative expectation that women will be better teachers than their male peers.

It should be noted that although there is no empirical work directly associating female staff levels with university academic performances the empirical indications seem to imply that it would not be wrong to infer a likely negative association with university research performance and a positive one with university teaching performance.

On the whole then the many strands of discussions on the five separate categories of staff contracts makes clear how important this dimension of university governance is. Universities face a unique challenge in calibrating these contracts to meet their differing mission based, academic and student market-based imperatives. Therefore, a third principal hypothesis must be formulated here as shown below.

H3j: There is a positive association between female staff diversity and the research performance of a university.

H3k: There is a positive association between female staff diversity and the teaching performance of a university.

3.2.1.4 Pedagogical orientations in student population

The UK student market for higher education is rich and diverse. Students seek different types of courses and academic ambience from institutions and these portals of higher learning also target different parts of the student population to establish their academic niches (House, 2010; Pittaway et al., 1998; Polat et al., 2019).

The public role of a university as a higher education portal generates the expectation that it should be active in all different levels of academic attainment i.e. undergraduate, postgraduate and doctoral levels. The Public Accountability narrative therefore seems to suggest that a diverse student body accommodative of all of society's public goals in education is an important objective for a university (Spencer-Rodgers & McGovern, 2002; Volet & Ang, 1998:21). Similarly, Student and staff stakeholders in a university demand a meaningful and complete pedagogical environment that includes all levels and types of students who can contribute to a richer learning (Trice, 2003; Taylor, 2005).

On the other hand, Resource Dependence narratives are more nuanced underlining the university's need to tailor its student body to match its academic resources and competencies. The theory also points to the dangers of resource stretching that might be inevitable if a university expands its academic repertoire or expands its student bodies to include international students (Coate, 2008; Hartnett et al., 2004; Iannelli & Huang, 2014). Legitimacy in its pragmatic version makes the important argument that a university should target a student body that fits the general perceptions of its academic specializations otherwise it risks a serious delegitimization of its knowledge contribution (Stensaker, 2018; Sawir, 2013; Bright, 2004; Suchman, 1995). Cultural considerations stress how student body compositions are an important governance discretion that could differentiate the academic ambience of a university (Trowler, 2008: 2001; Sawir, 2013). As a domestic institution these universities face an important choice in terms of international student entry. Quality assurance connects student

body choices with the overall ability of universities to effectively meet academic quality goals especially at higher levels of academic attainment (Mazzarol & Soutar, 2002; Furedi, 2004; Bright, 2004).

In sum then these theories of university governance throw the spotlight on student body compositions in universities as an important governance discretion facing them. On the one hand these knowledge institutions face a unique challenge in crafting their student recruitment policies to achieve the best balance between diversity in academic levels and academic specialisations. On the other hand, they also need to bridge the divide between the domestic and the global in their student bodies. Large swathes of policy-based narratives highlight the unique trade-offs facing universities in crafting their student recruitment policies (Dearing, 1997; Harris, 1996; Nicholls et al., 1995; Smith et al., 2010; House, 2010; Bolsmann & Miller, 2008). While there are several indications of likely governance issues and challenges in many of these narratives, scholars do not coalesce these discussions to frame a specific governance construct.

Therefore, departing from existing university governance trajectories this thesis frames a singular missing dimension here namely pedagogical orientations in student body diversities. It uses two relatively simple ratios i.e. the proportion of post graduate students (PGINT) and the proportion of international students (INTS) to map this dimension of university governance and its impacts on university performances.

H4: The pedagogical orientations of a university should significantly associate with its academic and financial performances.

3.2.1.4.1 Fraction of International Students

Theories of university governance have mixed and often ambiguous predictions about how international students at a university might affect its performance. Legitimacy theorist (Suchman, 1995; Coy & Pratt, 1998; Maingot & Zeghal, 2008) note how higher fraction of these students raise the reputation of the institution. This should if taken on board draw excellent research and teaching faculty to the university and improve its performance. As salient stakeholders, international students bring much needed intellectual diversity to a university's academic environment and this should further enrich its academic performance. Knowledge and skillsets would be shared across this diverse academic student pool and this would lead to a. Attracting international students is also congruous with the economy's need for diverse talented and experienced global work force. This is why public policy commentators (Parker, 2011; Middlehurst, 2013; Parry, 2013; Rowlands, 2013; Collini, 2005; Suchman, 1995; De Villiers & Van Staden, 2006) stress that a university would improve its academic and financial performance by recruiting more international students.

Other theories have rather mixed predictions. While resource dependence (Pfeffer, 1987; Callen et al., 2010; Hartnett et al., 2004) recognizes that international students will bring higher fees and thus improve the institution's financial viability, the theory simultaneously flags the academic resource burdens that such students might impose on the university. Similarly, optimal contracting (Verschuere & De Corte, 2014; Mitchell et al., 1997) makes it clear that international students might bring higher fees but may also expect higher levels of facilities and academic services to compensate them for this. Cultural considerations welcome the diversity of international students but caution against loss of the domestic academic culture (Trice, 2003; Volet & Ang, 1998; Ward, 2001; Barron, 2006). Quality concerns abound whether international students might reduce service levels for domestic peers (Anyanwu, 2004; Delaney, 2002).

Within this ambiguous theoretical context it is unsurprising to find that there has been limited empirical work studying the relationship between the number of international students a university takes and its performance. Some studies highlight the academic burdens of international students while others document such students' academic outperformance. For example, (Anyanwu 2004; Barron 2006; Furedi 2004; Bright, 2004; Delaney, 2002) find that some UK institutions have had to lower academic pass marks just in order to accommodate

international students. Others like Pauley (1988) and Williams (1989) in their Australian samples show that international students academically outperformed their domestic peers and improved the university's performance. Elsewhere Marshall & Chilton (1995) in their UK study document the positive relationship between numbers of international students and university good honours degree awards. Wright and Cochrane's (2000) In their cross-sectional study find a positive link between the ratio of research international students at a university and university research performance (research degree completion). On the other hand, Makepeace & Baxter (1990) and De Vita (2002) find that first year international students underperform academically when compared to their domestic UK peers, but this assessment offers a limited and narrow view of the international student's full output and potential contribution to the university's performance, as some international students need time to adopt as pointed out by Russell et al. (2010), Lebcir et al. 2008 and Wu et al. (2015).

In a more recent study Sawir (2013) finds that teaching techniques has improved for the better in universities with more international students, it has also showed that it has contributed to the development of domestic students learning. The study suggests that if well utilized, international students in universities can contribute to the overall performance of a university. Morrison et al. (2005) UK study from 1995 to 2000 show that some international students, specifically from north and south America did improve the academic performance of the university, while international students from other parts of the world performed the same or sometimes less than their domestic peers. This here provides further indication of the optimal contracting discussion, that universities which carefully choose their international student population can ultimately improve their performance.

it is quite apposite that policy-based narratives and normative discussions in the literature too are divided. With the reduction of government support there has been increased competition in recruiting international students among UK universities. Policy commentators (Brown, 2011a; Foskett, 2010; Hemsley-Brown, 2011; Lomer et al., 2018) suggest that universities have been viewing this as an opportunity to counterbalance the cuts in government funding and boost their revenue streams. In fact, the UK Government itself in its much publicized campaign to rebrand UK universities in 1999 framed extensive guidelines called exhorting universities to seek international students from across the globe to foster and maintain their brand superiority (Taylor, 2005; Li et al., 2010). Recent observations of external multilateral institutions such as the OECD (2004) confirm this. In its policy paper the institution underlines how the UK has

indeed been encouraging universities to adopt a revenue generation policy by attracting larger numbers of non-EU students.

Elsewhere there are arguments that if UK universities choose their international students wisely, they can simultaneously achieve university academic performance and financial viability (Rogers & McGovern, 2002; Soo & Elliot, 2010; Pauley, 1988; Williams, 1989). Undoubtedly this puts pressure on governors to ensure that universities continue to academically perform and meet or exceed the expectations of international students as salient stakeholders or risk failure to attract them (Collini, 2005; Michelon & Parbonetti, 2012). Yet this burden is worth shouldering. At another level the very fact that international students court a particular university in itself creates a reputational halo that helps it further in the next recruitment season especially through word of mouth referrals (Marginson et al., 2010; Gabaix & Landler, 2008; Mazzarol & Soutar, 2002).

On the whole there is enough evidence to infer that larger fractions of international students as a governance policy should positively impact a university's financial performance. But with academic performance the inference is relatively harder to make. Yet on the weight of overall evidence this thesis posits a likely positive impact on it.

H4a: There is a positive association between the ratio of International students and the research performance of a university.

H4b: There is a positive association between the ratio of International students and the financial performance of a university.

3.2.1.4.2 Postgraduate Intensity

In general, most theories of university governance predict a positive association between the number of post graduate students at a university and its academic performance. Culture/quality assurance scholars (Kim, 2008; Trowler, 2008; Brown, 2004; Salter & Tapper, 2000; Vidovich, 2002) aver that institutions with higher levels of postgraduates have an academic ethos stemming from their mission of being more than just a finishing school. This improves their academic ambience and should result in better research (Melville Ross, 2010; Hordern, 2013; Stanton et al., 2009). The theory also suggests that such focused institutions possibly mobilize

a range of specialized research related resources that further aids their research orientation. The public role and mission of a university to increase student coverage implies higher numbers of student places. But different universities have internalized this role in different ways (Coy et al., 2011; Nelson et al., 2002; Tarbert et al., 2008). Some have increased undergraduate places as this is easiest to do and imposes lower academic resource burdens while others have increased postgraduate coverage. Yet universities as institutions of higher learning have a public duty to make advanced learning as accessible as possible and this positive externality should improve them academically (House, 2010; Neves, 2018; Leitch, 2006).

Resource intensity of postgraduate institutions is definitely higher and this might lead to a higher financial burden on them (House, 2010; Priporas & Kamenidou, 2011). But network externalities of higher qualified staff at such institutions might encourage higher funding as well as better pedagogy. Postgraduate places might also raise the reputational legitimacy of a given university and this could help it attract a range of fee-paying students including international ones (Angell et al., 2008). New post-1992 universities quickly recognized the potential financial and reputational benefits stemming from carefully considering their postgraduate population, and started investing more resources towards recruitment and improving research facilities in order to improve their university research and financial performance (Callen et al., 2010; Verbruggen et al., 2011; Iannelli & Huang, 2014).

Empirical work on post graduate students and their impacts upon university academic and financial performances have largely been tangential. At least two studies conflate post graduate intensities of universities as indicators of academic and/or research performance. Using a UK sample Tarbert et al. (2008) uncover evidence that Vice Chancellors are financially rewarded for recruiting higher numbers of postgraduates. The author seems to infer that such rewards are driven out of an internal governance perception that higher post graduates improve research reputation, expertise and performance. More recently Boliver (2015) uses postgraduate student population as a research activity/research quality measure. He uncovers distinct links between the higher levels of post graduate students and research activities/ financial resources in most Pre-1992 and Russell Group universities when compared to peers. The author consequently infers that the proportion of postgraduate students enrolled at a given institution reflects its internal governance priorities towards research and academic excellence.

Elsewhere narratives within the literature highlight the many benefits that students derive from universities that have larger numbers of post graduates. In these too the undercurrent is definitely one that recognises how students and staff themselves perceive the post graduate intensity of an institution as a reflector of its research reputation excellence and expertise. For example, Angell et al. (2008) document how students are drawn to institutions with large postgraduate populations because they believe that these institutions will enable them to participate in rich business networks and find effective footholds in the industries where they intend to seek employment after the course. Similarly, Balmer & Liao (2007) show how postgraduate students often seek the benefits of brand reputation that universities with large numbers of post graduate students and courses embody. The implication is that such universities have a combined academic and professional ambience that helps the student build an effective industry-based community and network which will ultimately help him/her in career progression. Extending these results, one is able to infer that the paper suggests that these better graduate prospects should in turn improve the academic performance of the institution too.

There is evidence that students themselves use postgraduate intensities as a filter mechanism in their university selection criteria. Igraduate (2013), Staurt et al. (2008) and Donaldson & McNicholas (2004) underline in their different student samples that when ranking the institutions of their choice students use the number of postgraduates as a short hand for good academic ambience and research expertise and reputation. It is not hard therefore to understand why some scholars above have used this variable as a university performance indicator. At another level these findings may be seen as an indication of the complex governance processes that may be at play here. Choosing higher levels of postgraduate places may have to go hand in hand with large levels of investment in educational and research facilities if it is to yield a positive impact on academic performance. Students might be inferring a research reputation in postgraduate places but unless the university supports such places with world class facilities it might not follow through on this promise of academic performance (Barnes, 2007; Adee, 1997).

This argument is stretched in other ways by other scholars. For example, Smith et al. (2010) points to the important educational benefits that post graduate courses bring to UK universities. The author highlights how according to him UK's significant 8% contribution to the research

output of the world is a direct consequence of the post graduate orientation of most universities in the country. Yet the author also admits that such higher post graduate places are not free. Universities need to spend much larger amounts on services and facilities in order to be able to support higher post graduate intensities. Such a resource burden may not be plausible or even appropriate for all universities. Others like House (2010) maintain that for at least some universities the higher levels of facilities spend due to post graduates may be worth the increased research output and academic credentials. In fact, this is why a host of policy critics led by Callen et al. (2010), Leitch (2006) and Verbruggen et al. (2011) uphold the notion that universities calibrating their post graduate places upward and supporting them with higher infrastructural spending would surely reap the benefits in terms of higher academic and financial performances.

To close the empirical discussion there seems enough tangential evidence in UK HEI that higher levels of postgraduates at a university should positively associate with both its research and financial performances. On the whole then reading across the two new variables of INTS and PGINT one can formulate the following key hypothesis.

H4c: There is a positive association between the ratio of postgraduate student and the research performance of a university.

H4d: There is a positive association between the ratio of postgraduate students and the financial performance of a university.

3.2.1.5 Strategic Financial Choices in Asset/Revenue Structures

Universities are financial entities too. But their asset and revenue structures are much richer than their corporate counterparts. This is why all theories of university governance invariably highlight governance discretions and challenges in these structural choices. For example, a university's prioritization of certain revenue streams or assets could have far reaching implications for its resource dependencies (Flowes, 2014; Taylor, 2013a; Hamsley-Brown & Oplatka, 2006). These decisions once made would not only be very difficult to reverse but also might burden the institution for several decades and constrain its performance. Similarly, as good stewards the governors of a higher education institution have to play a checks and balances role with respect to to the executive profligacy of the Vice Chancellor and his/her

team. This profligacy could centrally manifest in revenue stream and asset structure choices where vested interests could easily skew the decisions and thus lead to underperformance (Dolton & Ma, 2003, Cyert, 1975:9-11; Gounopoulos et al., 2019). The public manifesto of universities implies an integrity in earning and spending that must ensure above all the fulfilment of societal expectations. This implies a thrift and wisdom in financial choices that goes far beyond the narrow interests of one or the other societal constituent (CUC, 2017; CUC, 2016; Brown et al., 2010; Tarbert et al., 2008). All stakeholder needs and legitimate concerns must be taken on board and carefully traded off. Otherwise the university risks just a focus on financial performance at the expense of its more important academic performance. From a separate perspective the quality of higher education does indeed have a financial basis that cannot and should not be ignored. In choosing revenues and assets the university must take account of the likely long-term ramifications on its ability to assure current and future students, staff and other interested parties of the overall quality of higher education delivered by it.

It is surprising that despite these theoretical indications that there may be several important governance trade-offs embedded in the unique asset and revenue structure choices of universities, extant research does not engage with them. Consequently, the thesis aggregates a set of six different revenue and asset structure-based variables into one composite construct and hypothesizes the existence of this fifth hidden dimension of university governance namely Strategic financial choices in Asset/Revenue Structures.

H5: The Strategic Financial Choices in Asset/Revenue Structures of a university should significantly associate with its academic and financial performances.

3.2.1.5.1 Tuition Fees

At least two theories of university governance take a negative view of a fee based higher education system and Legitimacy stress the fact that as public institutions with a wider societal remit, universities must take active steps to increase access to higher education not limit it. Tuition fees at universities force students especially from economically disadvantaged backgrounds to rethink their higher education opportunities and thus disallow their effective participation in economic advancement (Fowles, 2014; Boliver, 2013; Mangan et al., 2010a, b; Sutton Trust, 2004; Chowdry et al., 2013; Dunnett et al., 2012). Yet universities just like their

corporate counterparts are resource-based institutions that derive a large fraction of their financial sustenance from such fees. Resource dependence argues therefore that these revenue sources cannot be neglected (Fowles, 2014; Taylor, 2013a,b; Marginson, 2018; OFA, 2019; Molesworth et al., 2009). Optimal contracting and quality assurance add other dimensions to the argument. Without a properly calibrated tuition structure an institution would be swamped with too many non serious students free riding and degrading the intellectual ambience (Baldwin & James, 2000; Naidoo & Jamieson, 2005; Potts, 2005). The facilities and salaries that a higher education institution needs to fund would be put in jeopardy if tuition fees are not appropriately designed.

Theory based divides notwithstanding, significant strands of policy-based narratives continue to stress the positives of tuition fees for universities. The introduction of the quasi-market and the freeing up of tuition fee caps for domestic students have been seen as salutary to the average institution (Nixon et al., 2016; Shattock, 2010: 2008; Parker, 2011; Middlehurst, 2013; Browne, 2010, Ntim et al., 2017). While demand for higher education has surged in past decades from 14% in 1980 to more than 40% in 2006 (Shattock, 2010) universities in the UK have been facing financial constraints due to reduced government funding. This is why Browne's (2010) recommendations for increased tuition for domestic students was so well received. There have been ongoing discussion about how this has supported university efforts to become self-sustainable and counterbalance the reduced government funding (Fowles, 2014; Pfeffer and Salancik, 2003). There is the general perception that universities view this as an opportunity to raise more funds in order to improve their teaching/research facilities and invest more on skilled staff. The inference is obviously that this should consequently improve the institution's academic performance.

There is a lack of direct studies empirically associating tuition fees with university performance. Yet scholars have raised a rich range of concerns about their likely impact on students and universities alike. In particular, there is the finding that increased tuition fees have placed potential students from less advantageous socioeconomical backgrounds in the UK at a disadvantageous position (Callender & Jackson, 2008; Boliver, 2013). Domestic students have been discouraged from going to the university of their choice due to the high fee implication and instead opting to join an institution closer to home (Fowles, 2014; Boliver, 2013; Mangan et al., 2010a, b; Sutton Trust, 2004). Other evidence Dunnett et al. (2012) shows how tuition fee has become the all-important factor while deciding which university to apply to. Elsewhere

Fortin (2004)'s inconclusive study associating higher tuition fees and enrolments seems to downplay this importance or argument.

Other empirical work (Heller, 1997; 1999; Peter & Waterman, 1982; Handy, 1993; Gayle et al., 2003; Gunasekera & Reed, 2008; Gomes & Novaes, 2005) shows how an increased reliance on the fee paying student has meant that universities have increasingly started prioritizing student and parent concerns in a move described as the marketization of higher education (Molesworth et al., 2012) arguably at the expense of their other important academic objectives. Another key narrative uncovered in empirical work suggests a likely link between tuition fees, numbers of undergraduate students and an inordinate focus on improvement in teaching facilities at some (Fowles, 2014; Alderman, 2010; Colini, 2005; Rowlands, 2012). There seems to be an inference here that these universities will naturally focus on internal governances that facilitate student satisfaction in order to retain the all important fee paying student. Consequently this might have a negative impact on research, as such universities are more likely to overlook research activities and developments. When the tuition fee cap was introduced it was up to the discretion of the university to decide its tuition fee and how to invest the funds generated (Verschuere & De Corte, 2014). The relationship between tuition fee fraction and academic performance has not been explored, and based on the literature above it is expected that tuition fee fraction is negatively associated with research and positively associated with teaching.

H5a: There is a negative association between tuition fees fraction and the research performance of a university.

H5b: There is a positive association between tuition fees fraction and the teaching performance of a university.

3.2.1.5.2 Service and Facility Spend per Student

From a stewardship, resource dependence and optimal contracting (Edmans & Gabaix, 2009; Mallin et al., 2015; Murphy, 2012; Middlehurst, 2004; 2013; Bennett, 2002; Knight, 2002) standpoint universities that strategically invests their money on improving their libraries and facilities are expected to have better teaching and research outcomes. Such investment will make the university more attractive to potential students thus increasing its student coverage and selectivity, and helps the university in recruiting talented staff persuaded by the academic environment and facilities (Edmans & Gabaix, 2009; Price et al., 2003; Mallin et al., 2015;

Murphy, 2012; Binsardi & Ekwulugo, 2003; Knight, 2002; Hamsley-Brown & Oplatka, 2006). As a good steward university boards that spend effectively on the knowledge facilities that matter are indeed husbanding resources of the institution well and this should lead to better research and teaching outcomes (Davis et al., 1997; Donaldson & Davis, 1991: 82; Donaldson, 1990). Public accountability stresses that universities should ensure that society as a whole is able to benefit from a well equipped and facility rich institution that helps all its constituents (Farr, 2003; Coy, 2001; Mcgettigan, 2013). The argument runs that the improved facilities and resources should lead to better public research output and to an innovative teaching environment all of which should lead to better university performance.

In the normative and policy-based literature many voices stress how a university's teaching and research performance is a direct function of its training efforts (Gayle et al., 2003; Trakman, 2008; Collini, 2005; Ritzer, 2002; Trowler, 2008). Elsewhere there are arguments that university governance mechanisms that prioritize time, money and resources on training lecturers and researchers are likely to generate improved student satisfaction scores, better student performances in the job market and higher quality published research (Shattock, 2010; 2013; McGettigan, 2013). In fact, this explains why in the UK, training is one of the key indicators by which the Quality Assurance Agency (QAA) assesses the quality of a university's academic governance (QAA, 2005; 2009; 2011).

Empirically Dao & Thorpe (2015), Migin et al. (2015) and Wiers-Jenssen et al. (2002) find that the services and facilities provided in a university plays an integral part in the students decision to join. Metcalf et al. (2015) finds that state of art facilities and equipment is an incentive when universities are recruiting highly skilled academic staff. Earthman (2002) and Ganyaupfu (2013) both found that such investments have a positive impact on the teachers, teaching and student's academic achievements. Mushtaq and Khan (2012) and Kirmani & Siddiquah, (2008) both find that universities that have invested in student learning facilities have witnessed an increase in students achieving higher grades, and this finding is further corroborated by Karemera et al. (2003) and Young (1999) who found that a student's performance is directly linked to the library and facilities provided in the university. Given that university performance is influenced by attracting the best students, highly skilled staff and providing a fertile environment for them to flourish, It makes sense therefore to associate higher spending by a university on training its staff with improved teaching and research outcomes. This should also improve student recruitment outcomes leading to better financial

performance. Therefore, a relevant hypothesis is that service and facility spend is positively associated with research, teaching and financial performance.

H5c: There is a positive association between service and facility spend per student and the research performance of a university.

H5d: There is a positive association between service and facility spend per student and the teaching performance of a university.

H5e: There is a positive association between service and facility spend per student and the financial performance of a university.

3.2.1.5.3 Endowment to Total Assets

A unique asset structure within universities is the endowment which does not have an easily comparable counterpart in the corporate sector. To an extent the endowment is like a financial reserve that the university is able to draw upon sometimes to generate an additional income or to use to invest in selective research. Resource Dependence tenets (Hillman & Dalziel, 2003; Borgatti & Foster, 2003; Bouwman, 2011) aver that universities that are less dependent on funds/grants providers i.e. having a higher endowment to total assets ratios should arguably be able to forge an optimal governance direction that aids its performance. Such universities are more likely to innovate and implement independent teaching regimes and research orientations as deemed fit internally. There may be less need to follow other fund provider guidance (Washburn, 2008; Carrington et al., 2018).

Yet, higher levels of endowment are not an unmixed blessing. As endowment levels rise, endowment donors might begin exerting their own vested interests/power (bebchuk et al., 2002; Van Essen et al., 2015). This is why public accountability raises concerns that universities may prioritize the research interests of endowment donors instead of establishing a robust public orientation in the research function (Butt, 2019; Squire, 2014; Parker, 2012). Similarly, legitimacy warns about how very high levels of endowments may make the academic institution opaque to student/parent concerns and subservient to corporate/donor vested interests (Ntim et al., 2017; Ashforth & Gibbs, 1990; Suchman, 1995).

As mentioned earlier there are no counterparts to endowments in the corporate sector (Brown et al., 2012) Yet given the flexibility angle that is a predominant motivation for university

endowments it may be useful to examine corporate research into financial flexibilities of the firm. Hansmann (1990), Foskett (2010), and Acharya & Dimson (2007) document that the financial flexibilities afforded to a firm by the many reserve balances stored away from the good financial performances over the years are extremely useful. They allow the firm to establish an independent research and development trajectory and thus improve financial performance subsequently.

In UK HEI, empirical studies flag Endowment levels differences across universities. Boliver (2015) highlights how older pre-1992 universities that are well-reputed for being research intensive have larger endowments than their post-1992 peers. Furthermore, the study notes that within the pre-1992 universities, Cambridge and Oxford have the largest endowments although their teaching performance quality assessed by student suggested similar scores. With regards to research activity, the study finds that universities that outperformed at research were the ones with higher endowments regardless of their Russell Group status a fact corroborated by Fazackerley (2013) and Rogerson (2013).

Although Asif & Searcy (2014) have used income from endowment as a university financial measure, and Olson (2000) identified endowments as a research performance measure and found a positive relationship with board size and board diversity. There are no previous empirical studies investigating the relationship between endowment levels with university research, teaching and financial performance. However interpreting the theoretical, normative and corporate sector evidence it seems reasonable to postulate that larger endowments to total assets would positively associate with research, teaching and financial performance of a university.

H5f: There is a positive association between endowment to total assets and the research performance of a university.

H5g: There is a positive association between endowment to total assets and the teaching performance of a university.

H5h: There is a positive association between endowment to total assets and the financial performance of a university.

3.2.1.5.4 Cash to Total Assets, Debt to Total Assets and Fixed to Total Assets

The core theories of university governance have some imperatives for the influences of liquidity, leverage and the regular asset structures of universities on their performances. The public role of universities suggests that these institutions should pay close attention to cash, debt and fixed asset levels (CUC, 2016; 2017; OFS, 2019a:b). Governors should ensure that universities do not become insolvent or illiquid as this will harm the public purpose (McGettigan, 2012; Hayes & Wynyard, 2002; CUC, 201; 2017; HEC, 2014). At the same time such an institution should ensure it has the fixed assets including facilities and equipment to serve society (Toutkoushian, 2001; Taylor, 2013a). Resource dependence warns against fiscal profligacy that might reduce its ability to attract resources (Flowers, 2014; Parker, 2012; 2013; Jabbar et al., 2018). A university that marshalls its assets suboptimally or borrows excessively might compromise its academic integrity and thus lose legitimacy among its constituents (Mcgettigin, 2013).

Within the other ancillary theories, the checks and balances of the good steward principle demand that a university manage cash and debt levels prudently to ensure long term financial sustainability (Dalton & Kesner, 1987; Donaldson & Davis, 1991; Kenser & Johnson, 1990). If it does not do so the institution will surely deteriorate its academic and financial performances. This theory also underlines the fact that lenders and university governors may play an unhealthy game of one-upmanship especially when debt levels are too high. Optimal contracting once again stresses the fact that an optimal balance is essential in these structures to ensure financial performance (Williamson, 2000; 2005; Chizema & Buck, 2006; Jacobson & Andreosso-O'Callaghan, 1996). Quality assurance suggests the strong link between fiscal prudence embedded in these structures and the quality of the services delivered (Salter & Tapper, 2000; Yoke, 2000). Finally, managerial power stresses how internal governors may face huge problems in establishing an independent policy direction when the institution has over borrowed (Dixon & Coy, 2007; Marginson & Considine, 2002; Capano, 2013; McGettigan, 2013). On the whole, then all theories of governance stress the correct calibration of these asset structures for the university's performances.

The debt problems of universities have been strongly underlined in the university policy and normative literature. Universities enthusiastically started borrowing funds in order to invest in expansion plans and resources to ensure a higher ability to accommodate a targeted growth in student populations (Ferry & Eckersley, 2012). But this borrowing reached such unsustainable levels that there have been growing calls for a measure of sustainability in university debt

levels. In the last decade alone university debt in the UK tripled to £12 billion pounds. While 1 in 5 universities were running a budget deficit funded by debt in 2011 in 2018 this had climbed to 1 in 4 universities (UK Universities, 2015; Grant Thornton; 2016; HESA, 2016; 2019). This is why some universities have even had to sell off their assets to help ease the financial difficulties (University of Reading, 2018). As many as 4 universities had to be bailed out by the Office for Students (OfS) recently. Traditionally banks have been the biggest lenders, but due to new capital adequacy rules they have started to pull back and universities have turned to riskier private placement funds. This has resulted in the piquant situation where some low ranking universities who can least afford it continue to run big deficits on the funds obtained from private financiers at slightly higher rates further jeopardising themselves (IRF, 2018). Policy commentators like McGettigan (2012) warn that such trends if they persist would seriously “risk killing the golden goose of UK HEI by loading it with debt”.

Within this alarming context OFS has been forced to step in recently. The regulatory body mandated that it will not bail out universities in financial difficulties (Adam, 2018; Britain, 2019; OFS, 2019a,b). The “too big to fail” banker mentality according to it should not be transferred in to the HEI sector (HEC, 2014). Therefore, it is imperative on universities to practice financial prudence and avoid fiscal profligacy. Such a tough stand has seen widespread support among both scholars and practitioners who have lauded it (HEC, 2014) (OFS, 2019) (Adams, 2018) (Jack, 2018a,b). According to them this will avoid the triple problems of poor decision making, lack of financial discipline and lowered accountability of universities.

Be that as it may there are indications that universities simply continue to flout fiscal prudence and borrow excessively in the hope that fee paying and international students will allow them to service their debts yet flourish (Iman, 2018; Turner, 2019; Watson, 2012). All the while however student numbers have been dropping and there are signs that they may continue to decline in the context of geo-political trends towards self sufficiency especially after the recent public health scares, the likelihood of a demographic dip and the impending Brexit (Turner, 2019; Hillman, 2018; Jack, 2018b). UK universities borrowing in the hope of future income may find it to be a mirage and find it difficult to survive.

At another level students themselves have started to get wind of these trends and seem rather worried. Student surveys such as (CUC, 2019; HEPI, 2019) find that a rising proportion feel

reluctant to even apply to universities that have financial difficulties. Credit rating agencies like Moody's have generally rated the entire sector except the Oxbridge institutions negatively (Moody, 2019).

Earlier empirical work in the university sector associating DTA with performance is non-existent. But the earlier corporate literature is rich with many findings about the influence of debt on the firm's value/ financial performance. One strand (Champion, 1999; Gosh et al., 2000; Hadlock and James, 2002; Abor, 2005; Arbiyan & Safari, 2009; Taun, 1975; Nerlove, 1968; Baker, 1973; Petersen & Rajan, 1994) documents positive associations, the second strand negative associations (Pathak 2011; Wiwattanakantang, 1999; Haung & Song, 2006; Chakraborty, 2010; Salim & Yadav, 2012; Abor, 2007; Hammes, 2003; Mesquita & Lara, 2003; Fama & French, 1998; Ramdan & Ramdan, 2015) while a third strand (Siddik et al., 2017; Al-Taani, 2013; Ebaid, 2009; Jensen & Meckling, 1975) finds no significant associations here. On the whole, then, it does seem highly likely that higher debt on the balance sheet of a university is likely to deteriorate its financial performance. Therefore, the following hypothesis is advanced.

H5i: There is a negative association between debt to total assets and the financial performance of a university.

Recent empirical work in the corporate sector on cash levels of firms document a growing trend towards holding higher levels of cash (Mikkelson and Partch, 2003; Kim et al., 1998; Opler et al., 1999). There are some indications that at least some firms benefit financially from such a stance. Yet there are also other studies that seem to infer that higher cash levels may be symptomatic of a deeper malaise in the firm. It could well be that the firm is holding this higher cash because of an uncertainty with future cash flows or to mitigate trade related concerns (Bates, Kahle and Stulz, 2007; Gao et al., 2013). By contrast although cash levels have not been directly associated with university performance there are many empirical indications in the sector that the university cash problem may be distinctly different (Marginson, 2018; McGettigan, 2013; Jack, 2018b; UCU, 2019; Brackley, 2020; Universities UK, 202). The burgeoning debt crisis in UK universities is a well referenced fact here (Ferry & Eckersley, 2012; UK Universities, 2015; Grant Thornton; 2016; HESA, 2016; 2019). Such debt is often taken to meet investment projects that generally draw down across several years. In the meantime, the university holds large levels of cash on its balance sheet. Banks and other

financial institutions that lend may have conditionalities associated with their debt (IFR, 2019; Moody, 2019) that preclude universities from spending on discretionary payments such as research but allow contingent payments like teaching. Research payments can be postponed but teaching ones especially salaries cannot without a bankruptcy implication. A higher cash level may actually indicate that the university has borrowed excessively with a delayed drawdown time table for proposed facilities investments but is still restricted from spending on research. On the whole then it seems appropriate to surmise that university cash levels should negatively associate with all of its performance. Therefore, the following hypothesis is advanced.

Fixed asset proportions have been studied fairly extensively in the corporate literature. At least one study Kotsina & Hazak, (2012) finds that firm choices of fixed asset levels has no significant association with Asset Turnover (AT). Others find empirical evidence on both the positive (Al-Ani, 2014; Olatunji & Adegbite, 2014; Okwo et al., 2012; Reyhani, 2012; Azadi, 2013; Iqbal & Mati, 2012; Inyama et al., 2017) and negative sides (Li, 2004; Dong et al., 2012) of the debate. By contrast although there is no direct empirical work associating fixed asset levels with the financial performance of a university, it can be inferred that the higher levels of facilities and equipment that are after all the core of the fixed assets will attract students and staff and thus help the university generate higher tuition fees and revenues (Bachan, 2017; Bradley et al., 2008). Therefore, the following hypothesis

H5j: There is a negative association between cash to total assets and the research performance of a university.

H5k: There is a negative association between cash to total assets and the teaching performance of a university.

H5l: There is a negative association between cash to total assets and the financial performance of a university.

H5m: There is a negative association between fixed to total assets and the financial performance of a university.

In totality this section has demonstrated how there are theoretical and empirical indications of the vital importance of six different strategic asset and revenue structure choices that have been neglected in university governance studies. As shown here most of these strategic variables have been often the subject matter of regulatory prescriptions of institutions like the OFS and

the CUC and so it is indeed surprising to find a lack of focus in debating this construct in the extant body of empirical work (CUC, 2017; 2016; ref – see folder). Therefore, the following key hypothesis advanced here.

3.2.2 University Board and Audit Related Governance

The previous section developed a set of key hypotheses linking a set of carefully identified missing dimensions of university governance with this institution's performance. Yet as mentioned before this thesis does not ignore the usual sets of board level and audit related governance dimensions widely studied both in the extant university governance literature as well as the corporate governance literature (Ntim et al., 2017; Harris, 2014; Olson, 2000; Lokuwaduge, 2011; Low et al., 2015; Guest, 2014; Walker et al., 2019). Such literature has already identified how each of the seven theories chosen to explain university governance have normative implications for these governance dimensions. For example, board compositions need to take account of public needs, stakeholder competing claims, legitimacy debates among constituents, resource needs and utilizations, academic/non-academic quality assurance aspects, balancing managerial power and maintaining an optimal balance in all external contracting (Coy et al., 2001; Donaldson & Preston, 1995; Freeman, 2015; Suchman, 1995; Ashforth & Gibbs, 1990; Bebhuck et al., 2002; Pfeffer & Salancik, 2003; Fowles, 2014; Deem et al., 2007; Brown, 2004). Similarly, these theories predict a range of governance performance effects embedded in the external and internal audit structures of the university. Therefore, on the whole, there is little doubt that board and audit related governances are an important influence on the performance of the university and a key hypothesis must be framed here.

H6: The Board and Audit Related Governance of a university should significantly associate with its academic and financial performances.

In what follows the thesis critically identifies the theoretical underpinnings of each of the usual set of board level and audit related governance mechanisms.

3.2.2.1 Board Size

Stakeholder, Resource Dependence, Legitimacy and Stewardship theories aver that larger boards are likely to improve organizational performance (Freeman & Reed, 1983; Freeman, 1984; Ashforth & Gibbs, 1990; Suchman, 1995; Smallman 2004; Davis, Schoorman & Donaldson, 1997). Stakeholder theory points out how in larger boards there is greater scope to include all the diverse stakeholders in universities ensuring their voice is incorporated in governance policies (Davis et al., 1997; Fama, 1980; Freeman, 1984). This would improve performance. Legitimacy (Hyples, 1995; Tilling, 2004; Deegan, 2004) argues that larger boards will have greater scope to include all the important constituencies of a university in its top tier governance. This would generate greater reputational legitimacy and thus enhance performance. Resource Dependence (Pfeffer & salancik, 2003; Marginson, 2006) aver that larger boards are more likely to consist of members with a wealth of experience and networks. This would help the university improve its research, teaching and financial performance. Finally Stewardship (Saltman et al., 2000; Swansson, Mow & Bartos, 2004) posit that larger boards are likely to possess the right balance to ensure a good stewardship of university achieving better performance.

By Contrast Public Accountability, Quality Assurance and Optimal Contracting adopt a nuanced view. All three theories concur that it is right sizing of boards that help achieve coherence in governance policy and thus leads to enhanced performance (Lipton & Lorsch, 1992; Jensen, 1983; Yermack, 1996; Trowler, 2008; Bebchuk & Fried, 2003; Mallin et al., 2015). In other words these theories suggest that neither too large nor too small boards would work. Quality assurance advocates carefully choosing board members who correctly identified quality deficits in research, teaching and financial governances (Brown, 2004; Leiyste & Westerheijden, 2014; Salter & Tapper, 2000; Kim, 2008; Stensaker, 2018; Nelson, 2002). Similarly, Optimal Contracting (Edmans & Gabaix, 2009; Mallin et al., 2015; Nelson, 2002a:b; Murphy, 2012) suggests that too large a board would dissipate focus and might result in analysis paralysis while too small a board would lack ability to oversee contracts and performances efficiently. Finally Public Accountability (Coy ey al., 2001; Nelson et al., 2013; mKreysing, 2002; Banks et al., 1997) maintains that boards would be more accountable to general public interests if they included the right number of outside neutral and independent members. Clearly the two sets of theories pull in different directions and there is no consensus on the direction of association between university board size and its performance.

Corporate governance empirical research predominantly finds that larger board sizes correlate negatively with firm performance (Yermack, 1996; Eisenberg et al., 1998; Conyon & Peck, 1998; Loderer & Peyer, 2002; Tomasic et al., 2003; Hermalin & Weisbach, 1988; Pathan et al., 2007). This scholarship concurs that large boards give rise to the free rider problem with most board members taking on a passive role. Some corporate studies do find that larger boards are associated with better firm performance such as Belkhir (2009), Adam & Mehran (2005) and Kiel & Nicholson (2003). These authors in general trace this better performance to the superior monitoring ability of larger boards. Elsewhere at least two empirical studies namely Adams & Mehran (2005) and Cobham & Subramaniam (1998) uncover evidence of a U shaped relationship between board size and firm performance suggesting that neither too small nor too large a board size is efficient.

Surprisingly and by way of contrast the only extant research findings in university governance and performance i.e. Lokuwaduge (2011) and Lokuwaduge & Atmstrong (2015) find that board size is uncorrelated with teaching or research performance. In their sample of Australian public universities the authors find that it is only asset turnover i.e. financial performance of universities that correlate positively with university council sizes. However the fact that this study is cross-sectional detracts from the robustness of their findings. Elsewhere Olson (2000) in their single year sample found a significant positive relationship between board size and an increase of endowment levels and total number of gift income.

Given the above ambiguity in direction of association between university governance and performance the following main hypothesis is formulated with regard to the UK university sector.

H6a: There is a positive association between board size and research performances of a university.

H6b: There is a positive association between board size and teaching performances of a university.

3.2.2.2 Board Diversity

The main theories underpinning university governance i.e. public accountability, stakeholder, resource dependence and legitimacy invariably find merit in greater board diversities. Public accountability suggests that diverse boards are likely to meet the general public's concern with the neutrality, fairness and independence of university governance (Coy et al., 2011). Legitimacy adds that diverse boards will necessarily be drawn from different constituencies in society and therefore the university will be perceived to be more credible and trustworthy (Suchman, 1995; De Villiers and Van Staden, 2006). Stakeholder perspectives underline how ensuring that the governing board is drawn from each set of stakeholder groups will ensure that board members take clear account of the differing concerns of each group (Roberts, 1992; Mitchell et al., 1997). Resource dependence posits that a diverse university board can be assured of experienced academics and professionals who bring varied expertise and network resources to the institution (Pfeffer, 1987; Verbruggen et al., 2011). Yet it must be noted that each of the four theories welcome certain types of diversity but not others. For example, Public Accountability and Legitimacy lay emphasis on independence and neutrality of directors while resource dependence and stakeholder focus on the expertise and resource richness among them.

Between the seven theories only managerial power and optimal contracting strike a dissenting note. These scholars draw attention to the fact that diversity in boards could interfere with cohesion in policy formulation leading to policy logjam (Williamson, 2000; 2005; Chizema & Buck, 2006; Jacobson & Andreosso-O'Callaghan, 1996). Diverse board members will necessarily pull in different directions and this will result in policy disagreements. Decision-making will become slow and ponderous and the university will find itself unable to respond to changing conditions in higher education. In totality five of the seven theories suggest diversity will have a positive influence on performance while the other two posit a negative one.

Board diversity including gender, ethnic and experience diversities among corporate firms has been extensively studied (Carter et al., 2003; Van der Walt & Ingley, 2003; Mahadeo et al., 2012; Ntim, 2015). Most authors seem to find that both types of diversity positively affects firm performance.

Erhardt et al. (2003) report positive associations between board and ethnic diversities and the performances of 127 large US listed firms between 1993 and 1998. Similarly, Lückerath-Rovers (2013) in their sample of 99 Dutch listed companies throughout years 2005-2007 find that gender-diverse boards may provide better monitoring over management and improve firms' financial performance. Ntim (2015) documents that board diversities are significantly and positively associated with market valuation of all 169 firms listed on Johannesburg Stock Exchange.

Within the UK corporate context, Singh et al. (2008) find that new women directors tend to be more reputed with greater board and career experience, and education than their male counterparts. This suggests that board diversity can bring diverse ideas, experience, knowledge and business contracts, all of which may enhance a firm's financial performance. Similarly, Arun et al. (2015) report that greater gender diversity can promote the implementation of restrained earning management practices among FTSE 350 UK listed firms. Elsewhere, Gregory-Smith et al. (2014b) find no relationship between board gender diversity and financial performance for all FTSE 350 firms. Ntim (2015b) in his South African sample finds evidence that ethnicity and gender both have a positive influence on voluntary disclosure.

In the university performance empirical literature board diversity is studied in different ways. Lokuwaduge (2011) does not directly measure board diversity at all in her Australian sample preferring to document only the number of Government appointed board members at each university. In other words, the author only measures one type of diversity among board members i.e. whether the government nominates them or not. She finds no impact of these government appointees on teaching research or financial performance. Elsewhere Harris (2014) does find among US universities that higher numbers of female board directors impact positively on financial/administrative performances such as new student recruitments and retentions. Olson (2000) in his study of independent not-for-profit colleges finds that board members with business executive backgrounds and experience contribute positively to gift incomes at these institutions. Ntim et al. (2017) distinguish clearly between gender and ethnic diversities in UK university boards and underline an important association between these and voluntary disclosure levels at these institutions.

In addition, there is policy-based evidence in the UK that regulators feel that both gender and ethnic diversity on boards should positively impact university performance. The CUC (2009),

UUK (2011), (Davies-Report, 2011) and FSSG (2011) have been emphasizing that university boards take active steps to diversify their memberships to reflect the right balance of genders, ethnicities, age groups and experience. It must be noted that diversity at the board level can and should lead to diversity lower down in the university (Collini, 2005; 2008; Trowler, 2008; Ritzer, 2002; Ntim et al., 2017). For instance, ethnically diverse university boards would both attract new students from similar ethnic backgrounds and also generate more ethnically orientated research funds and bursaries. Similarly, women board members would encourage policies and programs that target more female students and staff. After all Stakeholder Theory (Ullman, 1985; Roberts, 1992; Mitchell et al., 1997) posits that ethnic and gender diversities would necessarily play such an instrumental role and hence must be encouraged. From another angle diverse board members would be seen as more legitimate by university grant providers (Suchman, 1995; De Villiers & Van Staden, 2006) and also attract resources from institutions focused on ethnicity or gender based research (Vebruggen et al., 2011; Callen et al., 2010). Earlier empirical research in university governance such as Ntim et al. (2017) and Harris (2014) within their differing contexts does find evidence for such arguments.

Diverse university boards should encourage dissent, prevent “group-think” and check unfettered executive power at the top of the organizational pyramid (Parker, 2011; Trackman, 2008; Parry, 2011; Trowler, 2008; Collini, 2005; Melville-Ross, 2011). For instance, the Vice Chancellor and his executive team might be driven to generate more resources for research through narrowly seeking such resources in private sector corporate sponsorships (Perez & Ode, 2013; Ferreira, 2015, p. 108; Adams & Ferreira, 2009; Jurkus et al., 2011; Walt & Ingle, 2003). In fact Nagy & Robb (2008) and Parker (2013) caution against such growing corporatist tendencies within university boards. A diverse board might rightly be expected to raise objections to such moves and lower these corporatist tendencies. This is what Ntim et al. (2017) in their empirical research in university governance and voluntary disclosure find. Diverse boards do encourage better disclosure particularly with regard to research sponsorship. Such transparency would surely improve the academic integrity of the institution and generate greater trust and credibility in the research produced by it.

Such diverse university boards may be expected to provide much needed balance within university spending budgets. For example, it is likely that Vice Chancellors recruited from the corporate sector at some universities might focus more on student recruitment, marketing and revenue generation at the expense of academic items such as services/facilities spend or teacher

training budgets. Parry (2013), Parker (2011), Melville-Ross (2010), Kim (2008), Trakman (2008) and Hordern (2013) highlight how the current trend towards making university boards and executive structures more managerial might inadvertently do exactly this. Academic spending on teaching/research infrastructure or teacher training may be given lower priority by a managerial Vice Chancellor more interested in the commercial and business aspects of the university. Diversity in the university board might check this trend. The argument is that female board members might easily spotlight such neglect and restore teaching related spending. Earlier empirical research by Ntim et al. (2017) supports such a view. The authors show that a gender and ethnicity rich board in UK at the very least improves voluntary disclosures in the institution about its financial spending. It is not difficult to make the inference that such financial transparency should lead to a rebalancing of budget priorities towards academic goals.

A diverse university board would generate greater legitimacy for the institution at least among the different board member constituencies. This is exactly what legitimacy theory predicts (Suchman, 1995; Coy & Pratt, 1998; Maingot & Zeghal, 2008). Thus specifically the presence of larger numbers of female board members should attract female staff and students. Similarly, minority board members should generate legitimacy for the institution among minority community staff and students. Such trends should lead to better quality gender/ethnicity research in the institution and raise its academic reputation with 148onsequent greater levels of on-campus-placements and better graduate-prospects (Shattock, 2013a, b; Lambert, 2007). In totality, there is ample evidence that board gender and ethnic diversities will positively correlate with the academic performances of a higher education institution. Therefore, the following key hypothesis is advanced here.

H6c: There is a positive association between ethnic diversity and the research performance of a university.

H6d: There is a positive association between ethnic diversity and the teaching performance of a university.

H6e: There is a positive association between board gender diversity and the research performance of a university.

H6f: There is a positive association between board gender diversity and the teaching performance of a university.

3.2.2.3 Board independence

Among the core theories of university governance only legitimacy and public accountability have a direct normative for board independence. Public accountability stresses that neutral public interest in universities is best operationalized when outside experts with no obvious stake in it are coopted at the highest governance levels (Coy et al., 2011; Nelson et al., 2003). These neutral outsiders will not hesitate to articulate the broader public interests and question the legitimacy of the university's governance. This would surely provide balance within a university's governance and enhance its subsequent multi-dimensional performance (Jongbloed et al., 2018; Pollitt, 1990; Nuemann & Guthrie, 2006). Legitimacy theory further argues that important stakeholders without direct stake in an institution accept that it is legitimate only when persons whose integrity and impartiality are assured govern it at the highest levels (Nagy & Robb, 2008; Parker, 2013; Suchman, 1995). When a university incorporates higher proportions of lay and independent board members it is seen as more legitimate and this enhances its performance in the long run. The other two core theories of university governance have no direct normative implication. As long as board members of a university are chosen for their rich resourcefulness and networks, Resource Dependence theory is satisfied (Pfeffer & Salancik, 2003; Kesner & Johnson, 1990; Osborne M & Bell, 2009). Similarly, Stakeholder theory does require wider representation of all salient stakeholder groups in the university board but once again there is no extra requirement of independence (Freeman et al., 2004; Davis Schoorman & Donaldson, 1995).

Stewardship, managerial power and optimal contracting theories tend to support independent boards as a device both to rein in powerful interest groups as well as bring fresh ideas and concepts into organisations (Donaldson I & Davis, 1991; Donaldson T & Preston, 1995; Donaldson, L, 1990). As institutions age, they tend to close themselves to new ideas from the outside world. This could prove disastrous. Bringing in fresh perspective from independently minded experts would refresh policy thinking at the highest level and avoid "group think" (Bebchuk & Fried, 2003; Mallin et al., 2015; Yermack, 1996). These theories therefore suggest that outside influence at the highest levels could prove salutary for a firm. Fresh governances would be introduced old styles of governances would be questioned and weeded out by the independent board members. Consequently, this would improve performance. Such arguments are particularly appropriate to universities, which as knowledge institutions are more at risk of intellectual stagnation (Parker, 2011; Collini, 2005)

Empirical research in corporate governance largely confirms the expectations of Legitimacy, Public Accountability and the three other non-core theories. For example Cobham & Subramaniam (1998), Mishra & Nielson (2000) and Pathan, Skully & Wickramanayake (2007) document that board independence has a positive relationship with service sector firm performance. Similarly Pathan et al (2007) show how independent board directors of firms prove to be better monitors for its performance simply because they have their own reputations to maintain. This explains why corporate governance best practice codes in several countries have mandated a majority of executive directors on corporate boards (ASX Corporate Governance Council, 2003; Cadbury, 1992; Hampel, 1998). It is also at the base of the university governance mandates in the UK that have stipulated 50% lay members on boards.

In university governance studies Harris (2014) samples US non-profit sector higher education institutions to discover that independent directors are indeed a significant positive influence on student retention rates and financial resource generation. Yet his findings indicate that only some types of independent directors, those with experience and expertise in fund raising, help generate additional resources for universities. Elsewhere agency and stewardship theory-based scholars (Baysinger & Butler, 1985; Weisbach, 1988; Zahra & Pearce, 1989) find evidence that independent boards do improve decision-making and consequent performance in universities. Lokuwaduge (2011) and Lokuwaduge & Armstrong (2015) in her Australian sample finds different directions of association between council independence and the university's teaching, research and financial performance. On the one hand lay members on a university's board increased teaching performance but decreased both research and financial performance in the author's investigation. Such a mixed result is hard to explain and does not seem to fit any neat theoretical logic. Ntim et al. (2017) underline significant positive relationships between board independence and university voluntary disclosure levels in their UK university sample. In related findings the authors document that the average proportions of lay members on university boards in UK in 2012 exceeded 50%. This fits with CUC recommendations and suggests that these institutions seem to be aware of the advantages they derive from such independent members.

At another level lay members can be expected to encourage quality directed changes in university teaching and research governance (Schofield, 2009; Greatbitch, 2014; Shattock, 2013a; Gompers et al., 2003; Beiner et al., 2006a; Bozec & Bozec, 2012). They are outsiders

who are more interested in their own long-term reputation rather than pursuing any narrow vested interests in the institution. In fact, this is why corporate governance scholarship (Gompers et al., 2003; Beiner et al., 2006a; 2006b; Bozec & Bozec, 2012) has found important links between the quality of firm performances and the number of laypersons on its boards.

Among universities Ntim et al. (2017) document that UK institutions with higher levels of board independence are more accountable and voluntarily disclose more financial and non-financial information. The implication clearly is that these directors from outside are more interested in long term performance, quality and reputational concerns than their internal counterparts with vested interests in the institution. In recent research Bachan (2017) and Johnes & Soo (2013) find clear evidence of grade inflation among UK universities. One would therefore expect that boards with more lay members would encourage crackdowns on cases of plagiarism and grade inflation (Trowler, 2008; Bozec & Bozec, 2012; Barako et al., 2006a, b). They would thus bring a much-needed quality imperative to all of the university's functions.

Other culture and learning narratives in university governance stress how independent and fresh voices at the board level might be essential to support evolution of appropriate teaching and learning regimes. Teaching infrastructure and budgets will tend to be neglected in universities because unlike research, teaching does not draw in resources or raise academic reputations. Due to their status and focus on the long term independent lay board members would act as an effective check on such tendencies to neglect teaching infrastructures and budgets (Trowler, 2008; Tennat & Duggan, 2008; Jack, 2008).

Finally, studies (Xiao et al., 2004; Cheng & Courtenay, 2006; Lim et al., 2007; Chan & Gray, 2010; Gisbert & Navallas, 2013; Ntim et al., 2017) also suggest that lay board members might have salutary influences on the audit function of any institution. Such members would surely question existing managerial audit and related governance practices, improve them and encourage voluntary disclosure. The argument is that such external members are rank outsiders and so relatively unaffected by vested interests in the institution. They would not hesitate to question internal audit mechanisms and/or call for forensic external audits of the institution by BIG4 audit firms. It is in this vein that Ntim et al. (2017) document in their UK based study that lay member fractions on UK University boards positively correlate with appointment of BIG4 audit firms as well as strong internal audits at these institutions. They also show how universities with lower levels of independent members in their sample continue to adopt lower

levels of audit compliance despite regulatory guidelines to the contrary in the country. Overall there seems to be enough empirical indication to infer and formulate the following key hypothesis.

H6g: There is a positive association between board independence and the research performance of a university.

H6h: There is a positive association between board independence and the teaching performance of a university.

3.2.2.4 Board Meeting Frequency

Core theories of governance and performance are invariably positive on the impact of board meeting frequencies on institutional performance. Public accountability scholarship (Vefeeas, 1999; Sonnenfeld, 2002; Carcello et al., 2002; Karamanou & Vefeeas, 2005) suggests that effective boards are generally evidenced by their meeting frequency. After all it is only in frequent meetings that such boards can monitor and modify institutional governances bringing them in line with public purpose. It is this that will vocalize public purpose and accountability leading to higher performance. In a similar vein resource dependence (Reverte, 2009; Schofield, 2009) argues that periods of financial uncertainty competition and reform require boards to meet regularly to strategize, discuss, plan and assess executive performance. It is also in these frequent meetings that resource rich board members can exchange valuable strategic information about their network contacts. These are what will then improve the board's access to resources leading to better performance. Stakeholder theorists such as Freeman & Reed (1983) opine that frequent board meetings also help diverse stakeholders voice and debate their different opinions. The regular debates balance and enrich governance policy leading to better overall performance in the institution. Meeting more frequently can also help keep governors informed and updated about developments in the institution. This enables them to address critical problems in a timely manner and thus increases the legitimacy of the institution (Ashforth & Gibbs, 1990; Suchman, 1995).

By contrast ancillary theories of governance are generally mixed in their analysis of how board-meeting frequencies impact upon performance. For example, Jensen (1993) and Vefeeas (1999) argue that too many board meetings generally reduce performance in terms of executive time,

travel arrangements and potential conflict of opinions. The authors suggest that an effective board must sometimes do nothing and allow the executive to get on with the job. Others here suggest that it might make sense for a board to vary its meeting frequency based on external and internal environment pressures. For example, stewardship and agency scholarship (Kohli & Saha, 2008; Shivdasani & Zenner, 2004; Bebchuk, Cohen & Farrell, 2004) argue that a board can recover faster from poor performance if it meets more frequently. Taken together therefore the multi-theoretical framework seems to suggest that governing board meetings might either have a positive or negative impact on institutional performance.

Empirical corporate literature documents a clear negative link between the frequency of board meetings and firm performance (Vefas, 1999; Fich & Shivdasani, 2006). By contrast in the university literature, Lokuwaduge (2011) and Lokuwaduge & Armstrong (2015) find in their Australian sample that overall performance is weakly (i.e. only at 90% level of confidence) positively impacted by council meetings. But when she breaks down performance she finds a positive significant impact only on research but no significant impacts on teaching or financial performances. Ntim et al. (2017) discover in their UK sample that board-meeting frequency does not have any significant influence on levels of voluntary disclosure. Despite these contra and mixed theoretical and empirical indications the thesis posits a positive association here. The following key hypothesis is advanced.

H6i: There is a positive association between board meeting frequency and the research performance of a university.

H6j: There is a positive association between board meeting frequency and the financial performance of a university.

3.2.2.5 Executive Team Meeting Frequency

High performing universities share academic and financial decision-making at many levels and in different bodies. Several authors including Knight (2002), Salter & Tapper (2002), Dearlove (2002), Taylor (2013b) and Melville Ross (2010) concur that UK university governance is mostly a model of shared governance divided between at least three different bodies namely the Governing Board, and the Vice Chancellor's executive team. This is particularly true in development of teaching assessments, protocols and regimes. For example, influential and

experienced professors on the board often make the important policy decisions on academic syllabi, teaching and assessment protocols. Similarly, deans and pro-vice chancellors sit with the Vice Chancellor on his executive team to decide on important governance protocols affecting exam standards, administration, learning outcomes and so on of the university. In fact this is the very essence of the collegial arrangements lauded by a range of university governance scholars (Middlehurst, 2013; Lambert, 2005; Parker, 2011; Shattock, 2013a, b). Larger size of these bodies might on the one hand ensure greater balance and seamless incorporation of plurality in teaching governances. On the other hand, too many members on either body may bring a dysfunctional influence on it. However, it is to be expected that greater monitoring and frequent calibration of teaching performance by the executive team ought to improve such performance. Ntim et al. (2017) document the important moderating influence of executive teams in the university governance voluntary disclosure relation. But the authors' study does not investigate this link with university performance. Therefore, the direction of the relationship between executive team meeting and academic performance although difficult to determine a-priori due to the lack of direct empirical work here can be largely posited to be positive. Therefore, the following hypothesis is advanced.

H6k: There is a positive association between Vice-Chancellor's executive team meeting frequency and teaching performance of a university.

3.2.2.6 Presence of a Unique Governance Committee

The clutch of four core theories underpinning governance highlights the need for special internal governance structures and committees to regularly monitor and calibrate compliance with best practice governance and thus improve institutional performance. Public accountability argues that by giving special status to a governance committee the board establishes the priority it accords to internal governance processes and mechanisms. This should imbue the institution with a public environment that actively encourages governance debate. In the process there will be changes to governance protocols that should improve the institution's public performance (Coy et al., 2001; Bedard & Gendorn, 2006; Jetty & Bertie, 2012). Resource dependence suggests that the special committees on internal governance instituted by a board would help it focus on discovering existing deficiencies in internal resources within the institution. This may then be easily corrected using the rich resource

networks of the board (Pfeffer & Salancik, 2003; Marginson, 2006). Legitimacy traces the positive links between instituting a special committee on governance and transparency perceptions among societal constituents (Gibbs, 2001; Bradley et al., 2009; Osborne M & Bell, 2009; Weir, Laing & McKnight, 2002). Finally, stakeholder scholars point to how a special governance committee could be the most suitable portal to flag the concerns of minority and less salient stakeholders of an organization. Within these specialized debating platforms in the organization a truly inclusive approach that balances all competing interests may be trashed out and forged (Donaldson L & Davis, 1991; Wicks & Parmar, 2004; Donaldson T & Preston, 1995; Freeman, 2010)

Unique Governance committees could arguably provide another channel for the board in its role as a good steward to check on executive excess. Yet stewardship as a theory admits that whether such a committee actually becomes effective or not in its channelling is an empirical question that is not necessarily proven (Marginson & Considine, 2000; Mow & Bartos, 2004). Optimal contracting (Edmans & Gabaix, 2009; Mallin et al., 2015; Murphy, 2012) also takes a more rational view of institution of special committees on governance. The theory suggests that special committees may or may not work in an optimal way. There is the ever-present danger that such mechanisms do not really help and become another layer of red tape within the institution. Managerial power agrees and suggests that although governance committees might help check inordinate increases in managerial influence within internal decision-making, there is no guarantee that they will indeed (Bebchuk et al., 2002; Van essen et al., 2015; Kalyta & Magnan, 2008; Byrd et al., 2010). Thus, there is a neat division between the seven theories about the utility of special governance committees with the core set arguing for them but the ancillary set questioning their efficacy.

Another key aspect of the theoretical indications in respect of this variable is worth noting. Specialized Governance committees could have a special reputational effect due to their very nature (Ntim et al., 2017). A university that sets up such a committee is signalling the public, salient stakeholders and other constituents that it adheres to the highest academic standards (Core, 2001). Theoretically such a signal might have a more direct association with research.

Empirical research in the performance impacts of unique governance committees within university governance literature is mostly indirect and so it may be useful first to highlight some notable findings from the corporate literature. For example, Datar et al. (1991) and Wang

et al. (2008) suggest firms ought to ensure that there are adequate numbers of internal committees so that there is effective oversight of executive spending decisions. This would not only make fraud difficult but also ensure appropriate balance in spending across the firm's strategic priorities. Naturally the institution will thus be able to demonstrate its public accountability, stakeholder focus and legitimacy. This is exactly what Ntim et al. (2012) find within their sample of South African firms between 2002 and 2006. Firms that set up different committees and in particular those that set up a separate governance committee disclose more governance related information and in general improve their reputation in the market. In a related vein Gietzmann & Ireland (2005) Gray et al. (1996), Braadbart (2007) and Bushman & Smith (2003) show how strategic and timely information disclosures play an important role in performance and lead to better accountability.

Within university governance the CUC (2009) mandates the need for at least three separate committees to oversee accounting, internal control, risk, appointment and remuneration. Although this regulatory body does not require universities to set up a separate governance committee, Ntim et al. (2017) find in their UK university sample that those that did voluntarily disclosed more governance and performance information than their peers. Lokuwaduge (2011) determine in their Australian sample that universities with larger numbers of committees perform worse in teaching but better in research and financial performances than their peers. She further finds that the transparency level of a given university in her sample has no significant impact on any of its performances. To date however no study in university governance has examined explicitly whether the presence of a separate governance committee at a university improved its research performance. Therefore, the following hypothesis is advanced.

H6l: There is a positive association between the presence of a unique governance committee and university research performance.

H6m: There is a positive association between the presence of a unique governance committee and university financial performance.

3.2.2.7 Audit Committee Size

Internal audits are recommended by five of the seven theories of university governance as an important device to improve transparency and performance of universities. At one level while such audits demonstrate the commitment of the institution to public purpose at another, they also improve legitimacy due to the presence of effective internal audit and governance mechanisms which increases the efficiency of internal processes in the organization, which subsequently leads to improved perception amongst stakeholders (Gibbs, 2001; Bradley et al., 2009; Osborne M & Bell, 2009; Weir, Laing & McKnight, 2002). This ultimately leads to improved internal mechanisms for stakeholder inclusion and create another channel for the checks and balances of a good steward (Donaldson L & Davis, 1991; Wicks & Parmar, 2004; Donaldson T & Preston, 1995; Freeman, 2010).

In addition, the quality and optimality of a university's academic and financial services will surely improve due to a stronger internal audit function (Pfeffer & Salancik, 2003; Marginson, 2006). Thus, the overall theoretical indications seem to stress the importance of the audit function in a university (Coy et al., 2001; Bedard & Gendorn, 2006; Jetty & Bertie, 2012).

A direct inference can be made that the size of such committees would allow for greater diversity and independence to exert itself in the fulfilment of all these objectives. This justifies why audit committee size is an important likely antecedent of university performance. Important empirical work has been conducted in corporate sector on internal audit. Some studies suggest that when correctly composed with financial experts' internal audits actually improve the institution's functioning (Bedard et al., 2004; Krishnan, 2005; Dhaliwal et al., 2006). Other studies (DeFond et al., 2005; Davidson et al., 2004) find that the market positively values the appointment of expert auditors. In fact, Agyemang- Mintah & Schadewitz in their UK sample of 63 financial institutions over 12 years found that the adoption of an AC by financial institutions has a positive and statistically significant impact on firm value. By contrast work on this variable in the university sector has been scant as observed by Ntim et al. (2017). There have been some calls in the empirical literature for more financial experts on university audit committees (CUC, 2006a, b; 2008; Dewing & Williams, 1995; Pearson, 2009); university funding councils have been stressing the need for more robust internal audit interventions to improve the quality assurance in universities and scholars have been underling the importance of this function to improve transparency and accountability. The only set of

studies actually measuring audit committee functioning (Dewing & Williams, 1995; Pearson, 2009) conclude that the function is yet to become robust and is need of much reorientation and reframing. On the whole then there seem to be enough indications for a likely positive association between this variable and the university's financial performance. Hence the following hypothesis is advanced.

H6n: There is a positive association between audit committee size and the financial performance of a university.

3.2.2.8 Use of BIG-4 Audit Firm for External Audit

All theories of governance welcome the use of reputed external audit as an internal governance mechanism. Public accountability stresses that employing a reputed external auditor demonstrate an institution's higher desire to remain accountable (Coy et al., 1997; 2001). This ensures that the institution is seen to be fulfilling its public remit without resorting to fraud, maladministration or poor governance. Stewardship contends that reputed external auditors have the power to self-select their clients and protect their reputation and thus mitigate agency problems (Davis et al., 1997; Saltman et al., 2000; Marginson & Considine, 2000; Swansson, Mow & Bartos, 2004; DeAngelo, 1981a, b). In other words, by simply ensuring BIG4 audit an organization sends a clear signal that its stewards are indeed acting in the best interest of all stakeholders and are not frightened of stricter external scrutiny. Legitimacy and resource dependence (Deegan, 2004; Suchman, 1995; Hybels, 1995; Tilling, 2004; Kesner & Johnson, 1990; Lorsch & MacIver, 1989; Pfeffer & Salancik, 2003) support such stricter external audits on the grounds that it lends the institution a halo of transparency and accountability, which enhance both its legitimacy and access to resources. When an institution demonstrates that it employs the best external audit teams to certify its internal governance practices then resource rich board members are attracted to it.

These board members then provide expanded channels of resources access to it. This would help it outperform. Similarly, employment of BIG4 audit teams generates a halo of legitimacy in itself. This gains its legitimacy and that helps it outperform. Stakeholder theorists suggest that effective representation of all stakeholder groups in internal decision-making is ensured when BIG4 auditors critically comment on these (DeAngelo, 1981a, b; Lennox, 1999). In

particular when these large reputed audit agencies point out internal deficiencies then the board takes it seriously and acts improving several performance metrics consequently (Donaldson & Davis, 1991; Freeman, 1999) Optimal Contracting and Managerial power (Donaldson & Davis, 1991; Freeman, 1999; Jacobson & Andreosso-O'Callaghan, 1996; Williamson, 2005; Bebcuk et al., 2002; Van Essen et al., 2015; Kalyta & Magnan, 2008) each separately underline the ability of such external audits to maintain the effective and optimal balance among competing interests in the institution. For example, BIG4 audits often specifically comment on deleterious relationships or practices, which often lead to corrective governance reforms. This subsequently balances power structures in the organization and improves performance.

All seven theories of university governance in general seem to be in favour of better external scrutiny as a means to improve institutional performance. However, it can be inferred as with the previous variable that the decision to employ a BIG4 auditor is more directly linked to research rather than teaching performances at a university. Research as an academic function is largely external in its orientation unlike teaching. Skilled research staff are generally likely to be attracted to universities that are forensic and transparent in their functioning. Such staff unsurprisingly would go on to produce higher quality research at such a university. Therefore, there is an expectation that BIG 4 audits will have a direct and positive impact on university research (Xue & O'Sullivan, 2013; DeAngelo, 1981a, b; Lennox, 1999). After all external independent scrutiny would surely impact academic reputation in terms of research more than teaching.

As in the case of other audit related governance dimensions, here too university literature is largely indirect in scope. It may be useful to note a few important findings from corporate work. Camfferman & Cooke (2002), Adelope (2011), Jetty & Beattie (2012), and DeFond (1992) demonstrates how the quality, status and size of the external audit firm is a core factor in improving both governance and performance within the company. In particular, these studies highlight the higher credibility signals sent by the corporate firm in employing a BIG 6 audit firm. DeFond (1992) finds that employing a large and well reputed auditor would enable better monitoring and help mitigate agency conflicts. While elsewhere, Chen et al. (2013) report empirical evidence that firm performance is positively influenced by the size of the auditing firm. They all also show how these signals have tangible positive effects on the firm's consequent performance. Within the university sector many researchers (Xue & O'Sullivan, 2013; Gordon et al., 2002; Ntim et al., 2017) underline the propensity of UK universities especially the

traditional i.e. pre-1992 ones to employ large external audit firms. Of these Gordon et al. (2002) and Ntim et al. (2017) verify that employing such BIG 4 audit firms do indeed have a positive impact on voluntary disclosure levels at these universities. Yet the question of its impact on university teaching research or financial performance is hardly explored in these investigations. Even Lokuwaduge (2011) in her governance-performance study using a fairly large sample of Australian universities does not even consider such a variable thus losing a potentially rich source of explanation. A valuable opportunity is thus available to this thesis to investigate the questions. Hence the following hypothesis is proposed.

H6o: There is a positive association between use of big four audit firm and research performance of a university.

3.2.2.9 Vice-Chancellor Pay

The tricky question of the remuneration of the CEO has occupied a significant part of Corporate Governance theory and literature (Andreas et al., 2012; Cambini et al., 2015; Conyon, 2014). Scholars have and continue to question the excessive nature of such pay and its link with firm performance. They ask what safeguards are available to shareholders in the event of subsequent underperformance. Public accountability and Legitimacy (Ashforth & Gibbs, 1990; Tilling, 2004; Judge et al., 2008; Donaldson & Davis, 1994) naturally stress that the chief executive must be held accountable and his/her pay must be legitimately earned. This argument is obviously appropriate to VC pay given the university's public role and its higher need to remain legitimate to both students and taxpayers. Stakeholder perspectives (Ogden & Watson, 1999; Berman et al., 1999; Wicks, Berman & Jones, 1999; Kiel & Nicholson, 2003) stress a measure of balance in the remuneration of all internal governors and executives in the firm. The theory also encourages coopting CEOs as partial shareholders to align their interests with the firm. While this shareholder alignment argument may not be wholly appropriate in higher education still there are indications that student/staff interests in universities may question very high levels of VC pay. Resource dependence (Pfeffer & Salancik, 2003; Marginson, 2006) recognizes that CEOs might have to be paid for their rich resource, networks and strategic insights but emphasizes "value-for-money" here. Such an argument is even more topical to universities. Stewardship (Daily et al., 2003; Christopher, 2010; Dedman, 2000) claims that

CEOs/VCs will act in the best interests of the firm/university when they are empowered appropriately. So executive pay ought to be seen in that light.

Managerial power theory is the first to strike a discordant note. Bebchuk & Fried (2003) and Finkelstein (1992) draw attention to the problems of executive pay and its impact on power balance between the different governing bodies of the firm and the CEO. Theorists also argue that executives at the top of the organizational pyramid often have too much power to influence the level and structure of their own pay (Byrd et al., 2010; Holderness & Sheehan, 1988; Kalyta & Magnan, 2008; Hill & Phan, 1991). Therefore, excessive pay generates conflicts of interest and makes internal governance less democratic. This reduces firm performance. If this is the case with corporate firms then it is truer within universities. After all these institutions are difficult to control and govern and impose greater burdens on the chief executive (Johnes & Virmani, 2019; Simon, 1957; Shackleton, 2017). By contrast Optimal Contracting theory suggests that executive pay may be structured well in firms where the governing board is active, independent and acting at arms-length to the institution (Edmans & Gabaix, 2009; Mallin et al., 2015; Murphy, 2012). In such firms the correct trade-off is achieved between hiring the best-fit talent at the top of the organization while right-sizing pay levels and structures (Custodio et al., 2013; Gabaix & Landier, 2008; Cordeiro et al., 2016). Such right sizing of pay would naturally enhance both governance and performance. All in all, most of the theoretical framework agrees that CEO/Vice Chancellor pay is an important governance variable with likely influences on both other internal governances and performances of the institution.

There has been growing concern in recent times about growing levels of VC remuneration in UK HEI. There has been a perception that with the increasing marketization of the university sector there have been pressures on university boards to increase remunerations for their chief executives. Many policy experts have criticised such tendencies arguing that the public nature and role of universities does not justify such excessive pay increases (CUC, 2018; Morgan, 2017; Grove, 2018; OFS, 2018a; Baker, 2017, Adams, 2017, Department of Education, 2017). In the face of this regulators such as the OFS have mandated strict checks on such profligacy stipulating that institutions that are unable to justify remuneration levels in excess of 150K for their VCs will be penalized. However, some policy debates raise the issue of talent, job scope and complexity in the context of VC pay (Whitchurch, 2006; Bosetti & Walker, 2010; Johnes & Virmani, 2019) These scholars suggest that it may actually be more than appropriate to pay higher salaries to VCs given the complexity of their jobs (Shackleton, 2017; Simon, 1957).

Evidence is advanced from the US and elsewhere to show how globally universities pay much more than the UK in order to retain their talented VCs (Blanchflower, 2017; Ross, 2018b; Grove, 2018b, Bennet, 2019). There is also the argument that universities are generally monopsonies in the VC recruitment market (Bachan & Reilly, 2016). By virtue of this, the institution has undue advantage anyway in pushing down VC pay levels. After all VCs with their university specific skill. Cannot easily find other comparable jobs in the market. This is exactly why Soh (2007) in their sample of 37 Australian universities covering the 8-year period from 1995 to 2002 documents highly significant differences between the remunerations of VCs and CEOs. A university institution that is 10% larger according to the author's study pays its VC only 2.7% more while its corporate peer of similar size pays its CEO 3.7% more. The economies of scale accruing to the institution in the remuneration of the highest executive are much greater in the university sector than in the corporate sector. Finally, some normative scholars advance the idea that lower salaries in higher education might drain the sector of its talent as really capable VCs might seek employment elsewhere (Shackelton, 2019; pg. 177; Richardson, 2017, Oxford University, 2018).

The policy debates notwithstanding, VC pay has been less studied than the pay of CEOs of firms. However, CEO pay has more often been directly correlated with governance and disclosure but only indirectly with performance. A transitive relationship with the firm performance often has to be inferred in many of these papers. For example, Brown & Lee (2010), Fahlenbrach (2009) and Joubert & Fakhfakh (2012) document a negative association between the quality of corporate governance within a firm and the levels of executive pay. Obviously, this fits within the idea that well governed firms perform better than peers and therefore ought to implement a rigorous "value for money" yardstick while deciding executive pay (Gompers et al., 2003; Henry, 2008; Tariq & Abbas, 2013). By contrast Al-Najjar et al (2016) report a positive association here suggesting that it is the poorly performing firm that constrains its executives pay.

In university governance and performance there is some evidence of earlier quantitative scholarly work linking Vice Chancellor (VC) pay with some internal governances and university performance. Baimbridge & Simpson (1996) use a cross-section of 64 VCs for the academic year 1993-94 to discover that pay is influenced by university income derived from research grants and fees. Ehrenberg et al. (2001) find a weak link between president pay and performance in their US college sample. Although the authors do find some evidence linking

a president's pay to tenure, past experience, governance type, size and income, their results are not robust across the specifications reported. Dolton & Ma (2003) estimate the earnings relationships for UK HEIs in panel data for the nine-year period 1993-94 to 2001-02 and find evidence for positive significant impacts from institutional characteristics such as governance-type, size, internal pay structures and income/research performances.

A fairly recent study by Tarbert et al. (2008) investigates the relationship between VC pay and university performance in UK for the period 1997 to 2002 using dynamic first-difference pay change models. The authors find at least two very interesting results. First VC pay changes seem to derive very little traction from changes in income, research grants or other such performance indicators in the overall sample that includes both the research-intensive pre-1992 institutions and post-1992 ones. Instead they seem to be more explained by benchmarking indices with levels of corporate CEO pay and the changing pay structures of senior academic staff at any given university. Further the authors underline the fact that despite significant rises in VC pay in their sample there is still clear evidence of a negative drag on such pay arising out of legitimisation concerns about university VC pay levels. Second and more importantly when they splice the sample into research-intensive high status pre-1992 universities and post 1992 polytechnic ones they find a distinct pattern. Changes in university research income and numbers of postgraduate students positively affects changes in VC pay only in the former but not in the latter. Instead in the newer post 1992 institutions research income has no significant effect but the number of total students including undergraduate students has a positive effect while the number of postgraduate students has a negative effect on VC pay. In other words, it seems that universities reward VCs only if they further their distinct missions i.e. research and post graduate education in pre-1992 institutions and total numbers of students in the post 1992 ones. The authors conclude that in their sample VCs seem to be rewarded for presiding over only mission relevant improvements in performance.

Bachan & Reilly (2015) examine VC pay and its links with university performance from a distinctly different perspective. Their use a range of mission relevant, financial and non-financial performance indicators just like Tarbert et al's (2008), is noteworthy and in keeping with the multi-dimensionality of university performance. Further the fact that the authors acknowledge other putative measures of university performance in the UK such as Research Assessment Exercise (RAE) scores and Teaching Quality Assessment (TQA) scores despite not actually using them is nevertheless a useful confirmation of these variables as potential

performance metrics. Overall the study finds that higher levels of funding council grants and student recruitments from comprehensive schools/low participation geographies do positively increase VC pay. In other words, these two measures of non-financial performance drive universities to increase the remuneration for their highest executive. For example in their sample a 1% rise in highly paid staff earning in excess of GBP 70000 at a university increases VC pay by 0.43%. This is similar to Tarbert et al.'s (2008) results above. Similarly, a 1% increase in external pay levels of comparable institutions in the previous year increases VC pay by 0.15%. The authors also corroborate their results by simultaneously implementing university fixed effects and showing consistent estimates.

Both of the above studies document the fact that VCs seem to be underpaid relative to their corporate peers. This is corroborated in many other empirical studies in UK HEI. (Lucy et al., 2019; Hubble & Bolton, 2019; Shackleton, 2017) compare VC pay levels with CEOs of firms who have similarly large job responsibilities and show how the former are indeed disadvantaged. The overall narrative that seems to emerge in these studies is that the HEI sector has legitimisation concerns that do not allow fair pay scales for their senior executive.

Gschwandtner & McManus (2018) is the another paper correlating Vice-Chancellor pay and University performance in the UK. The study uses established econometric models and ample empirical evidence from a dataset of 154 UK universities over a period of 10 years. The authors also use a comprehensive set of key performance indicators related to both student numbers and student evaluations of the university (league tables) as well as its research and funding performance. The authors conclude that it is benchmarking with peer group pay that explains much of the variation in VC pay amongst UK universities.

Before outlining the main results of the paper it must be mentioned that the paper seminally classifies the theoretical literature on executive pay versus performance into three main strands and critically evaluates each. The first strand (Fama, 1980; Jensen & Murphy, 1990) models pay as a function of performance using agency and stewardship tenets that posit that principals necessarily incentivize agents by increasing their pay or performance-contingent bonus. The second strand based on optimal contracting and managerial power tenets (Raff & Summers, 1987; Banker et al., 1996; MacLeod & Malcomson, 1998) instead argues that higher pay increases productivity of employees. Finally the last strand (DiPrete et al., 2010; Schmidt & Dworschak, 2006; Garvey & Milbourn, 2006; Nagel, 2007; Bizjak et al., 2008; Faulkender &

Yang, 2010; Laschever, 2013) argues on the basis of benchmarking theory that CEO pay is characterized by asymmetry and determined more by peer group pay levels and differential degrees of CEO power.

Johnes & Virmani (2019) study VC pay and university performance between 2010-2017 in 149 Higher education institutions in UK. The authors find that VC pay is determined by neither the managerial efficiency measure, nor by the financial security index by HESA. The only measure which is related to VC pay is the overall performance score produced by *The University Guide*. The results cause the authors to speculate further that it is university reputation rather than performance driving VC Pay which is line with results and interpretation of Tang et al. (2000). Size of the HEI is positively associated to VC Pay. They also find that location is an important determinant of pay with universities in Wales exhibiting the lowest VC pay levels.

On the whole there is ample evidence for the importance of VC pay as a likely important antecedent of university performance. In the growing context of financial sustainability, mission and academic quality there is little doubt that research, teaching and financial performances of this institution will display a strong association with this variable. Hence the following key hypothesis is advanced.

H6p: There is a positive association between vice-chancellor pay and the research performance of a university.

H6q: There is a positive association between vice-chancellor pay and the teaching performance of a university.

6rc: There is a positive association between vice-chancellor pay and the financial performance of a university.

3.3 Conclusion

The Chapter has collated a rich and diverse empirical literature on university governance and performance. In section 3.1 it classified the principal empirical gaps in the existing literature into three main categories i.e. the missing dimensions of university governance and performance, the missing culture and quality assurance aspects in the research and the missing longitudinal analysis. This classification helped establish the multiple contours of the overall research gap and show how existing scholarship has but scratched the surface of the considerable research problem characterising multi-dimensional university governance and performance.

Using principles embedded in this formulation of the research gap, Section 3.2 developed a set of key hypotheses linking multi-dimensional university governance and performance. In the first sub-section here, the thesis uncovered a set of five missing dimensions of university governance namely, Selectivity in Entry Standards, Instruction Intensity in Student Staff Ratios, Research/Teaching/Gender Modalities in Staff Contracts, Pedagogical Orientations in Student Body Diversities and Strategic choices in Asset/Revenue Structures. Each of these five dimensions were separately identified and rooted in the seven-theory framework for university governance established in the previous chapter. Existent policy and empirical literatures were then carefully collated here to substantiate the lack of academic rigor. Nevertheless, the rich policy and empirical debates and insights were coagulated to formulate five key hypotheses and several related sub-hypotheses. In the second sub-section a broadly similar approach was followed with respect to the board and audit related university governances. The wider availability of empirical findings here allowed for an easier evaluation and calibration of several additional key hypotheses here.

On the whole then the chapter achieved a formulation of six key hypotheses and related sub-hypotheses as a basis for the analytical work of the thesis. Armed with these, the next chapter takes the research forward by describing and justifying the methods of data analysis intended in the project.

4. Chapter Four: Methodology

The principal purpose of this chapter is to present the overall methodology of this research project. The detailed list of hypotheses developed and explained in the previous chapter need to be tested within the UK university sample data collated. For this there is the obvious need for a structured econometric approach to decipher the trends and associations between university governance and performance. The chapter details this methodological approach. It begins with 4.1 research methodology section that highlights the philosophy underlining the choice of the study, followed by a research population section 4.2, which briefly presents the sample chosen for the study and its geographical scope. Section 4.3 is the section where the the thesis explains how the sample was collected especially those parts where a laborious manual method was implemented. This is followed by section 4.4 where the use of panel data and its suitability for this research are elucidated. Section 4.5 is the section where the conceptualisation and measurement of variables used is explained in brief. The large list of 25 university governance, 6 university performance and control variables are described and theoretically/empirically justified in the next section 4.6. Reference is made to extant studies that have used similar variables earlier while simultaneously attention is drawn to unique variables used for the first time by this thesis. The penultimate section 4.7 covers in detail the bivariate factor analyses intended here alongside the main regression models. In this section econometric issues connected with the thesis i.e The entire gamut of statistical procedures, tests, filters and models applied in the sample are fully delineated and justified. Finally, section 4.8 concludes the chapter.

4.1 Research Philosophy and Approach

The research philosophy/approach choice and explanation for any study is an integral part of the applied social science research. It ultimately determines the approach in which the study will be conducted, what are the suited indicators to be gathered, and how to analyse the data and interpret the results (Veal & Ticehurst 2005; Smith, 2003; Bernard, 2013; Bryman, 2012). There are two different approaches in the social science, deductive and inductive, and two different paradigms, positivism and interpretivism, both have contrasting outlooks. Positivism assumes that the researcher should be objective and independent from what is being observed

whereas interpretivism assumes that the researcher should not be independent from the research they are conducting (Kivunja & Kuyini, 2017).

The process of the positivist approach is to saturate the literature establishing and identifying the relevant theories in order to develop a hypothesis. Statistical tests either accept or reject the hypothesis. In general quantitative methods are used in positivist approaches that are used to search for cause and effect relationships as well as using measurable components to statistically test and interpret the results (Creswell, 2009; Howell, 2013). Using this approach will allow for the findings to be generalised to a large population. While in the interpretivist approach qualitative methods are preferred (Kaboub, 2001). The qualitative method can be deemed subjective and allows for further investigation into the subjects' thinking and experience, this is criticised for not being as rigorous as the quantitative method and for the rise of potential bias (Veal & Ticehurst 2005). Data can either be primary data or secondary data. Primary data is original empirical data gathered by undertaking surveys, questionnaires, experiments, observations and interviews. Secondary data is data that is already available and can be obtained from financial/annual reports, agency websites, books and journals (Bernard, 2013; Bryman, 2012).

Given the nature of the research gap, question and objectives established in the previous chapters the thesis is fundamentally rooted in the positivist philosophy with a largely deductive orientation. Empirical data is used to test and assess the theoretical predictions of a complex seven theory framework of university governance and performance. This is why the study adopts the positivist approach and quantitative techniques because the research starts with developing theoretical structures and hypothesis, this is subsequently followed by empirical tests for association and causality, and then finally comparing the results to earlier empirical evidence. Also, this study relies heavily on secondary data from university financial/annual reports and published data from government agencies to observe the links between the multi-dimensional features of university governance and performance. Such use of secondary data is common in the sector with several university governance studies (Lokuwaduge, 2011; Lokuwaduge and Armstrong; Ayoubi & Massoud, 2012; Ntim et al., 2017; Harris, 2014; Olson, 2000; Abbott & Doucouliagos 2003; Warning 2004; Worthington & Lee 2005)) doing likewise.

4.2 Research Population

The sample used in this study examines the multi-dimensional links between university governance and university performance in 132 UK higher education institutions (HEIs). This sample has also taken into account different regional distributions within the UK (England, Wales, Scotland and Northern Ireland), as well as university age represented as pre-1992 university, and university affiliation/alliance such as Russell Group. The study aimed to include all UK universities with available data from 2005 to 2015. HEIs that were excluded from the final sample were dropped due to the lack of information or inability to obtain data for the research period of 2005 to 2015 (Ayoubi, & Massoud, 2012; Lokawaduge, 2011; Lokawaduge & Armstrong, 2015). The final sample of 132 HEIs represents approximately 81% of the entire UK HEI population. The secondary data set was manually collected from university financial/annual statements, university websites and various government agencies such the Higher Education Statistics Agency (HESA), National Student Survey (NSS) and Research Excellence Framework (REF) etc. A full sample of all 132 HEI are presented in Appendix 9.

4.3 Types and Methods of Data collection

This section discusses the two different data collection methods used in the study. In the first method data already available in many standardized databases of the HEI sector in the UK was collated. The method of secondary data collection used in this study consisted of annual observations of 132 UK universities over the period 2005 to 2015 i.e. the chosen time frame were identified and extracted from university websites, university financial/annual reports, publications from UK higher education agencies such as: the Higher Education Statistics Agency (HESA), publications of the National Student Survey (NSS), publication of The Times Good University Guide, the Quality Assurance Agency (QAA) and the Higher Education Funding Council for England (HEFCE) and the Research Excellence Framework (REF) previously known as the Research Assessment Exercise (RAE). Teaching & research and financial related governance variables such as part-time to full time staff ratio, student staff ratio, teaching only staff, research only staff, teaching and research staff, postgraduate intensity, female staff fraction, service and facility spend per student, cash to total assets and debt to total assets were also obtained from published data collected by the Higher Education Statistics Agency (HESA), National Student Survey (NSS) and The Times Good University Guide. To measure the teaching performance of universities, data recording overall student

satisfaction, good honours, completion rate, graduate prospects and teaching grant fraction were obtained through the Higher Education Statistics Agency (HESA), the National Student Survey (NSS), the Quality Assurance Agency (QAA) and The Times Good University Guide for the years 2005 to 2015. Research performance data such as research quality, research income per academic, research grants were obtained through the Higher Education Statistics Agency (HESA), The Times Good University Guide, Higher Education Funding Council for England (HEFCE), Office for Students (OFS) and the Research Excellence Framework (REF) previously known as the Research Assessment Exercise (RAE). Size of the university characterised as total assets, total income and total staff has been obtained through university websites, financial/annual reports and the Higher Education Statistics Agency (HESA). Age, region and the university's affiliation/alliance has been obtained through university websites, association websites such as Russell Group, and the Higher Education Statistics Agency (HESA). Financial performance data for Asset turnover was collected from the Higher Education Statistics Agency (HESA) from 2005-2015 (Arabzad et al., 2013). Previous researchers (Ayoubi & Massoud, 2012; Patrick & Stanley, 1998; Boliver, 2015; McDonald, 2013; Asif & Searcy, 2013) have also collected performance data using the same methods and sources.

In the second method, data regarding the internal board governance variables such as board size, board independence, board meetings frequency, board ethnic and gender diversity, executive team size, audit committee meeting frequency, vice-chancellor pay, presence of a governance committee and Big-4 auditor were obtained by using the 2005 to 2015 financial/annual reports of all 132 UK universities and university websites. This was a laborious and time consuming process involving the actual manual recording of data in each variable for every university across the years.

4.4 Panel Data and its suitability for the research

This thesis uses a panel data of 25 governance and 6 performance variables across 132 UK universities from 2005 to 2015. Five main reasons underlie the decision to conduct a panel data study in this thesis.

First and foremost, the central narrative is that universities are unique institutions with embedded multi-dimensionalities in their governances and performances (Vukasovic et al., 2018; Piattoni, 2009; Gohari et al., 2019). These multi-dimensionalities are also characterized by complex sets of trade-offs that cannot be captured easily by the limited board level and audit related governance variable sets generally used by extant scholarship such as Lokuwaduge (2011) or Ntim et al. (2017). There is a need to go beyond the conventional and make use of a wider set of governance and performance variables to capture these missing aspects. But even more importantly the complex governance performance associations and trade-offs need the simultaneous capture of both the entity of each university and its yearly variations. For example, each university would decide on its entry standards based on its own past history and experience as well as the past history and experience of peer universities across the sample. If the sample only consists of a cross-section of universities across one year or one university across several years this dynamic and peer comparison-based governance decision will not be fully revealed or explained. In other words, different university entities based on their time-based assessments of internal governance-performance issues dynamically make and suffer consequences of their decisions across a given time horizon (Brown & Carasso, 2013; Buckland, 2004; Shattock, 2008: 2004; Middlehurst, 2004). Excluding either the entities or the timing would not replicate the real-life challenges facing university governors.

Second university academic governances and performances are complex constructs that are inter-linked (Collis, 2004; Jongbloed et al., 2018; Aghion et al., 2010; Taylor, 2001). Revealing and evaluating such inter-linkages has to be done in a panel because it only in the heterogeneity of different universities across time that these will emerge. The sample must afford scope to go forward and backward in time and criss-cross through different universities to determine how and why certain staff structures or student body mixes were chosen and how these choices had interlinkages with other governance choices as well as performance implications. In fact (Greene, 2012; Gil-Garcia & Puron-Cid, 2014) document why in social studies complex interlinkages between behavioural and amorphous constructs like governance and performance can best be studied only through panels and that is why this is becoming essential in most social

science research. A range of earlier empirical work has been calling for panel based longitudinal studies in university governance and performance for this very reason. (Ntim et al., 2017; Lokuwaduge, 2011; Lokuwaduge & Armstrong, 2015; Olson, 2000; Asif & Searcy, 2014).

Third, Governance and performance are both outcomes as well as processes. This is especially true in Higher Education. Where governance ends and performance begins or vice-versa is difficult to pin down. Performance-governance endogeneity and continuum type aspects are an essential component of the analysis here. This is why time series comparisons are essential in all university governance and performance variables (Hsiao, 1986; Ntim et al., 2017). Endogeneity has often been traced as the missing aspect in most governance literature, with Ntim et al. (2017) being among the first set of studies actively addressing it, albeit only in the relation to university voluntary disclosure. Across time and universities there are reverse causalities embedded in how university governance variables impact performance and vice versa. For example, universities increase entry standards one year and may find a salutary impact the next year on research or financial performance that emboldens them to further increase such standards in the year after. Such cyclical influences can only be traced robustly in panel based studies. Thus, taking just one observation for one year is simply unlikely to capture the complex interactive processes that underlie university research/teaching governances and performances. Panel data is therefore a very important prerequisite for this investigation.

Fourth, culture and quality aspects permeate university governance and performance debate in a manner that is unique. The academic functions of research and teaching are rooted in what the normative and qualitative governance literature in HEI calls TLRs or Teaching and Learning Regimes (Trowler, 2008, 2019; Trowler & Cooper, 2002; Gayle et al., 2003). These TLRs are a complex series of fundamental beliefs about teaching and learning that feed back into each other and evolve in complex manner in every institution across time. For example, universities differ in their beliefs about how teaching/learning/research is best achieved. These beliefs form the basis of staff contractual structures, entry standards, student-staff ratios and various other governance constructs which ultimately go on to produce the research teaching and financial performance of these complex multi-dimensional institution. To discover how these heterogenous beliefs are in play across time and in different universities naturally requires robust comparisons across both time and entity. A panel data set is, thus, what will be able to

capture these important fundamental influences on the relationships between university governance and performance.

Finally, there have been growing calls in the university governance literature for a longitudinal examination of governance performance relationships. Ntim et al. (2017), Shattock (2013), Christensen (2011) and Collini (2012) many others have been pointing to the many new regulatory changes initiated in UK HEI in recent years including the introduction of tuition fees, reduction in budgetary support, focus on student services and so on. It is only recently i.e. 2012 that many of these changes have been introduced. This is why having a panel data covering the decade commencing 2005 and ending 2015 is most appropriate here as it sandwiches many of these reforms and helps to assess their effectiveness empirically. After all many normative and policy-based governance studies (Watson, 2014; Middlehurst, 2014; Knight, 2002; Brown & Carasso, 2013; Jarvis, 2013; Hemsley-Brown, 2011) have been calling for more empirically derived policy reforms in UK HEI. Panel based studies are essential to assess and thus correct the policy input within the sector. This is why and uniquely, this investigation by its use of a panel data sample intends to richly contribute to the existing empirical body of knowledge in UK higher education.

4.5 Conceptualization and Measurement Analyses of the Variables

In this study, research quality, good honours, completion rate, graduate prospects, research grant fraction, overall student satisfaction, teaching grant fraction and asset turnover were expressed as fractions and percentages to keep the relationship in line with independent variables (Gujarati and Porter, 2009). Consistent with existing literature (Lokuwaduge, 2011; Lokuwaduge and Armstrong, 2015; Ntim et al., 2017; Tarbert et al., 2008) variables such as board size and board meeting frequency, executive team size, audit committee meeting frequency, vice-chancellor pay and size were transformed into logarithms to overcome the problem on non-linearity and make the data more normally distributed (Field, 2009). Other variables such as, teaching only staff, research only staff, teaching and research staff, part-time to full time staff, board gender diversity, board ethnic diversity, board independence, staff gender diversity, entry standard, tuition fees fraction, fraction of international student, postgraduate intensity, cash to total assets, debt to total assets, endowment to total assets, service and facility spend per student and student staff ratio were expressed as fractions/percentages. Presence of a unique governance committee and big four auditor are

dummy variables, thus not transformed. Missing values was not approximated for (Sterne et al. 2009; Kang, 2013). This study has used the same method used in previous studies.

4.6 Selection of variables

The study identifies 2 sets of variables, internal governance with its multi-dimensional characteristics/facets (board composition governance, research and teaching governance and financial governance) and performance (research, teaching and financial). As identified earlier in this study the dependent variable is performance and the independent variable is governance.

4.6.1 University Governance Variables

Internal governance mechanisms are concerned with the systems and practices adopted by the university to promote effective management of individual agents. Governance mechanisms comprise of missing dimensions i.e. *Entry Standards*, *Staff Student Ratio*, *Staff Contractual Arrangements*: part-time to full time staff, teaching and research staff, teaching only staff, research only staff, and female staff diversity, *Pedagogical Orientation*: postgraduate intensity, fraction of international student, *Strategic Choices in Asset and Revenue Structures*: tuition fee fraction, endowment to total asset, service and facility spend per student, cash to total asset, debt to total asset, and fixed to total asset. *Board and Audit Related governance variables*: board size, board gender diversity, board ethnic diversity, board independence, board meeting frequency, executive team size, audit committee meeting frequency, vice-chancellor pay, presence of unique governance committee, big-4 auditor. Table 3 below shows the measures for each variable used to unpack the links between university governance and performance in this study.

Table 3: Variables used to study governance of UK universities

<i>Variable</i>	<i>Measure</i>	<i>Acronym</i>
Governance		
Entry standard	The percentage of the mean tariff point scores on entry.	ES
Student staff ratio	The percentage of full-time equivalent (FTE) students at each institution to the number of FTE staff.	SSR
<i>Staff Contractual Arrangements</i>		
Teaching and research staff	The percentage staff are those whose contracts of employment state that they are employed to undertake both teaching and research to total number of staff.	TRST

Teaching only staff	The percentage staff are those whose contracts of employment state that they are employed only to undertake teaching to total number of staff.	TONLY
Research only staff	The percentage staff are those whose contracts of employment state that the primary academic employment function is research only to total number of staff (even though the contract may include a limited number of hours teaching up to 6 hours).	RONLY
Part-time to full time staff	The percentage of part-time staff to full time staff .	PTTSR
Female staff diversity	Is the percentage of female staff to the total number of staff .	FSF
<i>Pedagogical Orientation</i>		
Postgraduate intensity	The percentage of postgraduate student to the total number of student.	PGINT
Fraction of international students	The percentage of international student to total number of students .	INTS
<i>Strategic Choices in Asset and Revenue Structures</i>		
Tuition fee fraction	The percentage of tuition fee to total income.	TFEE
Endowment to total assets	The percentage of endowment to total assets.	ENDWTA
Service and facility spend per student	A two-year average of expenditure on academic services and staff and student facilities, divided by the total number of FTE students.	SFSPEND
Cash to total assets	The percentage of cash to total assets.	CTA
Debt to total assets	The percentage of debt to total assets.	DTA
Fixed to total assets	The percentage of fixed assets to total assets.	FTA
<i>Board and Audit Related governance</i>		
Board size	The total number of governing board members.	BSIZE
Board gender diversity	Percentage of number of females to the total number of governing board members.	BGDIV
Board ethnic diversity	Percentage of number of ethnic minorities (black Asian and ethnic minorities) to the total number of governing board members.	BEDIV
Board independence	Percentage of independent/lay members to the total of governing board members.	IGOV
Board meeting frequency	The frequency of governing board meetings.	BMFS

Executive team meeting frequency	The frequency of executive team board meetings.	ETMFS
Audit committee size	The total number of audit committee members.	ADSIZE
Vice-chancellor pay	The amount of emolument/remuneration the vice-chancellor receives at the end of each year.	VCPAY
Presence of a unique governance committee	1, if a HEI has set up a separate governance committee, 0 otherwise.	UGCOM
Big-4 auditor	1, if a HEI is audited by a big four audit firm (PricewaterhouseCoopers, Deloitte, Ernst and Young, and KPMG), 0 otherwise.	BIG4A

Entry Standard

Entry standard is calculated as the percentage of the mean tariff point scores on entry (Ayoubi & Massoud, 2012; Harris, 2014; Boliver, 2015; Boliver, 2013; Ayoubi & Massoud, 2007; Gorard et al., 2019). As an exclusivity measure such a variable neatly captures the governance challenge of the university's public coverage role (Coy et al., 2001; Kim, 2008; Shore & Wright, 2004; Freemna, 2015) traded off against its quality assurance imperatives (Brown, 2005: 2009; Sawir, 2013; Hoecht, 2006; Leisyte & Westerheijde, 2014; Salter & tapper, 2000; Gibbs, 2012). ***Student Staff Ratio***

In this study, this variable is calculated as the percentage of full-time equivalent (FTE) students at each institution to the number of FTE staff. This method was also used by (McDonald, 2013; Ayoubi & Massoud, 2012; Boliver, 2015; Lokuwaduge, 2011; Lokuwaduge and Armstrong, 2015; Abbott & Doucouliagos 2003; Kokkelenberg et al., 2008; Warning 2004; Warning 2007; Worthington & Lee 2005). The variable measures the instruction intensity of the university's academic functions helping to encapsulate resource-based concerns (Fowles, 2014; Foskett, 2010; Pfeffer, salancik, 2003) along with salient student stakeholder issues (Mitchell et al., 1997; Roberts, 1992; Freeman, 1999; Wise et al., 2020). It also presents the challenging student population coverage angle (Marginson, 2018; Molesworth et al., 2010; Brown & Carasso, 2013; McGettigan, 2013) along with the quality of higher education aspect (Sawir, 2013; bachan, 2017; Bright, 2004; Brown, 2004: 2009; Vidovich, 2002).

Teaching and Research Staff

Teaching and research staff was calculated as the percentage of staff whose contracts of employment state that they are employed to undertake both teaching and research to the total number of staff. (Tytherleigh et al., 2005). This is the proportion of staff on standard tenure track contract and has the longest established theoretical imperatives in higher education (MacFarlane, 2011; Whitchurch, 2016; Oncea et al., 2010).

Teaching Only Staff

Teaching only staff was calculated as the percentage of staff whose contracts of employment state that they are employed only to undertake teaching the total number of staff (Nyamapfene, 2018; Tytherleigh et al., 2005). This is an indicator of the teaching governance priorities of the institution and captures quality based, instrumental and other legitimation concerns expressed in theory (Oxford, 2000; Locke & Bennion, 2011; Harley, 2002).

Research Only Staff

Research only staff was calculated as the percentage of staff whose contracts of employment state that the primary academic employment function is research only to the total number of staff. (Patrick & Stanley, 1998; Tytherleigh et al., 2005). This is an indicator of the research governance priorities of the institution and captures culture, quality based, instrumental and other legitimation concerns expressed in theory (Blackwell., 2006; Probert, 2013; locke, 2012; Blackmore, 2016; Shelton et al., 2001).

Part-Time to Full Time Staff

This part-time ratio is calculated as a percentage of the number of part-time staff to full time staff at a given university (Ackers & Oliver, 2007). The measure has a clear quality-based dimension (Bryson & Blackwell, 2001; Bryson & Barnes, 2000a, b) but it also captures the resource imperatives of a university in optimizing its staff usage (Raff & Summers, 1987; Williamson, 2005; Burgess et al., 2006).

Female Staff Diversity

In this study, female staff diversity was calculated as the percentage of female staff members to the total number of staff. This is the same method used by (Santos & Van Phu, 2019). The variable measures gender diversity at the staff level. It captures a range of stakeholder, legitimacy and public accountability imperatives at the academic level in the university (Wise et al., 2020; Coy et al., 2001; Woodward et al., 1996).

Postgraduate Intensity

Postgraduate intensity was measured as the percentage of the number of postgraduate student to total number of students (Boliver, 2015; Tarbert et al., 2008). As a student body composition indicator of the university the variable has been underlined as a proxy for the academic ethos and reputation both in culture & quality assurance as well as legitimacy theories (Suchman, 1995; Ashforth & Gibbs, 1990; Cremonini et al., 2015; Stensaker, 2018). It has also been emphasized as a likely resource burden (House, 2010; Neves, 2018).

Fraction of International Student

In this study, fraction of international students was calculated as the percentage of international students to the total number of students at a given university (Dolton & Ma, 2003). Governance theory especially in stakeholder, legitimacy and culture & Quality Assurance perspectives argues that this variable is a good measure of the effects of salient international fee-paying students, the academic reputation and quality burden on the university (Freeman, 2010; Suchman, 1995; Leisyte & westerheijden, 2014; Stensaker, 2018).

Tuition Fee Fraction

This variable was calculated as a percentage of the total income from tuition fees to total income for each university. (Dolton & Ma, 2003; Ayoubi & Massoud, 2007). Resource dependence, legitimacy and public accountability concerns (Coy et al., 2001; Pfeffer, 1987; Fowles, 2014; Suchman, 1995) are primarily reflected and traded off in this variable.

Service and Facility Spend per Student

This study has used the same method to calculate the measurement for service and facility spend per student as Ayoubi & Massoud (2012) study of 100 UK universities, Boliver (2015) and The Times Good University Guide. Optimal contracting, stewardship and resource dependence (Williamson, 2000: 2005; Davis et al., 1997; Perez & Ode, 2013; Pfeffer, 1987; Fowles, 2014; Foskett, 2010) imperatives are mirrored and balanced in this variable.

Endowments to Total Assets

Endowment to total assets has been calculated as the percentage of endowment to total assets. This method is line with previous university governance studies (Olson, 2000; Bown et al., 2010; Boliver, 2015). Public accountability and legitimacy stress the importance of such an indicator of likely corporate donor interests and research priorities and proclivities (Suchman, 1995; Ashforth & Gibbs, 1990; Coy et al., 2001; Dowling & Pfeffer, 1975; ; Stensaker, 2018; Scherer et al., 2013; Kim, 2008).

Cash to Total Assets

This variable was calculated as the amount of cash held within a university to total assets. The liquidity of the institution has been used in both the corporate and university governance literature (Zahra & Pearce, 1989; Lokuwaduge and Armstrong, 2015; Lokuwaduge, 2011; Ntim *et al.*, 2017; Guthrie, J. & Neumann 2007; Rashid, Islam & Anderson 2008). Stewardship, Managerial Power and optimal contracting (Perez & Odo, 2013; Davis et al., 1997; Van Essen et al., 2015; Bebchuk et al., 2002; Williamson, 2005 ; Raff & Summers, 1987) highlight this variable as an important proxy for financial constraints and challenges facing the university.

Debt to Total Assets

This study has calculated debt to total assets as a percentage of the debt of a university to total assets. (Calabrese, 2011; Rosen & Sappington, 2016; Sheikh & Wang, 2012; Jensen, 1986; Grossman and Hart; 1982; Jiraporn *et al.*, 2012;). Legitimacy Public Accountability and stewardship (Perez & Odo, 2013; Davis et al., 1997; Donaldson & Davis, 1991) highlight the importance of sensible and appropriate leverage policies in universities.

Fixed to Total Assets

This study has calculated fixed to total assets as a percentage of the fixed assets of a university to total assets. (Calabrese, 2011; Rosen & Sappington, 2016; Sheikh & Wang, 2012; Jensen, 1986; Grossman and Hart; 1982; Jiraporn *et al.*, 2012;). Theories of stewardship and optimal contracting underline how university choices of fixed assets reflect its pedagogical priorities and burdens (Perez & Odo, 2013; Davis *et al.*, 1997; Van Essen *et al.*, 2015; Bebchuk *et al.*, 2002; Williamson, 2005 ; Raff & Summers, 1987).

Board Size

Board size (Guest, 2009) was computed as the natural log of the number of members on the university governing board. The variable has been used extensively in the corporate governance and firm performance literature (Guest, 2009; Kalsie, A., & Shrivastav, S. M., 2016; Khanchel, 2007; Yermack, 1996; Eisenberg *et al.*, 1998; Adams & Mehran, 2005; Chaganti, Mahajan & Sharma 1985). In the university governance scholarship, previous studies such as (Lokuwaduge, 2011; Lokuwaduge & Armstrong, 2015; Olson, 2000; Ntim *et al.*, 2017) have used the same method to construct this variable.

Board Gender and Ethnic Diversity

Board gender and ethnic diversity was calculated as a percentage of the number of female members and the percentage of ethnic minorities (black, Asians and ethnic minorities) to the total number of university governing board members respectively. In line with previous studies in the corporate governance literature (Carter *et al.*, 2010; Carter *et al.*, 2000; Ntim, 2015; Barako & Brown, 2008; Haniffa & Cooke, 2005; Fields and Keys 2003; Ostrower 2007) and in the university governance literature (Olson, 2000; Harris, 2014; Ntim *et al.*, 2017) this study will further investigate ethnic and gender diversity characteristics.

Board Independence

Board independence was calculated as a percentage of the number of independent/lay members to the total number of university governing board members. Previous corporate governance studies (Bhagat & Jefferis 2002; Bhagat and Black, 2002; Vafeas and Theodorou, 1998; Weir *et al.*; 2002; Dahya and McConnell, 2007; Agrawal and Chadha, 2005) and university governance studies (Harris, 2014; Ntim *et al.*, 2017; Lokuwaduge, 2011; Lokuwaduge & Armstrong, 2015) have used the same method to construct this measurement.

Board Meeting Frequency

Board meeting frequency was computed as the natural log of the number of meetings a governing board held during the year. This is line with previous corporate governance studies (Rodriguez-Fernandez *et al.*, 2014; Chen & Chen, 2012; Christensen *et al.*, 2015; Hu *et al.*, 2010; Vafeas, 1999; Karamanou & Vafeas, 2005). In the university governance studies (Ntim *et al.*, 2017; Lokuwaduge, 2011) have also used this method to determine this variable.

Executive Team Meeting Frequency

In this study, we calculate executive team meeting frequency as the natural log of the number of meetings an executive team held during the year. Earlier university governance study Ntim *et al.* (2017) have conducted the same method to construct this variable.

Audit Committee Size

Audit committee size was calculated as the natural log of the number of members on the university audit committee. (Ntim *et al.*, 2017; De Silva & Armstrong, 2012; Vermeer, and Raghunandan, 2006; Harris, 2014)

Vice-Chancellor Pay

Vice-chancellor pay was calculated as the natural log of the amount of remuneration the vice-chancellor receives each year. This variable has been used in previous studies in the university governance literature by (Bachan and Reilly, 2015; Tarbert *et al.* 2008; Dolton and Ma, 2003)

Presence of Unique Governance Committee

The existence of a unique governance committee within a university was given a 1, 0 otherwise. The same method was used in previous university governance studies (Lokuwaduge, 2011; Lokuwaduge & Armstrong, 2015; Ntim *et al.*, 2017).

Big-4 Auditor

Whether a university is audited by one of the big four audit firms which are PricewaterhouseCoopers, Deloitte, Ernst and Young, and KPMG. If yes it was given a 1, 0 otherwise. The same method was used in previous corporate governance literature (Beiner *et al.*, 2006; Elmagrhi *et al.*, 2018; El-Halaby and Hussainey, 2015; Huang and Kung, 2010) and in university governance scholarship (Lokuwaduge, 2011; Lokuwaduge & Armstrong, 2015; Ntim *et al.*, 2017).

4.6.2 University Performance Variables

The dependent variable performance consists of three variables: research performance, teaching performance and financial performance. Table 4 below shows the measures for each variable used to unpack the links between university governance and performance in this study.

Table 4: Variables used to study the performance of UK universities

<i>Variable</i>	<i>Measure</i>	<i>Acronym</i>
Performance		
<i>Research Performance</i>		
Research performance index	An index consisting of research quality, research grant fraction, completion rate, graduate prospects, good honours. Research income per academic has been used as an ancillary variable independent from the index	RPI
Research quality	Overall quality of research based on the Research Exercise Framework (REF). The output of the REF gave each institution a profile in the following categories: 4* world-leading; 3* internationally excellent; 2* internationally recognised; 1* nationally recognised and unclassified	RQ
Research grant fraction	The percentage of all income in respect of externally sponsored research carried out by the university to total assets	RGF
<i>Teaching performance</i>		
Teaching performance index	An index consisting of overall student satisfaction, completion rate, good honours, graduate prospects. Teaching grant fraction has been used independently from index.	TPI
Teaching grant fraction	The percentage of total grant for teaching to total income	TGF
Overall student satisfaction	is split into two components that give students' views of the quality of their courses: i) Teaching quality: Is a measure that reflects the average NSS scores of the teaching, learning opportunities, assessment and feedback, and academic support sections. ii) Student experience: is a measure that is drawn from the average NSS scores in the organisation and management, learning resources, learning community and student voice sections	SATIS
Completion rate	Percentage of students that complete their degree	CPRATE

Good honours	The number of students who graduated with a first-class distinction or upper second-class degree as a proportion of the total number of graduates with classified degrees.	GHONR
Graduate prospects	Destinations of leavers. It is based on the activity of leavers six months after graduation and whether they entered professional or non-professional employment.	GPRO
<i>Financial performance</i>		
Asset turnover	Total income to total assets	AT

Research Performance Index

The research performance index consists of 5 variables, namely, research quality, research grant fraction, degree completion rate, good honours, graduate prospects. Research income per academic has been dropped from the research performance index and has only been used as an ancillary variable in some cases if it provided further insight. Previous studies (Boliver, 2015; Ayoubi & Massoud, 2012; Lokuwaduge, 2011; Lokuwaduge and Armstrong, 2015; Harris, 2014; Linke 1995; Valadkhani & Worthington 2006; Warning 2007) have used the same variables to measure research performance specifically and non-financial performance in general. In this study, all 5 variables were used to calculate the research performance index.

Research Quality

Research quality is part of the Research Performance Index (RPI). This variable is measured as a percentage score awarded to each university based on its research output. This is published by the Research Excellence Framework (REF) previously known as the Research Excellence Framework (RAE) and The Times Good University Guide. This indicator is objective and has been used by several university performance literature (Lokuwaduge, 2011; Lokuwaduge and Armstrong; Ayoubi & Massoud, 2012; Boliver, 2015; Patrick & Stanley, 1998).

Research Grant Fraction

Research grant fraction is part of the Research Performance Index (RPI). This variable is calculated as research grant divided by total income. This variable offers an additional

dimension to research performance by having an independent grant provider offering/rewarding research grants based on the merits of that institutions research output and capabilities (Bachan & Reilly, 2015; Asif & Searcy, 2013).

Teaching Performance Index

The teaching performance index was generated using 4 variables, that are, student satisfaction as a teaching quality and student experience measure, completion rate as the success rate measure, good honours, graduate prospects as the graduate and employability measure (Lokuwaduge, 2011; Lokuwaduge and Armstrong; Ayoubi & Massoud, 2012; Boliver, 2015; Guthrie, J & Neumann 2006; Guthrie, J. & Neumann 2007; Warning 2007; Patrick & Stanley, 1998). In addition to the above Teaching grant fraction was used as separate but important measure of teaching performance but is not part of the teaching performance index (Santos & Van Phu, 2019). This study uses data published by the National Student Survey (NSS), The Times Good University Guide and the Office for Students (OfS) from 2005 to 2015.

Asset Turnover

Asset turnover has been calculated as the net income divided by total assets. This variable has been widely used as indicator to measure financial performance in previous literature (Beiner & Schmid 2005; Kyereboah-Coleman & Biekpe 2005; Lokuwaduge, 2011; Lokuwaduge and Armstrong; Ayoubi & Massoud, 2012).

4.6.3 Controls

The control variables are university size, region, age of the institution and university affiliation/alliance. Table 5 below shows the measures for each of the control variables used.

Table 5: Control variables used to study the governance and performance of UK universities

<i>Variable</i>	<i>Measure</i>	<i>Acronym</i>
Controls		
Size	This is captured in three different ways. It is measured as the log of total assets or log total income or total staff. All three represent size of the institution.	TA; TINC; TST
Region	The regional distribution of universities was measured as 1 for England, 2 for Wales, 3 for Scotland and 4 for Northern Ireland.	REGION
Age	The age of the university was measured as 1, if the university is an old pre-1992 university, 0 otherwise.	PRE92
University Mission/Alliance	1, if the university is a member of the Russell Group, 0 otherwise.	RGROUP

Size of the University

The size of the university has been calculated as the natural log of total assets, total income and total staff respectively. Both corporate and university governance literature supports this (Harris 2014; Ntim et al., 2017; Tarbert *et al.*, 2008; Boliver, 2015; Oi and Idson, 1999).

Region

Region was measured as the location of the university within the UK. England, Wales, Scotland and Northern Ireland, each were given 1, 2, 3 and 4 respectively (Bachan, 2017; Ntim et al. 2017).

Age and Affiliation of the University

Whether or not the university is an established pre-1992 university. If yes it was given a 1, 0 otherwise. The university's alliance and affiliation such as Russell group, Million+, Red Brick, University Alliance and unaffiliated universities. 1 if a university is a Russell Group member, 0 otherwise. (Boliver, 2015; Boliver, 2013; Ntim *et al.*, 2017; Bachan & Reilly, 2015; Santos & Van Phu, 2019; Patrick & Stanley, 1998).

4.7 Analysis of the Data

In order to decipher the complex links between university governance and performance this study uses regression analysis to uncover the complex and multi-dimensional relationship between university governance instruments, the dependent variable (university performance) and control variables.

Relationships between dependent and independent variables are generally done using Ordinary Least Squares (OLS) based estimations that do not distinguish between time and entity. All observations irrespective of years or entities are simply stacked above each other and an overall average relationship between the variables is estimated (Gujarati, 2003; Gil-Garcia & Puron-Cid, 2014). This results in an inaccurate assessment of the true relationship between the variables since the time effects and entity effects are blurred and combined. Despite high R-squares and significances of coefficients there may be significant autocorrelation, misspecification and biased coefficients in such a model due to this (Baltagi, 2008; Wooldridge, 2010; Gil-Garcia & Puron-Cid, 2014). This is why regression models that account for both time and entity fixed effects are the standard in most panel studies. The main regression model used in this thesis is based on GLS (FE) estimation accounting for both entity and time effects. This choice of the GLS (FE) is highly appropriate in this thesis for the following main reasons.

First and foremost, the sample used in this data set is a panel. Every governance and performance variable varies across universities and years. Each university has to be separately accounted for and its governance performance equation contrasted with every one of its peers across the ten years of the sample. If entity and time fixed effects are not included in the regression only an average and misspecified relationship between such governance and performance will emerge here (Baltagi, 2008; Gujarati, 2003; Wooldridge, 2010). Hence to capture the rich heterogeneity in the governance performance relationships of every university and year in the sample a fixed time and entity effects regression is essential. Fixed effects regressions have been widely used in the extant empirical literature of both corporate and university governance and therefore its choice here is well substantiated. A few classic examples here include (Lucey et al., 2019; Dolton & Ma, 2003; Bachan & Rielly, 2015; Yekini

et al., 2017; Gschwandtner & McManus, 2018; Gounopoulos et al., 2019; Chowdry et al., 2008; Kokkelenber et al., 2008)

Second, every university performance dependent variable used in the models of the thesis may have time invariant heterogenous influences on it that are unobservable. For example, research performance of a given university may be a function of many time varying governance variables like entry standards, student staff ratios and so on but may also be a function of some time invariant variables such as its research mission which generally do not change much during even a decade. To ensure that only time variant factors account for the changes in the dependent variable once again a fixed effects (FE) estimation is most suitable as suggested by Greene (2008). After all factors that influence performance but do not change over time imply that they are stable across time and so there is no governance change associated with them. A university will not change its research mission in one year or even in several years and so any influence on performance remains the same across all the ten years of the results (Greene, 2008). It must not therefore enter the regression and to ensure this a fixed effects regression is essential.

Third, the choice of GLS FE instead of OLS as the base level regression is to control for econometric problems that in most economic samples like this one make assumptions of classical OLS untenable. For example, homoscedasticity in the residuals of the regression is not generally held in panel data of this kind and this is likely in my sample too. Similarly, most panel data suffer from autocorrelation, multicollinearity and endogeneity and as stressed earlier this is very true in my sample. In addition, my univariate statistics show how all my variables are not strictly normally distributed. Thus, most of the assumptions of classical OLS are not met in the sample. It is widely agreed (Baltagi, 2008; Gujarati, 2003; Wooldridge, 2010; Hsiao, 2006: 1986) that the GLS method is more robust to the presence of such econometric problems in any data set. Therefore, it is used as the main model here. Notwithstanding this, the sensitivity analysis section below explains and justifies how this thesis further double checks, verifies and controls for each of these problems through a suite of other regressions.

Finally, the use of GLS FE in this thesis has been further corroborated by cross checking all models with OLS results. Everywhere the results (interpreted in chapter 6) show the many sensitivities associated with the OLS and thus justify the use of GLS FE as the main basis for interpretations here. However to robustly substantiate this, post-estimation Hausman

specification tests have also been carried out that rejected (p-value < 0.05) the null hypothesis of no correlation between the explanatory variables and the random effect model in each case.

The Fixed-Effects (FE) method is applied in this study as a powerful and widely used method to estimate the parameter of a regression model (Gujarati & Porter, 2009). The FE method allows the intercept to differ across time and institutions, but not over time, while assuming the slope coefficient are constant as the intercept varies across cross-sectional units, thus taking into account individuality. A representation the generic version of the econometric model chosen in this thesis is shown in the equation below:

$$Y_{it} = \alpha_{li} + \beta_1 X_{it} + \beta_2 X_{it} + \mu_{it} \quad (1)$$

Y = The dependent variable (university performance)

α = The constant

β_n = The slope of independent variable and controls

X_{it} = The independent variable (university governance and controls)

μ_{it} = error term

t = Time

I = Institution

Six governance-performance models fall within this generic formulation as shown below:

Model 1:

$$RPI_{it} = \alpha_{it} + \beta_1 ES_{it} + \beta_2 INTS_{it} + \beta_3 BSIZE_{it} + \beta_4 TRST_{it} + \beta_5 GCOM_{it} + \beta_6 SSR_{it} + \beta_7 IGOV_{it} + \beta_8 FSF_{it} + \beta_9 CTA_{it} + \beta_{10} TST_{it} + \beta_{11} PRE1992_{it} + \beta_{12} REGION_{it} + \beta_{13} CODE_{it} + \beta_{14} YEAR_{it} + \mu_{it} \quad (1.1)$$

Where: RPI denotes research performance index; ES denotes entry standards; $INTS$ denotes fraction international students; $GBSIZE$ denotes governing board size; $TRST$ denotes teaching and research staff; $GCOM$ denotes the existence of a separate governance committee; SSR student to staff ratio; $IGOV$ denotes independent governors; FSF denotes female staff fraction; CTA denotes cash to total assets; $CONTS$ denotes control variables for university size (TST), university age ($PRE1992$), university region ($REGION$), university code ($CODE$) and year ($YEAR$).

Model 2:

$$RQ_{it} = \alpha_{it} + \beta_1 ES_{it} + \beta_2 BIG4A_{it} + \beta_3 BSIZE_{it} + \beta_4 FSF_{it} + \beta_5 BGDIV_{it} + \beta_6 VCPAY_{it} + \beta_7 ENDWTA_{it} + \beta_8 PGINT_{it} + \beta_9 PGINT_{2it} + \beta_{10} PTTR_{it} + \beta_{11} TFEE_{it} + \beta_{12} SFSPEND_{it} + \beta_{13} TI_{it} + \beta_{14} PRE1992_{it} + \beta_{15} REGION_{it} + \beta_{16} CODE_{it} + \mu_{it} \quad (1.2)$$

Where: *RQ* denotes research quality; *ES* denotes entry standards; *BIG4A* denotes if HEI is audited by a big 4 auditor; *BSIZE* denotes governing board size; *FSF* denotes female staff fraction; *BGDIV* denotes governing board gender diversity; *VCPAY* denotes vice-chancellor emolument; *ENDWTA* denotes endowment to total assets; *PGINT* denotes postgraduate intensity; *TFEE* denotes tuition fee fraction; *SFSPEND* denotes service and facility spend per student; *CONTS* denotes control variables for university size (*TI*), university herageitage (*PRE1992*), university region (*REGION*), university code (*CODE*) and year (*YEAR*).

Model 3:

$$RGF_{it} = \alpha_{it} + \beta_1 BMFS_{it} + \beta_2 BEDIV_{it} + \beta_3 TRST_{it} + \beta_4 PTTSR_{it} + \beta_5 TONLY_{it} + \beta_6 ENDWTA_{it} + \beta_7 FSF_{it} + \beta_8 TST_{it} + \beta_9 RGROUP_{it} + \beta_{10} YEAR_{it} + \beta_{11} CODE_{it} + \mu_{it} \quad (1.3)$$

Where: *RGF* denotes research grant fraction; *BMFS* denotes governing board meeting frequency; *BEDIV* denotes governing board ethnic diversity; *TRST* denotes teaching and research staff; *PTTSR* denotes part-time to total staff ratio; *TONLY* denotes teaching only staff; *ENDWTA* denotes endowment to total assets; *FSF* denotes female staff fraction; *CONTS* denotes control variables for university size (*TST*), university mission (*RGROUP*), university region (*REGION*), university code (*CODE*) and year (*YEAR*).

Model 4:

$$TPI_{it} = \alpha_{it} + \beta_1 ES_{it} + \beta_2 SSR_{it} + \beta_3 TFEE_{it} + \beta_4 FSF_{it} + \beta_5 CTA_{it} + \beta_6 BEDIV_{it} + \beta_7 BGDIV_{it} + \beta_8 SFSPEND_{it} + \beta_9 TA_{it} + \beta_{10} PRE1992_{it} + \beta_{11} REGION_{it} + \beta_{12} YEAR_{it} + \beta_{13} CODE_{it} + \mu_{it} \quad (1.4)$$

Where: *TPI* denotes teaching performance index; *ES* denotes entry standards; *SSR* student to staff ratio; *TFEE* denotes tuition fee fraction; *FSF* denotes female staff fraction; *CTA* denotes cash to total assets; *BEDIV* denotes governing board ethnic diversity; *BGDIV* denotes governing board gender diversity; *SFSPEND* denotes service and facility spend per student; *CONTS* denotes control variables for university size (*TA*), university age (*PRE1992*), university region (*REGION*), university code (*CODE*) and year (*YEAR*).

Model 5:

$$TGF_{it} = \alpha_{it} + \beta_1 TFEE_{it} + \beta_2 FSF_{it} + \beta_3 PTTSR_{it} + \beta_4 RONLY_{it} + \beta_5 ENDWTA_{it} + \beta_6 TRST_{it} + \beta_7 ETFS_{it} + \beta_8 BSIZE_{it} + \beta_9 VCPAY_{it} + \beta_{10} IGOV_{it} + \beta_{11} RGROUP_{it} + \beta_{12} PRE1992_{it} + \beta_{13} REGION_{it} + \beta_{14} YEAR_{it} + \beta_{15} CODE_{it} + \mu_{it} \quad (1.5)$$

Where: *TGF* denotes teaching grant fraction; *TFEE* denotes tuition fee fraction; *FSF* denotes female staff fraction; *PTTSR* denotes part-time to total staff ratio; *RONLY* denotes research only staff; *ENDWTA* denotes endowment to total assets; *TRST* denotes teaching and research staff; *ETFS* denotes executive team meeting frequency; *BSIZE* denotes governing board size; *VCPAY* denotes vice-chancellor emolument; *IGOV* denotes independent governors; *CONTS* denotes control variables for university mission (*RGROUP*), university age (*PRE1992*), university code (*CODE*) and year (*YEAR*).

Model 6:

$$AT_{it} = \alpha_{it} + \beta_1 FTA_{it} + \beta_2 DTA_{it} + \beta_3 CTA_{it} + \beta_4 SFSPEND_{it} + \beta_5 RONLY_{it} + \beta_6 TONLY_{it} + \beta_7 UGCOM_{it} + \beta_8 PTTSR_{it} + \beta_9 GBMFS_{it} + \beta_{10} VCPAY_{it} + \beta_{11} INTS_{it} + \beta_{12} PGINT_{it} + \beta_{13} ADSIZE_{it} + \beta_{14} TA_{it} + \beta_{15} RGROUP_{it} + \beta_{16} PRE92_{it} + \beta_{17} REGION_{it} + \beta_{18} YEAR_{it} + \beta_{19} CODE_{it} + \mu_{it} \quad (1.6)$$

Where: *AT* denotes asset turnover; *FTA* denotes fixed to total assets; *DTA* denotes debt to total assets; *CTA* denotes cash to total assets; *SFSPEND* denotes service and facility spend per student; *ENDWTA* denotes endowment to total assets; *RONLY* denotes research only staff; *TONLY* denotes teaching only staff; *UGCOM* denotes presence unique governance committee; *PTTSR* denotes part-time to total staff ratio; *GBMFS* denotes governing board meeting frequency; *VCPAY* denotes vice-chancellor pay; *INTS* denotes fraction of international students; *PGINT* denotes postgraduate intensity; *ADSIZE* denotes audit committee size; *CONTS* denotes control variables for university size (*TA*); university mission (*RGROUP*), university age (*PRE1992*); university region (*REGION*); code (*CODE*) and year (*YEAR*).

Models 1 to 6 examine the relationship between the multi-dimensional characteristics of university governance and a university's research, teaching and financial performance respectively. The β is expected show a positive result when the relationship between university governance and performance is positive and negative when the relationship is negative.

4.7.1 Sensitivity Tests

In each of the six models specified above a battery of tests are combined with an appropriate suite of 5 different regressions in order to verify the main GLS FE estimation. The first sensitivity regression implemented here is the GLS MLE (Maximum Likelihood Estimation). The overall idea is to maximize the likelihood function by estimating the parameter with a statistical approach that is distinct from the least squares approach (Ender, 2005; Field, 2009). This helps to robustly corroborate the GLS FE result. The maximum likelihood regressions unlike classical regression methods allow the dependent and independent variables to be drawn from distributions that are not strictly normal. Therefore, they provide an alternative estimation to check and verify the GLS FE result. Thus, accommodating a much wider range of variable distributions than the least squares as well as accounting for the presence of likely outliers in the sample data set. Earlier governance studies have indeed used the maximum likelihood estimation in other contexts (Kokkelenberga et al., 2008; Blank & Van Hulst, 2011; Renders & Gaeremynck, 2006).

The second sensitivity regression Autoregression (AR) is used to in order to implement a Koyck transformation (Koyck, 1954; Gujarati & Porter, 2009: 624-630) but through a generalized rather than an ordinary least squares regression. Here the dependent performance variable in the model is lagged one period and used as an additional regressor in the model. This is the autoregression (AR). The reasoning behind this is part theoretical and part empirical. Given that governance calibration takes time to implement it is reasonable to assume that the effect on university performance will be with a lag and as shown by Koyck (1954) this is most easily accounted for by the lagged performance dependent variable. Empirically this data set has just 10 years of data i.e, T is small with significant numbers of missing values. Lagging the independent variables i.e. distributed lag model will result in further loss of degrees of freedom reducing the representativeness (i.e. N) and robustness (Gujarati & Porter, 2009: 598) of the model. The use of GLS AR is an added validation here as the lagged dependent variable is a potential source of collinearity as well as serial correlation (Gujarati & Porter, 2009: 626).

This study also uses two additional Two-Stage Least Square (2SLS) and Generalised Method of Moments (GMM) to control for endogeneity concerns that arise from having one or more variables associated with the error term i.e. reverse causality. Durbin-Wu-Hausman (DWH)

test was used to check for the presence of endogenous variables in all 7 models. The independent variables in all models were assumed to be endogenous and are regressed, the residuals were then saved and regressed against the dependent (Field, 2012). The results are found in appendix table 6. The DWH was unable to accept the null hypothesis and therefore IV instruments has been used to account for endogeneity. The Two-Stage Least Square (2SLS) method which address concerns associated with the omitted variables, and the Generalised Method of Moments (GMM) method which relaxes the assumption have been applied in this study (Baum et al., 2003). Earlier studies that account for endogeneity have used this method (Antonakis et al., 2014; Soo & Elliot, 2010). For each of these a set of over-identification tests (i.e. Sargan, Basman and Hansen's J) are also conducted to confirm a robust lack of over-identification in these regressions.

4.7.3 Diagnostic Statistics

Variables board size, board meeting frequency, cash to total assets, executive team meeting frequency, vice-chancellor pay, audit committee size unique governance committee, total assets, total income, total staff were transformed into logarithms to remove any abnormalities this has been done in previous studies (Lokuwaduge, 2011; Ayoubi & Massoud, 2012; Bachan & Reilly, 2015; Ntim et al., 2017; Tarbert et al., 2008) . While board gender diversity, board ethnic diversity, board independent members, teaching and research staff, teaching only staff, research only staff, female staff diversity, part-time staff ratio, number of international students, tuition fees ratio, cash to total assets, debt to total assets, fixed to total assets were transformed into fractions/percentages.

4.7.4 R-squared

The R-squared value is a statistical measure which indicates how much of the variance in the dependant variable is explained by the independent variables. It is measured between 0 and 1, the closer the value is to 1 the better the fit/relationship between the university governance variables and university performance (Frost, 2013; Gujarati & Porter, 2009). The formula for R- squared is:

$$R^2 = 1 - \frac{\sum_i (y_i - \hat{y})^2}{\sum_i (y_i - \bar{y})^2} \quad (2)$$

4.7.5 Multicollinearity

Multicollinearity happens when there is high levels of correlation between two or more independent variables in the regression model (Gujarati & Porter, 2010). High levels of collinearity makes it less reliable and more complicated to assess the validity of results and this can lead to high standard deviation and limited R². High multicollinearity can be detected by using the Pearson & Spearman correlations shown in Table 15, any correlation between two variables that are higher than 0.80 or 0.90 indicates severe multicollinearity problems in the model (Field, 2013; Gujarati & Porter, 2010). The results from the correlation table shown in Table 15 indicate no serious multicollinearity levels. Due to the nature of the longitudinal data set some degree of multicollinearity are unescapable. To further detect whether the multicollinearity between the variables are at the acceptable levels, Variance Inflation Factor (VIF) and Tolerance test has also been used.

The Variance Inflation Factor (VIF) formula:

$$VIF = \frac{1}{1 - R^2} \quad (3)$$

The Tolerance formula:

$$TF = 1 - R^2 \quad (4)$$

Results showing VIF values that are above 10 and tolerance values below 0.10 means that multicollinearity could be a problem (Field, 2013). Appendix 4 shows the VIF and tolerance test results for all the models. The test results shows that the mean levels of VIF across all models do not exceed 5 but variables of Postgraduate Intensity (PGINT), Teaching Only Staff (TONLY) and Teaching and Research Staff (TRST) do exhibit high values. (see Appendix 4 for results)

4.7.6 Heteroscedasticity

This refers to the event where the variability of a variable is unequal across the range of values of the predictor variable. We have heteroscedasticity and homoscedasticity which shows the dependent variable's variability is equal across values of the independent variable. This study has used two tests The **Breusch-Pagan Test** and **White Test**. The Breusch-Pagan test is designed to detect any linear form of heteroscedasticity. The null hypothesis that the error variances are all equal versus the alternative that the error variances are a multiplicative function of one or more variables. A large chi-square would indicate that heteroskedasticity was present. If the p-value is > 0.05 the test suggests Homoscedasticity, If value is <0.05 it suggests Heteroskedasticity (See Appendix table 5 for results).

4.7.7 Endogeneity

Endogeneity emerges when one or more of the independent variables in the model are correlated with the error term in the model simultaneous causality, omission of variables is attributed to unavailable data and the variables can be influenced by omitted variable, and error in variables is when variables are measured incorrectly (Zaefarian et al., 2017). Accounting for endogeneity is an important element in a regression model that ultimately improves the validity of the results. Still, often time endogeneity problems are overlooked by researchers (Antonakis, et al., 2010; Antonakis, et al., 2010; 2014; Ntim et al., 2017; Beiner et al., 2006). Several university governance studies (Harris, 2014; Ntim et al., 2017; Lokuwaduge, 2011; Soo & Elliot, 2010) have alerted of the plagued endogeneity issues that are unaccounted for in most studies of this nature. The multi-dimensional features of university governance and performance and its complex process like characteristics has to be observed with a fine-tooth comb to truly unpack and detect its true influence and associations, this is particularly relevant in panel longitudinal data (Antonakis et al., 2010, 2014).

To avoid spurious results, this study employs the same different methods used by (Beiner et al., 2006; Ntim et al., 2017; Soo & Elliot, 2010) to check and address any endogeneity.

4.7.8 Factor Analysis

The study uses a factor analysis to find the correlation variables to construct and determine the weights for the factor loading. For this study the factor loading was used to construct two dependant variables which are, research performance index consisting of, research quality, research grant fraction, degree completion rate, graduate prospects and good honours. Research income per academic was dropped from the index as it showed the lowest factor loading (below 0.70). And teaching performance index compromised of, overall student satisfaction, good honours, completion rate and graduate prospects. Teaching grant fraction was dropped from the index due to its inconsistency with the other factor loading variables with regard to the sign, and for having a factor loading below 0.70. This is the same method suggested and used by (Lokuwaduge, 2011; Field, 2009). The academic performances of research and teaching both have overlapping variables that are used to construct the indices (Kline, 2014). These overlapping variable have common characteristics and associations for each of them as explained in the variable definitions section above. To help with the with interpretation of the factors, factor rotation and varimax rotation were used to help reduce the variables that have high loading in each factor, and reduces the sum of variance in the squared loading (Kline, 2014; Field, 2009). Variables with factors loading below 0.7 were considered were carefully considered or dropped, while factor loading above 0.7 was shown to extracts sufficient variance from the variable.

4.7.9 Descriptive Statistics

Descriptive statistics was used to analyse each of the independent (university governance), dependant (university performance: research, teaching and financial) and controls variables in this study of 132 UK HEI from 2005 to 2015. It shows the mean, median, standard deviation, maximum and minimum for each variable. This allows for a greater understanding of the variables and offers a useful insight to the longitudinal changes from 2005 to 2015 to be observed. Similar to prior variables were spliced to show the difference between pre-1992 and post-1992 universities and Russell Group and non-Russell Group universities (Bachan & Riley, 2015; Boliver, 2015; Ntim et al., 2017; Iannelli & Huang, 2014).

4.7.10 Programs Used in this Study

STATA and Microsoft Excel has been used in this study to obtain the results. The gathering of the data and the preparation of the data file was done in Microsoft Excel. STATA was used to transform variables and calculate descriptive statistics, correlations, factor analysis, assumption tests, multivariate analysis.

4.8 Conclusion

This chapter has presented and justified the entire gamut of research philosophies, approaches, methods, data and sample used in the thesis. In section 4.1 the thesis showed that a positivist philosophy and a consequent quantitative approach is most appropriate within the research context. The full geographical scope of the sample i.e the 132 UK universities and their salient features were described in the next section 4.2. The wide and extensive data sources in UK HEI from where the sample of thesis had been collected were detailed in section 4.3 which also described the different collection approaches and their difficulties. Panel data and its appropriateness for the research were highlighted next. Section 4.4 listed and explained five separate reasons for the use of panel data and justified this within the context of the research question and related objectives. In the next section 4.5 the techniques used to conceptualize the variables were made explicit. The large list of 25 governance and 6 university performance variables, two of them composite indices were formalised in the next section 4.6. How each variable is measured, the previous studies using the same variable and its theoretical importance were briefly enumerated. Section 4.7 was the data analyses section which described and justified the entire range of models, tests, filters and techniques intended in the thesis. Here the choice of the GLS fixed effects regression as the base model and the use of five other multivariate sensitivity regressions were presented and defended. Having established the methodological basis for the empirical analyses of the thesis the next Chapter 5 begins with a univariate and bivariate analysis of the research sample.

5. Chapter Five: Descriptive statistics and Correlations

This Chapter begins analysing the large longitudinal dataset of UK University Governance and performance variables collated from different data sources. The principal objective here is to decipher and interpret how each variable behaves across both the entire sample period between 2005 and 2015 as well as among the entire collated set of UK universities. Through such a multi-layered interpretation it is anticipated that the multi-dimensionality, process-like characteristics and culture/quality assurance elements embedded in university governance and performance will come to the fore thus providing a first confirmation of the research gap identified by this thesis. This will then provide a foundation for the more complex multivariate analyses to follow in Chapter 6.

In consonance with this aim the chapter divides into three main sections. Section 5.2 descriptively analyses each of the 25 university governance, 6 university performance variables and 4 controls in turn in three sub-sections 5.2.1, 5.2.2 and 5.2.3 respectively.

Section 5.3 then conducts an elaborate longitudinal cross-correlation analysis on the full sample. Through this section each of the several hypotheses outlined in Chapter 3 are quantitatively evaluated. This section also identifies the strongest associations between all pairs of variables as well as their likely combinations. Finally Section 5.3 concludes the main insights developed through the entire descriptive analyses.

5.2 Univariate Descriptive statistics

This section has three parts. Each independent governance variable is discussed in sub section 5.2.1, while each dependent performance ones is discussed in sub section 5.2.2 and finally controls are discussed in sub section 5.2.3. These variables attempts to shed light on hitherto unexplored dimensions of university governance/performance. It should be noted that almost every governance and performance variable is interpreted in terms of its university performance/governance implications respectively. This is entirely consistent with the primary empirical research gaps already identified in chapter 3 namely the explication of multi-

dimensionality and process-like characteristics of both these university constructs. In what follows a rich Interpretations that flag and explain these ambiguities form an important part.

5.2.1 University Governance Variables

The section analyses the independent variables that are interpreted as internal governances of a university. It begins with the standard variables used earlier in the governance literature before moving on to new ones that provide further rich explanation. Table 6 below shows the descriptive statistics for the independent governance variables from 2005 to 2015.

5.2.1.1. Board Size

University board size has been the most important governance variable of interest in the extant literature. However no empirical analysis explores this variable in more than a cross-section. For the first time this thesis evaluates this variable across 132 universities for a decade. The table 6 shows how UK university boards have been populated on average across the decade 2005 to 2015. Mean and median board sizes have been on the decline (from just above 26 to around 23) under regulatory pressures (CUC, 2009: 2014) as noted by extant scholarship (Ntim et al., 2017). This is well above the mean board size of 19 found by Lokawaduge (2011) in Australian universities. Worryingly, universities with the largest board sizes have persisted with them through the decade with at least one increasing board membership as recently as 2015 to 38 (see maximum in Table 6). This tendency among UK universities to persist with larger boards seems to concur with the recommendations of Stakeholder, Legitimacy, Resource Dependence and Stewardship (Davies et al., 1997; Tilling, 2004; Marginson, 2006; Saltman et al., 2000) while militating against Public Accountability, Quality Assurance and Optimal Contracting theories (Yermack, 1996; Bebchuk & Fried, 2003; Mallin et al., 2015).

Table 6: Univariate Descriptive Analysis for University Governance

Univariate Descriptive Analysis for University Governance

<i>Variable:</i>	All	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
<i>BSIZE: Board Size</i>												
Mean	24.248	26.225	25.738	25.369	24.796	24.370	24.539	24.084	23.565	23.2439	22.869	23.443
Median	24	25	25	25	25	24	24	24	23	23	23	23.5
STD	4.757	6.386	5.198	5.536	4.804	4.506	4.476	4.391	4.354	4.097	4.046	4.142
CV	.196	.243	.201	.218	.193	.184	.182	.182	.184	.176	.176	.176
Minimum	11	15	16	17	16	16	15	15	14	13	11	12
Maximum	43	43	39	42	40	37	36	36	40	34	34	38
<i>BGDIV: Board Gender Diversity (%)</i>												
Mean	.2911	.2483	.2607	.2728	.2658	.2737	.2848	.2947	.2989	.3098	.3167	.3330
Median	.2857	.2631	.2608	.2594	.2582	.2752	.2768	.2916	.2857	.3076	.3076	.3214
STD	.0945	.1001	.0924	.0941	.0938	.0886	.0949	.1040	.0918	.0882	.0833	.0808
CV	.3246	.4033	.3546	.3450	.3529	.3238	.3335	.3528	.3071	.2849	.2631	.2426
Minimum	0.4479	0.0412	0.0367	.0487	.05	.0333	.0740	.0882	.1111	.1333	.1333	.1333
Maximum	.5789	.5	.4761	.5714	.5238	.5454	.5333	.5789	.5263	.5263	.5555	.5
<i>BEDIV: Board Ethnic Diversity (%)</i>												
Mean	.06915	.0649	.0674	.0672	.0652	.0668	.0642	.0693	.0696	.0679	.0711	.0809
Median	.0513	.0533	.0625	.0513	.0476	.0488	.0434	.0526	.0526	.05	.0526	.0715
STD	.0678	.0600	.0571	.0597	.0617	.0699	.0716	.0706	.0646	.0694	.0687	.0790
CV	.9806	.9253	.8471	.8882	.9470	1.0475	1.1137	1.0192	.9284	1.0215	.9659	.9764
Minimum	0	0	0	0	0	0	0	0	0	0	0	0
Maximum	.36	.36	.32	.32	.32	.3333	.3529	.36	.3076	.3125	.3157	.32
<i>IGOV: Board Independent (%)</i>												
Mean	.5857	.5833	.5750	.5905	.5739	.5821	.5896	.5884	.5830	.5950	.5909	.5856
Median	.5769	.5517	.56	.5789	.56	.5659	.5882	.56	.5714	.5862	.5909	.5833
STD	.1289	.1443	.1458	.1274	.1419	.1293	.1283	.1231	.1177	.1224	.1244	.1272
CV	.2202	.2475	.2536	.2158	.2473	.2221	.2177	.2092	.2019	.2056	.2106	.2172
Minimum	.0434	.1111	.1111	.1	.0434	.1428	.1428	.1428	.16	.125	.16	.1538
Maximum	.8888	.8636	.8888	.8095	.8095	.8333	.875	.8695	.8095	.8888	.7894	.84
<i>GBMFS: Governing Board Meeting Frequency</i>												
Mean	4.9009	4.5777	4.7065	4.7551	4.6698	4.8962	4.8888	4.9166	5.0247	5.0588	5.0333	5.1967
Median	5	4	4	4	4	5	4	4	5	5	5	5
STD	1.4664	1.3152	1.4641	1.4647	1.2552	1.4069	1.4370	1.4528	1.5245	1.5853	1.4720	1.5987
CV	.299222	.2873	.3110	.3080	.2688	.2873	.2939	.2954	.3034	.3133	.2924	.3076
Minimum	3	3	3	3	3	3	3	3	3	3	3	3
Maximum	13	10	13	10	10	10	11	11	11	11	12	12
<i>ETMFS: Executive Team Meeting Frequency</i>												
Mean	26.3012	24.4285	25.5909	25.3636	26.4583	23.3928	25.9393	26.3611	27	26.8421	27.4594	28.4285
Median	24	21	23	22.5	23.5	19.5	24	24	24	24	24	26

Univariate Descriptive Analysis for University Governance

<i>Variable:</i>	All	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
STD	15.6747	16.9869	16.0316	16.2965	16.4369	17.5864	16.4809	15.1735	14.9073	15.2643	15.5520	14.9278
CV	.5959	.6953	.6264	.6425	.6212	.7517	.6353	.5756	.5521	.5686	.5663	.5250
Minimum	0	0	0	0	0	0	0	0	0	0	0	0
Maximum	52	52	52	52	52	52	52	52	52	52	52	52
<i>SSR: Student Staff Ratio</i>												
Mean	17.5229	16.7818	17.294	18.2851	-	17.2911	17.0745	17.2380	17.7843	17.6739	18.2116	17.4686
Median	17.65	16.9	17.15	18	-	17.4	17.1	17.7	18.1	17.9	18.5	17.7
STD	3.4383	3.4052	3.4248	3.7937	-	3.2123	3.3345	3.3054	3.3522	3.2005	3.6645	3.4837
CV	.1962	.2029	.1980	.2074	-	.1857	.1952	.1917	.1884	.1810	.2012	.1994
Minimum	7.1	7.1	7.6	8.4	-	9.1	8.9	8.9	8.9	10.1	10.2	10.2
Maximum	32.9	27.5	25.4	30.2	-	25.2	25.8	25.1	23.8	25.2	32.9	30.2
<i>ES: Entry Standard</i>												
Mean	58.5447	63.3316	57.5961	57.4268	-	59.9258	58.0493	57.8578	57.9575	57.0297	58.1113	58.6943
Median	54.1396	61.3559	54.7591	53.2850	-	55.4054	53.4322	52.4680	52.8622	51.1745	53.6065	54.7889
STD	14.7161	16.4021	15.2081	15.2471	-	14.4029	15.0839	14.6017	14.8942	14.5754	13.7613	12.8641
CV	.2513	.2589	.2640	.2655	-	.2403	.2598	.2523	.2569	.2555	.2368	.2191
Minimum	28.9463	38.9830	28.9463	32.3747	-	36.1003	33.2096	33.6380	33.4525	34.3959	35.0819	36.5259
Maximum	100	100	100	100	-	100	100	100	100	100	100	100
<i>PTTSR: Part-time to Full-time Staff (%)</i>												
Mean	.3338	.3031	.3175	.3228	.3302	.3393	.3492	.3420	.3482	.3409	.34316	.3345
Median	.3261	.2764	.2963	.2959	.3333	.3237	.3489	.3455	.3532	.3413	.3429	.3092
STD	.1612	.1668	.1671	.1605	.1551	.1642	.1662	.1630	.1624	.1561	.1544	.1575
CV	.4830	.5504	.5263	.4973	.4696	.4839	.4762	.4768	.4663	.4581	.4499	.4710
Minimum	0	0	0	0	.0634	.0672	.0690	.0608	.0648	.0720	.075	.0377
Maximum	.8639	.7614	.7105	.8068	.7813	.8316	.8639	.8257	.8419	.8080	.8204	.7393
<i>FSF: Female Staff Fraction (%)</i>												
Mean	.4471	.4234	.4310	.4375	.4393	.4453	.4517	.4534	.4567	.4565	.4586	.4640
Median	.4444	.4175	.4321	.4343	.4392	.4418	.4483	.4461	.4482	.4459	.4527	.4583
STD	.0704	.0694	.0704	.0720	.0725	.0725	.0709	.0698	.0675	.0660	.0667	.0672
CV	.1575	.1640	.1635	.1647	.1651	.1629	.1570	.1539	.1479	.1447	.1454	.1450
Minimum	.2164	.2222	.2301	.2255	.2164	.2248	.2283	.2615	.2794	.2837	.2848	.2974
Maximum	.7	.6486	.6554	.675	.6666	.6595	.6590	.6590	.6829	.6818	.6938	.7
<i>TRST: Teaching and Research Staff (%)</i>												
Mean	.5810	.5699	.5512	.5577	.5806	.5770	.5861	.6030	.6010	.5936	.5827	.5875
Median	.5487	.5545	.5420	.5434	.5666	.5444	.5456	.5585	.5531	.5447	.5357	.555
STD	.2208	.2229	.2192	.2263	.2237	.2308	.2392	.2258	.2236	.2104	.2053	.2006
CV	.3800	.3911	.3977	.4057	.3853	.4000	.4081	.3745	.3721	.3545	.3523	.3414
Minimum	0	0	0	0	0	0	0	0	0	.1489	.0962	.1875
Maximum	1	1	1	1	1	1	1	1	1	1	1	1
<i>TONLY: Teaching Only Staff (%)</i>												
Mean	.2566	.2580	.2694	.2697	.2527	.2607	.2572	.2415	.2476	.2480	.2622	.2557

Univariate Descriptive Analysis for University Governance

<i>Variable:</i>	All	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Median	.2174	.2055	.2171	.2081	.2101	.2136	.2076	.2051	.2013	.2359	.2508	.2393
STD	.2132	.2399	.2338	.2355	.2196	.2238	.2270	.2092	.2083	.1861	.1850	.1723
CV	.8310	.9298	.8681	.8733	.8692	.8585	.8824	.8663	.8412	.7503	.7056	.6737
Minimum	0	0	0	0	0	0	0	0	0	0	0	0
Maximum	1	1	1	1	1	1	1	.9615	1	.8457	.8930	.7596
<i>RONLY: Research Only Staff (%)</i>												
Mean	.1482	.1574	.1548	.1524	.1507	.1491	.1474	.1469	.1428	.1426	.1421	.1445
Median	.0793	.1031	.1054	.0987	.0821	.0772	.0789	.0796	.0721	.0665	.0689	.0695
STD	.1590	.1556	.1530	.1558	.1585	.1640	.1665	.1591	.1584	.1604	.1605	.1622
CV	1.072	.9883	.9883	1.022	1.051	1.099	1.129	1.083	1.109	1.125	1.129	1.122
Minimum	0	0	0	0	0	0	0	0	0	0	0	0
Maximum	.8	.6316	.6332	.6405	.6666	.75	.8	.6866	.6954	.6985	.7055	.728
<i>PGINT: Postgraduate Intensity (%)</i>												
Mean	.2333	.2341	.2355	.2375	.2187	.2272	.2395	.2418	.2314	.2316	.2338	.2356
Median	.2202	.2173	.2265	.2255	.2115	.2192	.2338	.2316	.2128	.2157	.2207	.2201
STD	.0951	.0947	.0961	.0970	.0924	.0922	.0968	.0981	.0959	.0929	.0950	.0965
CV	.4076	.4048	.4081	.4085	.4225	.4058	.4041	.4056	.4145	.4013	.4064	.4096
Minimum	.0060	.0167	.0144	.0216	.01	.0087	.0060	.0150	.0191	.0244	.0255	.0253
Maximum	.6027	.5439	.5618	.5764	.5694	.5561	.5815	.5826	.5905	.6013	.6027	.5834
<i>TFEE: Tuition Fee Fraction (%)</i>												
Mean	.3778	.2610	.2633	.2830	.3028	.3304	.3536	.3710	.3977	.4769	.5358	.5772
Median	.3506	.2561	.2513	.2687	.2987	.3341	.3581	.3739	.4042	.5232	.5949	.6334
STD	.1579	.0845	.0917	.0967	.0941	.0996	.1028	.1048	.1097	.1363	.1633	.1857
CV	.4180	.3239	.3484	.3416	.3109	.3014	.2908	.2825	.2758	.2857	.3048	.3217
Minimum	.0215	.0805	.0662	.0215	.0719	.0804	.0858	.1017	.1128	.1270	.1379	.0981
Maximum	.8229	.5819	.6622	.6862	.6619	.7109	.6969	.7161	.7297	.7753	.7720	.8229
<i>INTS: Fraction of International Students (%)</i>												
Mean	.1757	.1542	.1570	.1613	.1602	.1672	.1778	.1865	.1875	.1907	.1950	.1937
Median	.1605	.1390	.1481	.1516	.1547	.1645	.1689	.1756	.1750	.1737	.1717	.1801
STD	.1119	.1093	.1059	.1057	.1037	.1067	.1094	.1105	.1138	.1175	.1209	.1194
CV	.6371	.7088	.6743	.6552	.6472	.6380	.6151	.5927	.6070	.6161	.6202	.6165
Minimum	0	0	0	.0027	.0089	.0088	.0116	.0130	.0110	0	.0020	.0021
Maximum	.7536	.7536	.7133	.6616	.6776	.6845	.6542	.6614	.6675	.6706	.6692	.6650
<i>ENDWTA: Endowment to Total Assets (%)</i>												
Mean	.0468	.0633	.0615	.0563	.0469	.0401	.0412	.0432	.0413	.0414	.0408	.0401
Median	.0074	.0087	.0084	.0075	.0060	.0058	.0057	.0071	.0076	.0073	.0069	.0072
STD	.0890	.1169	.1133	.1073	.0893	.0772	.0778	.0829	.0793	.0742	.0740	.0724
CV	1.900	1.8459	1.842	1.9060	1.9016	1.9256	1.886	1.917	1.920	1.793	1.814	1.803
Minimum	0	0	0	0	0	0	0	0	0	0	0	0
Maximum	.6325	.6325	.6289	.5901	.5359	.4202	.4108	.5261	.4866	.3977	.3961	.4010

Univariate Descriptive Analysis for University Governance

<i>Variable:</i>	All	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
<i>VCPAY: Vice-Chancellor Pay</i>												
Mean	242197.2	183014.9	198733.8	208665.3	226062.7	248588.8	247904.3	251213.5	254779.6	263378.6	269055.5	277567.1
Median	238862	182807.5	195098	203500	219000	241000	244000	245000	245795.5	253528.5	263000	271000
STD	58467.62	38797.8	45843.55	43271.72	45494.62	50117.17	48634.44	52210.88	53945.55	57838.03	58949.7	60528.68
CV	.2414051	.2119925	.2306782	.2073738	.2012478	.201606	.1961823	.2078347	.2117342	.2196003	.2190987	.2180687
Minimum	86000	86000	117337	127666	135032	148000	143000	105000	121000	119000	125000	103917
Maximum	466000	323000	376000	355000	432000	415129	406000	424000	424000	466000	453000	462000
<i>BIG4: Audited by BIG-4 Auditor</i>												
Mean	.773539	.7849462	.78125	.7979798	.7596154	.745283	.7327586	.7642276	.7804878	.7642276	.7903226	.808
Median	1	1	1	1	1	1	1	1	1	1	1	1
STD	.4187108	.4130865	.4155687	.4035505	.4293864	.4377719	.4444392	.4262167	.4156091	.4262167	.4087298	.3954581
CV	.5412	.5262	.5319	.5057	.5652	.5873	.6065	.5577	.5324	.5577	.5171	.4894
Minimum	0	0	0	0	0	0	0	0	0	0	0	0
Maximum	1	1	1	1	1	1	1	1	1	1	1	1
<i>UGCOM: Presence Unique Governance Committee</i>												
Mean	.2232	.0632	.1058	.1648	.2020	.22	.2363	.2666	.275	.2601	.2704	.2833
Median	0	0	0	0	0	0	0	0	0	0	0	0
STD	.4166	.2450	.3095	.3730	.4035	.4163	.4267	.4440	.4483	.4405	.4460	.4525
CV	1.865	3.871	2.923	2.263	1.9975	1.8924	1.805	1.6652	1.630	1.6932	1.649	1.597
Minimum	0	0	0	0	0	0	0	0	0	0	0	0
Maximum	1	1	1	1	1	1	1	1	1	1	1	1
<i>SFSPEND: Service and Facility Spend per Student</i>												
Mean	1157.148	575.6183	606.9924	685.4538	-	1117.929	1203.728	1425.798	1462.845	1499.316	1524.893	1633.172
Median	1127	624	660	713.5	-	1014	1119.5	1312.5	1354.5	1372	1393	1520.5
STD	599.080	393.043	404.250	392.952	-	399.384	436.874	481.820	490.373	487.079	496.337	512.884
CV	.517721	.6828	.6659	.5732	-	.3572	.3629	.3379	.3352	.3248	.3254	.3140
Minimum	0	0	0	0	-	480	482	653	625	630	369	446
Maximum	4090	1921	1935	2020	-	3218	3518	4090	3971	3588	3490	3506
<i>CTA: Cash to Total Assets (%)</i>												
Mean	.0782	.0576	.0564	.0590	.0645	.0699	.0827	.0846	.0870	.1002	.0993	.0988
Median	.0486	.0264	.0296	.0322	.0310	.0385	.0513	.0607	.0634	.0814	.0890	.0812
STD	.0828	.0733	.0684	.0732	.0743	.0767	.0871	.0834	.0851	.0926	.0887	.0888
CV	1.0585	1.2722	1.212	1.240	1.151	1.096	1.053	.9863	.9780	.9247	.8935	.8996
Minimum	-.0013	0	0	.00009	0	0	0	0	.0010	-.0013	.0017	.0023
Maximum	.6049	.4305	.3446	.3544	.2799	.3337	.3653	.3733	.3404	.5168	.6049	.5604
<i>DTA: Debt to Total Assets (%)</i>												
Mean	.1563	.1530	.1452	.1438	.1530	.1578	.1584	.1562	.1588	.1592	.1608	.1728
Median	.1470	.1396	.136	.1321	.1464	.1521	.1438	.1449	.1577	.1564	.1651	.1728
STD	.1092	.1028	.0956	.1042	.1117	.1156	.1168	.1112	.1068	.1076	.1067	.1209
CV	.6986	.6719	.6584	.7250	.7299	.7324	.7374	.7122	.6722	.6761	.6633	.6995
Minimum	0	0	0	0	0	0	0	0	0	0	0	0

Univariate Descriptive Analysis for University Governance

<i>Variable:</i>	All	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Maximum	.6772	.4601	.4217	.4595	.5581	.5877	.5869	.5061	.4428	.4559	.4385	.6772
<i>FTA: Fixed to Total Assets (%)</i>												
Mean	.7661	.7940	.7927	.7847	.7741	.7688	.7560	.7538	.7527	.7474	.7537	.7508
Median	.7752	.8142	.8159	.8050	.7824	.7802	.7640	.7574	.7570	.7535	.7538	.7645
STD	.1063	.0975	.1021	.1219	.1068	.1038	.1113	.1072	.1060	.0992	.0949	.1056
CV	.1388	.1228	.1288	.1554	.1380	.1350	.1472	.1423	.1408	.1327	.1259	.1406
Minimum	.0596	.5000	.4164	.0596	.2895	.3183	.2878	.2541	.2868	.3045	.2492	.3048
Maximum	.9882	.9704	.9611	.988	.9551	.9584	.9510	.9313	.9214	.9330	.9237	.9259
<i>ADSIZE: Audit Committee Size</i>												
Mean	5.33741	5.09615	5	5.33898	5.20312	5.20312	5.5797	5.42253	5.30137	5.36363	5.45454	5.55263
Median	5	5	5	5	5	5	5	5	5	5	5	5
STD	1.77797	1.34688	1.59325	1.82520	1.67312	1.41622	1.94335	1.90234	1.83094	1.93247	1.97714	1.81398
CV	.333115	.264294	.31865	.341864	.32156	.272188	.348290	.350821	.34537	.360291	.362476	.326688
Minimum	2	3	3	3	2	3	3	3	3	3	3	2
Maximum	15	11	10	11	10	9	15	15	15	15	15	14

Differentiating the sample between old pre-1992 institutions and newer post 1992 ones does shows that older established universities exhibit less pressures to conform to regulations to limit board sizes and seem to persist in larger sizes when compared with their newer rivals a fact echoed by Ntim et al. (2017) see Appendix Table 1.

5.2.1.2. Ethnicity Diversity

The average UK University exhibits minimal compliance to statutes encouraging diversity on boards (CUC, 2001; 2003; 2006: 2009) employing just 1 or 2 members from ethnic minorities. This constitutes a low fraction of board size not exceeding 8.5% on average across the decade and these figures conform to earlier studies (Ntim et al., 2017; Schofield, 2009). It is gratifying to note the increase albeit very slow in these fractions especially in 2014/2015. What is extremely revealing is that at least half of the data sample of university years never exhibit fractions more than 5% from among minority groups. This diversity never exceeds 40% in any year for any university. Clearly exhortations of Public Accountability, Resource Dependence, Stakeholder and Legitimacy (Coy et al., 2011; De Villiers & Van Staden, 2006; Mitchell et al., 1997; Verbruggen et al., 2011) to increase ethnic diversity of boards are not heeded by UK universities. On the other hand it seems that these institutions would further lower ethnic diversity but for regulatory mandates (CUC, 2009; UUK, 2011; FSSG, 2011) forcing them not to. The elite russel group tend to exhibit significantly lower ethnic fractions in boards when compared to their peers. A bias against minority groups in board member recruitment cannot be ruled out in the former, a fact stressed in the extant literature (Ntim et al., 2017; Goodall & Osterloh, 2015; Santos & Van Phu, 2017). The finding is even more strongly corroborated among the older pre-92 institutions which display a strong aversion to ethnic minorities in Board compositions right up until 2015.

5.2.1.2.3 Gender Diversity

Women on average seem to be better represented (Anywhere between 6 and 7) than their ethnic minority counterparts on UK university boards across 2005 to 2015 (see Table 6). This makes for at least 25% of the total board sizes on average in almost all years reaching beyond 3 in every 10 by 2015. These results are in line with earlier estimates in the literature including Ntim et al.'s (2017) 26.28% for 2012. What is gratifying is that this proportion has been

increasing consistently. Yet there is a wide spread among the universities with many observations at both ends of the range. Fairly large percentage of university year observations fall between 20 and 40 percent with at least one university choosing to employ just 3 women as against a peer choosing as high as 14. UK Universities seem to be less reluctant to implement the exhortations of the four core theories of governance to increase board gender diversity (Coy et al., 2011; De Villiers & Van Staden, 2006; Mitchell et al., 1997; Verbruggen et al., 2011). Yet in the sample findings there is still some evidence of resistance to include women on the board arguably to reduce potential policy logjams on boards as suggested by Managerial Power and Optimal Contracting theorists (Williamson, 2000; 2005; Chizema & Buck, 2006; Jacobson & Andreosso-O'Callaghan, 1996). Older pre-92 institutions remain relatively rigid clearly resisting gender balance with the lowest average fractions across the decade. The newer universities (post-92) and those unaffiliated to either group exhibit some of the highest fractions of women members across the sample years (see Appendix 1).

5.2.1.4 Board Independence

UK universities have prioritized CUC guidelines (2009) regarding board independence. Average numbers of board members sourced from outside the university remain above majority i.e. 50% levels across the sample decade (see appendix). This conforms to extant findings within UK data by Ntim et al. (2012: levels of 54.5%) and is somewhat lower than the levels found in Australian Universities (60%) by Lokuwaduge (2011). However there is a wider variation in these levels across institutions in the UK ranging from as low as 4.3% to as high as 88.8% of board sizes. It is worthwhile to note how minimum levels have nevertheless been increasing across years. It seems that a large bulk of UK universities have taken on board the recommendations of Neo-classical stewardship, Managerial power and Optimal Contracting theories (Donaldson, 1990; Mallin et al., 2015; Yermack, 1996) by ensuring higher proportions of lay members. The elite Russell group universities in this data sample consistently on average prefer internal rather than lay board members (lay member mean fractions below or around 50%) when compared to their peers (lay member mean fractions above 60%) across the decade (see Appendix 1). From a resource dependence standpoint it could be that non-Russel institutions are gathering higher numbers of lay members in the hope to access richer resource networks or from a regulatory angle lack of dependence on Government funds in Russel universities when compared to non-Russel institutions makes the former seem less bound by board independence regulatory directives than the latter.

5.2.1.5 Board Meeting Frequency

University boards across the UK met 4-5 times a year on average across the decade (see Tables 6). This seems less than the Australian average of around 7 times discovered by Lokuwaduge (2011) but in line with Ntim et al.'s (2017) UK figure of about 5 times in 2012. The spread around these mean figures (from 3 to 12/13) is also similar to comparable findings reported elsewhere. It is interesting to note how the recent trend has clearly been towards higher numbers of meetings each year (see Table 6). This seems to align with the recommendations of Public Accountability, Resource Dependence, Stakeholder and legitimacy (Karamanou & Vefas, 2005; Reverte, 2009; Freeman & Reed, 1983; Ashforth & Gibbs, 1990) all of which stress the importance of frequent board level meetings. It seems that the elite Russell Group of UK universities in this sample endorse such a theoretical view and ensure their boards meet a significantly higher number of times than their peers (see Appendix 1). Yet there is an overall impression that UK universities seem to heterogeneously vary board meeting frequencies arguably to suit their individual emerging exigencies from year to year. This is what scholars like Kohli & Saha (2008) and Bebchuk, Cohen & Farrell (2004) have recommend.

5.2.1.6 Student Staff Ratio

The average UK University (both mean & median) has been remarkably consistent in choosing a relatively low student to staff ratio (between 16.5 and 18.5). This compares 206ndogeneity with the higher ratios (between 38 and 40) found by Lokuwaduge (2011) in her Australian university sample and Kokkelenberg et al. (2008). But such consistency belies a large variation across universities. The coefficient of variation (standard deviation/mean) in any given year is never below 18%. Universities spread out close to 20% around yearly mean values. This is preliminary evidence of how differently each university chooses to implement this academic governance. This ratio has been growing across the decade due to the public accountability pressure on universities to cover a larger proportion of the student population combined with the steady reduction in budgetary support (Shattock, 2013a, b; 2004a; Kim, 2008; Trakman, 2008; FSSG, 2011; UUK, 2011; CUC, 2006a, b; Prondzynski, 2012; Havergal, 2015a; 2015b). Reducing faculty recruitment seem to be at work here. Whether this lack of quality assurance in academic function of many universities is a consequence of resource provider vested interests or stakeholder (teacher unions)/managerial power exertions cannot be directly inferred but surely such forces must be at work in at least the low performing institutions.

Russell Group universities consistently out perform on this metric and exhibit low ratios in the overall sample (see Appendix 1). Here then is preliminary proof that a university's mission i.e. whether greater student coverage (post-1992) or higher quality teaching or research (pre-1992) is its main goal; has a significant influence on internal governance priorities a fact previously discovered and underlined by Tarbert et al. (2008).

5.2.1.7 Entry Standards

The entry standards in UK universities have varied widely across the decade as shown in the percent histogram for all university years in the sample (see Table 6). There is significant anecdotal evidence confirming the general rise in student recruitment standards across the UK partly from competitive dynamics, partly from regulatory pressures and partly from oft-cited dumbing down of standards in A-level results (FSSG, 2011: UUK, 2011; Havergal, 2015a; 2015b; Hordern, 2013; Parry, 2013; Woodford & Earl-Novell, 2006; Barrow Reilly & Woodfield, 2009; Bachan, 2017). Yet from a theoretical angle there is an important trade-off that characterize this variable. Public accountability avers that a university must not be too selective in its recruitment else it would risk excluding deserving students from higher education (Nelson et al., 2002; Parker, 2011). Stakeholder perspectives raise an opposite concern that university entry standards must not be dumbed down too far and thus risk the classroom environment and compromise important pedagogical objectives and future job market requirements (Ntim et al., 2017; Kim, 2008; Burrows, 2012). Russell group universities consistently display higher entry standards as anticipated (see Appendix 1). Clearly given their higher credibility these superior university brands have the luxury to choose their student intake unlike their lower ranked peers a clear case of an adverse-selection problem in the UK university student market. This confirms the academic selectivity of this group which has the status to attract students with the best A-level scores a fact repeatedly stressed by several university performance scholars (Raffe & Croxford, 2013;2014; Boliver, 2015). Also entry standards seem to be strongly influenced by the core mission of any given university for example higher student coverage or higher teaching/research performance. The new post-1992 institutions exhibit significantly lower entry standards when compared to their older well established peers (Tarbert et al., 2008).

5.2.1.8 Fractions of Tuition Fee

Summary statistics in the sample show that tuition fee is a very important source of funds for UK universities on average (both mean and median) and this dependence has been rising especially after the 2012 tuition fee cap increase, moving well above 50% of total incomes (see Table 6). Yet there is significant intra-university variation (from as low as 2% to as high as 82%) in this reliance on tuition fee confirming that UK universities should differ markedly in how they prioritize teaching related governances and outcomes. Instrumental versions of stakeholder theories should clearly apply here as universities dependent on these incomes prioritize parent-student concerns over others in ways different from peers relatively immune to such dependence (Ntim et al., 2017; Peter & Waterman, 1982; Handy, 1993; Gayle et al., 2003; Gunasekera & Reed, 2008; Gomes & Novaes, 2005). The summary table suggests that a very significant proportions of universities depended on tuition fee for between 40 and 70% of their incomes. The coefficient of variation corroborates this lower yet unique deviation from the mean by never exceeding 41% of the mean.

Russel Group universities are half as dependent on tuition fees whereas they earn anywhere between 3 to 5 times as much on average from research when compared to their non-elite peers (see Appendix 1). Here is also further indication of both the severe financial dependence on tuition fees (UUK, 2011; FSSG, 2011; Ntim et al., 2017) and pedestrian nature of research in the rest of the higher education sector in the country (RAE results. 1996-2008; League tables cited by Shattock, 2013a, b).

5.2.1.8. Postgraduate Intensity

The mean and median remain relatively the same throughout the decade at around 22-23%. But what is noteworthy is the vast contrast between the maximum and minimum values show in Table 6, some university are clearly more research intensive with as much as 60% higher degree students whereas at the other end of the spectrum a university could have a ratio as low as 1%. The priorities of universities between research and teaching governance is ostensibly to compare the number of higher degree students with those of lower degree students at a given institution. The larger numbers of postgraduate students at a given institution should flag its research orientation. Such widespread variation in postgraduate intensity in UK universities suggests how at least some mission led institutions have internalized Public Accountability

pressures of increasing coverage (Coy et al., 2011; Nelson et al., 2002; Tarbert et al., 2008), ostensibly by increasing undergraduate places. Conversely others have been brand/reputation and legitimacy driven (Melville Ross, 2010; Hordern, 2013; Soobaroyen & Ntim, 2013) and thus solely increased postgraduate enrollments.

Russell Group universities demonstrates significantly higher post graduate students when compared to their non-elite counterparts. Across the decade Just below 50% of the student population at a Russell Group university has been postgraduate unlike the under 30% at peer institutions (see Appendix 1). Contrasting the pre-1992 and post-1992 universities reveals a similar picture with the former group consistently reporting higher postgraduate student fractions than the latter.

5.2.1.7.9 Fraction of International Students

The multi-dimensional nature of UK universities is in part derived from their international status. One could infer consequently that the numbers of international students enrolled at a given institution would change its inter-se priorities with respect to teaching and research. In particular to enhance the credibility of an institution in the global higher education marketplace it may be argued that universities might need to calibrate research and teaching modalities. Therefore a variable measuring the fraction of international students at a given university would help unpack research and teaching governance priorities from yet another unique dimension.

The slow and steady growth in the fraction of international students across the decade in UK universities is evidenced in the summary statistics of this variable (see Table 6). From levels as low as 3 international students in every 20 students in 2005 they have reached levels of 1 in every 5 by 2015. What is noteworthy is that at almost all segments of the spectrum in the data sample and importantly in the lower levels UK universities have been largely increasing fractions of international students. One could infer that these institutions particularly at the bottom end have been exploiting the status and credibility (Bonroy & Constantatos, 2008; Dulleck & Kerschbamer, 2006; van Vught et al., 2012) that their top UK peers in general enjoy across the globe.

5.2.1.7.10 Ratio of Research and Teaching staff to total staff

In Universities that prioritize research it can be expected that larger numbers of research staff would be employed. Measuring the ratios of research or teaching staff to total staff across universities would reveal inter-se differences in their research/teaching governance priorities. Therefore these ratios are constructed as a final proxy in this sample.

As anticipated universities in the sample (see Table 6) on average (mean) report a combined research only and research/teaching staff of anywhere between 70 and 75% across the ten years. But interestingly there is at least one university that reports 0 staff involved in research (see minimum in table 1) and one that reports 0 pure teaching staff (see maximum in table 1). Examining the ratio of teaching only staff to total staff sheds further light. Mean pure teaching staff levels do not ever exceed 27% in any year. But there is wide dispersion here unlike in the research staff variable with a coefficient of variation anywhere between 0.67 and 0.92. This is 3 to 4 times as high as the latter.

The histograms (in Appendix table 2) make this difference even starker. Notice the long right tail in teaching only staff with fairly substantial university year observations exhibiting 35-40% teaching only staff. Percentile tables (Appendix 2) confirm that there seem to be significant numbers of universities with very high fractions of teaching only staff. The finding accords with extant normative scholarship (Foskett, 2010; Gayle et al., 2003; Shattock, 2013a, b) that questions whether some UK universities actually generate any new knowledge at all or are simply teaching institutions properly classifiable as colleges.

A credibility issue (Bonroy & Constantatos, 2008; Dulleck & Kerschbamer, 2006; van Vught et al., 2012) is certainly highlighted in the sample where at least a significant number of universities neglect research almost entirely. Worryingly this number has remained rather stable with more than a score of such universities persisting across the decade with half or more of pure teaching faculty. From a legitimacy angle (Lindblom, 1994; De Villers & Van Staden, 2006) UK university users are arguably right to be concerned whether some institutions are indeed failing in the knowledge generation dimension.

Splicing by Russell Group once again differentiates this elite group from peers (see Appendix 1). On average teaching only staff in the non-Russell are twice as high (28.43%) as the Russell

group (13.94%). A simple comparison of the maximum values in either sub-group highlights how the non-elite group has some universities in all years that choose (100%) teaching staff whereas no Russell Group University ever employs more than (44%) of pure teaching only staff in any year. Clearly then Russell universities maintain a tight governance regime unlike their rivals that ensures no undue priority to either teaching or research.

5.2.1.7.11 Part-time to Full-time Staff

The median average for part-time staff has increased from (27%) in 2006 to (34%) in 2014. This increase of ominous non-permeant contacts is a response by universities from the external public pressures to increase student coverage population (Brown & Carasso, 2013; McDonald, 2013; Davern et al., 2006; Bachan & Reilly, 2015). Universities should carefully choose their part-time to full-time ratio. The maximum of (86%) and minimum of (3%) are showing a very contrasting picture that might have significant implications on their performance. Therefore, this important university governance policy needs delicate calibration.

5.2.1.13 Female Staff Diversity

Diversity has been studied in the board level but not in the staff level, therefore this is one additional facet of the multi-dimensional university governance concept. Female staff diversity has been on the rise in the past decade from a mean of as low as (42%) in 2005 to (46.4%) in 2015. This improvement in gender diversity levels is in line with Botella et al. (2019) calls for reducing the gender gap in academia and staff employment. Stakeholder theorist (Suchman, 1995; Coy & Pratt, 1998; Maingot & Zeghal, 2008) also suggest that employing more female staff will improve a university's performance and that it should create further legitimacy to the institution (Carter et al., 2003).

5.2.1.14 Vice-Chancellor Pay

The descriptive summary shows a clear steady increase in vice-chancellor's pay from a mean of £242,000 in 2005 to £277,500 in 2015. The pay gap between the maximum and the minimum is starkening with the highest earning vice-chancellor earning more than 4 times than his/her counterparts (see Table 6). This finding is in line with earlier studies (Bachan & Reilly, 2015;

Tarbert et al., 2008). The increase in vice-chancellors pay has not been without its back lash. Remuneration of top executives has increased in both the public and private sector (Bachan & Reilly, 2015), but university vice-chancellors seem to receive higher criticism. As universities move towards a quasi-market it has been assessed as such entities and have become rewarded based on its merit by fund providers (Dolton & Ma, 2003). Therefore, vice-chancellors that outperform for their institutions are rewarded likewise.

5.2.1.15 Cash to Total Assets, Debt to Total Assets and Fixed to Total Assets

Cash to total assets median has more than doubled over the past decade from as low as 2.5% in 2006 to 8% in 2015. This result is similar to Bates et al. (2008) US finding in the corporate sector where between 1980 to 2006 the cash ratio has more than doubles from 10.5% to 23%. In the higher end of the spectrum some universities cash ratio is higher than 50%. Perhaps with universities becoming less reliant on government funding these universities are withholding cash as a precautionary as they working under financial limits (Bates, Kahle and Stulz, 2007). Debt to total assets also shows alarming pattern with some universities acquiring debt above 65% and the mean keeps increasing year on year from 15% in 2005 to 17% in 2015. Optimal contracting, managerial power and stewardship all warn against high levels of debt (Pathak 2011; Wiwattanakantang, 1999; Haung & Song, 2006; Chakraborty, 2010). This would impinge on a university's independence. As recent as 2018 the Office for Student (OfS) has offered bail out for 3 universities that were on the verge of bankruptcy (OfS, 2018b, c; 2019b; Adam, 2018). This a clear indication that UK HEIs need to improve their financial governance policies.

Fixed to total assets seems to show a steady pattern across the decade with little change. The mean does not fluctuate and remains within 75% to 77% levels. But the gap between the maximum and minimum seems to reflect the differences in policies applied by each university.

5.2.1.16 Endowment to Total Assets

The mean throughout the 10 year remains relatively the same at around (4.5%-5.5%). Some universities exhibit 0 endowments, whereas the maximum university has an endowment level higher than 50% across the decade. Resource dependence theorists (Hillman & Dalziel, 2003;

Bouwman, 2011) have suggested that universities that are financially independent are able to forge the governance direction that aids its objectives, therefore, leading to better performance. But there is a trade-off associated with large endowments, the donors might impose their influence on the institutions which might hinder the process of knowledge creation (Bebchuck et al., 2002; Van Essen et al., 2015).

5.2.2 University Performance Variables

This section introduces the 3 dependent variables that of research, teaching and financial performance of a university. The order of discussion here is driven by the theoretical and methodological imperatives of the thesis.

5.2.2.1 Research Performance Index

The research performance index was constructed using five measures, research quality, research grant fraction, degree completion rate, graduate prospects and good honors.

5.2.2.1 Research Quality

It is quite revealing to see the rapid decline in research quality of the average UK University during the decade 2005 to 2015. This decline is particularly severe between 2007 and 2010 possibly due to the increased quality based regulation and rating systems initiated by the Research Assessment Exercise in the UK (Ntim et al., 2017; Foskett, 2010). This is preliminary quantitative confirmation of “the decline in research quality” argument repeatedly stressed in UK governance normative literature (Brown, 2011a; Foskett, 2010; Hemsley-Brown, 2011). The diversity among universities is also obvious here. The ratio of the standard deviation to the mean in this sample (i.e. the coefficient of variation) has been growing and is between 80 and 94% especially in recent years 2012-2015 suggesting the growing disparity in research quality among universities. The 95th percentile of the data comprises universities with RQ ratings above just 66 and 69 when compared to a maximum possible rating of 100. 95% of the universities lie below this RQ rating. Only about 5% of the sample is in the very high research quality bracket of 70% or above. Clearly then UK universities can be divided into two different

segments of research quality (Boliver, 2015; RAE results. 1996-2008; League tables cited by Shattock, 2013a: 13-15).

Therefore preliminary evidence emerges that research quality is a core concern in UK university governance and performance. It also seems to confirm why recent theoretical and empirical scholarship (Jongbloed et al., 2018; Bonroy & Constantatos, 2008; Dulleck & Kerschbamer, 2006; van Vught et al., 2012) has repeatedly stressed internal governances that foster the ‘credence/experience good’ nature of university education. The average UK University has its work cut out to assure potential students about its research credentials.

Splicing the sample by Russel group further accentuates this argument. Across the decade the 24 universities comprising this elite group consistently outperform peers on this metric (see Appendix 1). Undoubtedly this group fully earns its epithet “research intensive” given by several scholars (Tarbert et al., 2008; Bachan, 2015). Such distinct differences are visible across another sample splicing between the old pre-1992 universities and their post-92 peers. Traditional UK universities i.e. pre-1992 ones outperform and stand out as comprising another part of the high research quality segment. Their post-92 peers are clear laggards.

5.2.2.3 Research Grant Fraction

The mean average for research grants fractions remain relatively the same throughout the decade at (9%) levels. What is noteworthy, is the maximum and minimum values. Some universities receive no research grant fraction while others receive as much as (43%). It appears that most UK universities were hardly dependent on research grants or incomes and on average this situation has hardly changed across the decade (see Tables 7). Large numbers of universities (nearly 52% of all university year observations) earned less than 5% of their total income from research while a few of them (less than 1% of the data set) earned as high as 30-43% of their income from this source. This distinctive pattern is a preliminary confirmation of arguments advanced in the Culture & Quality Assurance (CQA) theoretical paradigm about the dwindling quality in UK research (Canado in Blessinger & Anchan (eds), 2015:55; Eurydice, 2010:24; Brown & Carasso, 2013 144-168; Allen, 2011; Jack, 2008; Palfreyman, 2010). The fact that most universities earn next to nothing from research suggests that they lack the skills and competence to generate resources from this highly competitive sector.

Table 7: Univariate Descriptive Analysis for University Performance

Univariate Descriptive Analysis for University Performance

<i>Variables:</i>	All	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
<i>RPI: Research Performance Index</i>												
Mean	207.666	229.0212	221.1556	219.0257	-	208.2422	201.6778	201.3409	198.5217	197.9393	201.3403	204.0676
Median	198.0395	232.6351	223.5802	214.9101	-	193.8905	189.6947	187.654	183.1669	182.9632	186.8099	189.5096
STD	40.87049	34.23181	37.87466	38.35283	-	43.96849	40.03092	40.23602	40.68209	41.67301	39.80342	39.24552
CV	.1968087	.14947	.171258	.1751065	-	.2111411	.1984895	.1998402	.2049252	.2105343	.1976923	.1923162
Minimum	129.8801	157.1375	149.7937	149.7571	-	143.3908	145.7924	139.0404	133.9586	129.8801	136.1901	144.9552
Maximum	312.1263	312.1263	310.0207	306.4429	-	307.5002	307.5331	307.4383	308.4206	306.8635	309.1741	311.3969
<i>RQ: Research Quality</i>												
Mean	37.13213	60.75911	60.37879	56.73554	-	41.07304	29.07658	27.68549	26.92762	26.34146	26.60422	26.67218
Median	34.88372	68.18182	67.42424	61.36364	-	26.15385	16.21622	13.95349	12.19512	11.85185	11.77778	11.77778
STD	28.92105	23.09889	23.2945	25.24143	-	29.947	25.05892	25.61677	25.36692	25.07927	25.16937	25.10797
CV	.7788686	.3801717	.385806	.4448963	-	.7291157	.8618251	.9252777	.9420411	.9520834	.9460668	.9413545
Minimum	0	7.575758	7.575758	0	-	0	0	0	0	0	0	.6666667
Maximum	100	100	100	100	-	100	100	100	100	100	100	100
<i>RGF: Research Grant Fraction</i>												
Mean	.0943918	.0995783	.0980832	.092078	.093442	.0940843	.0935653	.0940159	.0925701	.0924094	.0930417	.0957339
Median	.0465621	.0541409	.0526034	.0490078	.0482894	.0445159	.0453411	.045145	.0425256	.0435512	.0427195	.046461
STD	.0986629	.095619	.0960443	.0958763	.0976915	.1004063	.1021097	.1014003	.099263	.0981657	.0987565	.1030859
CV	1.045248	.9602392	.9792127	1.041251	1.045477	1.067195	1.09132	1.078545	1.0723	1.062291	1.061421	1.076795
Minimum	0	0	0	0	0	0	0	0	0	0	0	0
Maximum	.4369483	.3853796	.4069535	.4136162	.4235437	.4267778	.4277241	.4244216	.4100335	.3999228	.4058093	.4369483
<i>TPI: Teaching Performance Index</i>												
Mean	169.3254	170.2762	163.8089	165.1341	-	166.3763	170.0396	169.2596	168.6768	168.9535	172.6296	175.4925
Median	166.8273	170.2088	164.5041	160.6616	-	164.781	167.4167	166.1165	164.267	164.2137	168.2076	172.747
STD	19.22052	14.27968	17.5311	19.14733	-	19.50108	18.96165	19.03322	19.83144	20.99016	19.53654	18.94515
CV	.1135123	.0838618	.1070217	.1159502	-	.1172107	.1115132	.1124498	.1175706	.1242364	.1131703	.1079542
Minimum	122.6914	146.9586	126.9453	128.6928	-	133.2226	133.8969	132.8866	126.1024	122.6914	125.1516	134.8542
Maximum	219.121	202.1388	202.6141	214.5283	-	215.4522	215.6825	213.4344	218.0201	215.0857	217.2607	219.121
<i>TGF: Teaching Grant Fraction</i>												
Mean	.3009262	.3889369	.387905	.3776879	.3613594	.3483193	.3343147	.3185422	.2929882	.2186967	.1644564	.1185552
Median	.2855349	.4131778	.4130308	.4126563	.384764	.3693768	.3470723	.330348	.3092564	.2210988	.1431528	.0847147

Univariate Descriptive Analysis for University Performance

<i>Variables:</i>	All	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
STD	.155281	.1433928	.1504555	.1470546	.1384706	.1328311	.1284399	.1242865	.1167508	.1015839	.1043257	.1068141
CV	.5160101	.3686788	.3878668	.3893549	.3831936	.3813486	.3841885	.3901729	.3984831	.4644968	.634367	.9009653
Minimum	.053357	.0807707	.0020798	.053357	.0013063	.0005838	.0015085	.0024903	.0031122	.0029953	.0029953	.0018501
Maximum	.7113031	.7113031	.7011411	.6429751	.6632633	.704868	.6958703	.67426	.656284	.6701003	.6669917	.6495573
<i>SATIS: Overall Student Satisfaction</i>												
Mean	4.085029	3.978788	3.970297	4.025397	4.066222	4.039888	4.041186	4.078195	4.134296	4.167841	4.184307	4.19758
Median	4.1	4	4	4.019333	4.083889	4.058333	4.037917	4.082963	4.153333	4.191538	4.195517	4.210286
STD	.1836054	.1727761	.1835998	.1878717	.1890418	.1836306	.1800308	.1717424	.1567288	.1520066	.1356813	.1306723
CV	.0449459	.0434243	.0462434	.0466716	.0464908	.0454544	.044549	.0421124	.0379094	.0364713	.0324262	.0311304
Minimum	3.328889	3.5	3.4	3.56	3.477143	3.447778	3.328889	3.35333	3.5125	3.666	3.7087	3.873333
Maximum	4.6575	4.3	4.4	4.595	4.6575	4.486667	4.595714	4.538333	4.486667	4.5575	4.465556	4.572
<i>GHONR: Good Honors</i>												
Mean	62.44991	59.51818	59.51818	59.24444	-	60.11416	61.51316	62.5193	62.68707	64.03846	66	67.74344
Median	61.45	58.1	58.1	58.65	-	58.8	61.2	61.5	61.5	62.4	63.1	66.7
STD	10.97206	10.52977	10.58985	10.499	-	11.23511	10.88022	10.89174	10.92082	10.73701	10.29857	9.931409
CV	.1756937	.1769168	.1778163	.177215	-	.1868962	.1768763	.1742141	.1742117	.167665	.1560389	.1466033
Minimum	38.5	39.3	39.7	38.5	-	40.6	44.4	42.3	42.7	42.2	43.9	43.5
Maximum	91.8	89.3	90.4	88.4	-	90.1	91.1	91.8	91.2	90.9	90.9	91.5
<i>CPRATE: Completion Rate</i>												
Mean	84.59483	85.29293	84.719	84.17037	-	83.32832	83.58246	84.24159	84.90776	83.76207	85.82149	86.02623
Median	84.75	86	85.15	83.95	-	83.4	84.05	83.5	84.6	84.25	86	85.85
STD	7.721634	6.531326	8.290565	7.981208	-	8.193535	8.292424	7.557975	7.449227	8.469635	7.208805	6.789452
CV	.0912778	.0765752	.0978596	.0948221	-	.0983283	.0992125	.0897179	.0877332	.1011154	.0839977	.078923
Minimum	56	65	62	66.6	-	63.3	56	62.6	57.2	57.5	62.9	67.4
Maximum	99	98	98.5	98.9	-	98.6	99	98.6	98.7	98.8	98.8	98.9
<i>GRPROS: Graduate Prospects</i>												
Mean	65.70658	71.57071	62.954	63.59815	-	65.91239	68.60439	66.14211	63.65862	63.47692	64.87438	66.67623
Median	65.6	71.2	62	63.4	-	63.8	68.75	66.2	61.95	62.8	63.7	66
STD	9.598116	6.874506	8.62686	8.982548	-	9.316145	8.588811	8.930765	9.864676	10.35956	10.27018	10.18977
CV	.1460754	.0960519	.1370343	.1412391	-	.1413413	.1251933	.1350239	.1549621	.1632021	.1583087	.1528246
Minimum	39.4	54.9	43	41.7	-	45.2	50.9	45.3	45.4	39.4	43.7	46.1
Maximum	90.6	89.8	85.4	86.9	-	89.3	90.6	88.9	87.5	87.8	89.2	89.9

Univariate Descriptive Analysis for University Performance

<i>Variables:</i>	All	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
<i>AT: Asset Turnover</i>												
Mean	.3775446	.2610234	.2611874	.2830374	.3028236	.3304958	.3536976	.3710947	.3977158	.4769528	.5358993	.5772528
Median	.3505248	.2561531	.2513397	.2687744	.2987545	.3341654	.3581083	.3739431	.4042323	.523282	.5949422	.6334063
STD	.1582327	.0845527	.0943894	.0967052	.0941551	.0996175	.1028855	.1048694	.1097063	.1363031	.1633554	.1857341
CV	.4191101	.3239278	.3613857	.3416693	.3109241	.3014182	.2908854	.2825948	.2758409	.2857789	.3048248	.3217552
Minimum	.0215609	.0805616	.0719974	.0215609	.0719588	.080481	.0858079	.1017536	.1128741	.1270569	.1379523	.0981435
Maximum	.8229302	.5819177	.6622235	.6862482	.661935	.7109499	.6969327	.7161624	.7297449	.7753958	.7720457	.8229302

Teaching Performance Index

The teaching performance index was constructed using four measures, overall student satisfaction, degree completion rate, graduate prospects and good honors. Teaching grant fraction was used still used as a teaching performance indicator but not as part of the index for reasons explained in chapter four.

Teaching Grant Fraction

A clear reduction in teaching grants can be seen in Table 7. The mean and median average has dropped more than 50% from 2005 to 2015. Also there seems to be a stark contrast among universities, some universities are exhibiting as high as 70% of its income are from teaching grant providers while at the other end of the spectrum appears to show fractions of as small as 1%-5% levels.

Overall Student Satisfaction

overall student satisfaction has remained fairly the same in the past decade with a slight increase when comparing the average mean score of (3.97) in 2005 to (4.19) in 2015. The minimum and maximum for student satisfaction has been steadily improving throughout the years (see Table 7). Education is an experience good, the student based indicator is based on the students perception of the consumed goods. Several scholars have suggested that student are uniformed consumers, and the true value of their experience can only be assessed in the future (Bonroy & Constamntatos, 2008; Dulleck & Kerschbamer, 2006; Van Vught et al., 2012; Gannaway et al., 2018; Elliot & Shin, 2002)

Completion Rate

Completion rates has not fluctuated and remained more or less the same throughout the decade with an mean average of 84.5% for all years. The minimum has shown a steady increase from 65% in 2005 to 67.4% in 2015 (see Table 7). Then maximum value has remained high and have not decreased. It appears more students are finishing the courses they have started than in 2005.

Graduate Prospects

The mean value has changed across the decade, reaching its highest score in 2005 with a value of 71.5% and then decreasing to a minimum of 62.9% in 2006 and then steadily increasing until reaching a value of 66.6% in 2015. The same pattern applies to the minimum and maximum values.

Asset Turnover

A very clear picture appears when you look at the means average from 2005 to 2015, there seems to be a substantial 219e-education in asset turnover in 2006, 2007 and 2008. This coincides with the economic financial crisis at that time, this can also be reflected in the minimum and maximum being the lowest in that period. Although asset turnover regains strength and continues to increase year on year reaching an all high in 2015.

5.2.3. Descriptive Statistics for the Control Variables

This section analyses the 4 control variables which are university size (total assets, total income and total staff), University affiliation/alliance (Russell Group), Age (Pre1992) and region (England, Scotland, Wales and Northern Ireland).

5.2.3.1 University Size

A rapid and steady increase in the size control variables (total assets, total income, total staff) can be seen. In the past decade total assets has increased by more than (50%), from a median average of 193,522.5 million GBP in 2005 to 300,000 million GBP in 2015. The minimum and maximum has also shown to be on the up rise with total assets doubling in value in the past decade. Total income in UK universities have risen rapidly almost doubling on average across the decade from 134.8769 million GBP in 2005 to 239.2913 million GBP in 2015 (see Table 8). This is clear corroboration of how the quasi-market introduced in 2010 and subsequent freeing up of tuition fee caps for domestic students have significantly benefited the average institution (Shattock, 2010; Parker, 2011; Middlehurst, 2013; Browne, 2010, Ntim et al., 2017). But there is tremendous diversity in university financial earnings and the data sample in this

variable can hardly be considered to be normally distributed. Large fraction of universities are earning below 50 million GBP per year. These are the institutions facing huge financial constraints. Total staff has been raising in the UK mainly due to public pressure being applied on universities to increase its student coverage, together with the fact that universities have been increasing their student population to generate more revenues after reduced government support (Brown & Carasso, 2013; McDonald, 2013; Davern et al., 2006; Bachan & Reilly, 2015). This has been pressured universities to recruit more staff in order to cope with the influx of student demands.

5.2.3.2 Russell Group, Pre-1992 University and Region

These 3 variables were used as dummy variables to measure University affiliation, age and regional distribution of all 132 universities in the UK (England, Wales, Scotland and Northern Ireland).

Table 8: Descriptive Statistics for the Control Variables

Descriptive Statistics for the Control Variables												
Variables	Total	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
<i>TA: Total Assets</i>												
Mean	297174.5	193522.5	212185.1	227716.7	248770.5	268386.9	291241.2	315512.9	331407.8	359249.8	389758.8	427458.7
Median	201628	148217	153829	170327.5	184257	202267	204904	234287.5	242185.5	254300.5	271572	300089
STD	350223.9	204848.7	234859.4	252488.4	271241.9	285553.1	311441.7	337529.7	360420.4	423651.2	450286.1	511115
CV	1.178513	1.058526	1.106861	1.108783	1.09033	1.063961	1.06936	1.069781	1.087544	1.179266	1.155294	1.195706
Minimum	8655	8750	8655	10311	11332	13683	18224	14078	12923	15400	17793	24316
Maximum	3628607	1487138	1769826	1899353	1928740	1973675	2219303	2347726	2482816	3145928	3289488	3628607
<i>TINC: Total Income</i>												
Mean	190370.9	133395.2	144428.2	155483.8	172256.6	185488.3	196106	203270	206447.5	216060.1	231307.7	248858.2
Median	142560.5	106768	114906	126623	141380	150792	159378	166052	164094.5	171408	180362.5	187864
STD	191076.3	119812.6	136023	147279.2	161633.3	176108	183939.5	190694.7	202261.1	216615.9	230467	261506.3
CV	1.003705	.8981776	.9418033	.9472319	.9383286	.9494289	.9379599	.9381346	.9797218	1.002572	.9963655	1.050825
Minimum	8335	8335	8706	9289	11483	11991	13921	16062	15993	17606	17232	20087
Maximum	1638282	694624	890748	958166	1074018	1139897	1189669	1251484	1322128	1438245	1504477	1638282
<i>TST: Total Students</i>												
Mean	1289.837	1166.405	1175.282	1204.405	1239.921	1272.362	1290	1299.325	1305.595	1344.008	1424.28	1462.88
Median	1080	1050	1045	1055	1055	1090	1050	1090	1142.5	1135	1205	1160
STD	1027.084	863.3443	896.3561	921.4288	955.7437	982.4023	1009.41	1017.863	1045.783	1086.71	1180.271	1262.044
CV	.7962895	.7401755	.762673	.7650491	.77081	.772109	.7824886	.7833783	.8010007	.808559	.8286791	.8627119
Minimum	5	90	5	5	15	20	20	25	30	35	35	35
Maximum	7070	4320	4820	4760	4930	5080	5370	5425	5660	5965	6470	7070
<i>RGROUP: Russell Group Universities</i>												
Mean	.1832061	.1832061	.1832061	.1832061	.1832061	.1832061	.1832061	.1832061	.1832061	.1832061	.1832061	.1832061
Median	0	0	0	0	0	0	0	0	0	0	0	0
STD	.3869697	.3883204	.3883204	.3883204	.3883204	.3883204	.3883204	.3883204	.3883204	.3883204	.3883204	.3883204
CV	2.11221	2.119582	2.119582	2.119582	2.119582	2.119582	2.119582	2.119582	2.119582	2.119582	2.119582	2.119582
Minimum	0	0	0	0	0	0	0	0	0	0	0	0

Maximum	1	1	1	1	1	1	1	1	1	1	1	1
<i>PRE92: Pre-1992 Universities</i>												
Mean	.3819444	.3816794	.3816794	.3816794	.3816794	.3816794	.3816794	.3816794	.3816794	.3816794	.3816794	.3846154
Median	0	0	0	0	0	0	0	0	0	0	0	0
STD	.4860318	.4876634	.4876634	.4876634	.4876634	.4876634	.4876634	.4876634	.4876634	.4876634	.4876634	.4883863
CV	1.27252	1.277678	1.277678	1.277678	1.277678	1.277678	1.277678	1.277678	1.277678	1.277678	1.277678	1.269804
Minimum	0	0	0	0	0	0	0	0	0	0	0	0
Maximum	1	1	1	1	1	1	1	1	1	1	1	1
<i>REGION: Regional Distribution (England, Wales, Scotland and Northern Ireland)</i>												
Mean	1.374046	1.374046	1.374046	1.374046	1.374046	1.374046	1.374046	1.374046	1.374046	1.374046	1.374046	1.374046
Median	1	1	1	1	1	1	1	1	1	1	1	1
STD	.7552544	.7578906	.7578906	.7578906	.7578906	.7578906	.7578906	.7578906	.7578906	.7578906	.7578906	.7578906
CV	.5496574	.5515759	.5515759	.5515759	.5515759	.5515759	.5515759	.5515759	.5515759	.5515759	.5515759	.5515759
Minimum	1	1	1	1	1	1	1	1	1	1	1	1
Maximum	4	4	4	4	4	4	4	4	4	4	4	4

5.3 Correlation Analysis

The next section of this chapter is a detailed cross-correlation analysis that critically evaluates each potential; pair of variables both separately and in combination with all others. This is done with a view to developing the most parsimonious multiple regression models in the next chapter that will be able to decipher the complex multi-dimensional links between university governance and performance. In line with this aim section 5.3.1 presents selective cross-correlation tables that pair key variables involved in various hypotheses proposed in Chapter 3. This is then followed by section 5.3.2 which presents and analyses the complex implications for full model development. These include specification considerations, partial correlation tables and multicollinearity metrics.

5.3.1 Selective Correlations

Given that research, teaching and financial performances constitute the main dependent variables in this thesis the section first analyses select performance indicators with their likely governance based antecedents. In the process the hypotheses introduced in Chapter 3 are simultaneously evaluated. However governances and performances are also correlated amongst themselves too in the later part of this section to richly unpack the multi-dimensional, endogenous and process-like links between university governance and performance.

5.3.1.1 Research Performance

University research performance as argued earlier is multi-dimensional and therefore cannot be mapped solely by one variable. In order to capture the complete picture of a university's research performance of the several university year variables in this data set the following six are chosen as the most relevant indicators. The detailed univariate analysis of each variables has already been done in the earlier part of this chapter. But the rationale for their joint use here is briefly justified against each variable below.

Research Quality, is an indicator constructed and moderated by the Times Guide using both HESA and RAE (2008) data but updating it each year with information supplied by the university as described in the previous chapter. Given the robustness of this exercise this is arguably a prime indicator of research performance.

1. Research Grant Fraction – HESA figures for both Research grants and Total Income are used to compute this. The argument here is that a university that has higher fractions of its total income earned from research is a higher performer. Hence this variable is used as a second important proxy for research performance.
2. Research Income per Academic – HESA figures for research grants as well as research only plus research/teaching staff numbers are used to compute this. The logic here is that a per capita figure of how much a university attracts in terms of research grants per research academic in its employ reflects its performance.
3. Good Honours proportion – This variable is sourced from the TIMES and reflects the overall academic performance of a given university. It can be argued that a university with higher proportions of good honours degrees is likely to be a high performer in academics including both teaching and research.
4. Graduate Prospects – The percentage of students who either take up employment or further study reflects a university's research standing at least partially. That is the logic underlying this variable's inclusion.
5. Completion Rate – Although this variable is a projection of students expected to complete their study each year still given that this is a time series across the decade it can be argued that it proxies the university's academic performance to progress both its taught and non-taught (i.e. Mphil/Phd) students.

The first step here is to examine the correlations between all these indicators of university research performance as shown below.

Table 9: Shows the Correlations Between University Research Performance Indicators

<i>Variables</i>	Research Quality	Research Grant Fraction	Research Income per Academic	Good Honours	Graduate Prospects	Completion Rate
Research Quality	1.0000					
Research Grant Fraction	0.7199***	1.0000				
Research Income per Academic	0.1339***	0.3210***	1.0000			
Good Honours	0.6075***	0.7101***	0.4313***	1.0000		
Graduate Prospects	0.5730***	0.6159***	0.2406***	0.6188***	1.0000	
Completion Rate	0.6588***	0.5865***	0.1996***	0.7340***	0.5981***	1.0000

Table 9 fully defines all the variables used. *, **, ***, **** Correlation is significant at 5, 1, 0.1 and 10 per cent levels, respectively.

Variables are correlated with each other at 1% significance levels. But what is noteworthy is the strong correlation of research quality and all variables (above 0.55) except research income per academic (0.1339). To construct one research performance index variable that robustly maps the research function of a university a factor analysis combined with a principal components analysis is jointly performed here a method already attempted by Lokuwaduge (2011) and Lokuwaduge & Armstrong (2015) in her smaller cross sectional sample of Australian universities.

As anticipated the factor analysis using principal factors retains 3 factors out of 6 potentials with an LR test of independence Chi-squared of 4075.61 and extremely low p-value. The Eigen values range from positive 3.45272 to -0.16234 suggesting that it is research quality, research grant fraction and research income per academic that have linked factor explanations of research performance i.e. positive Eigen values. The other three variables with negative Eigen values stand apart possibly due to their contrarian and different explanation of research performance.

The final table using the principal components analysis method with **orthogonal Varimax rotation** of the six variables with Kaiser Correction is shown below. 5 of the 6 variables had factor loadings above 0.71 for the solitary factor retained as shown below.

¹ Lokuwaduge (2011) cites Field (2009) who opines that factor loadings above 0.7 are indicative of a well-defined correlation structure and ought to be applied in constructing the index, although in other

Table 10: Factor Analysis: Principle-Component Factors Varimax (Kaiser on) for RPI

<i>Variables</i>	Factor 1	Uniqueness
Research Quality	0.8303	0.3106
Research Grant Fraction	0.8933	0.2020
Research Income per Academic	0.5401	0.7083
Good Honours	0.8745	0.2352
Graduate Prospects	0.7819	0.3886
Completion Rate	0.8129	0.3391
<hr/>		
Retained factors	1	
Variance	3.81616	
Proportion	0.6360	
cumulative	0.6360	
Factor rotation matrix	1.000	

Research income per academic with a loading of just 0.5401 is consequently dropped from the index construction. Hence the research performance index is constructed as follows:

$$\text{Research Performance Index} = 0.8303 * \text{Research Quality} + 0.8933 * \text{Research Grant Fraction} + 0.8745 * \text{Good Honours} + 0.7819 * \text{Graduate Prospects} + 0.8129 * \text{Completion Rate}$$

The index accords different weights to each of the five variables but it is worth noting the highest weights to research grant fraction. Good honours, research quality in that descending order within the index. As anticipated in the correlation table amongst all variables research grant fraction is thrown up with the highest factor loading (0.8933). It supports the earlier contention that this variable is the strongest candidate for a comprehensive proxy for university research performance.

circumstances 0.6 is still considered an acceptable factor loading. (Hair et al., 2006) This suggestion is followed here.

Yet it should be mentioned that despite different weights for each index variable their differences are not substantial ranging from 0.7819 (Graduate Prospects) to 0.8933 (Research Grant Fraction). It may therefore be interpreted as largely an equal weighted index.

In what follows a detailed correlation analysis of this research performance index with related research governances, internal governances and various intended control variables is conducted. To richly unpack the multiple dimensions and trade-offs characterizing university performance (i.e. the principal research gap of this thesis) this correlation analysis also includes wherever important the correlation structure with index components separately as well as the excluded research income per academic variable.

Table 11: Correlation Metrics of Dependent and Independent Variables for Research Performance

Variable	Research Performance Indicators						
	Research Performance Index	Research Quality	Research Grant	Completion Rate	Good Honours	Graduate Prospect	Research Income Per Academic
BFSIZE	0.3818***	0.4208***	0.3081***	0.2719***	0.2276***	0.2360***	0.0599***
BGDIV	-0.1501***	-0.1869***	-0.0845***	-0.1106***	-0.0004	-0.1778***	0.0349
BEDIV	-0.2383***	-0.1689***	-0.2282***	-0.2553***	-0.2112***	-0.1928***	-0.1106***
IGOV	-0.5751***	-0.5201***	-0.4997***	-0.4780***	-0.5246***	-0.4389***	-0.0725**
GBMFS	0.1445***	0.0939***	0.2063***	0.0847***	0.2200***	0.1377***	0.1193***
ETMS	0.2854***	0.2003***	0.2827***	0.3751***	0.3181***	0.1123*	0.2648***
SSR	-0.7388***	-0.6562***	-0.7064***	-0.5778***	-0.6264***	-0.6200***	-0.6837***
ES	0.9238***	0.7912***	0.7613***	0.7896***	0.8555***	0.7309***	0.2410***
PTTSR	-0.3385***	-0.2911***	-0.4782***	-0.1782***	-0.2737***	-0.3713***	-0.1655***
FSF	-0.5283***	-0.5555***	-0.5256***	-0.3060***	-0.3378***	-0.3711***	-0.1565***
TRST	-0.5182***	-0.4548***	-0.3970***	-0.4066***	-0.4360***	-0.3015***	-0.2641***
TONLY	-0.1075***	-0.0829***	-0.2875***	-0.0306	-0.1192***	-0.1748***	-0.0995***
RONLY	0.7889***	0.6995***	0.9431***	0.5750***	0.7022***	0.6020***	0.3618***
PGINT	0.5217***	0.4857***	0.4563***	0.3625***	0.4336***	0.4506***	-0.0367
TFEE	-0.5019***	-0.5883***	-0.4871***	-0.2139***	-0.2150***	-0.3174***	-0.2046***
INTS	0.4165***	0.3888***	0.4067***	0.2519***	0.3761***	0.3625***	0.0051
ENDWTA	0.5450***	0.5448***	0.5319***	0.3800***	0.4521***	0.3404***	0.0728***
VCPAY	0.3011***	0.1577***	0.3954***	0.3137***	0.4675***	0.3482***	-0.0161
BIG4	0.3087***	0.2672***	0.2996***	0.2363***	0.2602***	0.2640***	0.0901***
UGCOM	-0.2743***	-0.2679***	-0.1800***	-0.2496***	-0.1852***	-0.1751***	-0.0775***
SFSPEND	0.3954***	0.1907***	0.4776***	0.4315***	0.5970***	0.4251***	0.0723**
CTA	-0.2596***	-0.2713***	-0.1372***	-0.2486***	-0.1347***	-0.2205***	0.1686***
DTA	0.0323	0.0238	-0.0694**	0.1495***	0.0336	0.0011	-0.1059***
FTA	0.1076***	0.1436***	-0.0291	0.1082***	-0.0096	0.0858***	-0.2221***
SUBCOM	0.0147	0.0555*	0.0542*	-0.0757***	-0.0053	-0.0119	0.0298
ADSIZE	0.0754*	0.0791*	0.0197	0.0825**	0.0598	0.0348	-0.1063***
TA	0.5627***	0.4566***	0.6065***	0.5028***	0.5928***	0.4904***	-0.0664**
TINC	0.5924***	0.5002***	0.6757***	0.4918***	0.5955***	0.5012***	0.0654**
TST	0.5833***	0.5286***	0.5427***	0.4835***	0.5102***	0.4613***	-0.2117***
RGROUP	0.6123***	0.5252*	0.7332***	0.5101***	0.5502***	0.4794***	0.1180***
PRE92	0.7286***	0.6828*	0.6533***	0.5245***	0.6115***	0.5156***	0.0817**
REGION	0.0315	0.0259	0.2305***	-0.1720***	0.0932**	0.0627*	0.1800***

Notes: The table contains Pearson's parametric correlation coefficients for independent variables with the teaching variables. Variables are defined as follows: governing board size (GBSIZE); board gender diversity (BGDIV); board ethnic diversity (BEDIV); independent governors (IGOV); frequency of governing board meetings (GBMs); frequency of executive team meetings (EFMs); student to staff ratio (SSR); entry standards (ES); part-time to total staff ratio (PTTSR); female staff fraction (FSF); teaching and research staff (TRST); teaching only staff (TONLY); research only staff (RONLY); postgraduate intensity (PGINT); tuition fee (TFEE); international students (INTS); endowment to total assets (ENDWTA); vice-chancellor pay (VCPAY); vice-chancellor (VCG); audit firm size (BIG4); and governance committee (GCOM); service and facility spend (SFSPEND); cash to total asset (CTA); debt to total asset (DTA); fixed to total assets (FTA); number of governance sub-committees (SUBCOM); audit committee size (ADSIZE); total assets (TA); total income (TINC); total staff (TST); 228ndogen group (RGROUP); pre-1992 university (PRE92); region (REGION). Table 11 fully defines all the variables used. *, **, ***, **** Correlation is significant at 5, 1, 0.1 and 10 per cent levels, respectively.

A few interesting and noteworthy results, in this the UK longitudinal sample, board size results indicate that larger boards are positively correlated with research performance. Lokuwaduge in her Australian cross-sectional sample does not even find a significant correlation between council size and research performance. This offers preliminary indications towards hypothesis (6a) with a positive sign. This positive association confirms for one that specifying a maximum board size of 25 as currently stipulated is irrelevant and might even be harmful to university research performance. The Board ethnic diversity variable shows a contrarian negative result at (-0.2383). this seems to indicate a contradiction to our hypothesis (6c) that UK university boards with higher levels of ethnic diversity perform poorly on research. Board independence seems to strongly negatively correlate with research performance (-0.5751). This result also does not lend support to the developed hypothesis (6g) advanced in Chapter 3. Although these results tally with Lokuwaduge's (2011) Australian results and corroborate that UK universities are similar to their Australian peers at least in respect of research performance.

Results also indicate that research performance index is strongly positively correlated with Entry standards. The relationship is similar with Research Quality (0.7912) and Research Grant Fraction (0.7613). There is some proof here that diversity in research student populations i.e. a more inclusive entry standards governance mechanism (lower entry standards) has a negative impact on research performance. This offers initial indication that supports our hypothesis. UK Universities that set high standards in selecting research students obviously are better at research.

Research performance is strongly negatively correlated with student staff ratio a key internal governance mechanism among universities (-0.7388). UK universities that indiscriminately recruit students under pressure from external regulators are severely compromising their research performances and the effect persists across the years. They have to find the right level of balance between student population coverage, staff utilization and research performance which is no easy task.

The gender diversity in staff members employed in a university strongly negatively correlates with research performance (-0.5283). The gender diversity in staff members employed in a university strongly negatively correlates with research performance. Ironically the larger the numbers of female staff employed at a given university the poorer seems to be its research performance at least on the surface.

As anticipated by theory especially the culture-quality assurance (CQA) paradigm there is indeed a significant negative correlation between *Part-time to total staff ratio* (-0.3385) and research performance. Given that the variable maps the proportion of ad hoc staff employed at a university it should indicate the quality of internal research and teaching governance priorities. A careful and judicious use of part-time staff is indeed an important governance priority that UK universities should adhere to (Brown & Carasso, 2013, Jack 2008).

The proportion of teaching and research staff employed by a university is strongly negatively correlated with research performance index (-0.3385). growing staff populations definitely imply both external pressures i.e. activist teaching union exertions to employ more standard contract (teaching and research) staff (Dearlove, 2002; Toma, 2007; Kim, 2008; Trakman, 2008; Parker. 2011) and internal governance pressures (rising numbers of student enrolment) to tackle rising academic workload (Middlehurst, 2013; Parry, 2013; Rowlands, 2013; Taylor, 2013a).

As per their respective missions universities do specialize in either undergraduate or postgraduate courses or both (Tarbert et al., 2008; Bachan & Reilly, 2015). It can therefore be inferred that the proportion of post graduate students enrolled at a given institution reflects its internal governance priorities towards research. The results show that UK Universities high postgraduate intensity perform better on the research dimension. This is a clear vindication of the Culture/Quality Assurance prediction that the culture and quality based ethos stemming from a mission of being more than just a finishing school aids research. It also suggests that such focused institutions possibly mobilize specialized research related resources and this is what shows up in their higher performance.

The results show a strong positive correlation between this financial governance of choosing an endowment level and research performance (0.545). This suggests that financial independence clearly seems to correlate with excellence in research.

Both Tarbert et al. (2008) and Bachan & Reilly (2015) suggest that Fraction of International Students is a good proxy for whether a given institution is likely to invest higher than average amounts (arguably arising from the higher tuition fees charged from this student fraction) in research and teaching governances. It is unsurprising therefore that UK universities show a moderate positive correlation between the variable and research performance.

Control variables logtotalincome (0.5924), logtotalassets (0.5627), logtotalstaff (0.5833) All the indicators controlling for size of a university display a strong positive correlation with research performance index. This is a very similar result to those found elsewhere particularly by Lokuwaduge (2011), McDonald (2012) and Bachan et al. (2015). Such result confirms the existence of a size related effect in university research performance.

5.3.1.2 Teaching Performance

Just like research, University teaching performance is also multi-dimensional although capturing it from even the wide set of variables available in this UK sample has proved challenging. Six potential candidate variables are identified each of which is briefly justified below. However simple correlation analysis among these strongly suggests an index combining only four of them. This is also justified subsequently.

1. Teaching Grant fraction – HESA provides details of funding grants for teaching, research and other activities provided by independent fund providers to each university every year. From this total figure the component pertaining to research is subtracted and the resultant figure is divided by the total income of the university. It is inferable that this fraction does indicate how an external body rates the teaching function of a university but not necessarily in a straight forward manner as in

research. Instead here financial support could be provided as a function of how the university fulfills its mission based mandate².

2. Overall student satisfaction – This is the NSS collated sample scores based entirely on student ratings of academic services received by them. A major criticism here is that this variable is biased and generally based on the opinions of uninformed users i.e. students. Still it must be considered for what it is worth.

The fourth fifth and sixth variables i.e. Graduate prospects, Good Honours and Completion Rate are the same as those considered in research performance. It is obvious that each of these variables indicates both research and teaching performance and so despite the overlap they ought to be considered.

Correlation between the variables clearly show how the 2nd 3rd 4th and 5th variables are strongly positively correlated with each other and overall student satisfaction. However, teaching grant fraction exhibit fairly moderate significant negative correlation with all others. This confirms that constructing a teaching performance index (TPI) in this sample has to span at most overall student satisfaction³ and the last set of three overlapping variables outlined above. But given the strong likelihood that the first variable of teaching grant fraction (TGF) is an objective and independent assessment of the teaching performance of any given university it is retained on its own⁴.

² HESA and its policies clearly suggest that teaching and other infrastructure related grants are means tested and critically based on a range of factors including whether the given university furthers student population coverage. This implies that there is already an expectation that this variable will behave differently from the others but potentially present a unique otherwise undiscoverable dimension of teaching performance. Hence its inclusion here is vital.

³ Jongbloed et al (2018) point to several voices in the emerging literature on university governance including Bonroy & Constantos (2008) Dulleck & Kerschbamer (2006) and Vught et al (2012) all of whom identify university education as a “credence good”. Its quality is difficult to estimate especially by student users who can at best be classified as uninformed. Their ratings of teaching performance must therefore not be accepted at face value.

⁴ One important additional reason for retaining this variable is that funding bodies are dividing their available resources based on their independent assessment of universities. The logic that such bodies would indeed do detailed due diligence before laying their money on the table is compelling. But equally important is the fact mentioned earlier that teaching performance is not as straight forward as research. Teaching is a knowledge transmission function that transforms the student from a lower skill level to a higher skill level. Therefore a university that takes highly competent students may actually be failing in the value addition of its teaching role.

Table 12: Factor Analysis: Principle-Component Factors Varimax (Kaiser on) for TPI

<i>Variables</i>	Factor 1	Uniqueness
Overall Student satisfaction	0.5939	0.6591
Graduate prospects	0.6992	0.5208
Good Honours	0.8480	0.2809
Completion Rate	0.8095	0.3447
<hr/>		
Retained factors	1	
Variance	2.19457	
Proportion	1.1369	
cumulative	1.1369	
Factor rotation matrix	1.000	

The above factor analysis table shows the factor loadings with Varimax rotation and Kaiser Normalization. All four factor loadings are used despite the fact that overall student satisfaction has a loading below 0.7 as it is still fairly high i.e. 0.5939 and displays the strongest uniqueness of 0.6591. Therefore, Teaching Performance Index is defined as below.

$$\text{Teaching Performance Index} = 0.6922 * \text{Graduate Prospects} + 0.8480 * \text{Good Honours} + 0.8095 * \text{Completion rate} + 0.5839 * \text{Overall Student Satisfaction}$$

The index accords different weights to each of the four variables but it is worth noting the highest weights to Good Honours. Completion Rate and Graduate Prospects in that descending order within the index. It should be mentioned that the different weights for each index variable are substantial ranging from 0.5939 (Overall Student Satisfaction) to 0.8480 (Good Honours). The index cannot therefore be interpreted as an equal weighted index.

In what follows a detailed correlation analysis of this teaching performance index with related research governances, internal governances and various intended control variables is conducted. To richly unpack the multiple dimensions and trade-offs characterizing university teaching performance. This correlation analysis as with research also includes

the correlation structure with index components separately. But in contrast to research here the excluded teaching grant fraction variable is not a footnote to the analysis but instead constitutes an integral part of it. This is because it appears that teaching performance is more nuanced and displays complex trade-offs that are only captured through this variable.

Table 13: Correlation metrics of dependent and independent variables for teaching performance

Variable	Teaching Performance Indicators					
	Teaching Performance Index	Student Satisfaction	Completion Rate	Good Honours	Graduate Prospect	Teaching Grant
BSIZE	0.2972***	0.1502***	0.2719***	0.2276***	0.2360***	-0.1496***
BGDIV	-0.1142***	-0.0570*	-0.1106***	-0.0004	-0.1778***	-0.0528*
BEDIV	-0.2513***	-0.2442***	-0.2553***	-0.2112***	-0.1928***	0.0205
IGOV	-0.5216***	-0.3572***	-0.4780***	-0.5246***	-0.4389***	0.3145***
GBFMS	0.1602***	0.1042***	0.0847***	0.2200***	0.1377***	-0.1449***
ETMS	0.3039***	0.2388***	0.3751***	0.3181***	0.1123*	-0.3309***
SSR	-0.6935***	-0.4170***	-0.5778***	-0.6264***	-0.6200***	0.4481***
ES	0.9118***	0.4465***	0.7896***	0.8555***	0.7309***	-0.4812***
PTTSR	-0.3197***	-0.2626***	-0.1782***	-0.2737***	-0.3713***	-0.4782***
FSF	-0.3974***	-0.2173***	-0.3060***	-0.3378***	-0.3711***	0.2728***
TRST	-0.4405***	-0.2958***	-0.4066***	-0.4360***	-0.3015***	0.2269***
TONLY	-0.1113***	0.0238	-0.0306	-0.1192***	-0.1748***	0.0871***
RONLY	0.7205***	0.3997***	0.5750***	0.7022***	0.6020***	-0.4703***
PGINT	0.4751***	0.3016***	0.3625***	0.4336***	0.4506***	-0.4744***
TFEE	-0.2771***	0.0506*	-0.2139***	-0.2150***	-0.3174***	-0.4048***
INTS	0.3925***	0.2172***	0.2519***	0.3761***	0.3625***	-0.5622***
ENDWTA	0.4256***	0.2882***	0.3800***	0.4521***	0.3404***	-0.3665***
VCPAY	0.4570***	0.2585***	0.3137***	0.4675***	0.3482***	-0.5068**
BIG4A	0.2959***	0.1366***	0.2363***	0.2602***	0.2640***	-0.1418***
UGCOM	-0.2271***	-0.1114***	-0.2496***	-0.1852***	-0.1751***	0.0938***
SFSPEND	0.5777***	0.4770***	0.4315***	0.5970***	0.4251***	-0.6354***
CTA	-0.2057***	0.0243	-0.2486***	-0.1347***	-0.2205***	0.0320
DTA	0.0697**	0.0115	0.1495***	0.0336	0.0011	-0.1493***
FTA	0.0480	-0.0760***	0.1082***	-0.0096	0.0858***	0.0537**
SUBCOM	-0.0274	-0.0646**	-0.0757***	-0.0053	-0.0119	0.0324
ADSIZE	-0.0826*	0.0273	0.0825**	0.0598	0.0348	-0.1335***
TA	0.5940***	0.2207***	0.5028***	0.5928***	0.4904***	-0.5678***
TINC	0.5984***	0.2085***	0.4918***	0.5955***	0.5012***	-0.5621***
TST	0.5385***	0.1300***	0.4835***	0.5102***	0.4613***	-0.4726***
RGROUP	0.5859***	0.2456***	0.5101***	0.5502***	0.4794***	-0.4236*
PRE92	0.6437***	0.4527***	0.5245***	0.6115***	0.5156***	-0.5361*
REGION	0.0534*	0.1266***	-0.1720***	0.0932**	0.0627*	0.1417*

Notes: The table contains Pearson's parametric correlation coefficients for independent variables with the teaching variables. Variables are defined as follows: governing board size (GBSIZE); board gender diversity (BGDIV); board ethnic diversity (BEDIV); independent governors (IGOV); frequency of governing board meetings (GBMs); frequency of executive team meetings (EFMs); student to staff ratio (SSR); entry standards (ES); part-time to total staff ratio (PTTSR); female staff fraction (FSF); teaching and research staff (TRST); teaching only staff (TONLY); research only staff (RONLY); postgraduate intensity (PGINT); tuition fee (TFEE); international students (INTS); endowment to total assets (ENDWTA); vice-chancellor pay (VCPAY); vice-chancellor (VCG); audit firm size (BIG4); and governance committee (GCOM); service and facility spend (SFSPEND); cash to total asset (CTA); debt to total asset (DTA); fixed to total assets (FTA); number of governance sub-committees (SUBCOM); audit committee size (ADSIZE); total assets (TA); total income (TINC); total staff (TST); 235ndogen group (RGROUP); pre-1992 university (PRE92); region (REGION). Table 13 fully defines all the variables used. *, **, ***, **** Correlation is significant at 5, 1, 0.1 and 10 per cent levels, respectively

A few results here are worth discussing. Board size just like research, teaching performance too displays a positive correlation with board size although its magnitude is much smaller (0.2972). Board ethnic diversity as in the case of research teaching performance is also negatively correlated with board ethnic diversity but the correlation magnitude is slightly higher (-0.2513).

Board Independence once again shows a significant and strong negative correlation (-0.5216) which suggests a contradicting association to hypothesis. Board independence interferes with teaching performance just as with research. The finding is at odds with Lokuwaduge (2011) who finds a positive correlation with all her teaching performance variables within the Australian context. In the UK sample then all the theoretical reasoning and justifications implied in research performance discussed earlier apply in teaching too. However as usual the teaching grant fraction shows a different dimension of teaching performance with a weak but significant positive correlation (0.3145).

Teaching performance strongly positively correlates with entry standards. However the picture changes completely when teaching grant fraction is used as a proxy for teaching performance. The relationship is moderately negative (-0.4812) and significant. The complexity of teaching performance which unlike research has a transformational dimension is neatly captured.

Teaching quality and performance depend on an average student's access to one-on-one teacher time and this is clearly substantiated in the strong negative correlation between this internal governance and the teaching index (-0.6935).

As anticipated university teaching performance seems strongly positively correlated with a university's spending on teaching related infrastructure (0.5777). Teaching grant fraction reverses the above finding with a significant and strong negative correlation (-0.6354).

Teaching and research staff fraction contracts negatively correlate with teaching performance (-0.4405). As with research performance the largest fraction of academic staff

employed on standard employment. Similar arguments as with research performance combining union activism with internal governance based pressures may be advanced here as well. Although teaching grant fraction shows a smaller positive correlation deeper analysis through pooled regressions show that this is not a straightforward association. Overall it does seem that in line with quality assurance assertions (Attwood, 2008b; Yorke, 2009a, b; Allen, 2011; Palfreyman, 2010) merely employing more numbers of academic staff do not necessarily improve teaching performances.

5.3.1.3 Financial Performance

University financial performance is the remaining dimension here but arguably more straightforward to measure. A single variable is used to map it viz., Asset Turnover. On the one hand the characteristics of this UK sample favors the use of this variable⁶. It also represents important aspects of financial performance in the institution i.e. at the level and at the profit/surplus level⁷ (Lukawaduge, 2011; Lukawaduge & Armstrong, 2015).

In what follows a brief summary analysis of the correlations between all the independent governance and control variables and the chosen financial variables is conducted. This analysis is nowhere near as detailed as the previous two performances as the financials of universities remain ancillary to the core focus of this thesis.

⁵ The quality of the incoming teaching staff and their ability to transform a wide range of student abilities in the incoming class make a significant difference to teaching performance.

⁶ In detailed analyses within the sample included within the appendix return on assets (ROA) turns out to be a weak indicator not correlating significantly with almost all financial and internal governances. Hence it is excluded here (Appendix 8).

⁷ A university's ability to generate revenues is an important indicator of its financial performance especially its ability to uniquely market its entire asset and brand portfolios within the UK student market. This is a broader indicator than return on equity which maps out the institution's ability to manage various costs. Both are inevitably important and different and so are separately used here.

Table 14: Correlation Metrics of Dependent and Independent Variables for Financial Performance

Financial Performance Indicators	
Variable	Asset Turnover
BSIZE	0.0658**
BGDIV	-0.0154
BEDIV	-0.0689**
IGOV	0.0493
GBMS	0.0361
ETMS	0.2310***
SSR	-0.0061
ES	-0.1253***
PTTSR	-0.1088***
FSF	-0.0964***
TRST	-0.1095***
TONLY	-0.0712***
RONLY	0.1192***
PGINT	-0.1474***
TFEE	-0.1754***
INTS	-0.1267***
ENDWTA	-0.0604**
VCPAY	-0.1697***
BIG4	-0.0067
UGCOM	-0.0768***
SFSPEND	-0.2153***
CTA	0.2704***
DTA	-0.1567***
FTA	-0.3722***
SUBCOM	0.0573**
ADSIZE	0.0695*
TA	-0.3836***
TINC	-0.1055***
TST	-0.3125***
RGROUP	-0.0742***
PRE92	-0.0510*
REGION	0.1450***

Notes: The table contains Pearson's parametric correlation coefficients for independent variables with the teaching variables. Variables are defined as follows: governing board size (GBSIZE); board gender diversity (BGDIV); board ethnic diversity (BEDIV); independent governors (IGOV); frequency of governing board meetings (GBMs); frequency of executive team meetings (EFMs); student to staff ratio (SSR); entry standards (ES); part-time to total staff ratio (PTTSR); female staff fraction (FSF); teaching and research staff (TRST); teaching only staff (TONLY); research only staff (RONLY); postgraduate intensity (PGINT); tuition fee (TFEE); international students (INTS); endowment to total assets (ENDWTA); vice-chancellor pay (VCPAY); vice-chancellor (VCG); audit firm size (BIG4); and governance committee (GCOM); service and facility spend (SFSPEND); cash to total asset (CTA); debt to total asset (DTA); fixed to total assets (FTA); number of governance sub-committees (SUBCOM); audit committee size (ADSIZE); total assets (TA); total income (TINC); total staff (TST); 238ndogen group (RGROUP); pre-1992 university (PRE92); region (REGION). Table 14 fully defines all the variables used. *, **, ***, **** Correlation is significant at 5, 1, 0.1 and 10 per cent levels, respectively.

The picture of correlations between asset turnover and governances/control variables in this UK sample is intriguing as well as remarkable. First no correlation in the table above exceeds a magnitude of 0.39 whether positive or negative. The implication is clearly that university financial performance is significantly weaker in its correlations with internal governances or controls when compared to teaching/research. Second correlations with some important variables such as Students to staff ratio, lay member board fractions, BIG4 Audit and Current Ratio are insignificant even at 5% and are so not displayed⁸. Third, the three financial governances of fixed to total assets (-.3722), cash to total assets (.2704) and debt to total assets (-.1567) confirm that universities do not need to invest in higher proportions of fixed assets; university financial performance reflects in robust cash levels and lower credit levels. Finally the contrarian directions of some correlations such as those of Services & Facilities spend per student (-.2153) and log VC pay (-.1697) need explanation. Here is clear evidence that like extant research (Tarbert et al., 2008; Bachan & Reilly, 2015) in this longitudinal UK sample there is evidence that the VC goes unrewarded for financial performance⁹. Similarly higher spending on teaching/research infrastructure coincides with slightly lower turnover ratios underlining the trade-offs that obviously pervade university finances and teaching/research. ¹⁰

5.3.1.5 Conclusion

A detailed and systematic univariate and bivariate analysis of the UK longitudinal sample of university governance and performance data. In the process an interesting pattern has emerged which lends support to many of the hypotheses posed in Chapter 3 while extending/expanding them in rich and varied dimensions. Methodologically the chapter has collated a rich body of analytical evidence on sample descriptors and correlations that can form the basis for any further sophisticated analysis. Overall there is now adequate empirical evidence to justify each of the five inter-linked research objectives posed in the introductory chapter. These clearly emerge as the main axes along which any rational and comprehensive investigation of university governance and performance must proceed. Additionally, the three main empirical

⁸ The fact that current ratio is not materially significant in this sample calls to question other empirical work such as that of Lokuwaduge (2011) who incorporates this variable as indicative of financial performance. Even theoretically coverage of liquid liabilities by liquid assets can at best be considered to be a measure of liquidity.

⁹ Soh's (2007) finding that there are significant economies of scale in university VC pay remuneration as compared to corporate CEOs is also relevant here. Additionally this finding also corroborates Tarbert Lee & Watson's (2008) finding that VC pay levels face downward drags despite good financial performance due to legitimation concerns within the UK university sector.

¹⁰ Most of the other correlations are extremely low in magnitude except Audit independence (-.2172) which as expected is negatively correlated with financial performance.

gaps identified in chapter 3 have now been displayed/demonstrated in different ways. The hypotheses supports along with the other findings in the chapter have illustrated the multi-dimensionality of university governance/performance; the complex trade-offs/ process like characteristics embedded in them; culture/quality assurance connotations and the longitudinal inter-relationships. The stage is thus set for the more complex multivariate regression analyses that follow in Chapter 6.

Table 15: Correlation Metrics of Independent Variables

Variable	BSIZE	GDIVG	GBAME	IGOV	GBMS	ETSIZE	ETMS	SSR	ES	PTTSR	FSF	TRST	TONLY	RONLY	PGINT	TFEE	INTS
BSIZE	1.000	-0.2526***	-0.0636**	-0.3052***	-0.1079***	0.1851***	0.1515***	-0.2557***	0.2933***	-0.1537***	-0.2657***	-0.1427***	-0.0505*	0.2657***	0.2719***	-0.2191***	0.2671***
GDIVG	-0.2526***	1.000	0.1494***	0.0945***	0.0657**	0.0891**	-0.1190**	0.0634*	-0.1037***	0.1389***	0.2416***	-0.0383	0.0829***	-0.0657**	-0.0849***	0.1720***	-0.0146
GBAME	-0.0636**	0.1494***	1.000	0.1640***	-0.0235	-0.0263	-0.1642***	0.1732***	-0.2293***	0.1924***	0.0225	0.1643***	0.0252	-0.2352***	0.0300	0.2669***	0.1088***
IGOV	-0.3052***	0.0945***	0.1640***	1.000	-0.1885***	-0.0840**	-0.1077*	0.4590***	-0.5585***	0.2623***	0.2498***	0.3231***	0.0679**	-0.5256***	-0.3743***	0.3359***	-0.2104***
GBMS	-0.1079***	0.0657**	-0.0235	-0.1885***	1.000	0.0851**	-0.0707	-0.0364	0.1819***	-0.2138***	-0.1419***	-0.0535*	-0.1644***	0.2802***	0.0843***	-0.0487*	0.0571**
ETSIZE	0.1851***	-0.0891**	-0.0263	-0.0840**	0.0851**	1.000	-0.3078***	-0.2971***	0.2479***	-0.2102***	-0.3068***	-0.0794**	-0.1131***	0.2167***	0.0711*	-0.1502***	0.2786***
ETMS	0.1515***	-0.1190**	-0.1642***	-0.1077*	-0.0707	-0.3078***	1.000	-0.2301***	0.2953***	0.0005	-0.1952***	-0.3460***	0.0860	0.3425***	0.2133***	-0.0588	0.1786***
SSR	-0.2557***	0.0634*	0.1732***	0.4590***	-0.0364	-0.2971***	-0.2301***	1.000	-0.7245***	0.2995***	0.4033***	0.4124***	0.1022***	-0.6544***	-0.4344***	0.3429***	-0.3774***
ES	0.2933***	-0.1037***	-0.2293***	-0.5585***	0.1819***	0.2479***	0.2953***	-0.7245***	1.000	-0.3770***	-0.4693***	-0.3751***	-0.2073***	0.8104***	0.4753***	-0.3879***	0.3568***
PTTSR	-0.1537***	0.1389***	0.1924***	0.2623***	-0.2138***	-0.2102***	0.0005	0.2995***	-0.3770***	1.000	0.3861***	-0.1703***	0.5797***	-0.5184***	-0.0786***	0.3310***	-0.0006
FSF	-0.2657***	0.2416***	0.0225	0.2498***	-0.1419***	-0.3068***	-0.1952***	0.4033***	-0.4693***	0.3861***	1.000	0.2308***	0.1555***	-0.5350***	-0.1891***	0.2963***	-0.3996***
TRST	-0.1427***	-0.0383	0.1643***	0.3231***	-0.0535*	-0.0794**	-0.3460***	0.4124***	-0.3751***	-0.1703***	0.2308***	1.000	-0.7202***	-0.3912***	-0.2133***	0.2620***	-0.2861***
TONLY	-0.0505*	0.0829***	0.0252	0.0679**	-0.1644***	-0.1131***	0.0860	0.1022***	-0.2073***	0.5797***	0.1555***	-0.7202***	1.000	-0.3334***	-0.0805***	0.1171***	0.0411
RONLY	0.2657***	-0.0657**	-0.2352***	-0.5256***	0.2802***	0.2167***	0.3425***	-0.6544***	0.8104***	-0.5184***	-0.5350***	-0.3912***	-0.3334***	1.0000	0.4520***	-0.5025***	0.3789***
PGINT	0.2719***	-0.0849***	0.0300	-0.3743***	0.0843***	0.0711*	0.2133***	-0.4344***	0.4753***	-0.0786***	-0.1891***	-0.2133***	-0.0805***	0.4520***	1.000	-0.0748***	0.5738***
TFEE	-0.2191***	0.1720***	0.2669***	0.3359***	-0.0487*	-0.1502***	-0.0588	0.3429***	-0.3879***	0.3310***	0.2963***	0.2620***	0.1171***	-0.5025***	-0.0748***	1.000	0.0949***
INTS	0.2671***	-0.0146	0.1088***	-0.2104***	0.0571**	0.2786***	0.1786***	-0.3774***	0.3568***	-0.0006	-0.3996***	-0.2861***	0.0411	0.3789***	0.5738***	0.0949***	1.000
ENDWTA	0.2135***	-0.0761***	-0.1305***	-0.5091***	0.1812***	0.2318***	0.1160**	-0.4130***	0.4853***	-0.1839***	-0.3122***	-0.2987***	-0.0887***	0.5610***	0.3484***	-0.300***	0.3685***
VCPAY	0.0464	-0.1571*	0.0006	-0.1966***	0.2263***	0.1861***	0.1852***	-0.2641***	0.3648***	-0.1579***	-0.1532***	-0.0228	-0.2233***	0.3856***	0.3259***	0.1295***	0.3309***
VCG	0.0522*	-0.1571**	-0.1135**	-0.0430	-0.0815***	0.0835**	0.1284**	-0.0584*	0.0195	-0.0551**	-0.0943***	-0.0015	-0.0845***	0.1124***	0.1255***	0.0088	0.0696**
BIG4	0.1727***	-0.0323	-0.1144***	-0.1543***	0.0995***	0.2392***	-0.0522	-0.2905***	0.2958***	-0.2261***	-0.2047***	-0.0463	-0.1670**	0.2827***	0.1113***	-0.1645***	0.1462***
UGCOM	-0.2203***	0.0971***	0.0434	0.0927***	0.0680**	0.0055	-0.1494**	0.2169***	-0.2017***	0.0521*	0.2041***	0.1214***	0.0173	-0.1943***	-0.2189***	0.1342***	-0.1411***
SFSPEND	0.0204	0.0615*	-0.1020***	-0.3286***	0.2152**	0.1291***	0.1457**	-0.4401***	0.5146***	-0.2004***	-0.2194***	-0.1307***	-0.1949***	0.4664***	0.3083***	0.1765***	0.4151***
CTA	-0.0724**	0.0736**	0.0650**	0.1716***	-0.0538*	-0.0537	0.0037	0.1592***	-0.2217***	0.0596**	0.0846***	0.0061	0.0634**	-0.1396***	-0.0906***	0.1599***	-0.0237
DTA	0.0322	-0.0157	0.0152	0.0291	-0.0470	-0.1239***	0.0664	-0.0084	0.0022	0.1342***	0.0528*	0.0799***	0.0200	-0.1019***	0.0441	0.1500***	0.0862**
FTA	0.0740**	-0.0381	-0.0599**	-0.0577*	-0.0859***	0.0326	-0.1831***	-0.1026**	0.0707**	0.0506*	0.0656**	0.1065***	-0.0330	-0.0650**	-0.0222	-0.0762***	0.0285
SUBCOM	0.0940***	-0.0308	0.0200	-0.0026	0.0696**	0.0558	-0.0276	-0.0254	0.0267	-0.0680**	-0.0916***	0.0715**	-0.1207***	0.0564*	-0.0281	-0.0994***	0.0563*
ADSIZE	0.1080***	0.1649***	-0.0856**	-0.0991***	-0.0556	-0.1673***	0.0492	-0.0063	0.0369	-0.0747**	0.1213***	0.0415	-0.0608	0.0305	-0.0132	0.0087	0.0042
ADMS	-0.0514	0.0268	-0.0534	0.0193	0.2729***	0.1639***	-0.0593	0.0263	-0.0641*	-0.1669***	-0.1018***	0.0947***	-0.0891***	-0.0140	-0.1069***	0.0702**	-0.0316
ADIND	0.0226	0.1883***	0.0015	0.0290	-0.0369	-0.0365	0.1408**	-0.1410***	0.1607***	-0.1061***	-0.0592	-0.0391	-0.1381***	0.1965***	0.0207	-0.1058***	0.0649
TA	0.0640**	0.0187	-0.0162	-0.3635***	0.2986***	0.2570***	0.1890***	-0.4973***	0.6267***	-0.2477***	-0.3283***	-0.0445*	-0.3585***	0.6182***	0.4024***	-0.0533**	0.3846***
TINC	0.1094***	0.0010	-0.0259	-0.3714***	0.3309***	0.2522***	0.2564***	-0.5391***	0.6405***	-0.3011***	-0.3988***	-0.0767***	-0.3911***	0.6859***	0.3987***	-0.1058***	0.3908***
TST	0.0982***	-0.0239	0.0320	-0.3059***	0.2283***	0.2312***	0.2690***	-0.5286***	0.5988***	-0.0884***	-0.3192**	-0.0892***	-0.2218***	0.5247***	0.4152***	-0.0845***	0.3763***

(continued)

Variable	ENDWTA	VCPAY	VCG	BIG4	UGCOM	SFSPEND	CTA	DTA	FTA	SUBCOM	ADSIZE	ADMS	ADIND	TA	TINC	TST
BSIZE	0.2135***	0.0464	0.0522*	0.1727***	-0.2203***	0.0204	-0.0724**	0.0322	0.0740**	0.0940***	0.1080***	-0.0514	0.0226	0.0640**	0.1094***	0.0982***
BGDIV	-0.0761***	-0.1571*	-0.1571**	-0.0323	0.0971***	0.0615*	0.0736**	-0.0157	-0.0381	-0.0308	0.1649***	0.0268	0.1883***	0.0187	0.0010	-0.0239
BEDIV	-0.1305***	0.0006	-0.1135**	-0.1144***	0.0434	-0.1020***	0.0650**	0.0152	-0.0599**	0.0200	-0.0856**	-0.0534	0.0015	-0.0162	-0.0259	-0.3059***
IGOV	-0.5091***	-0.1966***	-0.0430	-0.1543***	0.0927***	-0.3286***	0.1716***	0.0291	-0.0577*	-0.0026	-0.0991***	0.0193	0.0290	-0.3635***	-0.3714***	-0.3059***
BMFS	0.1812***	0.2263***	-0.0815***	0.0995***	0.0680**	0.2152**	-0.0538*	-0.0470	-0.0859***	0.0696**	-0.0556	0.2729***	-0.0369	0.2986***	0.3309***	0.2283***
ETSIZE	0.2318***	0.1861***	0.0835**	0.2392***	0.0055	0.1291***	-0.0537	-0.1239***	0.0326	0.0558	-0.1673***	0.1639***	-0.0365	0.2570***	0.2522***	0.2312***
ETMS	0.1160**	0.1852***	0.1284**	-0.0522	-0.1494**	0.1457**	0.0037	0.0664	-0.1831***	-0.0276	0.0492	-0.0593	0.1408**	0.1890***	0.2564***	0.2690***
SSR	-0.4130***	-0.2641***	-0.0584*	-0.2905***	0.2169***	-0.4401***	0.1592***	-0.0084	-0.1026**	-0.0254	-0.0063	0.0263	-0.1410***	-0.4973***	-0.5391***	-0.5286***
ES	0.4853***	0.3648***	0.0195	0.2958***	-0.2017***	0.5146***	-0.2217***	0.0022	0.0707**	0.0267	0.0369	-0.0641*	0.1607***	0.6267***	0.6405***	0.5988***
PTTSR	-0.1839***	-0.1579***	-0.0551**	-0.2261***	0.0521*	-0.2004***	0.0596**	0.1342***	0.0506*	-0.0680**	-0.0747**	-0.1669***	-0.1061***	-0.2477***	-0.3011***	-0.0884***
FSF	-0.3122***	-0.1532***	-0.0943***	-0.2047***	0.2041***	-0.2194***	0.0846***	0.0528*	0.0656**	-0.0916***	0.1213***	-0.1018***	-0.0592	-0.3283***	-0.3988***	-0.3192**
TRST	-0.2987***	-0.0228	-0.0015	-0.0463	0.1214***	-0.1307***	0.0061	0.0799***	0.1065***	0.0715**	0.0415	0.0947***	-0.0391	-0.0445*	-0.0767***	-0.0892***
TONLY	-0.0887***	-0.2233***	-0.0845***	-0.1670**	0.0173	-0.1949***	0.0634**	0.0200	-0.0330	-0.1207***	-0.0608	-0.0891***	-0.1381***	-0.3585***	-0.3911***	-0.2218***
RONLY	0.5610***	0.3856***	0.1124***	0.2827***	-0.1943***	0.4664***	-0.1396***	-0.1019***	-0.0650**	0.0564*	0.0305	-0.0140	0.1965***	0.6182***	0.6859***	0.5247***
PGINT	0.3484***	0.3259***	0.1255***	0.1113***	-0.2189***	0.3083***	-0.0906***	0.0441	-0.0222	-0.0281	-0.0132	-0.1069***	0.0207	0.4024***	0.3987***	0.4152***
TFEE	-0.300***	0.1295***	0.0088	-0.1645***	0.1342***	0.1765***	0.1599***	0.1500***	-0.0762***	-0.0994***	0.0087	0.0702**	-0.1058***	-0.0533**	-0.1058***	-0.0845***
INTS	0.3685***	0.3309***	0.0696**	0.1462***	-0.1411***	0.4151***	-0.0237	0.0862**	0.0285	0.0563*	0.0042	-0.0316	0.0649	0.3846***	0.3908***	0.3763***
ENDWTA	1.000	0.2098***	0.0776***	0.1667***	-0.1446***	0.2843***	-0.0374	-0.0916***	0.0056	0.0711**	0.0314	-0.1036***	0.0235	0.3541***	0.3660***	0.3380***
VCPAY	0.2098***	1.000	0.0539*	0.1728***	-0.0089	0.6296***	-0.0447	0.0793***	-0.0536*	0.0155	0.1156***	0.0090	0.0518	0.6622***	0.6570***	0.5524***
VCG	0.0776***	0.0539*	1.000	0.0089	-0.0095	0.0136	0.0792***	-0.0931***	-0.0740***	0.1143***	-0.0101	-0.0095	-0.0631	0.0751***	0.1220***	0.1031***
BIG4	0.1667***	0.1728***	0.0089	1.000	-0.0969***	0.1445***	-0.0747***	-0.1108***	0.1070***	0.0410	-0.0202	0.1551***	-0.1218***	0.2464***	0.2442***	0.1791***
GCOM	-0.1446***	-0.0089	-0.0095	-0.0969***	1.000	0.0160	0.0691**	0.0106	0.0111	0.0786***	0.0799**	0.1037***	0.0066	-0.0970***	-0.1338***	-0.1113***
SFSPEND	0.2843***	0.6296***	0.0136	0.1445***	0.0160	1.000	-0.0060	0.0559*	-0.0234	0.0080	0.1237***	0.0356	0.1000	0.6245***	0.6013***	0.4769***
CTA	-0.0374	-0.0447	0.0792***	-0.0747***	0.0691**	-0.0060	1.000	-0.1428***	-0.4145***	-0.0098	-0.1019***	-0.0308	-0.0410	-0.2649***	-0.2127***	-0.3001***
DTA	-0.0916***	0.0793***	-0.0931***	-0.1108***	0.0106	0.0559*	-0.1428***	1.000**	0.1557***	-0.0299	0.2117***	-0.0946***	0.1097***	0.0886***	0.0469*	0.0807***
FTA	0.0056	-0.0536*	-0.0740***	0.1070***	0.0111	-0.0234	-0.4145***	0.1557***	1.000	0.0401	0.2209***	0.0339	0.2250***	0.0771***	-0.0522*	0.0517*
SUBCOM	0.0711**	0.0155	0.1143***	0.0410	0.0786***	0.0080	-0.0098	-0.0299	0.0401	1.000	0.0552	0.1214***	-0.0506	0.0431	0.0681**	0.0403
ADSIZE	0.0314	0.1156***	-0.0101	-0.0202	0.0799**	0.1237***	-0.1019***	0.2117***	0.2209***	0.0552	1.000	-0.0169	0.6259***	0.0935**	0.0340	0.0261
ADMS	-0.1036***	0.0090	-0.0095	0.1551***	0.1037***	0.0356	-0.0308	-0.0946***	0.0339	0.1214***	-0.0169	1.000	0.0454	0.0554*	0.0876***	0.0374
ADIND	0.0235	0.0518	-0.0631	-0.1218***	0.0066	0.1000	-0.0410	0.1097***	0.2250***	-0.0506	0.6259***	0.0454	1.000	0.2256***	0.1719***	0.1288***
TA	0.3541***	0.6622***	0.0751***	0.2464***	-0.0970***	0.6245***	-0.2649***	0.0886***	0.0771***	0.0431	0.0935**	0.0554*	0.2256***	1.000	0.9462***	0.9014***
TINC	0.3660***	0.6570***	0.1220***	0.2442***	-0.1338***	0.6013***	-0.2127***	0.0469*	-0.0522*	0.0681**	0.0340	0.0876***	0.1719***	0.9462***	1.000	0.935***
TST	0.3380***	0.5524***	0.1031***	0.1791***	-0.1113***	0.4769***	-0.3001***	0.0807***	0.0517*	0.0403	0.0261	0.0374	0.1288***	0.9014***	0.935***	1.000

Notes: The table contains Pearson's parametric correlation coefficients. Variables are defined as follows: governing board size (GBSIZE); board gender diversity (BGDIV); board ethnic diversity (BEDIV); independent governors (IGOV); frequency of governing board meetings (GBMS); executive team size (ETSIZE); frequency of executive team meetings (ETMS); student to staff ratio (SSR); entry standards (ET); part-time to total staff ratio (PTTSR); female staff fraction (FSF); teaching and research staff (TRST); teaching only staff (TONLY); postgraduate intensity (PGINT); tuition fee

(TFEE); international students (INTS); endowment to total assets (ENDWTA); vice-chancellor pay (VCPAY); vice-chancellor (VCG); audit firm size (BIG4); and governance committee (GCOM); service and facility spend (SFSPEND); cash to total asset (CTA); debt to total asset (DTA); fixed to total assets (FTA); number of governance sub-committees (SUBCOM); audit committee size (ADSIZE); audit committee meeting frequency (ADMS); audit committee independence (ADIND); total assets (TA); total income (TINC); total staff (TST). Table 15 fully defines all the variables used.

*, **, *** Correlation is significant at 10, 5 and 1 per cent levels, respectively

6. Chapter Six: Multivariate Analyses

Armed with the detailed results of the previous chapter the research delves deeper to unravel the best multiple regression models that robustly explain the multi-dimensional links between university governance and performance. In what follows a range of models are developed explaining research, teaching and financial performance of universities as well as their governances. However, these models are far from uniform and/or homogenous in keeping with the complex inter-linked research objectives of this thesis.

An eclectic approach is followed in model development. Independent Variables in this data set are entered selectively into each model using three criteria. First the theoretical/empirical justification for the variable itself; Second, how it contributes to extending the span of explanation covering missing dimensions of university governance; and finally the overall parsimony in explanation achieved in the GLS Fixed-Effects (FE) model as a consequence of its entry (Newman, 1956; Morrison, 1983; Gujarati & Porter, 2009: 42). However based on justification mentioned in the methodology chapter (see Chapter 4.7, pg.185), GLS (FE) fixed-effects is used as the main model and treated as the base.

The rationale for such an approach is threefold. First, the multiple dimensions of university governance and performance and the complex trade-offs underlying their associations imply that there is no alternative to the unusually large numbers of dependent (6), independent (25) and control (6) variables in this data set. The theoretical indications from the earlier chapters (Gayle et al., 2003; Alvenson, 2002; Vukasovic et al., 2018; Hooghe & Marx, 2003; Piattoni, 2010; Braun, 2008) and the nature of research objectives/gaps identified in the thesis make it vital that all these variables are simultaneously investigated. Without this a core objective of this investigation will remain unanswerable. This has already been mentioned in the empirical chapter and the methodology section therein.

Second, unlike corporate firms several process like characteristics and trade-offs characterize research/teaching/financial performances and the internal governances of a university (Chou & Gornitzka, 2014; Chou et al., 2017; Eitken, 2015; Peters, 2015; Gayle et al., 2003; Entwistle, 2007; Trowler, 2008). These complexities can only be explicated if different models are extracted from the data set each with its own distinct dependent/independent/control variable combination. In fact, this is one very important facet

of the research gap identified in Chapter 3. But here too there is the danger that university level unobserved factors in each model may be at work interfering and influencing these process-like characteristics and trade-offs. This is why each model is actually estimated and interpreted using the GLS FE.

This sample data set has important abnormalities. The main appendix shows that many variable distributions fail standard tests of skewness/kurtosis (see Appendix 3). It is also characterized by elements of multicollinearity, heteroscedasticity and endogeneity (see Appendix 4 & 5). Despite scaling all variables i.e. ensuring that all of them are either fractions or natural logarithms the problem of abnormality persists (see Appendix 3). Winsorization although an alternative is strictly avoided here in line with the statistical principles enunciated by Draper & Smith (Damodar & Gujarati, 2009: 497). This is to avoid the clear danger that it might remove the rich explanation of multiple dimensions, trade-offs and process like characteristics of the governance-performance relation emerging from outlier observations in the dataset. But in order to ensure a clear window in the model results that displays and accommodates these data-set abnormalities, it is the GLS FE that is used as the prime result in all interpretations.

Due to the iterative selection process involved in the model development it is worth clarifying three aspects. First and foremost, the iteration here is not driven by a blinkered R-square maximization approach. In fact, the entire process is entirely driven by theoretical/empirical indications and hypotheses testing. R-squares, coefficient statistics and sample coverage are only ever used as adjunct to the main process to achieve parsimony. This is in complete accordance with established econometric guidelines (Judge et al., 1982; Damodar & Gujarati, 2009: 206).

Second, it is not without justification that 6 different models explaining research, financial and teaching performances as functions of internal governances are developed. This is intended to fill the main research gap identified in this thesis. Complex multi-dimensional university performance whether it be research, teaching or financial is not simple or straightforward. It cannot be captured by one index or variable no matter how comprehensive (Lokawduge & Armstrong, 2015; Boliver, 2015). It is several different things all at once and needs to be studied in its varied dimensions. The choice of 3 different dependent measurements for research performance and 2 different ones for teaching performance is deliberately intended to unpack this complexity. Similarly, multi-dimensional university governance has several layers

and textures and the wide selection of 25 different independent governance variables is intended to simultaneously capture this.

Finally, every model is chosen with theoretical underpinnings, and interpretations are based primarily on the GLS FE regression results within each model. This ensures that the university level specific factors that may be unobserved in a regular panel OLS model are nevertheless fleshed out and accounted for. Panel OLS will be used merely to display the results for the control variables, that would naturally get omitted in a GLS FE regression. Nevertheless, the results will be interpreted and based on the more advanced GLS FE, thus the thesis completely avoids the major likely flaws of variable omission and university level heterogeneities.

The rest of the chapter is divided into 5 main sections that implement the above detailed model development procedure. Section 6.1 presents and discusses selected advanced multivariate models rigorously developed to explicate university research performance. In each model here eclectic selections of internal, board-level, research/teaching and financial governances alongside size/age, mission-based and region-based controls are used. Apart from the main GLS FE regression on which the discussion pivots two other GLS regression results are presented to assess the sensitivities of the main result. Two instrumented regressions namely the IV 2SLS and the IV 2SGMM are also presented to account for obvious endogeneities apparent in the main model. A robust battery of tests confirm the validity of each regression result¹¹. Sections 6.2 and 6.3 do likewise with teaching and financial performance respectively. The final section 6.4 is a short summary of the Chapter.

¹¹ A detailed analysis of control regressions performed with respect to research teaching and financial performances in this sample. The chosen model and its variable choices are always based on the most comprehensive theoretical/empirical indications. Parsimony is only ever used as an adjunct to this main basis.

6.1 Research Performance Advanced Models

As underlined earlier the multi-dimensional complex links between University performance and governance make it essential that a model development that is at once wide-spanned and eclectic is used. Therefore, in what follows below three important and robust models relating research performance in its many dimensions to internal, board level, research, financial governances and controls are primarily discussed. Each model uses a different research performance dependent variable namely Research Performance Index (RPI) in model 1, Research Quality (RQ) in model 2 and Research Grant Fraction (RGF) in model 3 respectively. The choice of these dependents is based on theoretical/empirical indications already discussed earlier in the data descriptive statistics chapter. To recapitulate briefly, RPI is a composite index subsuming many different facets of university research performance. Research Quality is an independent regulatory assessment of every UK university's research function based on the quantity and quality of its published work. Research Grant Fraction indicates how much financial support research grant providers are willing to provide based on their independent assessment of the research performance of a given institution. Thus combining three different dependents achieves a holistic and multi-dimensional explanation of university research performance.

Before moving on to the main discussions it is important to note the results of tests for normality, multicollinearity, heteroscedasticity, endogeneity and non-linearity shown in Appendix 3, 4, 5 and 6. Some variables (dependent & independent) have abnormal distributions in all three models. This is despite the fact that these variables are invariably scaled i.e. are either fractions or natural logarithms. Mean levels of VIF across the models do not exceed 5 but the variables of Postgraduate Intensity (PGINT), Teaching Only Staff (TONLY), and Teaching and Research Staff (TRST) do exhibit high values here. None of the independent variables exhibit endogeneity except Entry Standards. Durbin–Wu–Hausman (DWH) test was used to detect for endogeneity in all three research model. Entry Standard (ES) is the endogenous variable in models 1 and 2 and Teaching and Research Only Staff (TRST) is the endogenous variable in model 3 (see Appendix 6). Breusch-Pagan Test and White Test has been used to test for heteroscedasticity (see Appendix 5).

In what follows three separate multivariate models of University Research performance are critically analysed. Sub-section 6.1.1 is a model with Research Performance Index (RPI) as the dependent variable

while sub-sections 6.1.2 and 6.1.3 are the two models with Research Quality (RQ) and Research Grant Fraction (RGF) as the dependent variables respectively. Please note that each of these models includes board level governance variables already used in extant research wherever they are parsimonious. But more importantly for the first time new original governance variables mapping the very distinct multiple dimensions of university governance are used here to answer the research objectives. 6.1.1 Research Performance Index (RPI) Model

6.1.1.1 GLS Fixed-Effects Model

The table 17 below shows the status of the nine hypotheses based primarily on the results from the GLS FE regressions with robust standard errors using nine different internal governance variables and three different control variables. The dependent variable is Research Performance Index (RPI). The independent governances span the theoretical/empirical field of investigation and simultaneously represent one of the most parsimonious combination of explanations achievable in the sample.

Table 16: Model 1 all regressions with robust standard errors for dependent variable Research Performance Index (RPI)

Independent Variables	GLS FE	GLS MLE	GLS AR	IV 2SLS	IV 2S GMM	Panel OLS Model
(Model)	(1)	(2)	(3)	(4)	(5)	(6)
<i>Governance Variables:</i>						
ES	.3291(.129)***	0.822(.11369)***	1.228(.075)***	3.350(.272)***	3.306(.270)***	2.005(.054)***
INTS	-46.184(17.541)***	-37.386(9.179)***	-5.116(8.536)	7.244(6.471)	10.691(6.208)	15.356(5.404)***
BSIZE	7.662(4.720)*	8.999(2.417)***	5.133(2.518)**	11.137(3.375)***	10.223(3.328)***	4.999(2.383)***
TRST	0.102(4.286)	-2.274(3.206)	-1.688(3.422)	1.904(4.436)	-0.384(4.379)	-4.289(2.542)*
GCOM	-5.637(2.516)**	-5.199(1.578)***	-3.842(1.629)**	-3.390(1.307)***	-3.489(1.285)***	-2.221(.953)**
SSR	0.015(.273)	-0.280(.211)	-0.5148(.198)***	1.513(.608)**	1.473(.603)**	-0.641(.198)***
IGOV	2.884(7.768)	-4.508(5.293)	-8.290(4.504)*	20.203(8.385)**	22.316(8.284)***	-7.620(3.821)**
FSF	-180.745(29.939)***	-141.706(16.672)***	-49.778(13.776)***	31.320(16.246)*	24.905(16.010)	20.730(7.878)***
CTA	-28.023(10.310)***	-32.671(7.416)***	-10.253(6.968)	-24.235(7.905)***	-21.737(7.735)***	-14.128(5.740)**
<i>Controls Variables:</i>						
TST	7.290(3.931)*	5.059(1.991)**	5.264(1.483)***	-	-	2.496(.825)***
PRE1992	-	29.274(4.481)***	24.516(2.734)***	-	-	13.579(1.282)***
REGION	-	-3.625(2.272)	-2.956(1.310)**	-1.903(.950)**	-2.123(.943)**	-1.827(.735)***
YEAR	-	-	-	-	-	-1.772(.143)***
CODE	-	-	-	-	-	-0.014(.0146)
Constant		167.830(18.818)***	114.395(17.281)***	-75.275(36.577)***	-66.674(36.380)***	3623.785(.194)***
Number of Obs	827	827	827	827	827	827
F-Value	10.92	-	-	-	-	899.34
R ₂	0.5547	-	0.8799	0.8353	0.8393	0.9257
Wald Chi2	-	-	1483.69	3910.90	4064.04	-
LR Chi	-	358.21	-	-	-	-
rho	.93216293	.8198504	-	-	-	-
Autocorrelation coef (y _{t-1})	-	-	.70851549	-	-	-
Theta median	-	-	0.3112	-	-	-
Instrumented	-	-	-	ES	ES	-
Instruments	-	-	-	TST; Pre1992	TST; Pre1992	-
Estat overid score				22.4727 (p = 0.0000)		
chi2(1) p						
Sargan chi2				25.6487 (p = 0.0000)		
Basmann chi2				26.0855 (p = 0.0000)		
Score chi2				22.4727 (p = 0.0000)		
Hansen's J chi2					22.4727 (p = 0.0000)	

Notes: The table reports all regressions with robust standard errors. Regressions defined as follows: Generalized least square fixed-effects (GLS Fixed-Effects); generalized least square maximum likelihood estimation (GLS Maximum Likelihood); generalized least square auto-regression (GLS AR); instrumental variable two-stage least squares (IV 2SLS); instrumental variable two-stage; instrumental variable generalized method of moments (IV 2S GMM), panel ordinary least square model (Panel OLS Model); Variables are defined as follows: entry standards (ES); fraction international students (INTS); governing board size (GBSIZE); teaching and research staff (TRST); the existence of a separate governance committee (GCOM); student to staff ratio (SSR); independent governors (IGOV); female staff fraction (FSF); cash to total assets (CTA); total staff (TST); pre-1992 (PRE1992); region (REGION); year (YEAR); and code (CODE). *, **, *** indicate significance at 10, 5, and 1 per cent levels, respectively.

Clearly RPI seems to be a positive function of ES (sig.), TRST (insig.), BSIZE (sig.), SSR (insig.), IGOV (insig.), TST (sig.), PRE1992 (sig.), but a negative function of GCOM (sig.) and CTA (sig.).

Table 17: : Summary of the Findings and Hypothesis of Governance and Research Performance Index (RPI)

Dependent Variable	Research Performance Index (RPI)				
<i>Independent Variable:</i>	No. Hyp.	Predicted sign	Finding sign	Finding sig.	Hyp. Status
<i>Governance Variables:</i>					
Entry Standard (ES)	H1a	+	+	Sig. (1%)	Acep.
International Students ratio (INTS)	H4a	+	-	Sig. (1%)	Rejt.
Board Size (BSIZE)	H6a	+	+	Sig. (10%)	Acep.
Teaching and Research Staff (TRST)	H3a	-	+	insig.	Rejt.
Unique Governance Committee (GCOM)	H6l	+	-	Sig. (5%)	Rejt.
Student Staff Ratio (SSR)	H2a	-	+	insig.	Rejt.
Independent Board Members (IGOV)	H6g	+	+	insig.	Rejt.
Female Staff Fraction (FSF)	H3j	+	-	Sig. (1%)	Rejt.
Cash to Total Asset (CTA)	H5j	-	-	Sig. (5%)	Acep.

Notes: Hypothesised relationships are discussed in Chapter 3. Acep and Rejt denote accepting and rejecting hypothesised relationships, respectively.

Entry Standards (ES)

Entry Standards and its significant positive impact (at 1% level) on Research Performance, this confirms sub-hypothesis (H1a). Universities choosing high entry standards in this sample are seen to improve their research performance. Previous empirical work can be divided in two strands. One associates ES with some measures of academic performance such as research quality, student outcomes and satisfactions and find a positive association (Ayoubi & Massoud, 2012; Bolivar, 2015; Bachan, 2016; Johnes & Soo, 2013). The second does not link ES with university performance but in general examines and evaluates patterns of Entry Standards among the different types of universities in UK (Gorard et al., 2019; Jerrim & Vignoles, 2015; Chowdry et al., 2008; 2013).

On the surface this result seems to substantiate theoretical contentions of Quality Assurance and Optimal Contracting (Filippakou & Tapper, 2008; Sawir, 2013; Eurydice, 2010, pg. 24; Brown & Carasso, 2013; Allen, 2011; Jack, 2008; Palfreyman, 2010; Yorke,

2009a, b, 2000; Boliver, 2013; Bright 2004; Anyanwu 2004; Barron 2006; Furedi 2004) that being rigorous in selection procedures is essential to maintain the integrity and quality of the academic function. On the other hand it seems to make clear why UK universities face a challenge in remaining fair access institutions to the large majority of student populations a goal emphasized by Public Accountability, Stakeholder and Legitimacy (Coy et al., 2001; Blanden, & Machin, 2004; Coy et al., 2011; Nelson et al., 2002; Parker, 2012; Boliver, 2013; Burrows, 2012; Gunasekerage & Reed, 2008; Wicks & Parmar, 2004; De Villiers & Van Staden, 2006).

Fraction of International Students (INTS)

INTS displays a negative and significant coefficient (1% level) with research performance. This contradicts the earlier sub-hypothesis (H4a). Universities with higher fractions of international students seem to perform worse at research.

Diversities in student populations stemming from entry of students from different parts of the globe appear to be burdening the research function imposing constraints on the well-established teaching and learning regimes (TLRs) of UK universities. Pedagogical ambiances are negatively impacted by students coming from diverse learning cultures (Trowler, 2008, 2019; Trowler & Cooper, 2002). These students definitely seem to require heavier teaching and adaptation inputs from the faculty and this could be reducing the university's research productivity. Here is clear evidence that due to higher levels of international students' university time and workload are suboptimally organised, publishing quality is declining and staff resources are stretched to the fullest (Hartnett et al., 2004; Niles, 1995; Barron, 2006; De Vita & Case, 2003). Empirically although studies that associate INTS with academic performances of universities find mixed impacts on different types of such performances, the main debates in the literature remain contested on the issue of how international students affect university research performance (Marshall & Chilton, 1995; Makepeace & Baxter, 1990; Morrison et al., 2005).

Board Size (BSIZE)

Hypothesis (H6a) is confirmed. Board size is positively associated (at 10% level) with research performance. At least four theoretical arguments are confirmed. Larger board sizes will incorporate all stakeholders; such boards will benefit from a wider range of networks and resources as well as a wider legitimacy among constituents and will be better able to implement checks and balances on the executive team and hence will improve university research performance (Freeman & Reed, 1983; Freeman, 1984; Ashforth & Gibbs, 1990; Suchman, 1995; Smallman 2004; Davis, Schoorman & Donaldson, 1997) . But the result contradicts the expectations of Public Accountability (Coy et al., 1997, 2011; Nelson et al., 2003; Coy & Dixon, 2004) i.e. it is not just larger boards but instead higher numbers of lay members who ensure a public purpose in the board. Quality Assurance Assurance i.e. it is the expertise and experiential richness of board members that matter the most rather than just an expanded board and Optimal Contracting i.e. size should be optimally calibrated to suit the mission and scope of the institution (Edmans & Gabiax, 2009; Van-Essen et al., 2015; Lipton & Lorsch, 1992; Jensen, 1983; Yermack, 1996; Trowler, 2008; Bebchuk & Fried, 2003; Mallin et al., 2015).

Empirically the result does not lend support to Lokuwaduge's finding in her Australian sample that board size has an insignificant association with university research performance. But it does seem to fit Olson's (2000) finding of a positive association albeit with respect to university non academic performance.

Female Staff Fraction (FSF)

Sub-hypothesis (H3j) is rejected. Gender diversity within the university staff seems to be a strongly significant negative influence (at 1% level) on university research performance. On the surface Stakeholder and Public Accountability predictions (Roberts, 1992; Freeman, 2010; Mitchell et al., 1997; Coy et al., 2011) of a higher research performance due to fuller representations of both genders in academic staff or a more cohesive egalitarian gender balance are rejected. Similarly having more female staff do not seem to bring UK universities any legitimacy gains or a wider talent pool that could translate to better research performance (Pfeffer, 1987; Verbruggen et al., 2011; Suchman, 1995;

Ashforth & Gibbs, 1990). Empirically earlier research has not directly associated staff female diversity with research performance. But large strands of scholars have emphasized important aspects such as gender bias in university research (Santos & Van Phu, 2019; Blake & La Valle, 2000; Witteman, 2019; Huang et al., 2019; Metcalf et al., 2005; Botella et al., 2019) and employment (Dearden et al., 2012; Blackaby & Frank, 2000; Duflo, 2012; Moss-Racusin et al., 2012).

Teaching & Research Staff Fraction (TRST)

Sub-hypothesis (H3a) is rejected in the positive sign of this coefficient although without statistical significance. Higher fractions of omnibus tenure track staff (TRST) have no significant impact on a university's research performance. This lack of significance in the coefficient implies that one is unable to either corroborate or contradict the many theoretical predictions. Neither can one confirm whether TRST results in a privileging of research tasks as predicted by public accountability (Coy et al., 2001; Butt, 2019; Blackmore, 2016; Deem & Baird, 2019; Bexley et al., 2011; Probert, 2013) i.e. better research performance nor can we assess whether staff lose motivations in such dual contracts and underperform as suggested by resource dependence and stakeholder (Pfeffer & salancik, 2003; Fowles, 2014; Wise et al., 2020; Freeman, 2010; Bryson & Barnes, 2000a, b; Locke, 2012; Freeman, 2010 ; Leisyte & Westerhejden, 2014). Empirically hardly any scholars associate this variable with university academic performances although there are several normative and argumentative voices that discuss whether the contract remains relevant in the changing UK HEI context (Oxford, 2008; Whitchurch, 2016; AUT, 2005; Sikes, 2012).

Unique Governance Committee (UGCOM)

Sub-hypothesis (H6l) is rejected. Merely instituting a special committee of governance seems to harm research performance. UK universities that implement such bureaucratic policies are seen to visibly reduce their research performance in this sample. Stewardship precepts and Managerial power tenets that argue for slim and effective managerial (Bebchuck et al., 2009; Donaldson & davis, 1991; Perez & Ode, 2013), audit and governance structures seem reflected here (Donaldson & Preston, 1995; Agrawal &

Knoeber 1996). The UK university also does not seem to gain any research benefits from the enhanced legitimacy out of instituting such committees (Suchamn, 1995; Scherer et al., 2013). Empirically Ntim et al. (2017) does find that there is a positive association between UGCOM and university voluntary disclosure.

Student-Staff Ratio (SSR)

Sub-hypothesis (H2a) cannot be confirmed. There is now a positive sign on the coefficient unlike the bivariate correlation but it's insignificance implies we are unable to decide on the true direction of its association with RPI. The levels and degrees of staff to student interactions captured in this ratio seems not to matter to a university's research function. The finding contrasts with McDonald (2012), Bradley et al. (2008), Biddle & Berliner (2002), Glass & Smith (1979), and Kokkelenberg et al. (2005, 2008) negative impact on academic performance.

Lay board member fractions (IGOV)

The coefficient is insignificant although its sign remains positive. Yet sub-hypothesis (H6g) is rejected. Lokuwaduge's (2011) Australian HEI study where the author finds a significant negative impact on research performance seems to contrast with this result. Based on this result one is able to confirm the overall refrain in the university governance normative resource dependence stakeholder and policy literature (Ntim et al., 2017; Collet & Hrasky, 2005; Beekes & Brown, 2006; Samaha et al., 2015; Nelson et al., 2003; Maingot & Zehgal, 2008; Schofield, 2009; CUC, 2009) that larger numbers of lay members on a university's board are salutary to its research performance. Similarly, one is unable to contradict voices from the optimal contracting literature (Gompers et al., 2003; Beiner et al., 2006a, b; Bozec & Bozec, 2012) that argue against this principle of board independence and favour cohesion in policy making. This finding also fails to provide any fresh support to earlier studies in corporate governance. That evidence such a positive association between board independence and firm performance (Cobham & Subramaniam, 1998; Mishra & Nielson, 2000; Pathan, Skully & Wickramanayake, 2007) document that board independence has a positive relationship with service sector firm performance.

Cash-To-Total Assets (CTA)

The cash to total assets, a unique financial governance, shows a clear negative impact (at 1% level) on university research performance. This confirms hypothesis (H5j) and is in stark contrast with large strands of corporate governance scholarship (Mikkelsen and Partch, 2003; Kim et al., 1998; Opler et al., 1999; Bates et al., 2007; Gao et al., 2013). These scholars find that firms holding as much as a quarter of their assets in cash perform better than their peers. For public sector institutions holding too much cash is not an indication of strategic intent. Instead it suggests that these institutions are working under financial constraints (Bates, Kahle, and stulz, 2007) and/or agency conflicts (Gao et al., 2013). Holding too much cash on the balance sheet is a sure sign that the university is working under financial constraints. In such a scenario discretionary research spending is the first casualty as suggested by scholars in the Stewardship and Optimal Contracting literature (Lazerson, 1997; Swansson, Mow & Bartos, 2004; ; Mallin et al., 2015; Murphy, 2012; Davis et al., 1997; Perez & Ode, 2013). After all research spending is long term in nature and can be postponed whereas staff salaries and other contingent administrative costs cannot. It can therefore be inferred that the decline in research performance associated with higher cash levels on university balance sheets is due to this.

TST (Log Total Staff)

The size control based on the staff size of the institution remains positive and significant (at 10% level) in the main GLS fixed effects model. Clearly larger UK universities on the whole perform better at research than their smaller peers. This is an anticipated result given that such universities bring to bear their larger resources and networks to their internal governances.

6.1.1.2 Sensitivity Analysis

A robust set of four additional regressions are performed in order to test the sensitivity of various assumptions in the above GLS FE model. First and foremost, Generalized Least Squares Maximum Likelihood Estimation (MLE) regressions are implemented to tackle the main problem that many of the variables in this model display abnormalities as shown in the univariate statistics. In such cases and in moderately large samples like the one in this data set the econometric literature (Gujarati & Porter, 2009, pg.102-103) recommends such an estimation method. GLS MLE regression is implemented to test the difference in fixed-effects coefficients if the assumption of fixed-effects is relaxed (Gujarati & Porter, 2009, pg. 102-105). As shown in the appendix many of the governance and performance variables in this data set are abnormal despite scaling. Although Winsorization is an option, it is not implemented in this dataset so that the rich explanations emerging from outliers is not lost. Therefore, the GLS MLE coefficients are a robust check using a different method from the GLS FE. Third a GLSAR auto-regression is used to in order to implement a Koyck transformation (Koyck, 1954; Gujarati & Porter, 2009, pg. 624-630) but through a generalized rather than a fixed-effects regression. The reasoning behind this is part theoretical and part empirical. Given that governance calibration takes time to implement it is reasonable to assume that the effect on university performance will be with a lag and as shown by Koyck (1954) this is most easily accounted for by the lagged performance dependent variable. Empirically this data set has just 10 years of data i.e, T is small with significant numbers of missing values. Lagging the independent variables i.e. distributed lag model will result in further loss of degrees of freedom reducing the representativeness (i.e. N) and robustness (Gujarati & Porter, 2009, pg. 598) of the model. The use of GLSAR is an added validation here as the lagged dependent variable is a potential source of collinearity as well as serial correlation (Gujarati & Porter, 2009, pg. 626).

Fourthly tests of endogeneity (Hausman specification test: Gujarati & Porter, 2009, pg. 702) on each of the independent variables in the model (see Appendix 6) show that Entry Standards (ES) is a strong likely channel for reverse causality here. Hence, two additional instrumental variables (IV) regressions instrumenting for ES are implemented here in line

with the recommendations of Theil (1953), Basman (1957, pg. 77-83) and Gujarati & Porter (2009, pg. 718-721). The first is an IV two stage Least Squares approach i.e. IV2SLS whereas the second is an IV Generalized Method of Moments i.e. IV2SGMM approach. For each of these a set of over-identification tests (i.e. Sargan, Basman and Hansen's J) are conducted. Each of these tests confirm lack of over-identification in these regressions.

Finally, the results of the panel OLS regression with robust standard errors is also displayed here, only in order to display important patterns among controls i.e. university regional, mission age and time based control variables that gets omitted in the main model GLS FE. Here and in all the other models to follow these five sensitivity regression results are also interpreted in order to further explicate and test the governance antecedents of university research performance.

Entry Standards (ES)

The strongly significant and unchanged positive sign of the coefficient of this variable across the suite of four additional regressions seems to highlight the importance of selectivity in student recruitment to university research performance. In particular, while GLS coefficients decline in magnitude their significances remain at 1% levels. Interestingly, when endogeneity in this variable is instrumented for the coefficient jumps in magnitude (greater than the fixed-effects) while remaining significant and unchanged in direction. It is important to note that the strong significances and positive magnitudes in IV regressions suggest a strong reverse causality. Clearly entry standards positively associate with Research Performance and simultaneously over time better research performance allows for even higher entry standards. There is evidence for a cycle here that although virtuous for the individual institution in the top quartile of performance is clearly sub-optimal for the UK HEI sector. The interpretations in the main GLS FE remain strongly valid.

Fraction of International Students (INTS)

The coefficient remains negative in GLS MLE and GLS AR but with significance (at 1% level) in the former and without significance in the latter. However, in the IV regressions signs are positive and insignificant. Reading this together with the non-linearity in the bivariate correlations of this variable with research performance (see Appendix 2) one is forced to conclude a weaker yet largely negative association here. Overall, then, the complex implications inferred in the earlier discussion persist.

Board Size (BSIZE)

A very robust set of results are on display here. The coefficients remain positive, and significance improves across all GLS (from 10% to 1% in GLS MLE and from 10% to 5% in GLS AR) and IV regressions (from 10% to 1% Level) without any change in the original positive sign. In addition, all coefficient magnitudes are higher than in the main FE model except for the GLS AR. Overall then university board size is a strongly positive antecedent of research performance. The theoretical/empirical arguments advanced earlier especially the fact that restrictions on board size do not seem appropriate in the UK HEI sector are robustly confirmed.

Female Staff Fraction (FSF)

Both the GLS MLE and the GLS AR confirm the main fixed effects model in terms of a significant and negative association here (1% level). But the IV stage wise regressions display positive and significant coefficients (at 10% level in 2SLS). This rather mixed result seems to fit with the bivariate correlations in this variable. Overall, then one could argue that the sensitivity result weakly confirms the ‘systematic discrimination against women’ argument in UK HEI research. Arguably universities should take steps to employ more female staff although this must not come at the expense of aptitude-skill-talent considerations in the recruitment process. There is an optimality in this process of calibrating the governance of staff level gender diversity and this should not be lost sight of.

Teaching & Research Staff Fraction (TRST)

The variable remains insignificant across all GLS and IV regressions. It displays no change in sign across the GLS MLE, GLS AR and IV2SLS but changes sign to positive in the IV2SGMM. In totality then the implications derived in the main fixed effect model seem appropriate and fully explanatory.

Unique Governance Committee (GCOM)

The coefficients here show a neat pattern of increasing magnitudes without sign changes or insignificances in all the GLS and IV regressions. Overall, then, there is no change to theoretical/empirical findings here. Universities that merely institute a special governance committee only add red-tape. Therefore, they have almost no impact on research performance.

Student-Staff Ratio (SSR)

A complex pattern emerges in this variable. While GLS MLE coefficient is insignificant the GLS AR display significant negative coefficient. On the other hand, the IV2SLS and IV2SGMM show significant positive coefficients. The true association of SSR is difficult to determine. But in Chapter 3 previous empirical work (Johnson, 2010; Kennedy & Siegfried, 1979; Zietz & Cochran, 1997; Lopus & Maxwell, 1995) has been shown to underline many methodological problems with this variable. Scholars have found that SSR associations often display different signs of association based on the methods chosen even within one sample. Therefore, such an ambiguous result here is not entirely surprising.

Lay board member fractions (IGOV)

The coefficients become significant in GLS AR (at 10% level) and the two IV regressions (at 5% level in 2SLS and at 1% level in GMM). However, the signs change to negative in GLS MLE and GLS AR, while they remain positive in the last two IV regressions. This mixed nature of results here seems to reflect the complex non-linearity already spotted in this variable in the bivariate correlations. Overall then, the evidence seems to suggest that UK universities should not just adhere to a blind policy of employing 50% or more externals as most of them currently do (see Chapter 5, table 6). Instead they should pay

close attention to the experience/resource credentials of external board members before they co-opt them.

Cash To Total Assets (CTA)

The coefficients show a neat pattern staying significant (except GLS AR at 15%) and increasing in magnitudes without any change in the negative sign. The earlier theoretical/empirical arguments stand robustly confirmed. Overall then holding too much cash on the balance sheet detracts from university research performance.

TST (Log Total Staff)

The size control remains robustly positive in both the additional GLS (MLE and AR) regressions confirming our earlier interpretation.

Region, Year & Pre-1992 (REGION, YEAR & PRE1992)

REGION coefficient although omitted in the main GLSFE regression shows a robust negative sign across GLS MLE GLS AR, IV2SLS, IV 2GMM and panel OLS. As anticipated in various normative theories linking university governance with regional culture (Zhou et al., 2008; Brown & Carasso, 2013; Bachan, 2017), this UK sample exhibits significant negative differences in research performance across the different regions i.e. Wales, England, Scotland and North Ireland. In other words there is clear evidence of a worrying drop in research performance across the decade 2005 to 2015 in this sample as one moves northward or westward from the base English region. Similarly, with YEAR the results also highlight a drop in UK university research performance across the decade 2005 to 2015 as suggested by Shattock (2013), Middlehurst (2013), Ntim et al. (2017) and several others. This can be inferred clearly in the negative sign of the coefficient in the panel OLS result. The university age control of Pre-1992 although omitted due to collinearity in the main GLS FE model displays a strong positive coefficient in the GLS MLE, GLS AR and panel OLS. Overall there is evidence that older and earlier established universities in this sample outperform newer peers at research.

6.1.2 Research Quality (RQ) Model

6.1.2.1 GLS Fixed-Effects Model

The table 19 below shows the status of the eleven hypotheses based on the results from the GLS fixed-effects regressions with robust standard errors using eleven different internal governance variables and three different control variables. The dependent variable is Research Quality (RQ). Note that although this is a constituent of RPI it is a variable that captures the quality of the research publications actually delivered by UK universities. The independent governances still span the theoretical/empirical field of investigation. But some variables here are as in the previous model while others are unique. However, like the RPI model, this too, represents one of the most parsimonious combination of explanations achievable in the sample.

Table 18: Model 2 all regressions with robust standard errors for dependent variable Research Quality (RQ)

Independent Variables	GLS FE	GLS MLE	GLS AR	IV 2SLS	IV GMM	Panel OLS Model
(Model)	(1)	(2)	(3)	(4)	(5)	(6)
<i>Governance Variables:</i>						
ES	-0.073(.084)	0.422(.088)***	0.471(.055)***	2.159(.219)***	2.230(.224)***	0.881(.048)***
BIG4A	1.378(1.534)	1.714(1.166)	1.608(1.123)	-1.043(1.353)	-1.111(1.389)	1.873(.799)**
BSIZE	6.400(3.821)*	7.599(1.997)***	4.298(1.892)**	7.446(3.516)**	6.623(3.605)*	9.971(2.261)***
FSF	-90.104(22.074)***	-121.208(13.852)***	-71.540(11.587)***	-42.011(11.957)***	-36.732(12.190)***	-43.510(6.619)***
BGDIV	-2.544(4.672)	-4.903(3.738)	-0.761(3.318)	-2.922(5.730)	-3.248(5.871)	9.339(3.926)**
VCPAY	0.242(2.459)	-4.201(2.124)***	-1.560(1.644)	-15.396(3.053)***	-16.000(3.122)***	-4.977(2.135)**
ENDWTA	-33.280(19.349)*	24.534(10.732)**	37.253(8.635)***	3.330(9.772)	3.466(10.092)	26.757(5.040)***
PGINT	99.782(46.112)**	174.625(25.798)***	126.911(23.441)***	16.290(40.015)	5.887(41.246)	103.630(15.226)***
PGINT ₂	-172.097(84.887)**	-288.230(43.750)***	-203.954(38.874)***	-11.247(63.507)	4.634(65.507)	-175.398(24.972)***
PTTSR	-11.419(5.775)**	-8.013(4.518)*	0.938(3.734)	19.226(3.963)***	18.768(4.056)***	13.787(2.972)**
TFEE	-9.788(4.802)**	-26.070(3.183)***	-36.831(3.501)***	-13.963(6.088)**	-12.073(6.226)*	-6.859(3.604)*
SFSPEND	-0.006(.001)***	-0.008(.001)***	-0.004(.001)***	-0.014(.002)***	-0.015(.002)***	0.003(.000)***
<i>Controls Variables:</i>						
TI	-29.120(3.452)***	-6.591(1.985)***	-1.112(1.274)	-	-	1.886(.765)**
PRE1992	-	22.776(4.255)***	18.198(2.335)***	-	-	12.298(1.177)***
REGION	-	-6.578(1.719)***	-5.554(1.157)***	-3.969(.847)***	-3.984(.871)***	-3.665(.627)***
YEAR	-	-	-	-	-	-3.090(.220)***
CODE	-	-	-	-	-	0.039(.011)***
Constant	411.119(44.521)***	171.053(30.757)***	60.945(22.931)***	117.909(37.691)***	123.374(38.617)***	6197.516(433.996)***
Number of Obs	883	883	883	883	883	883
F-Value	42.13	-	-	-	-	471.67
R ₂	0.1821	-	0.8145	0.7371	0.7236	0.8819
Wald Chi2	-	-	1130.55	2777.29	2599.36	-
LR Chi	-	-	-	-	-	-
rho	.97957706	0.7908521	-	-	-	-
Autocorrelation coef (y _{t-1})	-	-	0.73898638	-	-	-
Theta median	-	-	0.3570	-	-	-
Instrumented	-	-	-	ES	ES	-
Instruments	-	-	-	TI; Pre1992	TI; Pre1992	-
Estat overid score chi2(1) p	-	-	-	8.22837(p=0.0041)	-	-
Sargan chi2	-	-	-	7.96617(p=0.0048)	-	-
Basmann chi2	-	-	-	7.90214(p=0.0049)	-	-
Score chi2	-	-	-	8.22837(p=0.0041)	-	-
Hansen's J chi2	-	-	-	-	8.22837(p=0.0041)	-

Notes: The table reports all regressions with robust standard errors. Regressions defined as follows: Generalised least square fixed-effects (GLS Fixed-Effects); generalised least square maximum likelihood estimation (GLS Maximum Likelihood); generalised least square auto-regression (GLS AR); instrumental variable two-stage least squares (IV 2SLS); instrumental variable two-stage; instrumental variable generalized method of moments (IV GMM); panel ordinary least square model (Panel OLS Model). Variables are defined as follows: entry standards (ES); if HEI is audited by a big four auditor (BIG4A); governing board size (GBSIZE); female staff fraction (FSF); board gender diversity (BGDIV); vice-chancellor emolument (VCPAY); endowment to total asset (ENDWTA); postgraduate intensity (PGINT); part-time to total staff ratio (PTTSR); tuition fee fraction (TFEE); service and facility spend per student (SFSPEND); total income (TI); pre-1992 (PRE1992); region (REGION); year (YEAR); and code (CODE). *, **, *** indicate significance at 10, 5, and 1 per cent levels, respectively.

RQ seems to be a positive function of BIG4A (insig), BSIZE (sig.), VCPAY (insig) and PGINT (sig.), but a negative function of ES (insig), FSF (sig.), BGDIV (insig), ENDWTA (sig.), PGINT₂ (sig.), PTTSR (sig.), TFEE (sig.), SFSPEND (sig.) and TI (sig.).

Table 19: Summary of the Findings and Hypothesis of Governance and Research Quality (RQ)

Dependent Variable	Research Quality (RQ)				
<i>Independent Variable:</i>	No. Hyp.	Predicted sign	Finding sign	Finding sig.	Hyp. Status
<i>Governance Variables:</i>					
Entry Standard (ES)	H1a	+	-	Insig.	Rejt.
Big-4 Auditor (BIG4A)	H6o	+	+	Insig.	Rejt.
Board Size (BSIZE)	H6a	+	+	Sig. (10%)	Acep.
Female Staff Fraction (FSF)	H3j	+	-	Sig. (1%)	Rejt.
Board Gender Diversity (BGDIV)	H6c	+	-	Insig.	Rejt.
Vice-Chancellor Pay (VCPAY)	H6p	+	+	Insig.	Rejt.
Endowment to Total Assets (ENDWTA)	H5f	+	-	Sig. (10%)	Rejt.
Postgraduate Intensity (PGINT)	H4c	+	+	Sig. (5%)	Acep.
Part-time to Full-time Staff (PTTSR)	H3g	-	-	Sig. (5%)	Acep.
Tuition Fee Fraction (TFEE)	H5a	-	-	Sig. (5%)	Acep.
Service and Facility Spend per Student (SFSPEND)	H5c	+	-	Sig. (1%)	Rejt.

Notes: Hypothesised relationships are discussed in Chapter 3. Acep and Rejt denote accepting and rejecting hypothesised relationships, respectively.

Entry Standards (ES)

Entry Standards now displays a negative association although one that is insignificant. This contradicts the signs of association in the earlier RPI model. The fact that this negative impact is not significant and could well be zero raises doubts about sub-hypothesis (H1a). It is hard to interpret this result. One way to interpret this result is to pay attention to the exact dependent variable in this regression. It is the published research quality of the university. This means that at least some universities in the sample that do not stipulate very high entry standards still perform equally well in the quality of their published output. For the first time then a slightly less skewed picture emerges. The elite and exclusive nature of UK HEI research is now arguably being challenged albeit weakly (Jerrim & Vignoles, 2015).

BIG 4 External Audit (BIG4A)

Although the sign on this variable is positive the coefficient is insignificant. Sub-hypothesis (H6o) is rejected. Just because a university contracts to get its processes, systems and finances audited by a BIG4 audit firm it does not necessarily produce better research. This seems intuitive. Good research is an artefact of a sound system of idea generation, debate and refinement rooted in the teaching learning regimes (TLRs) evolved by a university over decades (Trowler, 2008, 2019; Trowler & Cooper, 2002; Gayle et al., 2003). Therefore, it is to be anticipated that merely ensuring transparent objective external audit will not change these longstanding research processes. Yet this is not to suggest that this lack of direct association implies that reputed external audit may not actually improve the teaching and learning ambience in the university. It could do this by for instance 'lending a halo of legitimacy' to the university and thus improving the research atmosphere (Deegan, 2004; Davis et al., 1997; Saltman et al., 2000; Marginson & Considine, 2000; Swansson, Mow & Bartos, 2004; Suchman, 1995). From another angle it could also check managerial hubris improve stakeholder representation and reduce manager-academic conflicts (Freeman et al., 2004; Hybels, 1995; Tilling, 2004; Kesner & Johnson, 1990; Lorsch & MacIver, 1989; Pfeffer & Salancik, 2003; Bebhuk et al., 2002; Van Essen et al., 2015; Kalyta & Magnan, 2008). Yet this result does not corroborate any of these theoretical predictions. Empirically Ntim et al. (2017) and Gordon et al. (2002) too find that BIG4 audit does improve university voluntary disclosure. In corporate studies a positive association is confirmed by Chen et al. (2013) between BIG4 audits and firm performance

Board Size (BSIZE)

Board size and its positive impact (at 10% level) on research quality further confirms and corroborates hypothesis (H6a) It is in line with model 1 above. Larger board sizes seem to improve the research quality of published output of these UK universities. The theoretical expectations and interpretations alluded to in model 1 apply here too. But specifically the results here seem to strongly suggest that the resource networks and experience diversities of larger boards seem to provide better strategic direction to the research scholarship within a university. This is to be expected in a complex knowledge institution such as a university where the research function is original creative and ideational (Fowles, 2013; Pfeffer &

salancik, 2003; Marginson, 2006). Every new board member added brings to bear fresh alternative perspectives and this enriches the idea generation and modification process inherent to research. This is what is generally confirmed in earlier empirical work here, notably, Olson (2000). It can be inferred that this is what is resulting in the higher research quality of the published output of such institutions.

Board Gender Diversity (BGDIV)

Gender diversity at the board level displays a negative association but without significance. Sub-hypothesis (H6c) is rejected. Therefore on the one hand the association predictions of Public Accountability, Legitimacy, Resource Dependence, Stakeholder and Stewardship (Coy et al., 2011; De Villiers and Van Staden, 2006; Verbruggen et al., 2011; Mitchell et al., 1997; Pfeffer, 1987; Mitchell et al., 1997; Donaldson & Davis, 1991) that inclusivity and gender balance on the board improve research integrity and value remain unsupported here. But on the other the result also does not support the contentions of Managerial power and Optimal Contracting theorists (Williamson. 2000; 2005; Chizema & Buck, 2006; Jacobson & Andreosso-O'Callaghan, 1996) who call for homogenous single gender boards because they avoid conflicts and analysis-paralysis . There seems very little evidence in this UK sample for the “unconscious bias” arguments (Santos & Van Phu, 2019; David, 2017; Moss-Racusin et al., 2012; Prena, 2005) rife in the governance literature. This result is also at odds with the earlier corporate governance (Carter et al., 2003; Van der Walt & Ingley, 2003; Mahadeo et al., 2012; Ntim, 2015) and university governance (Harris, 2014; Olson, 2000) research that have found evidence for a positive association.

Endowment to Total Assets (ENDWTA)

The negative and significant association (at 10% level) of this coefficient in the main GLS FE model rejects sub-hypothesis (H5f). High quality university research in this sample seems to come from institutions that have distinctly lower proportions of endowment. Universities with larger endowment resources do not necessarily forge an independent research strategy (Hillman & Dalziel, 2003; Borgatti & Foster, 2003; Bouwman, 2011). As predicted by resource dependence. But the negative association here seems to support public accountability (coy et al., 2001; Butt, 2019l Parker, 2012) concerns that high

ENDWTA will mean over alignment with corporate research interests and thus reduce the independence and integrity of the research function. It also seems to support the legitimacy prediction that an endowment rich university will only legitimate itself to donors and in the process lose its legitimacy in the wider academic research community (Asforth & Gibbs, 1990; Dowling & Pfeffer, 1975). Earlier empirical work has indicated that larger older and research-intensive universities in the UK tend to have the largest endowments (Boliver, 2015; Fazackerley, 2013).

Postgraduate Intensity (PGINT)

The proportion of postgraduate students at a university as expected is positively correlated with Research Quality. Thus sub-hypothesis (H4c) is confirmed. Universities that specialize in postgraduate courses create and facilitate the right research ambience in their various departments. A mission-based ethos is inculcated in the institution as suggested by Culture/Quality Assurance theorists (Gayle et al., 2002; Trowler, 2008; Alvesson, 2002; Brown, 2004, 2009; Salter & Tapper, 2000; Cremonini et al., 2015; Wilmott, 1993), Public accountability (Coy et al., 2011; Vidovich & Slee, 2001) theorists and other governance scholars (Tarbert et al., 2008; Bachan & Reilly, 2015). This also seems to drive the institution to invest in the resources appropriate to high quality research as argued by Resource Dependence (Flowes, 2014; Pfeffer & Salancik, 2003; Callen et al., 2010; Verbruggen et al., 2011; Donaldson & McNicholas, 2004, p.349; Angell et al., 2008; Smith et al., 2010). This is what seems to be showing up in the higher quality published research of such institutions. Earlier empirical research has not directly associated this variable with university academic performance although there are many normative and argumentative voices (Donaldson & McNicholas, 2004; Sturt et al., 2008) that opine that higher levels of postgraduate students will improve academic performance.

Postgraduate Intensity (PGINT)²

For the first time in the results there is clear evidence in this research quality model of a quadratic non-linear effect that is significant. Obviously the negative quadratic coefficient here must be read in conjunction with the positive linear term coefficient above. PGINT does not display a simple linear association. There is an important trade-off here. Just

increasing post graduate student intake indiscriminately may harm the research quality of the institution. Resource dependence arguments (Pfeffer, 1987; Fowles, 2014) that too many postgraduate students exert heavy resource burdens on the university that might interfere with the integrity of the research function do find some support here. Such a finding also lends some support to the critics (Collini, 2005; Collis, 2004; Rowlands, 2012; Middlehurst, 2013; Parker, 2011) of the increasingly marketized student market in UK HEI who argue against excessive post graduate student places at recent universities. Perhaps in many of these recent universities the number of such students far exceeds the instruction/interaction limits imposed by existing staff and other resource facilities. This may be what is showing up in the evidence here as a complex linear positive non-linear negative combined impact.

Part-time to Total Staff Ratio (PTTSR)

There is a negative and significant association (at 5% level) between this variable and Research Quality. This fits with its sign in the bivariate correlations. The main GLS FE model thus confirms sub-hypothesis (H3g). There is undoubtedly significant merit in Quality Assurance tenets (Brown, 2004, 2009; Filippakou & Tapper, 2008; Rowley, 1996; Angell et al., 2008; Eurydice, 2010, pg. 24; Brown & Carasso, 2013, pg. 144-163; Attwood, 2008b; Yorke, 2009a, b; Allen, 2011; Jack, 2008; Palfreyman, 2010; Coughlan, 2015) that normatively argue that ad-hoc contractual arrangements destroy the quality of academic work.

Services & Facilities Spend (SFSPEND)

The proportion of a university's spending on academic facilities/services shows a negative and significant association (at 1% level) with Research Quality. This contradicts sub-hypothesis (H5c). The result does not support either the arguments of neo-classical/optimal contracting (Price et al., 2003; Williamson, 2000; 2005; Chizema & Buck, 2006; Rosen, 1990) that expect an optimal academic environment due to facility spending or a better husbanding of resources leading to better research (Nelson et al., 2002) theories. UK universities that spend larger fractions on library, computing and other knowledge facilitating assets in this sample do not seem to improve the quality of their published output a rather counter-intuitive finding. The finding also contradicts extant empirical

research (Earthman, 2002; Ganyaupfyu, 2013; Mushtaq & Khan, 2012; Kirmani & Siddiquah, 2008; Karemera et al., 2003; Young, 1999) that finds a positive impact on university performance especially with regard to teaching.

Female Staff Fraction (FSF)

In line with model 1 results and its bivariate correlations this variable displays a negative and significant association with Research Quality. This, thus rejects sub-hypothesis (H3j). Once again the variable contradicts our ex-ante expectation. Staff level diversity unlike its board level counterpart shows a significant and negative association. It clearly seems to reduce the quality of research output of UK universities. This contradicts several voices in the policy and normative literature (Collini, 2005; 2008; Trowler, 2008; Ritzer, 2002; Ntim et al., 2017; Bryson, 2004) that suggest that gender balance and inclusivity should improve research performance and quality. It also does not lend any support to the theoretical arguments of public accountability resource dependence Legitimacy and Stakeholder (Coy et al., 2001; Pfeffer & Salancik, 2003; Suchman, 1995; Ashforth & Gibbs, 1990; Ullman, 1985; Roberts, 1992; Mitchell et al., 1997) all of which argue for a richer research ambience stemming from tighter gender balance among research staff. In this sample unmistakably higher levels of female staff simply reduce the quality of the published output of a university. Although empirical scholarship does not have any direct results to validate/contradict the result, many studies here highlight how female staff contributions are generally undervalued in the published research of the university (Wenneras, 1997; Witteman, 2019; Budden et al., 2008; Helmer et al., 2017).

Vice Chancellor Pay (VCPAY)

This variable displays a positive association with Research Quality but the coefficient is insignificant. Sub- hypothesis (H6p) is rejected. Therefore One is unable to fully reject Public accountability and Legitimacy arguments (Clarke & Gibson-Sweet, 1999; Melis et al., 2015; Reverte, 2009) that top research universities hold down the pay of their chief executives in order to meet critical public scrutiny and moral legitimacy concerns. After all unlike CEOs of firms Vice Chancellors are public servants and so cannot and must not

be paid liberally like their corporate counterparts. Simultaneously this insignificance suggests that even the monopsony arguments of Optimal contracting (Raff & Summers, 1987; Banker et al., 1996; MacLeod & Malcomson, 1998; Tarbert et al., 2008) are not completely without merit. High research quality UK universities are specialist employers and VCs are in many ways dependent upon them for their jobs. Therefore, such institutions are able to drive a hard bargain and negotiate down the salary of their VCs.

This finding is in stark contrast to the CEO pay literature in corporate governance where many studies (Murphy, 1999; Jensen & Murphy, 1990; Joskow & Rose, 1994; Kaplan, 1994; Boschen & Smith, 1995; Hallock, 1998; Hall & Liebman, 1998; Unite et al., 2008) document the positive association between firm performance and CEO salaries. This unique sample finding is amply supported in a growing VC pay empirical literature (Bachan & Reilly, 2015; Tarbert et al., 2008). These scholars document that UK universities do underpay their VCs in relation to comparable CEOs and suggest that this is due to the legitimacy/public accountability concerns as well as the monopsony arguments alluded to earlier.

Tuition Fee Fraction (TFEE)

TFEE i.e. the fraction of a university's total income that is derived from student fees, negatively associates with Research Quality. Sub-hypothesis (H5a) is confirmed. Theoretical arguments of Instrumental versions of Stakeholder theory (Freeman, 2010; 1999; Wise et al., 2020; Mitchell et al., 1997; Heller, 1997; 1999; Peter & Waterman, 1982; Handy, 1993; Gayle et al., 2003; Gunasekera & Reed, 2008; Gomes & Novaes, 2005) seem to be supported here. Universities that derive large fractions of their incomes from student fees prioritize internal governances that facilitate teaching and student learning. Consequently, research governances and processes are neglected. This is what shows up in reduced Research Quality. Legitimacy and Resource dependence too predict such a result. After all a university that is highly dependent on fee paying students would focus on legitimating itself to these important constituents as a priority (Fowles, 2014; Pfeffer and Salancik, 2003; Mangan et al., 2010a, b; Sutton Trust, 2004). It would therefore marshal internal resources towards teaching and its facilitation. Research would definitely be

downplayed and this is what is evident in the sample. Similarly, the large resources derived from student fees would impel internal governors to prioritize student learning and facilitation (Molesworth et al., 2012, Wellman et al., 2009; Flowes, 2014; Jabbar et al., 2017; Nixon et al., 2016; Jarvis, 2014). Empirical studies (Dunnett et al., 2012; dao & Thrope, 2015; Migin et al., 2015) generally find evidence supporting a positive association between tuition fees and teaching facility spending by UK universities and thus seem to suggest a de-emphasis of the research function.

Total Income (TI)

The size control based on the total incomes of the university shows a robust negative association with research quality . This seems to suggest that universities with lower incomes outperform their higher income earning peers at published research an unexpected finding. While this is hard to explain it does seem to lend some support to voices in the argumentative literature that call to question the real contribution of large well established universities to true knowledge creation (Collini, 2012; Boliver, 2013).

6.1.2.2 Sensitivity Analysis

As in the previous model a set of five additional regressions are implemented here to address heteroscedasticity, abnormal distributional concerns, multi-collinearity, autocorrelation and endogeneity. The same empirical and methodological justifications apply here too as discussed there (please see all relevant tests in appendix 2, 3, 4, 5 and 6 for this model).

Entry Standards (ES)

A complex result emerges in this variable. The insignificant and negative association in the main GLS FE model is contradicted by the GLS MLE and GLS AR and both IV (2SLS and GMM) all of which display positive significant associations at 1% level. In totality the result expands and enriches the issue. Research Quality i.e. the quality of the published output of a university unlike its overall research performance (RPI) seems less positively aligned with the selectivity in its recruitment standards (ES). This is the first sign of

evidence in this UK sample that there definitely are some universities that outperform at least in published research quality without imposing stiff selectivity barriers in student recruitment. Public Accountability and legitimacy theorists (Schwartz, 2004; Higgs & Forster, 2009; Boliver, 2013; 2011; Zimdars, 2010; Jones & Thomas, 2005; Harrison, 2011) who warn against an elitist selectivity approach in HEI obtain some support from these findings. Simultaneously the dangers of applying a straightjacket neo-classical and neo-managerial (Murdoch, 2011; Molesworth et al., 2012; Van Vught, 2008; Marginson, 2004, 2002; Trowler, 2008; Brown, 2010; Meyer, 2002; Biggs, 2003) perspective to universities is richly supported by this complex result. Clearly, not all high quality published research output is necessarily derived from elite scholars with privileged academic and social backgrounds. Transformation of the research skills and output of incoming students continues to be an important university function and here is some, albeit weak proof, that it does work and produces equally valid research.

BIG4A

All the GLS coefficients here lose significances/magnitudes but do not change their positive sign. However, in the IV regressions without significance the coefficient switches to negative with a reduced magnitude. Ambiguity is then the primary theme in this variable and its impact on Research Quality. Overall, then, there is far weaker evidence in this model that audits by reputed external auditors necessarily improve the quality of research of any given UK HEI.

Board Size (BSIZE)

As in model 1, the positive sign on this coefficient remains unchanged across all GLS and two IV regressions. However, there are drops in magnitude across all regressions here. GLS MLE coefficients remain as significant i.e. at 1%. GLS AR and IV2SLS drop to 5% significance whereas GLS FE and IV 2GMM drop to 10% significance respectively. Regardless, however, the overall conclusion of the GLS remains robust. Larger boards are a significant positive influence on Research Quality in this sample. Overall, then, there is no empirical evidence to support board size restrictions emphasized by regulators in the UK HEI sector.

Board Gender Diversity (BGDIV)

All the GLS and IV coefficients remain negative but lose significance. Overall, there is no need to modify the interpretations derived from the main GLS FE. The influence of this variable seems fairly weak and ambiguous. Apart from the low levels of this ratio itself (never exceeding 34% on average (mean/median) in any year; see univariate statistics Table 6) already mentioned above it must be noted that there are relatively larger numbers of missing values (1,111 observations i.e. 30.3%) in this variable in the sample. This could be at the base of the weak statistical significances in the additional GLS and IV regressions here.

Endowment to Total Assets (ENDWTA)

The negative sign on this coefficient in the main GLS FE switches to positive with significance in GLS MLE (5%), GLS AR (1%) and without significance in the IV regressions. This strongly suggests that the original interpretation that ENDWTA should be treated with caution is completely valid. While the main FE model shows a negative association this must not be taken completely at face value. There are contrarian indications within this sample especially when accounting for abnormalities, autocorrelations and endogeneities. In many ways this fits within the narrative of ‘no straight-jacket’ and cautious calibration of this variable as already suggested above.

Post Graduate Intensity (PGINT) & PGINT²

The pattern of sensitivities in respect of the linear and non-linear terms here are remarkably similar and so it makes sense to discuss both together. All the GLS coefficients display similar signs and significances in both GLS MLE (1% significance) and GLS AR (1% significance) as in the main model. However, both the IV coefficients lose significance/magnitudes although they do not change signs. On the whole this is a robust result. Heteroskedasticity, abnormality and auto-correlations in the data sample do not change the main mixed linear positive and non-linear negative impact of this new hitherto untested internal university governance.

In this robustness one can infer some process-like and culturally moderated characteristics of this variable (Chou & Gornitzka, 2014; Chou et al., 2017; Eitken, 2015; Peters, 2015; Gayle et al., 2003; Entwistle, 2007; Trowler, 2008). Levels of post graduate students impel universities to change other related governance priorities such as student facilities, subject mix, staffing, research culture & ethos and so on. It is due to these processes that the research quality at the institution would ultimately improve. Yet these linked processes are neither assured nor certain. The sample result here and its robust twin directional associations seems to be suggesting this complex chain of processes that need to work. A UK university wishing to climb up the research quality chart would need to carefully think through the proportion of post graduate courses/places it should offer in the HEI quasi-market. Blindly aping its peers could seriously harm it especially in the long run due to the various process linkages. University Governors would do well to take a comprehensive balanced view of all internal governances before taking a calibrated decision here.

Part time to Total Staff Ratio (PTTSR)

GLS MLE coefficient retains the negative sign (at 10% level) while GLS AR changes sign to positive and insignificance. It is only in the IV 2SLS and IV 2GMM that the coefficient switches to a positive and significant association (at 1% level). A mixed and ambiguous picture of the association of this variable with Research Quality now emerges. Use of Part time staff is not necessarily all negative in its implications. There are some signs that stewardship and optimal contracting scholars (Williamson, 2000; 2005; Chizema & Buck, 2006; Rosen, 1990) may not be completely wrong in their contentions that the part time contract if appropriately designed and implemented might actually introduce elements of accountability and performance amongst all staff. In totality then there is a rich and mixed pattern in this variable unlike TRST in model 1. The trade-offs already mentioned in the use of part time staff seem further emphasized in this. Levels and types of part time staff have significant impacts upon the published research output of the university and there is need for governors to pay close attention to the nature and types of staff they are recruiting here.

Services & Facilities Spend (SFSPEND)

All the GLS and IV coefficients robustly confirm the negative association here. Only the panel OLS regression changes sign to positive with significance. But as discussed before despite its importance as a filtering and explanatory regression one should not rely on it. Therefore, there is no need here to interfere with the narrative developed in the main GLS FE model above.

Female Staff Fraction (FSF)

The coefficients remain negative and significant (at 1% level) in their associations across the five regressions.. This is a robust result and fully confirms the interpretations from the main GLS FE model above. Staff level gender diversity needs a sensible governance approach. At one level employing female staff must be on merits and should not just be for the sake of improving gender diversity compliance targets. At another level there is a clear need to expand and strengthen training and skilling inputs aimed at female research staff to address any long standing skill gaps in their academic repertoire.

Vice Chancellor Pay (VCPAY)

All GLS IV and panel OLS regression coefficients change their signs uniformly to negative and are significant except for the GLS Auto-regression. Unlike the fixed effects model where there was ambiguity about the sign of the association as the coefficient was insignificant there seems to be some evidence now in the full suite of regressions of a negative association between VC PAY and research quality. One is unable to fully reject Public accountability and Legitimacy arguments (Clarke & Gibson-Sweet, 1999; Melis et al., 2015; Reverte, 2009) that top research universities hold down the pay of their chief executives in order to meet critical public scrutiny and moral legitimacy concerns. After all unlike CEOs of firms Vice Chancellors are public servants and so cannot and must not be paid liberally like their corporate counterparts. Simultaneously this mixed sensitivity shows some evidence of the monopsony arguments of Optimal contracting (Raff & Summers, 1987; Banker et al., 1996; MacLeod & Malcomson, 1998; Tarbert et al., 2008). High quality research universities are specialist employers and VCs are in many ways

dependent upon them for their jobs. Therefore such institutions are able to drive a hard bargain and negotiate down the salary of their VCs.

This finding is in stark contrast to the CEO pay literature in corporate governance where many studies (Murphy, 1999; Jensen & Murphy, 1990; Joskow & Rose, 1994; Kaplan; 1994; Boschen & Smith, 1995; Hallock, 1998; Hall & Liebman, 1998; Unite et al., 2008) document the positive association between firm performance and CEO salaries. VC pay has a different and weakly negative association with the performance indicator of research quality. This unique sample finding is amply supported in a growing VC pay empirical literature (Bachan & Reilly, 2015; Tarbert et al., 2008). These scholars document that UK universities do underpay their VCs in relation to comparable CEOs and suggest that this is due to the legitimacy/public accountability concerns as well as the monopsony arguments alluded to earlier.

A final note of caution here seems to be in order. The sample evidence can be interpreted to mean that high quality UK research universities perversely underpay their VCs while their poorer quality peers overpay them. One could argue that in general the latter i.e. the poor research quality performers chase “star rated” VCs in a bid to improve their legitimacy and gain resources/networks. This is not a sustainable strategy for these institutions in the long run. Regulatory guidelines about how universities should pay their Vice Chancellors seem to be in order.

Tuition Fee Fraction (TFEE)

All GLS IV and panel OLS coefficients remain robustly negative at 1 % level in GLS MLE and GLS AR. The significance drops back again in the IV 2SLS to 5% and 10% in IV GMM. There is also a rise in magnitudes across all 5 regressions although significances weaken in some. Overall then the distinctive sample findings in respect of this variable and the complex trade-offs alluded to in the main model remain strongly relevant.

TI (Log Total Income)

The size control of TI remains robustly negative in all GLS regressions and therefore our earlier narrative remains valid here.

Pre-1992 (PRE1992)

This university mission based control remains robustly positive in both the additional GLS regressions and the panel OLS underlining that across this sample older established universities produce higher quality research, an anticipated result.

Region & Year (REGION & YEAR)

Just like in model 1 above both these variables display a significant negative coefficient. University Research Quality has been secularly declining across the decade. Scottish, Welsh and Northern Irish universities are clearly lower in research quality than their English peers. Region does not change sign in all the sensitivities, whether GLS MLE, GLS AR, Panel OLS or IV 2SLS and IV GMM regressions, coefficients remain significant at 1%, and negative. Clearly the negative regional effect persists in research quality, just as in RPI. Elsewhere, from the panel OLS coefficient, the worrying trend of decline in research quality across the decade is obvious, although this result is based on panel OLS because the controls get omitted in GLS FE, so this should be interpreted with care.

6.1.3 Research Grant Fraction (RGF) Model

6.1.3.1 GLS Fixed-Effects Model

The table 21 below shows the status of the seven hypotheses based on the results from the main GLS fixed-effects FE regression with robust standard errors using eleven significant and explanatory internal governance variables and three different control variables. The dependent variable is Research Grant fraction (RGF). Just like Research Quality this is a constituent of RPI. But it is a monetary indicator potentially capturing the research funding agencies' independent assessment of the research performance at a given university.. The independent governance still span the theoretical/empirical field of investigation. But some variables here are as in the previous model while others are unique. However, like the RPI and RQ models, this too, represents one of the most parsimonious combination of variables as per the GLS FE achievable in the sample.

Table 20: Model 3 all regressions with robust standard errors for dependent variable Research Grant Fraction (RGF)

Independent Variables	GLS FE	GLS MLE	GLS AR	IV 2SLS	IV GMM	Panel OLS Model
(Model)	(1)	(2)	(3)	(4)	(5)	(6)
<i>Governance Variables:</i>						
BMFS	0.006(.003)**	0.006(.002)***	0.001(.002)	-0.032(006)***	-0.023(.005)***	-0.032(.004)***
BEDIV	-0.017(.010)*	-0.020(.010)*	-0.021(.010)**	0.052 (.021)**	.0114(.017)	-0.033(.012)***
TRST	-0.100(.023)***	-0.127(.012)***	-0.194(.012)***	-0.679(.019)***	-0.669(.019)***	-0.459(.022)***
PTTSR	-0.022(.009)**	-0.031(.008)***	-0.030(.008)***	0.015(.014)	.023(.014)	-0.044(.012)***
TONLY	-0.094(.024)***	-0.119(0.012)***	-0.186(.013)***	-0.650(.019)	-0.655(.019)***	-0.429(.025)***
ENDWTA	0.008(.028)	0.026(.019)	0.074(.020)***	-0.037(.031)	-0.064(.030)**	0.012(.024)
FSF	0.037(.045)	0.023(.020)	-0.011(.022)	0.020(.036)	-0.036(.033)	-0.077(.023)***
<i>Controls Variables:</i>						
TST	0.006(.005)	0.010(.002)***	0.015(.002)***	-	-	0.021(.002)***
RGROUP	-	0.129(0.013)***	0.097(.008)***	-	-	0.020(.005)***
YEAR	-	-	-	-	-	0.001(.000)***
CODE	-	-	-	-	-	0.000(.000)**
Constant	0.114(.037)***	0.088(.020)***	0.137(.022)***	0.691(.021)***	0.702(.020)***	-2.377(.686)***
Number of Obs	1,042	1,042	1,042	1,042	1,042	1,042
F-Value	6.65	-	-	-	-	585.36
R ₂	0.8354	-	0.7977	0.8259	0.8259	0.8900
Wald Chi2	-	-	1264.80	4521.33	5123.11	-
LR Chi	-	-	-	-	-	-
rho	.97701098	0.9460321	-	-	-	-
Autocorrelation coef (y _{t-1})	-	-	0.6430441	-	-	-
Theta median	-	-	0.6639	-	-	-
Instrumented	-	-	-	TRST	TRST	-
Instruments	-	-	-	RGROUP; TST	RGROUP; TST	-
Estat overid score	-	-	-	11.0401 (p = 0.0009)	-	-
chi2(1) p	-	-	-	-	-	-
Sargan chi2	-	-	-	143.656 (p = 0.0000)	-	-
Basman chi2	-	-	-	165.189 (p = 0.0000)	-	-
Score chi2	-	-	-	11.0401 (p = 0.0009)	-	-
Hansen's J chi2	-	-	-	-	11.0401 (p = 0.0009)	-

Notes: The table reports all regressions with robust standard errors. Regressions defined as follows: Generalised least square fixed-effects (GLS Fixed-Effects); generalised least square maximum likelihood estimation (GLS Maximum Likelihood); generalised least square auto-regression (GLS AR); instrumental variable two-stage least squares (IV 2SLS); instrumental variable two-stage; instrumental variable generalized method of moments (IV GMM); panel ordinary least square model (Panel OLS Model). Variables are defined as follows: board meeting frequency (BMFS); board ethnic fraction (BEDIV); teaching and research staff fraction (TRST); part-time to total staff ratio (PTTSR); teaching only staff fraction (TONLY); endowment to total assets (ENDWTA); female staff fraction (FSF); total staff (TST); 278ndogen group university (RGROUP); year (YEAR); and code (CODE). *, **, *** indicate significance at 10, 5, and 1 per cent levels, respectively.

Clearly RGF seems to be a positive function of BMFS (sig.), ENDWTA (insg.), FSF (insig.) and TST (insig.), but a negative function of BEDIV (sig.), TRST (sig.), PTTSR (sig.), TONLY (sig.).

Table 21: Summary of the Findings and Hypothesis of Governance and Research Grant Fraction (RGF)

Dependent Variable	Research Grant Fraction (RGF)				
<i>Independent Variable:</i>	No. Hyp.	Predicted sign	Finding sign	Finding sig.	Hyp. Status
<i>Governance Variables:</i>					
Board Meeting Frequency (BMFS)	H6i	+	+	Sig. (5%)	Acep.
Board Ethnic Diversity (BEDIV)	H6e	+	-	Sig. (1%)	Rejt.
Teaching and Research Staff (TRST)	H3a	-	-	Sig. (1%)	Acep.
Part-time to Total Staff Ratio (PTTSR)	H3g	-	-	Sig. (5%)	Acep.
Teaching Only Staff (TONLY)	H3e	-	-	Sig. (1%)	Acep.
Endowment to Total Assets (ENDWTA)	H5f	+	+	Insig.	Rejt.
Female Staff Fraction (FSF)	H3j	+	+	Insig.	Rejt.

Notes: Hypothesised relationships are discussed in Chapter 3. Acep and Rejt denote accepting and rejecting hypothesised relationships, respectively.

Board Meeting Frequency (BMFS)

Board Meeting frequency is significant at (1% level) and shows a positive association with Research Grant Fraction. This result confirms sub-hypothesis (H6i). In this UK sample there is strong evidence that university boards that meet more often are able to generate significantly higher levels of research grants. The finding lends support to all core theoretical predictions of Public Accountability, Stakeholder Resource Dependence, Stewardship and Legitimacy. Clearly frequent meetings vocalize public purpose better (Donaldson & Preston, 1995; Coy et al., 2001;), allow for value-added interactions among relevant stakeholders (Mitchell., 1997; Roberts, 1992), enable resource rich members to contribute (Pfeffer & Salancik, 2003; Pfeffer, 1987; Reverte, 2009), help the institution spot and correct problems earlier (Vafeas, 1999) and use the halo of board legitimacy more effectively (Sonnenfeld, 2002; Suchman, 1995). Empirically Lokuwaduge (2011) corroborates this result in her Australian university sample although corporate governance studies generally contradict it (Vafeas, 1999; Fich & Shivdasani, 2006)

Board Ethnic Diversity (BEDIV)

Board ethnic diversity as reflected in the numbers of ethnic minorities (Black, Asian and minorities) on the board seems to be a negative influence (At 10% level) on university research grant acquisition. The finding contradicts sub-hypothesis (H6e). The finding seems to be supporting the predictions of optimal contracting and managerial power that suggest that ethnically diverse boards may pull in different directions and create academic policy logjam resulting in poorer research performance (Williamson, 2000; 2005; Chizema & Buck, 2006; Jacobson & Andreosso-O'Callaghan, 1996).

On the other hand it directly contradicts public accountability (Coy et al., 2011) suggestions of ethnic diversity resulting in greater neutrality leading to better research; legitimacy predictions of greater credibility with research grant providers due to ethnic diversity (Suchman, 1995; De Villiers and Van Staden, 2006). ; stakeholder predictions that accommodating diverse stakeholder interests will lead to a balanced focus on research (Roberts, 1992; Mitchell et al., 1997) or resource dependence arguments that ethnically diverse members will bring a better network reach generating more research funds (Pfeffer, 1987; Verbruggen et al., 2011). Empirical work in corporate and university governance generally contradicts this result (Erhardt et al., 2003; Ntim et al., 2015) although at least some policy/argumentative papers (Baranchuk & Dybvig, 2009; Goodstein et al., 1994) suggest that greater diversity may lead to conflict and underperformance.

Teaching and Research Staff (TRST)

The proportion of teaching and research staff employed by a university is strongly negatively correlated with research performance (at 1% level). This result confirms sub-hypothesis (H3a). Resource dependence and Stakeholder concerns (Norton, 2013; Oancea et al., 2010) with the high workloads and motivational drag of such contracts seem to echo in the result. Yet research grant providers do not seem to agree that TRST contracts will improve research function in the university as indicated by public accountability (Bryson & Barnes, 2000a, b; Locke, 2012). Earlier empirical work associating this variable with research performance is almost non-existent but many normative voices Whitchurch, 2016; AUT, 2005; Sikes, 2012; Chalmers, 2010 call for a reevaluation of the omnibus tenure track contract and its place in the university sector.

Part-Time to Total Staff Ratio (PTTSR)

As anticipated by theory especially the culture-quality assurance (CQA) paradigm there is indeed a significant negative impact (at 5% level) between the number of part-time staff a university chooses to employ and its research grant acquisitions. Similarly, Legitimacy and Stakeholder arguments (Suchman, 1995; Freeman, 2010; Wise et al., 2020; Leisyte & Westerhejden, 2014; Stensaker, 2018) that too many part time staff paint a grim picture of the research ambience of a university to students and research grant providers seem to be corroborated. High percentage of part time staff clearly interfere with the ability to attract research grants. Therefore sub-hypothesis (H3g) is confirmed.

Earlier empirical work do not associate this variable directly with research performance but several qualitative surveys and normative voices do raise the demotivational aspects of the part time contract. Staff employed on such contracts neither feel valued nor are able to access the full range of academic resources and hence find themselves unable to contribute to research proposals (Purcell et al., 1999; Allen-Collinson, 2004; Thewlis, 2003; Ackers & Oliver, 2007).

Teaching Only Staff (TONLY)

The negative and statistically significant (at 1% level) coefficient on teaching only staff strongly underlines how universities employing larger fraction of teaching only staff systematically deteriorate their own research grant acquisition. This result confirms sub-hypothesis (H3e). Employing high levels of Tonly staff who have a teaching focus and do not contribute to research naturally do not improve research performance as predicted by Optimal contracting and quality assurance (Ackers & Oliver, 2007; Probert, 2013; Sikes, 2006). Grant providers as instrumental stakeholders see high levels of such staff and assume that the university may face difficulties in completing research projects on time as predicted by resource dependence (Kessner & Johnson, 1990, Pfeffer & Salancik, 2003; Harley, 2002; Oxford, 2008). Earlier empirical studies have not associated TONLY with research performance.

Endowment to Total Assets (ENDWTA)

The coefficient on endowment to total assets suggests an insignificant but positive effect on research grant fraction. Hence we reject sub-hypothesis (H5f). Research performance as assessed

by the grant providers does not positively associate with a university's endowment levels. There is no evidence of resource dependence predictions (Hillman & Dalziel, 2003; Fowles, 2014; Pfeffer & Salancik, 2003) that universities with higher endowments will adopt independent research trajectories and excel in it. Similarly the result does not seem to fit with public accountability or legitimacy arguments of lack of public orientation reducing publically relevant research performance or inordinate vested endowment donor interests creating a corporate bias (Dowling & Pfeffer, 1975; Ashforth & Gibbs, 1990; Van Essen et al., 2015, Butt, 2019). Earlier empirical work has generally flagged the higher endowment levels at older established UK universities (Boliver, 2015) without directly drawing any link with research performance.

Female Staff Fraction (FSF)

Female staff fraction is insignificant in the main GLS FE model but with a positive association. The result is at odds with both research models 1 and 2 above. The sub-hypothesis (H3j) is therefore rejected. It seems that decisions to award research grants are not materially affected by the gender compositions of UK universities. The result is much in line with public accountability and legitimacy arguments (Suchman, 1995; Coy et al., 2001) that strongly argue for gender neutrality in research processes and governances. There seems to be no support for the resource dependence argument that higher female staff levels will attract higher levels of gender and soft subject research grants. The result seems to imply that UK research grants are driven solely by merit, a finding echoed elsewhere within the empirical UK governance literature (Blake & La Valle, 2000; Santos & Van Phu, 2019).

TST (Log Total Staff)

The size control based on the staff size of the institution is insignificant in the main GLS fixed effects model. Therefore we are unable to support the narrative that larger UK universities on the whole perform better at research than their smaller peers (Ntim et al., 2017). This is an anticipated result given that such universities bring to bear their larger resources and networks to their internal governances.

6.1.3.2 Sensitivity test Analysis

Board Meeting Frequency (BMFS)

BMFS remains negative and significant in GLS MLE (at 1%) but loses significance in GLS AR. However, the coefficient changes its sign with significance (at 1%) to negative in both the IV 2SLS and IV 2GMM regressions. There is clearly some element of ambiguity now in the impact of this variable. Not all university boards that meet frequently in this UK sample actually improve research grant acquisition. Some boards despite implementing a regime of increased meetings continue to remain inefficient and ineffective.

Board Ethnic Diversity (BEDIV)

Board ethnic fraction does not change sign and remains significant throughout the GLS regressions at 10% level although the significance level rise to 5% in GLS AR. What is noteworthy is that BEDIV changes sign from negative to positive in the IV 2SLS (5% significance level), but remains positive without significance in IV GMM. This result is complex and ambiguous. It does validate the cautious interpretation advanced in the main GLS FE model above. Board level ethnic diversity needs careful nurturing and support from UK HEI regulators.

Teaching and Research Staff (TRST)

The optimal fraction that a university should employ is arguably one of the most difficult facing both heads of departments and university governors. This is robustly confirmed in all the sensitivities. The negative association between this variable and research grant fraction is robust through all the GLS and IV regressions (at 1% level). The results clearly indicate that universities under pressure to employ more staff on omnibus contracts and submit to union pressures and also to cope with the growing student population are at risk of being overlooked by research grant providers thus hindering their research performance.

Part-Time to Total Staff Ratio (PTTSR)

The variable maintains its negative association with significance in all GLS regressions (at 1% level). In the IV regressions significance is lost but there is a sign reversal. The sensitivities in this

variable largely confirm the main narrative developed above. PTTSR is a variable that universities must employ with careful consideration to their overall staffing policies. It is imperative that HEI regulators frame guidelines and develop best practice to guide universities here.

Teaching Only Staff (TONLY)

The negative and significant result is corroborated in all the GLS and IV 2GMM regressions (at 1% level). Only the IV 2SLS loses significance although the sign of association remains negative. There is no need to interject or modify the interpretation developed in the main GLS FE model developed above.

Endowment to Total Assets (ENDWTA)

The coefficient remains positive in all GLS but is significant only in the GLS AR (at 1%). In the IV 2SLS there is a sign reversal without significance but in IV 2GMM the negative association is significant (at 5%). The sensitivities in this variable although somewhat mixed still support the idea of a weak association. The main result here that ENDWTA levels do not materially influence the research grant sanctioning process of fund providers developed in the main GLS FE seems still largely relevant.

Female Staff Fraction (FSF)

All the GLS and IV coefficients remain insignificant but GLS AR associations turn negative. The sensitivities support most of the rich explanations and arguments already advanced in the main GLS FE model and there seems to be little need to modify them.

Log Total Staff (TST)

A positive association without significance seems to suggest that size of faculty at a given university does not seem to matter in the research fund granting process. One could interpret this finding as yet another indication of the largely neutral merit based research grant sanctioning process in the UK.

Russell Group (RGROUP)

The strongly significant positive coefficient here provides robust evidence that the elite Russell Group of universities outperform peers in respect of research grants. One could read into this result two opposite interpretations. On the one hand this may be proof that these 24 universities produce higher quality research proposals deemed worthy by the grant providers. On the other hand, this could be seen as confirmation of a selection bias by RGF providers against non-elite universities often debated in the policy and argumentative literature (Brown & Carasso, 2013; Boliver, 2015).

YEAR

The strongly positive coefficient is in contrast to the other two dependent variables in research performance i.e. RPI and Research Quality. As anticipated Research Grants have been increasing across this decade in line with trends mapped elsewhere in the normative and qualitative literature (Britain, 2019; Foskett, 2010).

6.2 Teaching Performance Advanced Model

This section implements the same model development approach as in research performance critically discussed earlier, with Teaching Performance.

The same approach is now implemented with Teaching Performance. Therefore, in what follows below two important and robust models relating teaching performance in its many dimensions to internal, board level, teaching, financial governance and controls are primarily discussed. Each model uses a different teaching performance dependent variable namely Teaching Performance Index (TPI) in model 4 and Teaching Grant Fraction (TGF) in model 5 respectively. The choice of these dependents is based on theoretical/empirical indications already discussed earlier in the data descriptive statistics chapter. To recapitulate briefly, Teaching Performance Index (TPI) is a composite index weighting and combining different likely dimensions of teaching performance captured in 4 different variables already critically discussed earlier. In that sense in itself the index is holistic and comprehensive. However, it includes overall student satisfaction scores, which as discussed before, are a biased and subjective assessment of teaching performance. Therefore in order to provide a robust alternative perspective a second dependent variable viz. Teaching Grant Fraction is also used in model 5. TGF measures how much financial support independent teaching grant providers are willing to provide based on their independent assessment of the teaching performance of any given university. Thus combining two different dependents achieves a relatively unbiased and multi-dimensional explanation of university teaching performance.

Before moving on to the main discussions it is important to note here too the results of tests for normality, multicollinearity, heteroscedasticity endogeneity and non-linearity shown in Appendix 2, 3, 4, 5 and 6 . Some variables (dependent & independent) did exhibit abnormal distributions in the two teaching performance models here. This is despite the fact that these variables are invariably scaled i.e. are either fractions or natural logarithms. No winsorization is attempted here to avoid the rich patterns that might be lost with the outlier data points in the sample. Mean levels of VIF across the models do not exceed 5 but the variable of Research Only Staff (RONLY) does exhibit high values here. Durbin–Wu–Hausman (DWH) test was used to detect for endogeneity in both teaching models, and unlike Research Performance, three of the independent variables here

exhibit endogeneity namely, Entry Standards (ES), Tuition Fees (TFEE) and Research Only Staff (RONLY). Breusch-Pagan Test and White Test has been used to test for heteroscedasticity (see Appendix 5).

In what follows these two separate multivariate models of University Teaching performance are critically analysed. Sub-section 6.2.1 is the model with Teaching Performance Index (TPI) as the dependent variable while sub-sections 6.2.2 is the one with Teaching Grant Fraction (RGF) as the dependent variable. The same carefully calibrated selection strategy intended to achieve parsimony and theoretical/empirical span is implemented in each of these models as with Research Performance above.

An eclectic approach is followed in model development. Independent Variables in this data set are entered selectively into each model using three criteria. First the theoretical/empirical justification for the variable itself; Second, how it contributes to extending the span of explanation covering missing dimensions of university governance; and finally the overall parsimony in explanation achieved in the GLS FE as a consequence of its entry (Newman, 1956; Morrison, 1983; Gujarati & Porter, 2009, pg. 42). Due to a range of statistical problems apparent in every model if panel OLS is used (see Appendix 7), it is the GLS (FE) fixed effects results that are treated as the base.

The rationale for such an approach is threefold. First, the multiple dimensions of university governance and performance and the complex trade-offs underlying their associations imply that there is no alternative to the unusually large numbers of dependent (6), independent (25) and control (6) variables in this data set. The theoretical indications from the earlier chapters (Gayle et al., 2003; Alverson, 2002; Vukasovic et al., 2018; Hooghe & Marx, 2003; Piattoni, 2010; Braun, 2008) and the nature of research objectives/gaps identified in the thesis make it vital that all these variables are simultaneously investigated. Without this a core objective of this investigation will remain unanswerable. This has already been mentioned in the empirical chapter and the methodology section therein.

Second, unlike corporate firms several process like characteristics and trade-offs characterize research/teaching/financial performances and the internal governances of a university (Chou &

Gornitzka, 2014; Chou et al., 2017; Eitken, 2015; Peters, 2015; Gayle et al., 2003; Entwistle, 2007; Trowler, 2008). These complexities can only be explicated if different models are extracted from the data set each with its own distinct dependent/independent/control variable combination. In fact, this is one very important facet of the research gap identified in Chapter 3. But here too there is the danger that university level unobserved factors in each model may be at work interfering and moderating these process-like characteristics and trade-offs. This is why each model is primarily estimated and interpreted using the GLS FE.

Finally, this sample data set has important abnormalities. The main appendix shows that many variable distributions fail standard tests of skewness/kurtosis. It is also characterized by elements of multicollinearity, heteroscedasticity and endogeneity. Despite scaling all variables i.e. ensuring that all of them are either fractions or natural logarithms the problem of abnormality persists (see Appendix 3, 4, 5 and 6). Winsorization although an alternative is strictly avoided here in line with the statistical principles enunciated by Draper & Smith (1992) and Damodar & Gujarati, 2009, pg. 497). This is to avoid the clear danger that it might remove the rich explanation of multiple dimensions, trade-offs and process like characteristics of the governance-performance relation emerging from outlier observations in the dataset. But in order to ensure a clear window in the model results that displays and accommodates these data-set abnormalities it is the GLS FE that is used as the prime result in all interpretations.

6.2.1 Teaching Performance Index (TPI) Model

6.2.1.1 GLS Fixed-Effects

The table 23 below shows the status of the eight hypotheses based on the results from the GLS fixed-effects (FE) regressions with robust standard errors using eight different internal governance variables and three different control variables. The dependent variable is Teaching Performance Index (TPI). The independent governance span the theoretical/empirical field of investigation and simultaneously represent one of the most parsimonious combination of explanations achievable in the sample.

Table 22: Model 4 all regressions with robust standard errors for dependent variable Teaching Performance Index (TPI)

Independent Variables	GLS FE	GLS MLE	GLS AR	IV 2SLS	IV 2S GMM	Panel OLS Model
(Model)	(1)	(2)	(3)	(4)	(5)	(6)
<i>Governance Variables:</i>						
ES	0.277(.096)***	0.746(.067)***	0.869(.045)***	1.651(.097)***	1.657(.097)***	1.188(.036)***
SSR	-0.372(.169)**	-0.445(.120)***	-0.396(.124)***	.321(.218)	0.346(.218)	-0.272(.134)**
TFEE	18.730(4.181)***	14.517(2.076)***	14.775(2.473)***	25.222(2.772)***	25.166(2.780)***	13.408(2.660)***
FSF	-5.365(17.151)	15.797(8.382)*	22.540(7.331)***	34.971(5.993)***	35.492(6.003)***	26.855(5.018)***
CTA	-0.968(5.913)	-2.858(3.995)	-0.470(3.990)	-0.388(3.730)	0.469(3.701)	-6.708(3.304)**
BEDIV	1.860(5.772)	-4.694(4.552)	-4.898(4.415)	-4.460(4.809)	-4.611(4.817)	-9.529(4.433)**
BGDIV	2.080(3.304)	1.274(2.762)	-2.403(2.872)	-6.861(2.796)**	-7.055(2.800)**	-6.396(2.608)**
SFSPEND	0.002(.001)*	0.002(.000)***	0.003(.000)***	-0.001(.001)	-0.001(.001)	0.000(.000)
<i>Controls Variables:</i>						
TA	3.354(2.304)	3.160(.781)***	2.508(.672)***	-	-	0.859(.426)**
PRE1992	(omitted collinearity)	8.042(1.743)***	6.616(1.289)***	-	-	3.110(.694)***
REGION	(omitted collinearity)	0.331(.868)	0.130(.678)	0.376(.422)	0.340(.423)	0.736(.483)
YEAR	-	-	-	-	-	0.305(.162)*
CODE	-	-	-	-	-	-0.024(.008)***
Constant	109.639(26.111)***	74.626(9.816)***	72.701(9.154)***	45.756(10.875)***	44.775(10.899)***	-536.552(323.354)*
Number of Obs	849	849	849	849	849	849
F-Value	17.69	-	-	-	-	571.69
R ₂	0.6923	-	0.8624	0.8482	0.8474	0.8784
Wald Chi2	-	-	1584.70	4153.63	4130.49	-
LR Chi	-	495.28	-	-	-	-
rho	0.88431646	0.597(0.057)	-	-	-	-
Autocorrelation coef (y _{t-1})	-	-	0.52309537	-	-	-
Theta median	-	-	0.3536	-	-	-
Instrumented	-	-	-	ES	ES	-
Instruments	-	-	-	TA; Pre1992	TA; Pre1992	-
Estat overid score chi2(1)	-	-	-	3.64378 (p = 0.0563)	-	-
p	-	-	-	-	-	-
Sargan chi2	-	-	-	4.0372 (p = 0.0445)	-	-
Basmann chi2	-	-	-	4.00394 (p = 0.0454)	-	-
Score chi2	-	-	-	3.64378 (p = 0.0563)	-	-
Hansen's J chi2	-	-	-	-	3.64378 (p = 0.0563)	-

Notes: The table reports all regressions with robust standard errors. Regressions defined as follows: Generalised least square fixed-effects (GLS Fixed-Effects); generalised least square maximum likelihood estimation (GLS Maximum Likelihood); generalised least square auto-regression (GLS AR); instrumental variable two-stage least squares (IV 2SLS); instrumental variable two-stage; instrumental variable generalized method of moments (IV 2S GMM); panel ordinary least square model (Panel OLS Model). Variables are defined as follows: entry standards (ES); student staff ratio (SSR); tuition fee fraction (TFEE); female staff fraction (FSF); cash to total assets (CTA); board ethnic diversity fraction (BEDIV); board gender diversity fraction (BGDIV); service and facility spend per student (SFSPEND); total assets (TA); pre-1992 (PRE1992); region (REGION); year (YEAR); and code (CODE). *, **, *** indicate significance at 10, 5, and 1 per cent levels, respectively.

Clearly TPI seems to be a positive function of ES (sig.), TFEE (insg.), BEDIV (insig.), BGDIV (insig.) SFSPEND (sig.) and TA (insig.), but a negative function of SSR (sig.), FSF (insig.) and CTA (insig.).

Table 23: Summary of the Findings and Hypothesis of Teaching Performance Index (TPI)

Dependent Variable	Teaching Performance Index (TPI)					
	<i>Independent Variable:</i>	No. Hyp.	Predicted sign	Finding sign	Finding sig.	Hyp. Status
<i>Governance Variables:</i>						
Entry Standard (ES)	H1b	+	+	Sig. (1%)	Acep.	
Student Staff Ratio (SSR)	H2b	-	-	Sig. (5%)	Acep.	
Tuition Fee Fraction (TFEE)	H5b	+	+	Sig. (1%)	Acep.	
Female Staff Fraction (FSF)	H3k	+	-	Insig.	Rejt.	
Cash to Total Assets (CTA)	H5k	-	-	Insig.	Rejt.	
Board Ethnic Diversity (BEDIV)	H6f	+	+	Insig.	Rejt.	
Board Gender Diversity (BGDIV)	H6c	+	+	Insig.	Rejt.	
Service and Facility Spend per Student (SFSPEND)	H5d	+	+	Sig. (10%)	Acep.	

Notes: Hypothesised relationships are discussed in Chapter 3. Acep and Rejt denote accepting and rejecting hypothesised relationships, respectively.

Entry Standard (ES)

The variable displays a significant positive impact (at 1% level) on TPI. This confirms sub-hypothesis (H1b) Selectivity in entry standards seems an important positive influence on teaching performance in this UK sample. Previous empirical work has largely found a similar positive association between ES and student outcomes, retention rates and proportions of good honours (Johnes & Soo, 2013; Boliver, 2015; Bachan, 2017; Ayoubi & Massoud, 2012). However, there are other voices in the literature who argue that this positive association is also symptomatic of a deep abiding elitism within UK HEI, combined with an abnegation of the academic transformation intended by university teaching (Jerrim & Vignoles, 2015; Furedi, 2004; Anyanwu, 2004; Barron, 2006; Freemam, 2015; Tapper & Palfreyman, 2010; 2012; Waller et al., 2017; Schwartz, 2004; Margison, 2018).

The result seems to substantiate a quality-based linkage between high entry standards and teaching performance (Palfreyman & Tapper 2012; Filippakou, & Tapper, 2008; Brown, 2004). It also seems to lend credence to a resource dependence imperative within university student recruitment

i.e. select students using criteria that only the elite can easily fulfil (Marginson, 2018; Freeman, 2015). There is also the related question of the inordinate salience of important stakeholder parents /students who obviously stand to benefit from such a high ES stance as opposed to their more disadvantaged peers.

Student Staff Ratio (SSR)

The student staff ratio is significantly (at 5% level) and negatively associated with TPI. This aligns with the negative bivariate correlations of the variable and confirms sub-hypothesis (H2b) A university's ability to intelligently calibrate its students to staff ratio is shown here to be a very important negative antecedent of its teaching performance. The normative predictions of a host of governance scholars including Shattock (2013), Taylor, (2013a), (2013b), Knight (2002), Trakman (2008), Melville-Ross (2010) and Hordern (2013) seem fulfilled. Teaching effectiveness in the lecture room unlike its research counterpart is a strong and unambiguous positive function of ease in one-to-one interaction. Lower SSRs that enable such an ease consequently improve teaching performance.

Theoretically Resource dependence and Optimal Contracting (Pfeffer & Salancik, 2003; Fowles, 2014; Edmans & Gabiax, 2009; Mallin et al., 2015; Jacobson & Andreosso-O'Callaghan, 1996) emphasize value for money in the delivery of teaching through staff utilization and so encourage high SSRs while culture and quality assurance (Rowley, 1996; Trowler, 2008; Gayle et al., 2003; Yorke, 2009a, b; Varouchas et al., 2018; Salter & Tapper, 2002) is concerned with the interaction intensity that is the basis of teaching effectiveness and so recommends low SSRs. Empirically this result corresponds with a large number of earlier studies (Ayoubi & Massoud, 2012; Bandiera et al., 2009; Bedard & Kuhn, 2008; Gannaway et al., 2018; Shane, 1961; Kokkelenberg et al., 2008; Arias & Walker, 2004) that have found a negative association between SSR and teaching performance.

Tuition Fee Fraction (TFEE)

The significant positive coefficient on this variable confirms the ex-ante expectations in sub-hypothesis (H5b) Instrumental stakeholder, legitimacy and resource dependence (Mitchell et al.,

1997; Heller, 1997; 1999; Peter & Waterman, 1982; Handy, 1993; Gayle et al., 2003; Gunasekera & Reed, 2008; Fowles, 2014; Boliver, 2013; Jabbar et al., 2018; Browne, 2010) seem to be robustly corroborated in this result. After all, for universities highly dependent on tuition fees, students/parents become the most instrumental stakeholders whose teaching priorities are paramount. Small wonder that such institutions focus on teaching governances and outperform in teaching. Students and parents, by providing a larger part of the university's budget, also become the most important target with whom the university needs to acquire and maintain legitimacy by ensuring high teaching performances. Finally, internal governors are impelled to act in specific ways by their resource dependence on tuition fees. Students and their teaching become higher priorities and so governance is focused around enhancing student satisfactions. These theoretical arguments are fully corroborated and confirmed in this result. Empirically while many governance scholars take issue with the growing tuition fee dependence of UK universities (Nixon et al., 2016; Dunnett et al., 2012; Collini, 2012; Brown & Carasso, 2013; Fowles, 2014) there is less direct work examining the association between TFEE and teaching performance.

Female Staff Fraction (FSF)

The coefficient is insignificant but with a negative sign. Sub-hypothesis (H3k) is rejected. Public Accountability (Coy et al., 2001; Kreysing, 2002; Coy & Dixon, 2004), Resource Dependence, legitimacy and Stakeholder (Suchman, 1995; De Villiers and Van Staden, 2006; Verbruggen et al., 2011; Pfeffer & Salancik, 2003; Clarke, 2004) predictions that gender diversity should improve teaching performance through an unbiased teaching infrastructure and enhanced reputation based instrumental stakeholder engagement are not supported. At another level the arguments of qualitative and normative university governance scholars notably Mestre et al. (2009), Kaschak (1978), Acker (1994) and many others about the higher emotional empathy of female staff improving teaching functionalities is also unsupported here. There is no empirical work directly associating FSF with university teaching performance although a range of argumentative voices (Haung et al., 2019; Metcalf et al., 2005; Moss-Racusin et al., 2012, Barrett et al., 2011) call for greater gender diversity at university staff levels.

Cash to Total Assets (CTA)

The association is negative but it is insignificant. Therefore, sub-hypothesis (H5k) is rejected. The result is in stark contrast to the negative and significant association of this variable with research performance in model 1. The likely negative impact of high cash levels on teaching performance posited in theory do not find any robust support here. Thus public accountability arguments for fiscal prudence or the good steward argument of optimal liquidity (McGettigan, 2012; Hayes & Wynyard, 2002; CUC, 201; 2017; HEC, 2014; Dalton & Kesner, 1987; Donaldson & Davis, 1991; Kenser & Johnson, 1990; Coy et al., 2001; Perez & Ode, 2013) leading to better performance do not seem supported in the sample. Neither is there any evidence for the resource dependence argument against discal profligacy or the legitimacy argument for maintaining prudent fiscal management (Flowes, 2014; Parker, 2012; 2013; Jabbar et al., 2018; Mcgettigin, 2013). Empirical while there has been no work associating cash levels with university teaching performance many scholars discuss issues related to cash management and the fiscal health of UK universities (Inman, 2018; Hilman, 2018; Jack, 2018b; OFS, 2019a).

Board Ethnic Diversity (BEDIV)

Board level ethnic diversity displays an insignificant but positive association with TPI. This contrasts with the variable's negative significant association with RGF in model 3. Sub-hypothesis (H6f) is rejected. Diversity in ethnicities on university boards do not seem not to affect a university's teaching performance.

The lack of significance here is against all theoretical expectations. For one the predictions of Public Accountability, Resource Dependence, Stakeholder and Legitimacy (Coy et al., 2011; Pfeffer, 1987; Verbruggen et al., 2011; Roberts, 1992; Mitchell et al., 1997; Pfeffer, 1987; Verbruggen et al., 2011; Suchman, 1995; De Villiers and Van Staden, 2006) that diverse boards improve the teaching ambience at universities are not confirmed. But so too are the arguments of managerial power and optimal contracting (Williamson. 2000; 2005; Chizema & Buck, 2006; Jacobson & Andreosso-O'Callaghan, 1996) about likely policy disagreements and logjam generated from ethnically diverse university boards and consequent teaching underperformance.

The insignificant association here is very different from what has been found in the many ethnic diversity studies in corporate governance. An overwhelming number of studies find a positive association here i.e. that firms with diverse boards perform better (Carter et al., 2003; Van der Walt & Ingley, 2003; Mahadeo et al., 2012; Ntim, 2015). However a few do find evidence of a negative impact here notably Pitts & Jarry (2007), Churchill & Valenzuela (2019), Branchuk & Dybvig (2009) and Brammer et al. (2007). Earlier empirical work (Lokuwaduge, 2011; Harris, 2014; Olson, 2000) in university governance has not examined ethnic diversity and its university performance impact. However Ntim et al. (2017) find that such diversity does have a positive and significant impact on university voluntary disclosure.

Board Gender Diversity (BGDIV)

Like research quality in model 2 the association between board gender diversity and university teaching performance is positive but insignificant. One has to reject sub-hypothesis (H6d). Theoretically the result does not confirm the predictions of dysfunctionality attributed to gender and other forms of diversity by Managerial Power and Optimal Contracting theorists (Williamson, 2000; 2005; Chizema & Buck, 2006; Jacobson & Andreosso-O'Callaghan, 1996). At another level one is also unable to support the contention that gender balance on the board brings any gains to teaching performance due to its fulfilment of public purpose or its legitimating effect or the availability of gender voices or capture of gendered stakeholder interests or a better checks and balances due to gender presence (Coy et al., 2011; De Villiers and Van Staden, 2006; Verbruggen et al., 2011; Mitchell et al., 1997). Earlier empirical work in corporate governance (Luckerath-Rovers, 2013; Ntim et al., 2015; Carter et al., 2003; Terjesen et al., 2015) largely documents a positive association between gender presence on the board and firm performance. In university research Ntim et al. (2017) find a positive significant association between gender presence on the board and university voluntary disclosure.

Service and Facility Spend per student (SFSPEND)

The coefficient displays a positive and significant association (10% level) confirming sub-hypothesis (H5d). The budgetary proportion of a university's spend on knowledge infrastructure in this UK sample clearly improves its teaching performance. The result here is in stark contrast to the negative impact seen in this variable with respect to Research Quality in model 2. But such

a positive result is anticipated here especially given the positive externalities and reputational effects of extra SFSPEND.

Optimal Contracting, Stewardship tenets and Resource Dependence (Binsardi & Ekwulugo, 2003; Price et al., 2003; Edmans & Gabaix, 2009; Mallin et al., 2015; Murphy, 2012; Middlehurst, 2004; 2013; Bennett, 2002; Knight, 2002; Edmans & Gabaix, 2009; Daily et al., 2003; Christopher, 2010; Dedman, 2000) presage such a result. Libraries, Information Technology and Laboratory spending have both direct and indirect positive effects on learning and teaching. By spending more on such assets a university is acting as a good steward, contracting early/optimally and aligning its resources well. Small wonder then that such a university does better on teaching outcomes as well as student satisfaction. Earlier empirical work largely corroborates a positive impact of Services and facilities spend on teaching performance and student/staff satisfaction (Karemera et al., 2003; Young, 1999; Metcalf et al., 2005; Earthman, 2002; Ganyaupfu, 2013).

Empirical work in UK governance richly corroborates this result. The largest strand (Ganyaupfu, 2013; Mushtaq & Khan, 2012; Kirmani & Siddiquah, 2008; Karemera et al., 2003; Young, 1999) find that universities that spend heavily on knowledge assets help students achieve the best learning outcomes and grades. At least three papers (Dao & Thrope, 2015; Migin et al., 2015; Wiers-Jenssen et al., 2002; Price et al., 2003; Tang et al. 2004; Joseph & Joseph, 2000) find evidence that UK students gravitate towards institutions with the best IT and knowledge facilitating assets. Elsewhere (Metcalf et al., 2015; Price et al., 2003) collate evidence that UK academics too favour universities that invest heavily in knowledge infrastructure. Overall the sample results then confirm that UK universities that display a strategic intent towards larger fractions of knowledge assets not only demonstrate their academic credentials but also create a facilitative academic ambience and thus improve teaching performance.

Total Assets (TA)

the size coefficients is positive but insignificant in the main GLS FE model, but positive and significant in the biased OLS model. Larger UK universities do not seem to perform better on the teaching function than their peers.

6.2.1.2 Sensitivity Analysis

Once again a rich suite of six additional regressions are implemented here to test the assumptions of homoscedasticity, autocorrelation, multicollinearity, normality in distributions and endogeneity. The arguments for this remain the same as in the research performance models and various test results robustly confirm this as shown in the appendix. It must be noted that only Entry Standards is seen to be the endogenous variable in this model (significant at 1%) and so it is instrumented for using the size and age controls here as in the research models.

Entry Standards (ES)

The coefficient remains strongly significant and positive across other GLS and IV at 1% level. Interestingly both the IV regressions display higher magnitudes once the endogenous variable is accounted for. But in all six regressions selectivity in student entry standards remains a positive antecedent of University teaching performance. Thus, accounting for heteroscedasticity, multicollinearity and abnormality in variable distributions robustly confirm the fundamental result. The variable also has an independent albeit weaker positive impact even after accounting for autocorrelation in the GLS AR. Overall, then, the earlier theoretical/empirical interpretations of the GLS FE model remain valid. In addition, the rise in magnitudes of coefficients in the IV regressions suggest the strong validity of the endogenous channel active through this variable. The worryingly exclusive and elite orientation of UK universities in teaching performance is characterized by a vicious cycle of repeated exclusion across the years and needs regulatory correction.

Student Staff Ratio (SSR)

All GLS regressions display the same negative association with as strong if not more significance than the main FE model (at 1% level). It should be noted that GLS AR suggests that even after accounting for the auto-correlation, SSR is still negatively associated with teaching performance. A similar argument must be made for the GLS MLE coefficient which proves that abnormalities in variable distributions does not interfere with the result and remains negative at 1% level. Only the IV regressions lose significance and reverse signs. Overall then it should be inferred that the

conclusions of the negative association of SSR drawn in the GLS FE remains largely valid. Teaching performance unlike research is unambiguously improved by lowering SSR.

Tuition Fee Fraction (TFEE)

A strong rise in magnitudes and significances in all GLS and IV regressions validates all the earlier theoretical/empirical arguments in the main GLS FE model. Adjusting for heteroscedasticity, multicollinearity and abnormality in variable distributions only strengthen the positive associations. The coefficient also displays a strong independent positive impact outside the autocorrelation channel inherent in teaching performance in the GLS AR, and once accounting for endogeneity in both the IV regressions 2SLS and GMM the coefficient magnitudes strengthens. Overall, there is robust evidence in this UK sample that universities that are highly dependent on student fees perform better than their peers in teaching performances.

Female Staff Fraction (FSF)

All other GLS and IV regressions displays a positive and significant association with Teaching Performance. Although this is some partial evidence that female staff levels do improve teaching performance at UK universities one should be cautious in going too far with this interpretation. The most appropriate explanation would be to reflect on the complexity of this result in light of the endogeneities embedded in this model. Therefore, due to the sensitivity with this variable with TPI, the result should be interpreted with care. The result from the main GLS FE model stands nonetheless.

Cash to Total Assets (CTA)

All coefficients in th GLS MLE, GLS AR, IV 2SLS and IV 2GMM lose significance. It can be inferred that the negative association of this variable is really weak. Adjusting for heteroscedasticity, multicollinearity autocorrelation, 298nalysed298ty and abnormality in variable distributions strongly suggests lack of any association. Overall, then the earlier inferences in the GLS FE do not need modification. There is no significant association between a university's teaching performance and the proportion of cash held by it in this UK sample. On average universities in UK seem to insulate teaching from changes in their cash levels.

Board Ethnic Diversity (BEDIV)

All GLS MLE, GLS AR, IV 2SLS and IV 2GMM regression coefficients remain insignificant but change associations to negative. After adjusting for heteroscedasticity, multicollinearity autocorrelation, 299ndogeneity and abnormality in variable distributions we still observe a lack of any association. Only the panel OLS regression coefficient displays a negative and significant association. But given the likely biases in the Panel OLS (see Chapter 4.7) there is no need to change the interpretations of this coefficient in the main FE model.

Board Gender Diversity (BGDIV)

All GLS regressions remain insignificant with a mixture of signs. But the IV coefficients become significant (at 5% level) and stay negative. The sensitivities seem more nuanced than BEDIV above. There is some trace of a negative effect on teaching performance but it is not fully ascertained. Overall, then Board gender diversity prescriptions as currently stipulated (Metcalf et al., 2005; Parry, 2013; Parker, 2011; Olson, 2000; Harris, 2014; Ntim *et al.*, 2017) must continue as suggested earlier until such time that we are truly able to ascertain the exact relationship between BGDIV and TPI.

Services & Facilities Spend (SFSPEND)

The GLS regressions do not change signs but it rises in significance in GLS MLE and GLS AR from 10% in FE to 1% level. Once accounting for endogeneity both IV 2SLS and GMM reverse sign but lose significance completely. Similarly, in panel OLS lose significance the sign remains positive but without significance. In totality there is no reason to interfere with the detailed interpretations of the main GLS FE model.

Total Assets (TA) and Pre-1992 (PRE1992)

Size control TA loses significance in the GLS FE but remains significant positive and increases in magnitude in all other GLS regressions. The age control PRE1992 is omitted due to collinearity in the GLS FE but shows a similar pattern in all other GLS regressions. There seems to be no reason to interfere with the panel OLS interpretations. Elsewhere, the age control coefficient in GLS MLE and GLS AR is positive and significant in this result. Some of the controls are omitted in the main

model GLS FE. All in all, it seems that larger and older UK universities are seen to perform better on the teaching function than their peers.

Region (REGION)

REGION coefficients is positive in this model. Which indicates that teaching performance of universities in this sample are seen to improve as one moves away from the England region. There is also evidence that university teaching performances unlike research have improved across the decade. But looking at this result along with the more advanced sensitivity regressions, all the GLS coefficients turn insignificant with the variable even being omitted in GLS FE. There is now complete ambiguity about the region based increases in teaching performance outside England identified in the panel OLS.

6.2.2 Teaching Grant Fraction (TGF) Model 5

6.2.2.1 GLS FE Main Model

The table 25 below shows the status of ten hypotheses. These are based on the results from the GLS fixed-effects (FE) regression with robust standard errors using ten different internal governance variables and three different control variables. The dependent variable here is Teaching Grant Fraction (TGF). TGF maps university teaching performance from the perspective of teaching grant providers and arguably is an independent critical assessment of the institution. This is because such grant providers tend to be guided not just by student satisfaction surveys (a rather dubious teaching performance measure) but more by a composite evaluation of student facilities, student service levels and student population coverage (Collini, 2012; Brown & Carasso, 2013). In this sense the model here is a completely different measurement of university teaching performance.

Table 24: Model 5 all regressions with robust standard errors for dependent variable Teaching Grant Fraction (TGF)

Independent Variables	GLS FE	GLS MLE	GLS AR	IV 2SLS	IV GMM	Panel OLS Model
(Model)	(1)	(2)	(3)	(4)	(5)	(6)
<i>Governance Variables:</i>						
TFEE	-0.876(.027)***	-0.871(.015)***	-0.853(0.019)***	-0.770.058)***	-0.805.058)***	-0.773(.035)***
FSF	0.336(.108)***	0.279(.080)***	0.045(0.084)	0.365(.112)***	0.525(.106)***	-0.386(.078)***
PTTSR	-0.115(.043)***	-0.131(.030)***	-0.096(.028)***	-0.355(.064)***	-0.345(.061)***	-0.260(.034)***
RONLY	-0.403(.104)***	-0.446(.051)***	-0.351(.050)***	-0.897(.092)***	-0.774(.087)***	-0.735(.043)***
ENDWTA	-0.051(.051)	-0.069(.036)*	-0.076(.040)*	-0.091(.051)*	-0.168(.045)***	-0.060(.023)**
TRST	-0.044(.018)**	-0.047(.010)***	-0.026(.012)**	-0.053(.038)	-0.002(.037)	-0.085(.019)***
ETFS	-0.004(.004)	-0.005(.003)	-0.004(.003)	-0.008(.008)	-0.019(.008)**	-0.017(.005)***
BSIZE	-0.039(.011)***	-0.039(.011)***	-0.020(.011)*	-0.020(.025)	-0.020(.025)	0.027(.015)*
VCPAY	-0.026(.010)**	-0.023(.009)**	-0.006(.008)			0.021(.016)
IGOV	0.045(.019)**	0.045(0.018)**	0.024(.015)	-0.041(.035)	-0.059(.034)*	-0.011(.024)
<i>Controls Variables:</i>						
RGROUP	-	-0.030(.028)	-0.046(0.020)**	-	-	0.022(.010)**
Pre1992	-	-0.122(.023)***	-0.153(0.017)***	-	-	-0.158(.007)***
YEAR	-	-	-	-	-	0.001(.001)
CODE	-	-	-	-	-	0.003(.000)***
Constant	1.300(.143)***	1.103(.118)***	0.918(.109)***	0.818(.143)***	0.754(.139)***	-2.754(2.813)
Number of Obs	273	273	273	273	273	273
F-Value	275.12	-	-	-	-	491.11
R ₂	0.5865	-	0.8504	0.8108	0.8079	0.9200
Wald Chi2	-	-	2525.60	965.33	1041.96	-
LR Chi	-	821.23	-	-	-	-
rho	0.96828161	0.920(.019)	-	-	-	-
Autocorrelation coef (y _{t-1})	-	-	0.67190961	-	-	-
Theta median	-	-	0.6362	-	-	-
Instrumented Instruments				TFEE;RONLY RGROUP; PRE92; VCPAY	TFEE;RONLY RGROUP; PRE92; VCPAY	
Estat overid score				84.2141 (p = 0.0000)		
chi2(1) p				140.16 (p = 0.0000)		
Sargan chi2				276.438 (p = 0.0000)		
Basman chi2				84.2141 (p = 0.0000)		
Score chi2						
Hansen's J chi2					84.2141 (p = 0.0000)	

Notes: The table reports all regressions with robust standard errors. Regressions defined as follows: Generalised least square fixed-effects (GLS Fixed-Effects); generalised least square maximum likelihood estimation (GLS Maximum Likelihood); generalised least square auto-regression (GLS AR); instrumental variable two-stage least squares (IV 2SLS); instrumental variable two-stage; instrumental variable generalized method of moments (IV 2S GMM); panel ordinary least square model (Panel OLS Model) . Variables are defined as follows: tuition fee fraction (TFEE); female staff fraction (FSF); part-time to total staff ratio (PTTSR); research only staff fraction (RONLY); endowment to total assets (ENDWTA); teaching and research staff fraction (TRST); executive team meeting frequency (ETFS); governing board size (BSIZE); vice-chancellor pay (VCPAY); independent board governors (IGOV); 301analyse group university (RGROUP); pre-1992 universities (PRE1992); year (YEAR); and code (CODE). *, **, *** indicate significance at 10, 5, and 1 per cent levels, respectively.

Clearly TGF seems to be a positive function of FSF (sig.) and IGOV (sig.), but a negative function of TFEE (sig.), PTTSR (sig.), RONLY (sig.), ENDWTA (insig.), TRST (sig.), ETFS (insig.), BSIZE (sig.) and VCPAY (sig.).

Table 25: Summary of the Findings and Hypothesis of Governance and Teaching Grant Fraction (TGF)

Dependent Variable	Teaching Grant Fraction (TGF)					
	<i>Independent Variable:</i>	No. Hyp.	Predicted sign	Finding sign	Finding sig.	Hyp. Status
<i>Governance Variables:</i>						
Tuition Fee (TFEE)	H5b	+	-		Sig. (1%)	Rejt.
Female Staff Fraction (FSF)	H3k	+	+		Sig. (1%)	Acep.
Part-time to Total-staff Ratio (PTTSR)	H3h	-	-		Sig. (1%)	Acep.
Research Only Staff (RONLY)	H3c	-	-		Sig. (1%)	Acep.
Endowment to Total Assets (ENDWTA)	H5g	+	-		Insig.	Rejt.
Teaching and Research Staff (TRST)	H3b	-	-		Sig. (5%)	Acep.
Executive team meeting frequency (ETFS)	H6k	+	-		Sig. (1%)	Rejt.
Board Size (BSIZE)	H6b	+	-		Sig. (1%)	Rejt.
Vice-chancellor Pay (VCPAY)	H6q	+	-		Sig. (5%).	Rejt.
Independent board members (IGOV)	H6h	+	+		Sig. (5%).	Acep.

Notes: Hypothesised relationships are discussed in Chapter 3. Acep and Rejt denote accepting and rejecting hypothesised relationships, respectively.

Tuition Fee Fraction (TFEE)

The variable shows a highly significant (at 1% level) negative association with TGF. This is in contrast to its positive association with Research Quality in model 2 above. The result also contradicts the positive association documented in teaching performance model 4. Ex ante expectations in hypothesis (H5b) are contradicted. In the main it appears that this result supports public accountability arguments that exclusivity associates with TFEE dependence in a university and therefore a teaching performance external assessor such as TGF should avoid encouraging it (Fowles, 2014; Boliver, 2013; Mangan et al., 2010a, b; Sutton Trust, 2004). The negative result also is in line with the legitimacy and resource dependence (Fowles, 2014; Taylor, 2013a,b; Marginson, 2018; OFA, 2019; Molesworth et al., 2009) argument that high TFEE dependence reduces the ability of a university to deliver education to the widest swathe of students from all backgrounds. Empirically while there is less direct work associating TFEE with teaching performance the growing levels of TFEE have been a matter of intense debates and scrutiny in the literature (Foskett, 2010; Fowles, 2014; Heller, 1999; Boliver, 2013; Callender & Jackson, 2008).

Female Staff Fraction (FSF)

Unlike the variable's negative associations in research models 1 and 2 and in contrast to its insignificance in research model 3 and teaching model 4 this variable of staff level gender diversity shows a significant positive association (at 1% level) here. This confirms hypothesis (H3k) UK universities with higher fractions of female staff are more likely to attract teaching grants. This is strong confirmation of the predictions of Public Accountability, Resource Dependence, Legitimacy Culture & Quality Assurance and Stakeholder theories (Coy et al., 2001; Suchman, 1995; Pfeffer & Salancik, 2003; Brown, 2004; Nuninger, 2016; Smart, 2008; Hellstorm, 2004; Cowen, 1996; Henkel, 1997; Barnett, 1996; Williams, 1997; Deem, 2004; Wood, 2002; Slaughter & Leslie, 1997; Fielden & Lockwood, 1973; Jones, 2002). After all female staff bring their unique teaching abilities and enrich the TLRs of the universities (Trowler, 2019; Trowler & Cooper, 2002). This generates greater community wide recognition i.e. public accountability, allows a balance in usage of teaching resources i.e. resource dependence and enables a reputational halo of legitimacy derived from gender affirmative action. Earlier empirical work directly associating FSF with teaching performance are rare. However, many empirical voices (Mackie, 1976; Kaschak, 1978; Acker, 1994; Ferber & Huber, 1975) suggest the natural proclivities of female staff towards teaching activities and therefore seem to imply a positive impact on teaching performance.

Part-time to total staff ratio (PTTSR)

In line with its negative associations in research model 2 and 3 here too the variable exhibits a negative and significant association (at 1% level) with TGF. This confirms sub-hypothesis (H3h). As expected Quality Assurance theoretical contentions (Eurydice, 2010, pg. 24; Brown & Carasso, 2013, pg. 144-163; Attwood, 2008b; Yorke, 2009a; Allen, 2011; Jack, 2008; Palfreyman, 2010) that too many adhoc staff interfere with the integrity of the teaching function seem to be robustly corroborated in this result. Optimal contracting tenets (Ward et al., 2001; Bryson & Barnes, 2000a, b; Nollen & Axel, 1996; Purcell et al., 1999; McColgan, 2003; Freedman, 2004) - ad hoc staffing arrangements indicate sub-optimal contracting; Legitimacy arguments that too many part time staff reduce reputational legitimacy and credibility among staff, students and parents (Lindblom, 1994; Suchman, 1995) are all ratified here. Empirical studies (Thewlis, 2003; Allen-Collinson, 2004) have associated PTTSR with university teaching functions and have often found a similar negative association.

Research Only Staff Fraction (RONLY)

The coefficient shows a significant (at 1% level) negative association. As anticipated this confirms sub-hypothesis (H3c). Teaching performance as assessed by Teaching Grant providers in UK HEI displays a negative association with proportions of research only staff at the institution. Universities that employ larger than usual staff on research only contracts surely emphasize research. Teaching Grant providers do not seem to see this positively perhaps due to a suspicion that such institutions may neglect teaching functionalities. Resource dependence tenets (Kessner and Johnson, 1990; Pfeffer & Salancik, 2003 and Hillman & Dalziel, 2003) that predict that university research or teaching priorities are closely reflected in their staff based resource dependences. Thus, larger proportions of RONLY suggest the university's focus on research and therefore teaching performance suffers. Culture, Quality Assurance and optimal contracting (Byrd et al., 2010; Holderness & Sheehan, 1988; Custodio et al., 2013; Gabaix & Landier, 2008; Gayle et al., 2003; Sikes, 2012; Chalmers, 2010; Elton, 2008; Ritzer, 2002) principles too may be invoked. Too many research only staff may shift the academic ambience and culture towards research, reduce the quality of resources dedicated to teaching and thus lead to lower teaching performance as in this result. Previous empirical work directly associating RONLY to university teaching performance do not exist but many normative and argumentative voices (Probert, 2013; Shelton et al., 2001; Locke, 2012; Blackmore, 2016) suggest how the contract has become widespread as a means to generate a research ambience and reputation for the university.

Endowment to Total assets (ENDWTA)

Unlike its negative significant coefficient with RQ in model 2 but like its insignificant association with RGF in model 3, ENDWTA here displays an insignificant coefficient in this TGF model. Therefore, sub-hypothesis (H5g) is rejected.

Teaching performance as assessed by teaching grant providers in UK HEI does not seem to depend on university endowment levels. So, there is no substantiation in this sample that endowments as independent university resources enable institutions to demonstrate to external fund providers that they will facilitate teaching or learning. At another level there is no proof either for the public accountability and legitimacy arguments (bebchuk et al., 2002; Van Essen et al., 2015; Ashforth & Gibbs, 1990; Suchman, 1995) that higher endowments might make institutions opaque to student, parent and public pedagogical concerns with regard to teaching. Empirically endowment levels in universities have been significantly contrasted in the different

types of UK universities but there is less direct work in associating them with teaching performance.

Teaching and Research Staff Fraction (TRST)

TRST displays a significant negative association with TGF thus confirming sub-hypothesis (H3b). This is similar to its negative significant association in RGF model 3. The result here seems to contradict resource dependence (Pfeffer, 1987; Pfeffer & Salancik, 2003; Fowles, 2014) expectations that dual function contracts could represent an efficient use of staff resources while corroborating optimal contracting and culture & quality assurance (Trowler, 2008; Gayle et al., 2003; Alvesson, 2003) predictions of the onerous nature of such contracts and their consequent negative teaching performance implications. There has been hardly any empirical work associating TRST with any type of academic performance but there are several normative arguments (Macfarlane, 2011; Locke, 2014; Bryson, 2013) here about the difficulties of an omnibus dual contract and how it might encourage a neglect of teaching functions.

Executive Team Meeting Frequency (ETFS)

The coefficient is insignificant in the GLS FE. Sub-hypothesis (H6k) is rejected. There is no evidence that more frequent VC level meetings improve external assessments of university teaching performance by independent teaching grant providers.

The result does not support either the prediction that effective checks on university managerial power (Bebchuk et al., 2002; Van Essen et al., 2015; Exworthy & Halford, 1999; Deem et al., 2007) by frequent executive level meetings improve teaching outcomes or that such meetings help good stewarding principles (Bebchuk & Fried, 2003; Schleifer & Vishny, 1997; bebchuk et al., 2002; Van Essen et al., 2015; Kalyta & Magnan, 2000) to flourish and improve teaching functionalities or allow optimality in academic governance mechanisms and check the tendency to privilege research over teaching (Ehrenberg et al., 2001; Soh, 2007; Tarbert et al., 2008). There is no support in this sample that a hands-on more active interventionist role by the executive team necessarily impresses teaching grant providers or improves teaching functionalities. Neither can one confirm the contentions of Legitimacy (Middlehurst, 2013; Lambert, 2005; Parker, 2011; Shattock, 2013a, b) and Resource Dependence (Pfeffer & Salancik, 2003; Marginson, 2006). Even VC teams that tailor their meeting to exigent evolving governance needs of the institutions and meet less often may or may not attract more teaching

funds. Earlier empirical work is rare in this variable and its association with academic performance in university governance literature.

Board Size (BSIZE)

Board size is significantly and negatively associated (at 1% level) with TGF. This contradicts ex-ante sub-hypothesis (H6b). The negative association here is in stark contrast to the positive associations found in both research performance model 1 and research quality model 2. The result does not support the larger board more stakeholders better teaching performance argument of stakeholder theory (Davis et al., 1997; Fama, 1980; Freeman, 1984) or the larger boards more constituent coverage greater legitimacy better teaching performance argument of legitimacy theory (Hyples, 1995; Tilling, 2004; Deegan, 2004). It also does not corroborate resource dependence predictions of the higher resources and networks of larger boards leading to better performance (Pfeffer & Salancik, 2003; Marginson, 2006) or the larger boards greater checks and balances better performance arguments of stewardship (Saltman et al., 2000; Swansson, Mow & Bartos, 2004). In the main this negative association seems to support public accountability views Lipton & Lorsch, 1992; Jensen, 1983; Yermack, 1996; Trowler, 2008; Bebchuk & Fried, 2003; Mallin et al., 2015 that balanced boards serve public purpose better, quality assurance perspectives that the quality of experience and resources of board members is what would matter not larger sizes and the optimal contracting contention that right sizing board size is what would generate higher performance.

Earlier empirical work in university governance especially Lokuwaduge (2011) and Lokuwaduge & Armstrong (2015) find no significant association between board size and teaching performance. Ntim et al. (2017) find a negative and insignificant association between this variable and voluntary disclosure. There are a few corporate studies (Yermack, 1996; Eisenberg et al., 1998; Conyon & Peck, 1998; Loderer & Peyer, 2002; Tomasic et al., 2003) that support a negative association between board size and firm performance just like in this result.

Vice Chancellor Pay (VCPAY)

The coefficient is significant and negative in its association (5% level) with TGF. This confirms sub-hypothesis (H6q). Universities with high levels of VC pay seem to attract lower levels of teaching grants. The fact that such universities are unable to attract teaching grants seems to echo legitimacy and public accountability concerns (Ashforth & Gibbs, 1990; Tilling,

2004; Judge et al., 2008; Donaldson & Davis, 1994; Coy et al., 2001) with high levels of VC pay.

Earlier empirical work in VC pay does not associate it with teaching performance specifically, but instead more generally with academic or financial performance. Results here are mixed with some studies finding a positive association (Gounopoulos et al., 2019; Johnes & Virmani, 2019; Bachan & Reilly, 2015; Johnes & Virmani, 2019; Dolton & Ma, 2003) while others finding a negative one (Cheng, 2014; Gschwandtner & McManus, 2018; Walker et al., 2019).

Lay board member fractions (IGOV)

The coefficient displays a positive and significant association (5% level) in the GLS FE. This confirms ex-ante sub-hypothesis (H6h). Independent boards seem to improve university teaching performance as assessed by independent teaching grant providers. Such boards seem to balance out vested stakeholder interests and check executive neglect of teaching 307nalysed307ty307ies, effectively moderate quality assurance concerns and enhance the academic reputation of the institution and thus improve TGF providers' impressions of teaching performance at these institutions (Cashmore et al., 2013; Fabrice, 2010; Hayes, 2019; Coy et al., 2001; Pathan et al., 2007; Stensaker, 2018; Kim, 2008).

6.2.2.2 Sensitivity Analysis

Once again a rich suite of six additional regressions are implemented in model 5 above to test the assumptions of homoscedasticity, autocorrelation, multicollinearity, normality in distributions and endogeneity. The empirical/methodological arguments for the first four remain the same as in the research/teaching performance models earlier. Various test results robustly confirm this as shown in the appendix (see Appendix 6). However, in this model, unlike all earlier models two variables namely TFEE and RONLY display strong endogeneity at 1% significances. Therefore, both these are instrumented for using three instruments. Two of these as in all earlier models are the control variables, based on university mission i.e. RGROUP and university age i.e. PRE1992 (Basman, 1957; Theil, 1953; Gujarati & Porter, 2009, pg. 718-730). The third instrument used here is VCPAY and it is based on the logic that although it is strongly correlated with the dependent variable TGF (-0.5068), it is only weakly correlated with either TFEE (0.1295) or RONLY (0.3856). It is therefore a good instrument (Seddighi et al., 2000, pg. 155-156; Sargan, 1964; Gujarati & Porter, 2009, pg. 669). The high

R-squares as well as small p-values in over-identification tests of the resultant two stage least squares (IV2SLS) and generalized method of moments (IV2SGMM) shown in the table confirm this strategy.

Tuition Fee Fraction (TFEE)

Both GLS MLE and GLS AR, coefficients remain robustly negative and significant at 1%. Similarly in IV 2SLS and GMM and after accounting for the 308analysed308ty the signs remain negative and the coefficient magnitude remains relatively the same. Here is robust confirmation that after accounting for heteroscedasticity, autocorrelation, 308analysed308ty and endogeneity the interpretation already advanced in the main GLS FE remains valid. It may be noted how the variable is highly endogenous and instrumented for in this model. Teaching grant provider assessments persist in cycles across the decade and confirm their largely negative view of universities with high TFEE fractions.

Female Staff Fraction (FSF)

GLS MLE retains significance but GLS AR loses it. The IV coefficients remain significant at 1%. In all 5 regressions the sign of the association remains positive. Magnitude drops in GLS MLE but only by a small percentage. Magnitudes rise in the IV regressions. Overall then after accounting for abnormalities in variable distributions and endogeneity within this sample there is still evidence that the association is indeed positive. The interpretations in the GLSFE main model need no further modification.

Part-time to total staff ratio (PTTSR)

A robust confirmation of the GLS FE result is seen here. All the GLS MLE and GLS AR, IV 2SLS and IV 2GMM coefficients remain strongly significant and negative at 1% level. There is a drop in the magnitudes of the former but there is even a significant rise in the magnitudes of the latter. Thus adjusting for heteroscedasticity, multicollinearity and abnormality in variable distributions only reduces the degree of negative impact but does not change it. On the other hand, accounting for the reverse causality in the model actually increases the degree of negative impact. The theoretical/empirical inferences drawn in the GLS FE need no modification here. Overall, then the sophisticated arguments in the main GLS FE model are robustly corroborated in the sensitivities. Higher levels of part-time staff employed by a university seem to dampen on teaching functionalities of the institution with Teaching Grant providers reducing grants to such institutions.

Research Only Staff (RONLY)

Here too there is robust confirmation of the GLS FE result just like PTTSR. Both GLS MLE and GLS AR remain negative and significant at 1%. Similarly, IV 2SLS and GMM coefficients remain strongly significant at 1% and negative. Magnitudes remains relatively the same in GLS MLE and drops in the GLS AR regressions but rise to almost double in the IV 2SLS and GMM regressions. Note too that this is the other endogenous variable instrumented for in this model implying a strong cyclical relationship. Hence one can argue that all the theoretical/empirical inferences drawn in the GLS FE are robustly corroborated. Overall, then employing too many Research only staff are perceived to be an obstacle to higher teaching performance. Teaching Grant providers are right in reducing funds to such institutions.

Endowment to Total assets (ENDWTA)

A fairly mixed result is seen here. The coefficient remains somewhat significant at in GLS MLE, GLS AR and IV 2SLS (10% respectively) and IV GMM (1%) with a negative sign. One cannot completely rule out some negative link between endowment levels and TGF in this sample. Therefore, the interpretations in the main GLS FE model above should be taken with a liberal dose of caution. It would be presumptuous to dismiss this slight negative association seen in five regressions entirely and internal governance policy framers need to be cognizant of this.

Teaching and Research Staff Fraction (TRST)

Both the GLS MLE and GLS AR coefficients are significant at 5% or above and remain negative with drops in magnitudes. But the IV 2SLS and IV GMM coefficients turn completely insignificant once endogeneity has been accounted for. Therefore, accounting for heteroscedasticity, multicollinearity, autocorrelation and abnormality in variable distributions does not change the direction of association but weakens it. But accounting for endogeneity in the model makes the variable insignificant although the association still remains negative. On the whole the interpretation of the GLS FE that teaching grant providers seem to opine that universities that employ too many TRST staff are the ones that seriously risk teaching underperformance seem corroborated.

Executive Team Meeting Frequency (ETFS)

Both the GLS MLE and GLS AR coefficients are insignificant although their negative sign remains unchanged. In the IV regressions too the signs do not change but the least squares 2SLS coefficient remains insignificant, while the GMM coefficient changes to significant at 5% with an increase in magnitude. In general, then the variable's impact is really weak and accounting for heteroscedasticity, multicollinearity, autocorrelation and abnormality as well as relaxing the many assumptions of OLS reveals that it hardly matters to teaching grant providers. Overall then all the earlier theoretical/empirical inferences of the FE model remain valid. Executive team meetings in this UK sample do not really have a robust negative impact on TGF.

Board Size (BSIZE)

Beside the spurious OLS result, all GLS regression coefficients change sign to negative. In the GLS MLE the result remains positive and significant at 1% level with the coefficient magnitude remaining the same. GLS AR remains positive and significant albeit with a drop in significance from 1% in the main FE model to 10% and with a slight drop in coefficient magnitude. Both the IV 2SLS and GMM regression coefficients however remain insignificant and negative. Tackling heteroscedasticity, multicollinearity and abnormality in variable distributions seems to reveal that Teaching Grant providers actually reward universities with small boards. Adjusting for the endogeneity in TFEE and RONLY simply weakens the negative impact but does not change it. Overall, then for the first time in this UK sample evidence emerges that fits the predictions of Public Accountability, Quality Assurance and Optimal Contracting (Lipton & Lorsch, 1992; Jensen, 1983; Yermack, 1996; Trowler, 2008; Bebchuk & Fried, 2003; Mallin et al., 2015). Board size has a negative impact on TGF and the finding and interpretations from the main FE model are moderately robust.

Vice Chancellor Pay (VCPAY)

Both GLS MLE and GLS AR coefficients remain negative with the latter losing significance. Only in the biased and difficult to explain panel OLS result above that VCPAY becomes positive but without significance. After tackling the problems of heteroscedasticity, multicollinearity and abnormality in variable distributions the true association of this variable is now shown to be negative, which is in line with research performance model 2. Overall, then it appears there is now strong evidence at least in this UK sample that even these independent assessors of university teaching performance i.e. teaching grant providers believe higher levels

of VC pay detract from the teaching/transformation function of universities. The main fixed-effects interpretation seem moderately validated and robust.

Lay board member fractions (IGOV)

A slightly complex pattern is seen here. GLS MLE coefficient remains positive and significant at 5%, and with the magnitude being unchanged from the main FE model. GLS AR follows suit but loses significance. IV2SLS coefficient becomes insignificant but changes its sign to negative. IV2SGMM coefficient on the other hand becomes significant at 10% but increases in magnitude and is negative. Tackling heteroscedasticity, multicollinearity and abnormality in distributions seem to suggest a positive impact but instrumenting for endogeneity confuses the issue. Overall, then there is significant ambiguity about the true nature of association here.

RUSSELL GROUP (RGROUP) & Pre-1992 (PRE1992)

Both coefficients are significant but RGROUP displays a positive coefficient while PRE1992 displays a negative one. Clearly teaching grant providers are seen to be partial to members of the elite Russell Group but avoid funding older well established universities i.e. the PRE1992 group. This seems deeply contradictory flawed and puzzling. After all, if teaching and learning regimes require financial support this would be outside both these groupings and largely among the newer and less established institutions. Perhaps this contradiction would get resolved in the sensitivity analysis below. While both controls are omitted in GLS FE they correctly display negative signs in GLS RE GLS MLE and GLS AR. The contradiction referred to in the panel OLS result gets resolved. Teaching Grant providers are correctly seen to avoid funding both older and more exclusive UK universities.

6.3 Financial Performance advanced model

University financial performance is the next theme of the chapter. Just as in research, there are multi-dimensional complex links between University financial performance and governance. Once again, therefore, a model development that is at once wide-spanned and eclectic is used. Within this sample there are two main variables available to proxy university financial performance namely Asset Turnover (AT) and Return on Equity (ROE). However the univariate and bivariate analyses done earlier strongly suggest the weak statistical properties of the latter when compared with the former. Hence, only one robust panel model is developed and critically analysed using Asset Turnover (AT) as the dependent variable here.

Before moving on to the main discussions it is important to note here too the results of tests for normality, multicollinearity, heteroscedasticity, endogeneity and non-linearity shown in tables 3, 4, 5, and 6 in the appendix. Some variables (dependent & independent) do exhibit abnormal distributions in the financial performance model. This is despite the fact that all variables as before are invariably scaled i.e. are either fractions or natural logarithms. No winsorization is attempted here to avoid the rich patterns that might be lost with the outlier data points in the sample. Mean levels of VIF in the model do not exceed 5 but the variable of Research Only Staff (RONLY) does exhibit high values here. Unlike earlier models three of the independent variables here exhibit endogeneity namely,

In what follows in sub-section 6.3.1 this sole financial performance model using Asset Turnover as the dependent variable is critically analysed. The same carefully calibrated variable selection strategy intended to achieve parsimony and theoretical/empirical span is implemented in developing this model as in all earlier ones.

6.3.1 Asset Turnover (AT) Model

6.3.1.1 GLS Fixed-Effects

The table 27 below shows the status of fourteen hypotheses. These are based on the results from the GLS fixed-effects (FE) regression with robust standard errors using fourteen different internal governance variables and four different control variables PRE1992, RGROUP, TA and REGION. The dependent variable here is Asset Turnover (AT), a financial performance measure that reflects how well a given university marshals its assets to generate revenues. As before, the independent governances here too span the theoretical/empirical field of investigation and simultaneously represent one of the most parsimonious combination of explanations achievable in the sample.

Table 26: Model 6 all regressions with robust standard errors for dependant variable asset turnover (AT)

Independent Variables	GLS FE	GLS MLE	GLS AR	IV 2SLS	IV GMM	Panel OLS Model
(Model)	(1)	(2)	(3)	(4)	(5)	(6)
<i>Governance Variables:</i>						
FTA	-0.039(.085)	-0.061(.053)	-0.131(.075)*	0.103(.414)	0.402(.420)	-1.109(.132)***
DTA	-0.126(.082)	-0.134(.049)***	-0.228(.069)***	-0.285(.113)**	-0.052(.108)	-0.188(.113)*
CTA	-0.289(.137)**	-0.274(.078)***	-0.145(.101)	1.900(.562)***	0.857(.597)	0.472(.241)*
SFSPEND	.00004(.0001)***	0.000(.000)***	0.000(.000)***	-0.335(.167)**	-0.0001(.00003)***	-0.000(.000)
ENDWTA	-0.138(.159)	-0.130(.120)	-0.061(.158)	-0.0001(.00002)***	-.0537(.1417)***	-0.639(.143)***
RONLY	-0.330(.298)	-0.166(.120)	0.214(.140)	0.114(.243)	0.650(.237)***	1.603(.363)***
TONLY	-0.044(.065)	-0.044(.033)	0.032(.047)	0.058(.128)	-0.074(.120)	-0.305(.132)**
UGCOM	-0.008(.019)	-0.012(.013)	-0.034(.019)*	-0.058(.036)	0.027(.026)	-0.069(.027)**
PTTSR	-0.044(.157)	-0.026(.066)	-0.147(.084)*	-0.378(.232)	0.303(.209)	0.457(.180)**
GBMFS	0.081(.030)***	0.080(.019)***	0.052(.026)**	0.201(.078)***	-0.074(.048)	0.103(.039)***
VCPAY	0.091(.030)***	0.096(.023)***	0.088(.028)***	-0.063(.071)	-0.024(.080)	0.160(.079)**
INTS	0.822(.241)***	0.805(.119)***	0.565(.170)***	0.323(.140)**	0.217(.142)	-0.084(.141)
PGINT	-0.143(.140)	-0.153(.112)	-0.162(.146)	-0.213(.228)	0.234(.199)	-0.609(.217)***
ADSIZE	0.056(.022)**	0.055(.015)***	0.036(.018)**	-0.009(.047)	0.082(.049)*	0.001(.040)
<i>Controls Variables:</i>						
TA	-0.402(.030)***	-0.396(.021)***	-0.372(.025)***	-	-	-0.303(.050)***
RGROUP	-	0.452(.113)***	0.3145(.072)***	-	-	-0.045(.039)
Pre1992	-	.056(.092)	0.015(.055)	-	-	0.063(.026)**
REGION	-	0.057(.046)	0.0386(.0260)	-	-	-0.097(.0186)***
YEAR	-	-	-	-	-	-0.003(.005)
CODE	-	-	-	-	-	0.001(.000)***
Constant	4.364(.489)***	3.980(.341)***	3.986(.407)***	1.343(1.040)***	0.486(1.183)***	10.173(10.711)
Number of Obs	543	543	543	543	543	543
F-Value	24.56	-	-	-	-	14.44
R2	0.1231	-	0.3443	0.2825	0.0707	0.6291
Wald Chi2	-	-	356.17	58.57	81.28	-
LR Chi	-	433.35	-	-	-	-
rho	.98328055	-	-	-	-	-
Autocorrelation coef (y-1)	-	-	.58774795	-	-	-
Theta median	-	-	0.7552	-	-	-
Instrumented				FTA;RONLY	FTA;RONLY	

Instruments			TA; RGROUP; PRE92; REGION	TA; RGROUP; PRE92; REGION
Estat overid score chi2(1) p			28.977(p = 0.0000)	
Sargan chi2			98.464(p = 0.0000)	
Basman chi2			116.50(p = 0.0000)	
Score chi2			28.977(p = 0.0000)	
Hansen's J chi2				28.977(p = 0.0000)

Notes: The table reports all regressions with robust standard errors for dependent variable asset turnover (AT). Regressions defined as follows: Generalised least square fixed-effects (GLS Fixed-Effects); generalised least square maximum likelihood estimation (GLS Maximum Likelihood); generalised least square auto-regression (GLS AR); instrumental variable two-stage least squares (IV 2SLS); instrumental variable two-stage; instrumental variable generalized method of moments (IV 2S GMM); panel ordinary least square model (Panel OLS Model). Variables are defined as follows: fixed to total assets (FTA); debt to total assets (DTA); cash to total assets (CTA); service and facility spend per student (SFSPEND); endowment to total assets (ENDWTA); research only staff (RONLY); teaching only staff (TONLY); presence unique governance committee (UGCOM); part-time to total staff ratio (PTTSR); governing board meeting frequency (GBMFS); vice-chancellor pay (VCPAY); fraction of international students (INTS); postgraduate intensity (PGINT); audit committee size (ADSIZE); total assets (TA); 315nalyse group university (RGROUP); pre-1992 universities (PRE1992); region (REGION); year (YEAR); and code (CODE). *, **, *** indicate significance at 10, 5, and 1 per cent levels, respectively.

Clearly AT seems to be a positive function of SFSPEND (sig.), GBMFS (sig.), VCPAY (sig.), INTS (sig.) and ADSIZE (sig.), but a negative function of FTA (insig.), DTA (insig.), CTA (sig.), ENDWTA (insig.), RONLY (insig.), TONLY (insig.), UGCOM (insig.), PTTSR (insig.), PGINT (insig.) and TA (sig.).

Table 27: Summary of the Findings and Hypothesis of Governance and Asset Turnover (AT)

Dependent Variable	Asset Turnover (AT)				
<i>Independent Variable:</i>	No. Hyp.	Predicted sign	Finding sign	Finding sig.	Hyp. Status
<i>Governance Variables:</i>					
Fixed to Total Assets (FTA)	H5m	-	-	Insig.	Rejt.
Debt to Total Assets (DTA)	H5i	-	-	Insig.	Rejt.
Cash to Total Assets (CTA)	H5l	-	-	Sig. (5%)	Acep.
Service and Facility Spend per Student (SFSPEND)	H5e	+	+	Sig. (1%)	Acep.
Endowment to Total Assets (ENDWTA)	H5h	+	-	Insig.	Rejt.
Research Only Staff (RONLY)	H3d	+	-	Insig.	Rejt.
Teaching Only Staff (TONLY)	H3f	-	-	Insig.	Rejt.
Unique Governance Committee (UGCOM)	H6m	+	-	Insig.	Rejt.
Part-time to Total Staff Ratio (PTTSR)	H3i	+	-	Insig.	Rejt.
Board Meeting Frequency (GBMFS)	H6j	+	+	Sig. (1%)	Acep.
Vice-Chancellor Pay (VCPAY)	H6r	+	+	Sig. (1%)	Acep.
International Students Ratio (INTS)	H4b	+	+	Sig. (1%)	Acep.
Postgraduate Intensity (PGINT)	H4d	+	-	Insig.	Rejt.
Audit Committee Size (ADSIZE)	H6n	+	+	Sig. (5%)	Acep.

Notes: Hypothesised relationships are discussed in Chapter 3. Acep and Rejt denote accepting and rejecting hypothesised relationships, respectively.

Fixed to Total Assets (FTA)

There is an insignificant association between the proportion of fixed assets a university chooses and its asset turnover. This contradicts sub-hypothesis (H5m). Theoretical indications in Optimal Contracting and stewardship precepts (Bachan, 2017; Bradley et al. 2008) argue that institutions that carry less fixed assets have the flexibility to design optimal contracts and husband their resources efficiently respectively. This should help them to generate high levels of turnover. The evidence in this UK university sample does not confirm this. But the contrarian prediction of resource dependence (Vegas & Coffin, 2015) that universities with higher levels of fixed asset ownership are able to use such resources more effectively than peers is also unable to be determined in this sample. All that stands out in this result is that fixed to total asset proportions in UK universities have no discernible impact on their asset turnover.

A comparison with corporate research is useful here. At least one study Kotsina & Hazak, (2012) finds that firm choices of fixed asset levels has no significant association with AT. Others find empirical evidence on both the positive (Al-Ani, 2014; Olatunji & Adegbite, 2014; Okwo et al., 2012; Reyhani, 2012; Azadi, 2013; Iqbal & Mati, 2012; Inyama et al., 2017) and negative sides (Li, 2004; Dong et al., 2012) of the debate. In totality it does appear that at least for UK universities FTA levels do not really matter to financial performance in asset turnover.

Debt to Total Assets (DTA)

The main GLS FE result here shows an insignificant but negative association with Asset Turnover. Sub-hypothesis (H5i) is rejected. Most theory i.e. Optimal Contracting, Managerial power, Stewardship and Legitimacy all warn against too much debt. High leverage levels are harmful to a university's financial abilities and cramp its revenue generation capability expressed in its Asset Turnover. Optimal Contracting (Callender & Jackson, 2008; Brigham & Houston, 2004; Hutchison, 1995; Jensen, 1986; Miller & Rock, 1985; Smith, 1986; Champion) suggests that high debt levels reduce the institution's independence/flexibility to strike the optimal contractual bargains. Managerial Power (Williamson, 2000; 2005; Chizema & Buck, 2006; Jacobson & Andreosso-O'Callaghan, 1996) argues that it disallows the institutions' governors from establishing an effective independent direction in policy making. Stewardship (Donaldson, 1990; Mallin et al., 2015; Yermack, 1996) points to the pernicious games generated from high debt levels that stymie financial stability and ability. Legitimacy (Hillman, 2018; HEPI, 2019; Iman, 2018; Margolis, 2004; Hayes & Wynyard, 2002) points to the reputational damage inflicted by leverage dependence. Earlier empirical work in debt levels is copious in corporate research but within university research both scholars and regulators warn against excessive debt and its negative implications (HEPI, 2019; UCU, 2018; HEC, 2014; OFS, 2019a, b; Moody, 2019)

Cash to Total Assets (CTA)

CTA displays a negative and significant association (at 5% level) with AT. This confirms sub-hypothesis (H5i). Higher cash levels on the balance sheet reduce the university's asset turnover. The finding seems to reflect public accountability concerns with too much cash holdings on university balance sheets (Taylor, 2013a,b; Shattock, 2010; Kelleher, 2004). It also echoes stewardship and agency problems that tend to go hand in hand with higher cash levels thus reducing financial performance (Bates, Kahle, and stulz, 2007; Gao et al., 2013). Earlier

empirical work in CTA association with university financial performance is scant although large numbers of studies raise important normative issues with high cash levels on university balance sheets (Mikkelsen & Partch, 2003; Kim et al., 1998; Opler et al., 1999).

Services & Facilities Spend (SFSPEND)

The coefficient is significant (at 1% level) and displays a positive sign. But it is noteworthy that it has a very small magnitude. Still one is able to confirm sub-hypothesis (H5e). The result here fits intuitive expectations that universities that spend higher amounts on tangible services and facilities attract more fee-paying students hence the higher AT. Resource dependence and Legitimacy arguments (Pfeffer, 1987; Pfeffer & Salancik, 2003; Suchman, 1995; Taylor, 2012; Knight, 2002; Fabrice, 2009; Parker, 2011, 2012, 2013; Taylor, 2013a,) are clearly fulfilled here. Universities that display higher levels of educational resources and infrastructure attract higher fee paying clientele and also raise their reputational legitimacy. Quality Assurance and Optimal Contracting predictions (Price et al., 2003; Williamson, 2005; Shattock, 2010; Prowle & Morgan, 2005; Binsardi & Ekwulugo, 2003) are also validated here. Higher per capita spend on facilities assures students of the quality of the institution while it suggests a long-term orientation in governance which is optimal for the institution. Empirical work on this variable in university governance finds very similar results. Several scholars (Fabrice, 2009; Dao & Thrope, 2015; Migin et al., 2015; Wiers-Jenssen et al., 2002; Price et al., 2003; Ganyaupfu, 2013; Mushtaq & Khan, 2012; Kirmani & Siddiquah, 2008; Karemera et al., 2003; Young, 1999; Tang et al., 2004) demonstrate in their UK based sample that universities that showcase their higher educational facilities attract fee paying students/parents and academics alike.

Endowment to Total Assets (ENDWTA)

The association of this variable is insignificant but with a negative sign. Sub-hypothesis (H5h) is rejected. UK university endowment levels do not seem to positively increase the revenue generation of universities in the sample. Universities that have high levels of endowments are resource rich (Hillman & Dalziel, 2003; Borgatti & Foster, 2003; Bouwman, 2011). And feel less need to increase their revenues and this shows in an insignificant association with their asset turnovers. It also seems that such universities are self assured and their managers do not see the need to chase revenue streams (Williamson, 2000; 2005; Chizema & Buck, 2006). Empirically there is almost no reference to university endowment levels in relation to financial performance although many policy and normative scholars do criticize the impact of such endowments on university performance in general (Butt, 2019; Squire, 2014; Parker, 2012).

Research Only Staff (RONLY)

An insignificant negative coefficient is displayed. The proportions of research only staff employed by a university seem to have no discernible impact on its asset turnover. The result rejects sub-hypothesis (H3d). Therefore it is now hard to find support for Stewardship, optimal contracting Legitimacy and Resource Dependence arguments in this result. Staff on research only contracts ought to be able to attract distinct streams of revenues and thus husband the available resources i.e. the university's assets better (Probert, 2013; Fabrice, 2009, pg. 47; Sikes, 2006; Henkel, 2005; Ackers & Oliver, 2007; Locke, 2014; Eurydice, 2010, pg. 24; Ehrenberg & Zhang, 2006; Himanen et al., 2009). But the actual evidence is weak. Similarly, the Research-only contractual form ought to be optimally suited to improving the revenue performance of a university (Nyamapfene, 2018; Graham, 2015; Bexley et al., 2013; Probert, 2013). It should also be an effective resource focused on generating research grants and thus raise AT. But the weak insignificant negative coefficient suggests otherwise. Finally, the empirical qualitative literature often argue that the reputational legitimacy of a university in terms of its research expertise should increase with larger RONLY (Whitchurch, 2016; Ackers & Oliver, 2007; Coughlan, 2015; Parker, 2008; Coate & et al., 2001; Norton, 2013; Locke, 2012, 2014; Blackmore, 2016). This should have positive impacts on research grant income as well as international fee paying students. But here too the sample evidence weakly suggests the opposite.

Teaching Only Staff (TONLY)

The coefficient is insignificant but negative in its association. Therefore, sub- hypothesis (H3f) is rejected. The proportion of teaching only staff does not seem to have any discernible impact on the revenue generating ability of the university. This contradicts resource dependence and optimal contracting expectations (Flowes, 2014; Rowley, 1997; Pfeffer & salancik, 2003; Jacobson & Andreosso-O'Callaghan, 1996; Williamson, 2005; Van Essen et al., 2015) that TONLY staff will reduce salary bills and thus enable universities to generate higher revenues on their asset base. Empirically there has been scant work associating TONLY contracts with financial performance although many scholars (Duflo, 2009; Locke et al., 2016; Nyamapfene, 2018) suggest the cost saving benefits that accrue to universities out of employing such fixed single function staff.

Unique Governance Committee (UGCOM)

The coefficient is insignificant and negative. Therefore sub-hypothesis (H6m) is rejected. One is unable to decipher the true association between UGCOM and AT in this sample. The overall interpretation here can only be that establishing such a unique governance committee has no significant impact on a university's revenue generation. Once again here is proof that adding layers of red-tape and bureaucracy do not materially impact the financial performance of a university. This is intuitive and appealing. After all this is what Stewardship and Managerial Power opine (Edmans & Gabaix, 2009; Mallin et al., 2015; Murphy, 2012; Davis et al., 1997; Perez & Ode, 2013). The result clashes with the positive association found between this variable and voluntary disclosure in the university governance empirical literature by Ntim et al. (2017).

Part-time to Full Time Staff (PTTSR)

The coefficient is insignificant and negative in GLS FE regression. Sub-hypothesis (H3i) is rejected. Stewardship predictions that a university will be able to husband its resources more effectively through checking executive tendencies for profligacy in full time contracts (davis et al., 1997; perez & Ode, 2013; Edmans & Gabaix, 2009; Van Essen et al., 2015; Williamson, 2005; raff & Summers, 1987) and thus improve financial performance is not proved here. Neither are we able to find any evidence for effective resource utilization or cost savings from optimal staff contracting (Fowles, 2014; Pfeffer & Salncik, 2003; Locke et al., 2016; Thewlis, 2003) in this insignificant negative association. Empirically while studies have not directly associated PTTSR with university financial performance many commentators (Ackers & Oliver, 2007; Bryson & Blackwell, 2006; Brown & Carasso, 2013) commend the use of such contracts in order to save the institution money.

Governing Board Meeting Frequency (GBMFS)

An important board level governance mechanism i.e. how often the board meets, shows itself to be a significant (at 1% level) positive antecedent of Asset Turnover. This confirms ex-ante expectations in sub-hypothesis (H6j). Higher numbers of board meetings seem to improve asset turnovers in this UK HEI sample. There is no evidence for the dysfunctionality and group think arguments advanced by some governance theories or even the optimality arguments of others (Reverte, 2009; Schofield, 2009). Yet the contentions of governance theories like stakeholder, legitimacy stewardship, Resource Dependence and Public Accountability seem fulfilled here. Frequent meetings seem to enable effective incorporation of stakeholder concerns thus

resulting in higher revenue generation (Vefees, 1999; Sonnenfeld). Such meetings also create greater legitimacy for the board both within and without the institution arguably enabling revenue generation. Boards that meet more often implement their good stewardship quickly identifying problems as they arise and solving them thus enabling higher asset turnovers (davis et al., 1997; perez & Ode, 2013). By meeting more often such boards are able to tap into board member resources networks and expertise (Freeman & Reed, 1983; Freeman, 1984; Ashforth & Gibbs, 1990). Finally, a fuller annual calendar of meetings of the board also seem to impress the wider public who aid the positive momentum required to accelerate revenue generation in such a university (Kohli & Saha, 2008; Shivdasani & Zenner, 2004).

This result is unlike earlier corporate governance studies that provide a mixed i.e. both positive and negative picture of how board meetings in firms affect their financial performance. However, it is broadly in line with the positive association found by two studies in university governance and performance by Lokuwaduge (2011) and Lokawaduge & Armstrong (2015).

Vice-Chancellor Pay (VCPAY)

The variable displays a significant (at 1% levels) positive coefficient here. This confirms ex-ante expectations in sub-hypothesis (H6r). It is also opposite the negative association found between this variable and Research Quality in model 2 and its true negative association with Teaching Grant Fraction documented in model 5. The finding aligns with stewardship predictions that VCs who are paid well will work in synch with the institution's financial aims and thus produce better financial performance (Bebchuck et al., 2002; Edmans & Gabaix, 2009; Bachan & Reilly, 2015; Van-Essen et al., 2015; Mallin et al., 2015). It also seems to support the idea that resource rich CEOs will only bring their expertise and networks when they are rewarded well (Edmans et al., 2009; Walker et al., 2019; Gabaix & Landier, 2008). A high pay to them will result in better financial performance. There is also evidence here that universities that pay their VCs well, optimally contract such individuals who are consequently more focused on delivering financial results (Soh, 2007; Johnes & Virmani, 2019; Raff & Summers, 1987; Gabaix & Landier, 2008).

Earlier empirical work in universities has either found a positive association with many different financial measures of performance (Dolton & Ma, 2003; Bachan & Rielly, 2015; Walker et al., 2019; Ehrenberg et al., 2001; Baimbridge & Simpson, 1996), or no significant association with such performance (Tarbert et al., 2008; Cheng, 2014).

Fraction of International Students (INTS)

The variable displays a significant (at 1% level) and positive coefficient here. This is opposite the direction of its association with Research Performance in Model 1. The result confirms ex-ante hypothesis (H4b). As anticipated the proportion of its international students (INTS) at a university improves its asset turnover. Legitimacy theory prediction of the academic ambience enhancing effects of international students are seen in the result. This is why a growing asset turnover is the impact here. Similar resource dependence contentions about the impact of higher fees paid by such students and the necessity to court them seem borne out here. While direct work is rare many voices in the literature mention the likely positive financial gains of a university from the number of international student places it offers (Du et al., 2019; Vickers & Bekhradnia, 2007; Coate, 2009; De Vita & Case, 2003; Kuo, 2007; Soo & Elliott, 2010; Sutton Trust, 2010; Universities UK, 2015; Ianella & Haung, 2014; Parker, 2013; Guthrie & Parker, 2010; Nania & Green, 2004; Throsby, 1998).

Postgraduate Intensity (PGINT)

An insignificant negative coefficient is displayed here. Sub-hypothesis (H4d) is rejected. The result does not support either the resource dependence argument that postgraduate students might bring higher levels of fees and thus help the university generate higher revenues on the same asset base or the legitimacy argument of a reputational halo and consequent further attraction of fee-paying students (Parker, 2008; Angell et al., 2008; Donaldson & McNicholas, 2004; House, 2010; Smith et al., 2010; Dolton & Ma, 2003). Voices in the empirical literature (Angell et al., 2008, Smith et al., 2010; HESA, 2015; House, 2010; Wilson, 2012; Universities UK, 2015; Harris, 1996) opine that although postgraduate students generally constitute a minority of the student body at most universities, a fact confirmed in this sample (see Chapter 5, table 6), still these students are a financial positive for the university but the result here does not support these either.

Audit Committee Size (ADSIZE)

A positive and significant (5% level) coefficient is displayed on this audit related board level governance variable. This confirms ex-ante expectations in sub-hypothesis (H6n). Clearly universities with larger audit committees are able to generate higher revenues on their asset bases than their peers. Public Accountability, Resource Dependence, Stakeholder, Legitimacy Stewardship and Quality Assurance arguments seem to be confirmed (Coy et al., 2001; Pfeffer & Salancik, 2003; Pfeffer, 1987; Flowes, 2014; Donaldson & Preston, 1995; Wise et al., 2020;

Suchman, 1995; Leisyte & Westerheijden, 2014; Stansaker, 2018; Perez & Ode, 2013). Larger audit committees are able to draw on their resources, networks, expertise and effective oversight abilities to help universities attract and exploit diverse revenues streams (Camfferman & Cooke, 2002; Adeloje, 2011; Jetty & Beattie, 2012; DeSimone & Rich, 2019; Montondon & Fischer, 1999). Earlier research is thin and sparse in university literatures. However, in corporate research (Raghunandan & Rama, 2007; Al-Najjar, 2011; Nelsom & Devi, 2013; Kipkoech & Rono, 2016; Archambeault et al., 2008; Klien, 2002) have found that large audit committee sizes aid expertise, oversight and internal financial efficiency which generally positively impacts the firm's financial performance. The sample evidence in UK HEI is in line with this corporate finding. Larger audit committees have a positive influence on the revenue generating ability of the university.

Total Assets (TA)

As expected a highly significant (at 1% level) negative coefficient is displayed on this size control. This is much in line with all our ex-ante expectations. Larger universities just like larger firms are only able to grow their asset turnovers slower than their smaller peers (Hymer & Pashigian, 1962).

6.3.2 Sensitivity Analysis

Once again a rich suite of six additional regressions are implemented in model 5 above to test the assumptions of homoscedasticity, autocorrelation, multicollinearity, normality in distributions and endogeneity (see Appendix 1, 2, 3, 4, 5 and 6). The empirical/methodological arguments for the first four remain the same here as in all previous models. Various test results robustly confirm this as shown in the appendix. However, in this model, unlike all earlier models three variables namely FTA, RONLY and ENDWTA display strong endogeneity at 1% significances (see Appendix 6). Therefore, all three are instrumented for using all four control variables in the model. But such a strategy completely breaks down the IV process. Both the IV regressions display zero R-squares and lack any significances. Over-identification tests also strongly suggest that the IV is over-identified and therefore the coefficients in these regressions are not reliable. Therefore, the variable with the lowest levels of endogeneity among the three i.e. ENDWTA is dropped and only the other two are instrumented for. The high R-squares as well as small p-values in over-identification tests of the resultant two stage least squares (IV2SLS) and generalized method of moments (IV2SGMM) shown in the table confirm this

strategy. Therefore, it is these two variables that are instrumented for in the sensitivity analysis here.

Fixed to Total Assets (FTA)

GLS MLE remains insignificant but in GLS AR and once accounting for autocorrelation by lagging the dependant variable the coefficient becomes significant at 10% level. Both display negative associations. Also after accounting for the endogenous variable in the model, both IV 2SLS and GMM regressions remain insignificant but switch sign to positive. The panel OLS is significant with a negative sign. Overall, the evidence that FTA does not seem to significantly impact AT does not need to be modified, but should be interpreted with care.

Debt to Total Assets (DTA)

A more complex pattern is seen in this variable that needs some careful delineation. Except IV2SGMM all the other GLS, IV and panel OLS coefficients display a negative and significant association. The magnitudes of coefficients even rise in GLS AR and IV2SLS. Accounting for heteroscedasticity weakens the result. But adjusting for abnormality in variable distributions does not. Further when the autocorrelation and endogeneity in the model are addressed there is in fact a strengthening of the negative impact on Asset Turnovers.

The true negative impact of a university's leverage on the institution's revenue generating ability now emerges. All the theoretical predictions mentioned in the main GLSFE analysis above are seen fulfilled and strongly corroborated here. Unlike the corporate firm there are no mitigating circumstances when a university should take high levels of debt. This rather strong sensitivity result adds credence to the many voices in the normative, policy and qualitative empirical literature (McGettigan, 2013, Foskett, 2010; Brown & Carasso, 2013; Brown, 2010, Gibbs, 2012; Hamsley-Brown, 2011; Kim, 2008, Molesworth et al., 2010, Hayes & Wynyard, 2002; Margolis, 2004) that have been criticising the UK Government's increasingly laissez-faire neo-liberal stance towards UK HEI. This is despite much empirical evidence of the lowered reputational legitimacy of overleveraged universities among students and staff (CUC, 2018; HEPI, 2019; Watson, 2012). This active marketization of student markets has even led to many universities notably even Cardiff and SOAS overstretching finances by projecting overoptimistic student recruitment numbers which were simply unattainable (Turner, 2019). The financial situation of these institutions have floundered especially after BREXIT and recent leverage surveys of UK HEI have highlighted the unsustainable huge debt in the sector

(£12bn). Many universities have even tethered on the brinks of bankruptcy in recent times (Hillman, 2018), But even recent pronouncements of the OFS (OFS, 2019a, b) have not gone far enough and merely tinkered with the policy response here. The regulator has merely repeated corporate research based injunctions (Cartwright et al., 2007; Zeeman & Benneworth, 2017; McGettigan, 2013) hoping that takeovers/mergers/leveraged-buyouts will do the trick in HEI as they have in the corporate sector. But the sample results clearly show how universities are unique entities and should singularly avoid the debt problem entirely.

Cash to Total Assets (CTA)

GLS MLE remains negative and significant (at 1%) but GLS AR although negative becomes insignificant. Both the IV2 SLS and panel OLS (merely used as a sensitivity – see Chapter 4.7) reverse signs to positive and significant while the IV2SGMM is positive without significance. This is a fairly mixed result especially when considering endogeneity. There is no evidence of cyclicity in the CTA-AT relationship. On the whole then although the interpretation in GLSFE above is not in need of any drastic change it should be interpreted with an element of caution.

Services & Facilities Spend (SFSPEND)

Both the GLS MLE and GLS AR coefficients remain positive and significant (at 1% level) which corroborates the main fixed-effects findings. The IV 2SLS and GMM regressions change signs to negative with significance. In this result too then the endogeneity regressions seem to rule out a positive cycle in SFSPEND AT relation. There seems to be no need to drastically modify the GLS FE interpretation above.

Endowment to Total Assets (ENDWTA)

All GLS coefficients remain negative and insignificant but the IV 2SLS and GMM and panel OLS coefficients turn significant at 1% and display a negative sign. There is no change in the negative sign across the entire suite of regressions including the GLSFE main regression. This is moderately strong evidence that ENDWTA's influence is indeed negative. Overall, then it does seem that there is no need to change the complex GLS FE interpretation of this variable above. The financial complacency argument does not need modification. ENDWTA clearly has a weak yet fairly distinct negative impact on university asset turnovers in this sample.

Research Only Staff (RONLY)

All GLS coefficients remain insignificant but GLS AR changes sign to positive. However the panel OLS and IV2SGMM are both positive and jump in significance to 1%. A curious result thus emerges in the sensitivities of this variable. Undoubtedly there is heteroscedasticity, abnormality in distribution, autocorrelation at work in this variable which explains so many significance and sign reversals. But some weak evidence of a positive association between the variable and AT cannot be ruled out. In particular the positive coefficient in IV two stage GMM suggests that it is not right to entirely dismiss the theoretical predictions of positive association as suggested in GLSFE main model above. In fact, there may be some slight evidence of a positive cycle of reinforcement in the IV2SGMM. Universities with high RONLY attract more research funds and then go on to hire even more RONLY an argument often advanced in the normative university literature (Locke, 2012; Nyamapfene, 2018; Deem, 2004; Locke et al., 2009; Jongbloed et al., 2018; Oancea et al. 2010; Proberts, 2013; Whelan, 2017). On the whole then it may be useful to admit that the exact nature of association between RONLY and AT is ambiguous in this sample and in need of further investigation.

Teaching Only Staff (TONLY)

GLS MLE remains negative but GLS AR turns positive but both remain insignificant. IV2SLS coefficient changes sign to positive without significance while IV 2GMM remains negative but again without significance. This result is even weaker than RONLY above. Overall, then the interpretations of the GLS FE main model need no modification here, and TONLY's insignificant association is robustly evident in the suit of all advanced regressions.

Unique Governance Committee (UGCOM)

Although all coefficients except IV 2GMM remain negative and except GLS AR none are significant. GLS AR, and after accounting for autocorrelation by lagging the dependent variable (AT) is showing a negative association at 10% levels, the result is very weak and one is only able to conclude that this variable does not seem to have any effect on asset turnover. Overall, after accounting for endogeneity, heteroscedasticity, abnormality, multicollinearity and autocorrelation the association is very weak and insignificant. There is no need to modify earlier interpretation in the main GLS FE model.

Part time to Total Staff Ratio (PTTSR)

The GLS MLE remains negative and insignificant while GLS AR does not change sign but becomes significant at 10 % level and increase in magnitude. The panel OLS, although biased, is the only coefficient that is positive and significant (at 5%). IV 2SLS and GMM are both insignificant although the latter changes sign to positive. On the whole the result is very weak and there is no need to interfere with the main GLS FE model interpretation above.

Board Meeting Frequency (GBMFS)

All GLS and panel OLS coefficients remain positive and significant. IV2SLS coefficient rises in magnitude and stays positive and significant. But the IV2SGMM coefficient changes sign to negative and loses significance. This is a moderately strong result. Accounting for heteroscedasticity, multicollinearity, abnormality in variable distributions, autocorrelation and endogeneity does not change the robust positive association here. Some evidence of a positive cycle in meetings to asset turnover positive relationship is also seen. Overall, then the theoretical/empirical insights advanced in the GLSFE with regard to this variable do not need any modification.

Vice Chancellor Pay (VCPAY)

The GLS MLE and AR coefficients remain robustly significant and positive just like with the main fixed-effects model. But both IV 2SLS and GMM coefficients lose significance and turn negative. Endogenous mechanisms merely weaken the result. Clearly one is unable to infer a positive cycle in this association. Overall, then, there is no need to interfere with the GLS FE interpretations. VCPAY is indeed positively associated with university asset turnover in this sample.

Fraction of International Students (INTS)

The findings are robust across all GLS regression, GLS MLE and GLE AR, at 1% level, and even after accounting for endogeneity the coefficients remain significant and positive in IV 2SLS at 5% level. Only the IV GMM coefficient loses significance but remains with an unchanged positive sign. Accounting for heteroscedasticity, multicollinearity, abnormality, autocorrelation and endogeneity does not materially alter the positive association with asset turnover. Clearly then, this evidence suggests that the important insights from the GLS FE regression above are robust and remain valid.

Post Graduate Intensity (PGINT)

All the GLS regressions, GLS MLE and GLS AR, display a similar result to the main fixed-effect finding of negative and insignificant association. Even after accounting for the endogenous variable, both IV 2SLS and GMM remain insignificant except the latter changes sign to positive. Although biased, the panel OLS regressions is the only significant association and is negative. There is no need to add further to the already nuanced discussion of this variable in the GLSFE model. The insignificant association in the suite of advanced regression is a further robust validation of the main fixed-effect finding.

Audit Committee Size (ADSIZE)

All GLS coefficients, GLS 2SLS and GMM remain significant at 5% or above. Coefficient remain positive and magnitudes is unchanged in GLS MLE and drops slightly in GLS AR. IV 2GMM coefficient is still positive and significant at 10%, but IV 2SLS remains changes sign without significance. Overall after accounting for heteroscedasticity, multicollinearity, abnormality, autocorrelation and endogeneity There seems to be sufficient corroborated evidence that sub-hypothesis (H6n) is held in this sample. UK universities with larger audit committees are able to generate higher revenues on their asset bases than their peers.

Total Assets (TA)

The sign remains negative and coefficient magnitudes rise and they remain significant at 1%. The size control remains a strong negative antecedent of Asset Turnover. The panel OLS interpretation stands strongly validated.

Russell Group (RGROUP)

The coefficient is strongly significant at 1% and the sign turns positive with rises in magnitudes. Clearly the panel OLS result which is negative but insignificant is completely rejected when the econometric issues within the sample are accounted for. Asset Turnovers of this elite group as anticipated are higher than their peers.

PRE1992

A significant (at 5% level) positive coefficient is displayed only in the panel OLS, which indicates that older established UK universities seem to grow their asset turnovers at a faster pace than their newer peers. Panel OLS is only used as part of the sensitivity tests with regard to the controls, as the controls get analysed in GLS FE. In all the other GLS tests (GLS MLE & GLS AR) coefficients turn insignificant. The panel OLS interpretation is weakened. There

is considerably less evidence for the higher Asset Turnovers of this university group in the sample.

REGION

A highly significant (at 1% level) negative coefficient is displayed in the panel OLS, It does seem as though asset turnovers decline as one moves away from England. However, this must be interpreted with care because after this is based on the panel OLS which is merely used in the sensitivity tests for the controls which gets omitted in GLS FE. Also, the result just like with PRE1992, all other GLS coefficients turn insignificant and so one is forced to conclude that there is weak evidence in this sample that University Asset Turnovers vary by region.

6.4 Chapter Summary

This chapter has presented and interpreted the results of the six multivariate regression models developed in university governance and performance in this UK sample. Research, teaching and financial performances and their multiple governance antecedents have been analysed to identify the many associations between them. Apart from the main GLS fixed effects regression a suite of five additional sensitivity regressions were also presented and analysed to robustly assess these associations. In the next chapter the interpretations of these six models are combined compared and evaluated in a detailed qualitative manner linking back to theory and literature to develop the main insights of this thesis.

7. Chapter Seven: Discussions and Insights

7.1 Introduction

This penultimate chapter weaves together the complex multi-layered findings from the previous analytical chapters 5 and 6 in order to understand their full meaning and scope. It forges a unitary coalesced narrative that uniquely draws together the different threads of theoretical and empirical insights emerging from the previous chapters. From this a novel understanding of the complex multi-dimensional governance performance challenges and trade-offs of UK universities emerges. The Chapter thus presents a summarised qualitative and macro understanding based on the quantitative interpretations of the results conducted in Chapter 5 and 6.

Universities are, as already discussed in Chapter 1, unique multi-dimensional institutions characterized by complex difficult to resolve trade-offs in their governance and performance. This is because society requires them to foster an extraordinary variety of intellectual, scientific and cultural knowledge. They are also required to manage complex societal goals associated with inter-generational divides and inter-segmental priorities. In all this they are significantly different from corporate firms. Knowledge creation i.e. research and knowledge dissemination i.e. teaching both constitute their most important functions. Creativity and innovation thus constitute their fundamental fabric. Any study of this Higher Education Institution must therefore be approached with a theoretical/empirical/methodological lens that squarely accounts for these differences.

Extant university governance-performance scholarship has failed to do this. The rare quantitative studies (Lokuwaduge, 2011; lokuwaduge & Armstrong, 2015; Olson, 2000; Harris, 2014) that do exist here have merely applied the corporate governance performance paradigm and its theoretical/empirical lens to this unique institution. This is not flawed, but overlooks other important dimensions. Not only is university governance multi-dimensional and significantly different from firms. But University performance is also multi-dimensional with research, teaching and financial performance each trading off against one another and associating in complex ways with important internal governance decisions. A need had

therefore been identified in Chapter 1 to accomplish a singular unpacking of the complex relationships between university governance and performance in the UK.

For the first time, then, in this thesis, this need is answered. Five distinctive aspects of the thesis must be highlighted upfront in this context.

First and foremost, it comprehensively crafts unique definitions of university governance and performance encompassing the multi-dimensionality of either theoretical construct (Gayle et al., 2003; Shattock, 2010; Jongbloed et al., 2018; Collini, 2012). These definitions in themselves expand earlier ones and enable a true unpacking of the associations between governance and performance in the UK HEI. Second, it establishes the relevance of a novel seven-fold theoretical framework and proceeds to critically analyse each theory and its implications to the research question (see Chapter 2.4). Third, from this and a critical review of the empirical literature the five important empirical and methodological research gaps are identified in the body of knowledge. Fourth, to fill these gaps, hypotheses are advanced capturing the multi-dimensional associations between university governance and performance. Fifth, a novel data sample consisting of 25 governance and 6 performance measurements for 132 UK universities across 10 years is collated. Finally, univariate, bivariate and multivariate analyses are innovatively and rigorously done in this data sample in order to answer the hypotheses posed. It is the interpretations of these results conducted in chapter 5 and 6 that constitute the basis of all the critical discussion to follow in this chapter.

The rest of the chapter is structured into seven main sections. The first section to follow i.e. 7.2 summarizes important novel findings about the university governance variables studied here and their important hitherto unexplored characteristics. In this, the section summarizes findings about five different missing dimensions of university governance aside from the usual Board and audit related ones. Section 7.3 forges together a narrative coalescing the different insights about UK university research performance and its antecedents from Chapter 5 and 6. The section first discusses insights about the research impacts of missing dimensions of university governance. It then draws insights about the usual board level and audit related dimensions. section 7.4 does likewise with university teaching performance. In section 7.5 the complex trade-offs between university research and teaching performance as evidenced in the sample are discussed. Section 7.6 fleshes the insights from university financial performance just like research and teaching earlier. Section 7.7 attempts to understand what the sample evidence

means for the trade-offs between a university's academic and non-academic performance. Section 7.8 is a summary conclusion of this penultimate chapter of the thesis.

7.2 The multiple dimensions of UK University Governance

From the univariate, bivariate and multivariate analyses of previous chapters a large number of missing dimensions of UK university governance emerge as central antecedents of university performance. The usual board level governances i.e. Board size, Board diversity etc., routinely studied by most scholars such as Lokuwaduge (2011), Lokuwaduge & Armstrong (2015), Olson (2000), Ntim et al. (2017) and others undoubtedly continue to be important influences on research, teaching and financial performances of UK universities. But singularly this research uncovers a range of other important dimensions of governance that impact these performances. This is an important contribution to the scholarly literature. These include **selectivity** in entry standards (ES), **instruction intensity** in student-staff ratio (SSR), **Research/teaching modalities** reflected in staff level diversities (FSF, PTTSR, TRST, TONLY, RONLY), **pedagogical orientations** captured in student body diversities (INTS, PGINT) and **strategic financial choices** expressed in chosen asset and revenue structures (ENDWTA, CTA, FTA, DTA, TFEE, SFSPEND). These new aggregate dimensions of university governance that emerge from the theoretical/empirical analysis of this thesis represent key additions to the body of knowledge here. In what follows the key insights emerging from both types of governance antecedents i.e. those already studied and those trailed in this thesis for the first time are critically coalesced to suggest the new complete picture of UK university governance in all its different dimensions.

7.2.1 What we know so far about the dimensions of UK University Governance

Most of the UK university governance and performance literature has been focused around the board (Lokawaduge, 2011; Lokuwaduge & Armstrong, 2015; Ntim et al., 2017; Harris, 2014; Olson, 2000). It is almost as though the rest of the organization simply does not matter. However, the range of empirical evidence uncovered in this thesis suggests that University Governance unlike that of a firm works in multiple ways and dimensions¹². It is expressed

¹² The reader is directed to Chapters 2 & 3 (sections 2.2.1 & 3.1.1) for a detailed analysis of this and the associated empirical gap identified by this thesis.

largely as a set of complex choices that universities implement not just at the board level but in various other parts of the entity. It is useful to first reflect on many of the new discretionary governance choices that have emerged in the sample.

Selectivity in Entry Standards

In line with the arguments of several policy and normative governance scholars (Shattock, 2008; Dearing, 1997; Dearlove, J. 2002; Frankel, 2011; McDonald, 2013; Trakman, 2008, Collini, 2012, Sawir, 2013; Brown & Carasso, 2013) the univariate analysis in Chapter 5 uncovers rich evidence for heterogeneity in ES across UK universities. Universities have been richly differentiating themselves from their peers in terms of how selectively they recruit students i.e. their ES. This more than confirms how important this decision is. It is not taken lightly or just at the board level but across the institution in departments, their committees and in myriad interactive ways. The public student coverage imperative along with the legitimacy of an overexclusive university clashes with the student/parent need for quality assured higher education, a fact deliberated extensively in hypothesis development in Chapter 3.2.1.1. On the whole coelascing all the univariate findings (see Table 6, pg. 198-202; Appendix Table 1, pg. 419-422) in this dimension it is overwhelmingly apparent that calibrating Entry Standards is a singular challenge facing university governance.

Interaction Intensity in Student Staff Ratio (SSR)

The rich heterogeneity in the levels of this ratio in this UK sample effectively interpreted in Chapter 5 demonstrate the many challenges faced by universities in this dimension. Universities are heterogenous in their choices of SSR (Chapter 5, pg. 205, 198-202; Appendix Table 1, pg. 419-422). Student places and Staff strengths to support them are the greatest challenge facing such knowledge institutions which have to balance conflicting concerns of student coverage, staff morale, union activism and quality of academic interactions (Coy et al., 2001; Leisyte & Westerhejden, 2014; Stensaker, 2018; Marginson, 2018; Freeman, 2015; Foskett, 2010; Fowles, 2014; Wise et al., 2020). Pulling together all the univariate interpretations on this dimension (Chapter 5, pg. 208, 198-202; Appendix Table 1, pg. 419-422) there is now definitely evidence that a university's SSR is individually rooted and hard to calibrate without a coherent effective governance vision across the entity as a whole.

Research/Teaching/gender modalities in Staff level diversities

Research and teaching are the most important twin functions of a university. Resource Dependence, Stakeholder, Culture, Quality Assurance and Optimal Contracting (Collinson, 2004; Verschuere & De Corte, 2014; Pfeffer, 1987; Fowles, 2014; Brown, 2004; Edmans & Gabaix, 2009; Mallin et al., 2015; Leisyte & Westerheijden, 2014; Rowley; 1996) posit that academic staff and their diverse contracts represent key modalities whereby the university calibrates governance associated with these functions. Evidence in Chapter 5 for the first time proves how female staff fraction (FSF), part-time to total staff ratio (PTTSR), Teaching & Research staff ratio (TRST), Teaching Only staff ratio (TONLY) and Research Only Staff Ratio (RONLY) are carefully considered trade-offs emerging from the teaching and learning regimes philosophies in the uniquely individual evolution of each UK university (Trowler, 2002). It is in the choice of staff contracts that important internal governance policies are expressed. The wide variation in these contractual levels point to a UK HEI sector clearly searching for complex governance answers to the puzzle of how to structure specific contracts. Several governance policy commentators have often underlined (Mintzberg & Rose, 2003; Minor, 2003; Campbell, 2003; Meyer, 2002; Sora, 2001; Collini, 2005; Parker, 2011; McGettigan, 2013; Shattock, 2008; Brown & Carasso, 2013; Toma, 2007; Vidovich & Currie, 2011; Parker, 2012; Rowlands, 2013; Molesworth et al., 2010) this turmoil in the increasingly marketized UK university sector. This research provides comprehensive quantitative evidence that this is indeed true.

Pedagogical orientations in student body diversities

The univariate analysis of proportion of International Students (INTS) and Postgraduate Students (PGINT) in Chapter 5 discovers many revealing nuance (see Table 6, pg. 198-202; Appendix Table 1, pg. 419- 422). UK universities displays keen differences in course choices, student places and professed specializations within the overall higher education market place in the country. These differences have been on the rise especially after the increasing marketization of UK Higher Education. Collis (2004), Molesworth et al. (2010), McGettigan (2013), Collini (2005), Foskett (2010), Brown & Carasso (2013), Shattock (2013), Kim (2008) and Ntim et al. (2017) take note of this fast emerging paradigm. Such an active differentiation in the sector proves for the first time that pedagogical orientation of universities is in itself a key governance dimension. It creates the academic ambience of the university and should therefore be deliberately accounted for. Many theories notably optimal contracting, legitimacy, stakeholder and public accountability predict this and argue for its inclusion (Pfeffer, 1978;

Donaldson & Preston, 1995; Suchman, 1995; Scherer et al., 2013). This thesis proves these arguments in the rich diversity of univariate results. Here then is proof that calls for inclusion of pedagogical orientation by normative and policy scholars (Dearlove, 2002; Shattock, 2008; Hillman, 2014; House, 2010; Smith et al., 2010; De Vita & Case, 2003; Harris, 1996; Hesketh & Knight, 1999; Bolsmann & Miller, 2008; Pittaway et al., 1998; Throsby, 1998; Coate, 2009; Hemsley-Brown & Oplatka, 2006; Collini, 2005; Parker, 2011; McGettigan, 2013) are not misplaced.

Strategic Financial Choices in chosen asset/revenue structures

The nature of strategic financial choices facing a university are different from those of a standard corporate firm in two important ways. First the endowment is an important financial structure that although similar to the financial reserves of a firm has significantly different characteristics. In many ways it captures the financial and academic autonomy of this institution but it also reflects some of its predilections as often underlined by Resource Dependence, Optimal Contracting and Stakeholder (Flowes, 2014; Toutkoushian, 2001; Taylor, 2013a; Parker, 2013, 2012; Fosto & Nkote, 2007; Ferry & Eckersley, 2011; Brown et al., 2012; Ntim et al., 2017; Kim, 2008). The sample evidence shows a wide variation in the way universities choose or maintain the balance in Endowments within their asset structures. For the first time then in extant university governance studies endowment to total assets ratio (ENDWTA) is studied here and reflects an important missing dimension. Second Resource Dependence, Quality Assurance, Public Accountability, Legitimacy and Optimal Contracting predict that the sources from which the university earns its important income streams will have key governance based trade-offs (Pfeffer, 1978; Stensaker, 2018; Leisyte & Westerheijden, 2014; Hoecht, 2006; Brown, 2004; Ferry & Eckersley, 2011). Tuition Fees and Research Grants are the two main streams of revenue for a UK university. By findings detailed evidence for heterogeneity in tuition fee fraction (TFEE) in this UK sample the thesis proves how universities are indeed cognisant of the difficulties they face in relying too heavily on either tuition paying students or research grant donors. It also suggests another important difference from the corporate firm that does not face such a trade-off. Once again for the first time here is proof that TFEE is indeed a missing strategic governance choice in the university sector.

Apart from these two variables the usual set of financial variables with governance implications i.e. leverage (DTA), fixed asset proportion (FTA) and Cash ratio (CTA) are also shown to exhibit rich differences and thus the thesis answers normative/theoretical calls (UK

Universities, 2015; Washburn, 2008; Carrington et al., 2018) for consideration of all financial aspects of governance in their totality.

Standard Board and related measures

The usual internal governance measures of a university extensively studied in earlier research i.e. Board composition and Audit related are combined in unique ways by this thesis (Ntim et al., 2017; Olson, 2000; Harris, 2014; Lokuwaduge, 2011; Lokuwaduge & Armstrong, 2015). Board compositions in terms of size (BSIZE) and diversities (BGDIV, BEDIV), board meeting frequencies (BMFS) and board independence (IGOV) display rich heterogeneity in line with theoretical and empirical predictions. Similarly, a range of auditory governance measure such as the presence of a unique governance committee (GCOM) and conduct of BIG-4 audit (BIG4A) remain importantly influential in the sample data. Some hitherto less used governance measure also show significant patterns here such as Vice Chancellor Pay (VCPAY), Executive Team Meeting Frequency (ETFS) and Audit Committee Size (ADSIZE).

7.3 UK university Research Performance and its Governance antecedents

A highly complex and nuanced picture of University Research Performance emerges from the univariate bivariate and multivariate analyses conducted on this UK HEI sample in the previous chapters 5 and 6. This section coalesces, qualitatively, the findings drawn from the three different advanced Research performance models in Chapter 6 (see Section 6.1, pg. 246-284). The intention is to fit together and weave the many complexities that obviously emerge here and thus present a comprehensive yet detailed picture of the governance antecedents of UK University Research Performance.

The following section divides into three main sub-sections. 7.3.1. discusses the multiple dimensions of university research performance in UK HEI as evidenced in the sample. In sub-section 7.3.2 summary insights are extracted from the uni/bi/multi variate analyses about how university research performance associates the missing dimensions of university governance (Entry Standards, Student Staff Ratio, Research/Teaching/ Gender Modalities in Staff Contractual Diversities, Pedagogical Orientations in Student Body Diversities and Strategic Financial Choices in Asset/ Revenue Structures). The Final sub-section 7.3.3 discusses similar

summary insights about how university research performance associates with the usual board and audit related governance measures.

7.3.1 Multiple Dimensions of University Research Performance

University Research Performance is multi-dimensional. It can be measured assessed and evaluated in different ways by students, researchers, governors, regulators and the general publics (Chapter 2, pg. 44-55; Chapter 5, pg. 222-238; Chapter 6, pg. 243-247; 285-287; 311). It is this multi-dimensionality that makes it so difficult to measure as suggested by empirical scholars (Jongbloed et al., 2018; Asif & Searcy, 2013; Palomares-Montero & Garcia-Aracil, 2011). Hence, there is a need to coalesce the various interpretation in Chapter 5 and 6 about university research performance to fully understand them. Singularly in extant UK HEI empirical literatures this thesis uses three distinct measures of university research performance. Research Performance Index (RPI) is a composite indicator combining and weighting scores from five separate variables (RQ, RGF, GHONR, GPRO, CR) as per a factor analysis in Chapter 5. Of these 5 variables, two viz. RQ and RGF are separately associated in the multivariate regression on their own due to their important independent angles on the research performance of the university. RQ i.e. Research Quality is after all an independent assessment of the published work of the institution derived from the RAE exercise of HEFC (Higher Education Funding Council) while RGF i.e. Research Grant Fraction is the fraction of total income that a given university earns from its research grants. From this at least three dimensions of university research performance are neatly captured. First and foremost, the index construction of RPI in Chapter 5 balances out different perspectives on research performance emerging from a range of different university stakeholders (Donaldson & Preston, 1995; Mitchell et al., 1997; Leisyte & Westerheijden, 2014; Wise et al., 2020). Since the index combines 5 variables each measuring a different angle of research performance and the factor analysis weights these based on a rational assessment of each it represents a synthesis of all types here. Second, the legitimacy and quality assurance contentions about research quality (RQ) being a vital indicator to the community at large about a university's academic orientation and achievements is richly captured (Stensaker, 2018; Ashforth & Gibbs, 1990; Filippakou & Tapper, 2008; Nuninger, 2016). Finally, resource dependence, optimal contracting and managerial power are fully reflected in the RGF results which examine research performance

as a function of its marketability to fund providers (Bebchuck et al., 2002; Deem et al., 2007; Pfeffer & Salancik, 2003; Fowles, 2014).

The results and their rich interpretations in Chapter 6 clearly show how multiple dimensions of university research performance exist simultaneously and pose serious challenges to the universities, regulators and policy makers. RPI, RQ and RGF prioritizes a very different set of internal governances in models 1, 2 and 3 and weights them in different ways to reflect the many conflicting concerns embedded in university research performance. Three notable differences between these research performance GLS FE models interpreted in Chapter 6 highlights this. First, RPI and RQ differently account for Entry Standards, the new missing dimensions uncovered by this thesis. Importantly RPI suggests a strong significant positive association while RQ demonstrates a less significant mixed association. Thus, one dimension of university research performance i.e. RPI suggests no redeeming characteristics in this UK sample. Only universities that posit high entry standards achieve high RPI confirming predictions of optimal contracting, resource dependence and stakeholder theories. But the other dimensions i.e. RQ suggests that there might be universities that are more inclusive and yet achieve high quality published research. This gives some credence to arguments from public accountability and legitimacy.

Second, in a similar vein of the three research models RPI and RQ documents a strong significant negative association with FSF i.e. staff level gender diversity. This is corroborative evidence that university research whether it be measured in a holistic index or in the published research output of the institution does not benefit from larger numbers of females on the faculty. By contrast the RGF model displays an insignificant association. Research performance of a university as assessed by an external grant provider seems to be uninfluenced by the gender balance in the staff. This redeems university research grant providers who seem to go purely on the merit of the proposal in front of them rather than the gender balance of the institution proposing it. Thus one set of research performance variables i.e. RPI and RQ do not support theoretical arguments for beneficial impacts from staff level gender diversity (Metcalf et al., 2005; Pfeffer, 1978; Verbruggen et al., 2011) while RGF at least is neutral on this question (Blake & La Valle, 2000; Santos & Van Phu, 2019).

Finally, ENDWTA (the proportion of a university's endowments) shows a rich differentiation between the RQ and the RGF models. RQ model displays a strong significant negative

association suggesting that rich endowments make university research complacent as argued in (Bebchuk et al., 2002; Van Essen et al., 2015; Butt, 2019) . But the RGF model strikingly finds a positive yet insignificant association documenting how research grant providers are uninfluenced by the corporate and endowment fund clout of research proposing universities. This is much in line with HEFCE (2012) & OFS (2018b, c). Thus, a fuller multi-dimensional picture of research performance in UK HEI emerges from the three separate research models of RPI, RQ and RGF.

7.3.2 University Research Performance in the missing dimensions of governance

In the multivariate interpretation of Chapter 6 the uniquely identified missing dimensions of university governance richly explain significant nuances of the three different research performances RPI, RQ and RGF in this UK sample. In what follows summary insights about these governances are brought together to explain the macro challenges that face a university that wishes to improve its research performance.

The two research performance models (RPI and RQ) with **Entry Standards** highlight the enormity/complexity of the challenge faced by universities in calibrating this missing dimension. At the very outset it must be stressed that my result that high ES leads to high research performance is supported by large numbers of empirical studies notably Ayoubi & Massoud (2012), Bolivar (2015), Johnes & Soo (2013), and Bachan (2017).

Although the result implies that setting higher entry standards is an easy way of improving university research performance, by the same logic on the other side reducing such standards also leads to lower performance. Therefore, it does seem to highlight acutely the conundrum facing universities who wish to maintain high research performance without restricting student access to the best and the brightest. Public accountability and policy scholars do often (Bolivar, 2013; 2011; Jerrim & Vognoles, 2015; Whitehead et al., 2006; Zimdars et al., 2009; Hutchings & Archer, 2001; Mangan et al., 2010a, b; Zimdars, 2010; 2016; Adnett et al., 2011; Callender & Scott, 2013, pg. 74-79) raise the bogey of exclusivity and elitism of the UK HEI and the result seems to explain why top universities stick to high unflinching entry standards. From a legitimacy angle (Avnett, 2006; Scherer et al., 2013; Freeman, 2016; Suchman, 1995; Harrison, 2014) it is apparent why top performing universities may be choosing high entry standards. After all the result seems to imply that this is the easiest and most pragmatic way to improve

research performance and reputation. Yet the result seems to amplify concerns that faced with such an easy high ES high research performance association the UK university will surely struggle to balance the nexus here with its moral obligations to the wider student population that too seeks academic improvement and transformation. Scholars in a different context like Ntim et al. (2017) have already underlined these moral versus pragmatic legitimacy concerns in the UK HEI. Further, from a HEI sectoral perspective it does seem that if all high research performers in the sample choose the best and brightest students then the other institutions are left facing an adverse selection problem of necessarily dumbing down to fill student places. Clearly this is unhealthy for the optimal contracting (Furedi, 2004; Bright, 2004; Anyanwu, 2004; De Fraja & Lossa, 2002; Edmans & gabaix, 2009) of higher education as a whole in any society.

At another level it does seem that across the sample years higher ES has always meant higher research performance lending credence to Quality Assurance arguments (Sawir, 2013; Brown & Carasso, 2013, pg. 144-163; Brown, 2004; 2009; 2013; Attwood, 2008b; Yorke, 2009a, b; Allen, 2011; Jack, 2008; Callender & Scott, 2013; Murdoch, 2011; Henard & Mitterle, 2010; Hoecht, 2006; Filippakou & Tapper, 2008; Salter & tapper, 2008; Vidovich, 2002) that universities as unique knowledge institutions must resist the tendency to dumb down academic standards.

Reading the result in this way suggests some key insights. Elite research performers in the UK, do not have any incentive to lower entry standards. Yet UK HEI as a whole might be benefited when these top performing institutions become slightly more accommodative in their student entry criteria (Harley, 2002; Jones & Thomas, 2005; Chowdry et al., 2013). This will help spread the intellectual talent of the incoming cohort across all universities in UK rather than being completely absorbed by just the top institutions. It will also help the lower and middle level institutions to benefit from the meritorious students entering their portals and raising the levels of intellectual debate within them. Perhaps this is why Gorard et al. (2009), Jerrim & Vignoles (2015), Boliver (2013), Zimdars et al. (2009), Harris (2010), Glennerster (2001), Harrison (2011) and Chowdry et al. (2013) repeatedly raise concerns of growing elitism in UK HEI and call for a more egalitarian fair access for students at all universities. On the whole the selectivity in entry standards of a UK university stands revealed as a multi-edged and challenging governance decision that requires a unique individually rooted and carefully

calibrated solution if the institution wishes to improve its research performance and all associated externalities.

The second missing dimension of **Instruction intensity in Student Staff ratio** displays a largely ambiguous pattern of associations with research performance.. This is unsurprising and in line with a large empirical scholarship referred to in Chapter 3 that find this variable difficult to model, interpret or fathom (Edmonson & Mulder, 1924; Johnson, 2010; Kennedy & Siegfried, 1979; Zietz & Cochran, 1977; Lopus & Maxwell, 1995). At the outset it should be noted that SSR in this thesis is defined in terms of all students at the university i.e. taught and research students. To an extent this might explain some part of the ambiguity here. After all the burden of taught students might interfere with the research productivity of academics while research students may actually aid the idea generation/idea refinement process of research.

But the true meaning of the result could also lie in other directions. A mixed pattern of association here could be flagging the difficulty of SSR calibration already highlighted in the theoretical and normative governance literatures. After all, a host of culture/quality assurance and argumentative university governance scholars including Filippakou & Tapper (2008), Brown (2004, 2013), Cremonini et al. (2015), Pollitt (1990), Trowler (2008), Shattock (2013), Taylor, (2013a,b), Knight (2002), Trakman (2008), Collini (2012), Collis (2004), Parker (2011), Melville-Ross (2010), Hordern (2013) and Bradley et al. (2008) strongly advocate that lower SSRs should enable idea generation and refinement through higher levels of debate and interaction both in the classroom and in the research lab. Lower SSRs should therefore improve a university's research function. But on the other hand, Optimal contracting and resource dependence theorists (Edmans & Gabaix, 2009; Mallin et al., 2015; Murphy, 2012; Pfeffer, 1978; Pfeffer & Salancik, 2003) emphasize the importance of right sizing staff resources to ensure the university is achieving value for money in its human resource function. Elsewhere, Stakeholder perspectives (Donaldson & Preston, 1995; Mitchell et al., 1997; McDonald, 2013; Hagenauer & Volet, 2014; Koenig et al., 2015) detail the likely conflicts between staff work life balance concerns, student/parent academic quality requirements and the university's need to balance its budgets. A likely triangular trade-off here is often expressed in these stakeholder conflicts and the theory suggests that these need careful mitigation by the university. It is these opposing and complex theoretical predictions and the trade-offs they highlight that seem to be at work in these ambiguous results.

With neither a neat positive or neat negative impact university governors face the challenge of whether to improve student body coverage i.e. increase SSR and take on the negative of academic burdens and work-life imbalances or do the opposite. While idea generation and refinement that constitute research might benefit from greater interaction among faculty and research students as argued by cultural governance theory such interaction is not essential. The sample seems to be pointing more towards optimality in this governance dimension i.e. neither too high nor too low SSRs are good for university research performance. At a separate level the ambiguous pattern may be a strong reflection of deeply entrenched teaching and learning regimes (TLRs) in each UK HE Institution (Trowler & Cooper, 2002; Trowler, 2019). In the ideational dynamics of research project development there may be deeply held learning beliefs both among research students and their supervisors.

Nevertheless, between these two missing dimensions and their impacts on university research performance there seems to be a curious pattern that is richly insightful. There is an endogeneity in the first dimension of ES that is robustly substantiated across my sample (see Appendix 6). When this is controlled for through instrumentation the impact of SSR on research becomes positive and significant. Reading these results jointly there seems to be at least some evidence of a combined and calculated impact. In short once universities choose a high ES they obtain the brightest and best and now any SSR increase would improve research performance. Thus, exclusive and selective institutions may be able to afford an increase in SSRs because they have already applied high entry standards, and their research performance would not drop due to the presence of these high achiever self-starter student/researcher (Wyness, 2017; De Fraja & Iossa, 2002; Harrison, 2004). Similarly, at the other end of the spectrum universities choosing a low ES might not be able to improve their research performance despite lowering their SSRs due to the poor creative abilities of the incoming research class. To sum up, the endogeneity based sensitivities confirms that the two missing dimensions of university governance i.e. ES and SSR have a combined calculus of impacts on university research performance and this is another significant part of the challenge here.

The third missing dimension of university governance is **research/teaching/gender modalities in staff contract diversity**. Before presenting the key rich insight that emerge within the five different staff contract choices here it is important to reflect on why jointly they represent a fundamental rethink of university governance performance relationships. One of the main narrative threads drawn across theory, practice, and hypothesis development (Chapter

2, pg. 59-90; Chapter 3, pg. 111-113) in this thesis is that research, teaching and gender are intertwined and enmeshed within university governance. Staff level contractual structures and their diversities are one unique way to unpack the knots here. The sample results in their rich complexities and patterns clearly shed enormous light on why university research performance is so heterogenous across this UK HEI sample.

First and foremost, the results seem to point towards a tenure track contract TRST that either does not influence research performance (RPI) or influences it negatively (RGF). This is not entirely unexpected from a theoretical stand point. After all an over burdened faculty doing both research and teaching would face severe motivational and morale issues (Tight, 2010; Locke, 2016, 2012; Bryson, 2004; MacFarlane, 2011). This is what optimal contracting (Byrd et al., 2010; Holderness & Sheehan, 1988; Custodio et al., 2013; Gabaix & Landier, 2008; Cordeiro et al., 2016) and stakeholder theories (Roberts, 1992; Mitchell et al., 1997 and Nelson et al., 2003; Leisyte & Westerheijden, 2014) would imply. At another level the likelihood of research teaching combinations deteriorating either function is a central concern of academic culture and quality assurance scholars (Eurydice, 2010, pg. 24; Ehrenberg & Zhang, 2006; Mouwen, 2000; Filippakou & Tapper, 2008; Salter & tapper, 2008; Brown, 2004). Faced with doing too much in a TRST contract it is very likely that staff will be forced to compromise in key aspects of their work such as applying effectively for research grants. This may be what is seen in the negative impact on RGF in my results.

These theoretical problems with the TRST contract and its likely negative research performance link have also been identified in a range of normative, policy related and argumentative scholarship in university governance earlier. For example (Ackers & Oliver, 2007; Locke et al., 2016; Metcalf et al., 2005; Dearlove, 2002; Kim, 2008; Trakman, 2008; Parker. 2011; Bryson & Barnes, 2000a, b; McNay, 2005, 2009) highlight how this contract although ubiquitous in UK HEI has huge workload work-life balance and motivational issues embedded within it. These authors argue that staff faced with rising academic workloads might take the easy way out and just satisfice to remain in the job rather than go the extra mile to achieve in each of their myriad academic tasks. My results especially in the RGF substantiate such contentions and so there seems to be evidence for a need to remodel/redraft this contract to suit the needs of a rapidly changing and evolving UK HEI sector (Kim, 2008; Shattock, 2008; Middlehurst, 2004; Brown, 2015).

Second my results highlight a negative association between the single function TONLY contract and Research performance (RGF). Once again such an association seems to fall in line with resource dependence arguments (Pfeffer & Salancik, 2003; Pfeffer, 1987; Locke & Bennion, 2011; Jenkins, 1995; Oancea et al., 2010; Adams et al., 2005) that an institution highly dependent on staff who lack research skills will obviously drop in research performance. These staff are not required to even participate in research projects and so the university will be able to apply only for a much lower number of research grants anyway. It also lends credence to the instrumental stakeholder angle (Harley, 2002; Oxford, 2008; Pascarella & Terenzini, 2005; Skelton, 2012). After all research fund granters in their instrumental perspectives will surely be concerned if a university employs too many TONLY staff. How much such an institution will emphasize the performance of research obligations is surely questionable. The negative association in my result also seems worryingly in line with the concerns of many student stakeholders (Neves & Hillman, 2016; Healey, 2005; Blackmore, 2016) that they feel cheated-out of a quality academic instruction when taught by instructors who lack active research credentials.

These questions seem to reflect voices in the empirical and policy based literatures (Vajoczki et al., 2011; Oxford, 2008; Blackmore, 2016; Locke & Bennion, 2011; Nyampfene, 2018; Harley, 2002) where the added question of UK universities recently switching to this TONLY contract as a response to budget constraints and rising academic workloads is highlighted. Elsewhere the fact that academics themselves consider this contract to be academically untenable is the theme stressed by Dyer et al. (2017), Oxford (2008), Brew et al. (2017), and Peters & Turner (2014, pg. 227). My result seems to thus validate these empirical and policy-based concerns too. Finally, the TONLY contract is one of the many part-time fixed term contracts offered to junior members of the academic community and in many ways represents a starting point of the academic journey (Locke, 2014, 2016; UCU, 2014). So, at one level this could reflect why my result shows their impact on research performance to be negative. These new inexperienced academics naturally are unable to contribute in any meaningful way to research.

Third, this brings us to the rather robust sample result that higher levels of part-time staff negatively impact research. Given the growing trends in UK HEI favouring higher student population coverage, reduced Government support, and continued expectations of full academic contributions of the university it is but natural that there has been a growing trend

towards employing more adhoc staffing (Molesworth et al., 2009; Brown, 2015; Taylor, 2006; Lowrie & Hamsley-Brown, 2013). But these staff do not really have the motivations to contribute to research grant proposals or publications. So, it is not surprising that my results here are invariably negative. Yet in theory such ad-hoc academic staffing is not entirely without potential positive benefits. Optimal Contracting and Resource Dependence (Williamson, 2000; 2005; Chizema & Buck, 2006; Jacobson & Andreosso-O'Callaghan, 1996; Pfeffer & Salancik, 2003; Marginson, 2006) stress how in the search for value for money universities might derive some benefit out of choosing ad hoc staff wisely. But my result does not support such an argument in university research performance. Instead it is the culture and quality assurance (Brown, 2004, 2013; Rowley, 1996; Brown & Carasso, 2013; Eurydice, 2010, pg. 24; Attwood, 2008b; Yorke, 2009a Cremonini et al., 2015; Palfreyman, 2010) contention of the likely deterioration in academic quality due to part-time staff that seems robustly substantiated here.

UK HEI statistics reveal some disconcerting facts that seem to explain why UK universities have been employing so many part-time staff over the past decades. After all student populations have nearly doubled while staff levels have more or less stagnated (Rosen, 2003, pg. 82; Bryson, 2004; Burgess et al., 2006). In the face of this universities have been left with no alternative except to use ad-hoc staffing arrangements to make do despite the dangers of deteriorating research quality and performance. Earlier scholarly work in university governance has also largely confirmed the highly demotivating nature of the part-time contract especially with regards to research performance. Thewlis (2003) reveals how the insecurities in this contract make researchers fearful for their future and do not allow them to focus on the job at hand. My negative result could be interpreted as the direct outcome of such insecurities and fears. Elsewhere Ackers & Oliver's (2007) suggestion that part time staff continue to be treated as marginal second-class academic citizens or Purcell et al. (1999) and Allen-Collinson's (2004) finding that such staff are isolated from academic community and face lower access to vital knowledge resources such as libraries or IT networks must surely be seen as one of the many reasons why they are unable to effectively contribute to the research function. Qualitative surveys of academics conducted in other strands of literature (Bryson & Blackwell, 2006; Allen-Collinson, 2004) too seem to substantiate this academic isolation and lower research productivity linkage.

The gender balance question with university staff is the final narrative thread in this missing dimensions. Two insights here need careful elaboration as there is significant ambiguity across

the sample. First, research performance as whole as well as the quality of published outputs of the university is largely adversely affected by higher levels of female staff. This contradicts many theoretical expectations. It does seem that universities do not derive any extra legitimacy from the presence of more female staff in their faculty (Dowling & Pfeffer; Kesner, 1988; Suchman, 1995; Hillman et al., 2002; Pfeffer & Salancik, 1978; Ashforth & Gibbs, 1990). Such universities do not seem to acquire a gendered research reputation or ambience that helps either the quality of their research output or overall research performance. Similarly, my results seem to reject the idea that more female staff diversify the talent pool and thus help research functionality (Pfeffer, 1987; Verbruggen et al., 2011). There is also no evidence in my result that becoming more public spirited (Coy et al., 2001; Deem & Baird, 2019; Shore & Wright, 2004, UCU, 2012a; Sagaria, 2007) by employing more females directly benefit the research performance of a university.

Yet all these theoretical rejections ought not to be interpreted in this straightforward manner. It is highly likely that lurking beneath this superficial pattern of negative association are a whole host of factors often voiced in many strands of the university governance literatures.

After all a large part empirical, normative and anecdotal literature confirms the existence of a deep unconscious negative bias against women in university research. Surely decades of underrepresentation and unconscious bias oft referred in the literature (Blake & La Valle, 2000; Santos & Van Phu, 2019; Carter et al., 1999; Metcalf et al., 2005; Thorton, 2013; Helmer et al., 2017; Court et al., 1996, pg. 25; Moss-Racusin et al., 2012; Botella et al., 2019) are at work behind the scenes here. Women face a steeper threshold than their male counterparts in the idea generation and refinement process that underlies all research publications (O'Brien & Hapgod, 2012; Abramo et al., 2009; Helmer et al., 2017; Blau & De Varo, 2007; Davies et al., 2020). This is due to years of institutional neglect where their skill gaps have not been readily addressed in university research labs. The argument that they must catch up with their male peers without any additional training inputs is unfair. After all their male peers have never faced a similar hostile research environment for so many decades. One has to thus place this negative association in this sample in this context.

At another level there is a plethora of evidence that females are underrepresented in academia compared with women in the labour force (Metcalf et al., 2005; Dearden et al., 2003). In the past two decades a number of studies (Blake & La Valle, 2000; Santos & Van Phu, 2019; Carter

et al., 1999; Metcalf et al., 2005) have highlighted the obstacles women face in trying to gain access to the highest and most prestigious academic often research based positions. Even the House of Commons Science and Technology Committee (2002) identified factors which might result in women being under-represented in such positions and instead be recruited on fixed-term impermanent non-research contracts. The house infact found evidence for direct discrimination in recruitment to permanent posts, difficulties of return after maternity leave or a career break, less control over job mobility, leading to less choice over job scope. Similar evidence is marshalled by Dyer (2017) and Angerval et al. (2015) who show how female staff are disproportionately employed on TONLY or part-time contracts. Such findings lend credence to the argument that the negative impact of female staff levels on research performance or published research output could actually have more to do with these systematic discriminatory tendencies in UK higher education precluding them from actually contributing here.

This is exactly what my sample evidence seems to suggest. On the surface there seem to be reasonable levels of female representation in staff contracts (see Chapter 5.2, table 4). But when one examines the nature and scope of these contracts one has to admit that research intensive roles are few and far between. Most of female staff employed are on either part-time or teaching-only positions (Barrett et al., 2011; O'Brien & Hapgood, 2012; Thorton, 2013). This is perhaps why the UCU and other regulatory bodies have been repeatedly calling for greater gender-based representation in research functions at universities (HEFCE, 2015; UCU, 2012a, b; 2011; Yarrow & Davies, 2018; Davies et al., 2019).

Mention should be made here of the RGF result that adds a different angle to the meaning of the results. The insignificant association with FSF in this measure of university research performance unlike RQ and RPI on the surface seems odd. But although the result implies that UK research granters do not discriminate on the basis of gender compositions and decide purely on the merits of the research grant proposal in front of them it may actually be hiding some complexities. This is empirically substantiated by the two largest empirical studies from the UK (Blake & La Valle, 2000; Santos & Van Phu, 2019) that focus on grant applications. Both find that although men and women had almost equal success rates for grant applications, proposals from the former constituted a larger proportion of the successful ones than the latter because women were less likely than men to apply. This seems to suggest like my result that research fund granting in the UK is largely gender neutral but female research proposal makers

still face the psychological challenge of applying for grants within a system that they feel discriminates against them. This is why they do not apply and so are generally under represented in successful research grants. Elsewhere a study by (Bornmann et al., 2007) shows that, even if women and men were generally equally successful at all career stages, still men with previous experience would obtain higher application and funding rates than women at similar career points. The studies conclude that there are unconscious biases in operation especially in grant review or selection. This echoes with findings that men with enhanced social networks tend to receive more favourable treatment from reviewers who are part of their network. (Pohlhaus et al., 2011; Perna, 2005; Mason et al., 2013). The RGF result must thus actually be read jointly with the negative associations in the RPI and RQ results and their clearly negative associations to obtain the complete overall picture. The sample results seem to jointly suggest that female staff although capable may be prevented from truly contributing due to systematic deficiencies in the environment surrounding research grant processes.

On the whole then the gender staff level diversity result suggests that women themselves may not be at fault for their lower research performance. If anything, the true reason might lie in the fact that they have faced several decades of hostile university research environments with little training/skill inputs (Fletcher et al., 2007; David, 2017). This fits with the picture of a sector where most university female staff are on short duration teaching only contracts with no research function implication (Thorton, 2013; Barrett et al., 2011; O'Brien & Hapgood, 2012; Marchant & Wallace, 2013). It must be inferred that this is why such staff therefore have a negative impact on research performance and are unable to contribute to research fund acquisition. HEI regulators would be well advised to focus attention on the processes of training and inputs for effective research and developing best practice guidelines here. Universities and their research labs must be encouraged to develop effective training protocols aimed to improve the skill sets of female researchers. Therefore, in totality the gender balance in academic staff emerges as an important and tricky internal governance challenge for UK universities.

In totality, staff contracts and their diversities add further to the enormity of the challenge facing university governance (Knight et al., 2007; Metcalf et al., 2005; Bryson & Blackwell, 2006; Burgess & Connell, 2006). When deciding the staff levels in the different contracts a university faces several trade-offs. For example, when reducing levels of tenure track staff driven by cost cutting considerations a university may be forced to use teaching-only or

research-only single function fixed duration contracts. But these came at the expense of research quality and this is evident in the sample. Similarly, when faced with the challenge of filling up gender places in the university women may be seen as the most appropriate to employ as part-time and short duration teaching only staff. But once again this implies a loss of their potentially rich gender-based contribution to research which although not directly visible might be huge. Echoes of these arguments are seen in the sample evidence especially when read jointly and must not be gainsaid. All in all, then it is obvious that academic staff contracts in the UK HEI are at the crossroads and in need of drastic overhaul to meet the growing demands of a burgeoning sector.

The fourth missing dimension of **pedagogical orientations in student body diversities** displays another set of keen patterns and inter-linked governance process-based trade-offs in university research in UK. The INTS-RPI negative association underlines how academic workloads associated with international students might be detracting the university from its research performance as predicted by Optimal Contracting and Resource Dependence (Soo & Elliot, 2010; Pfeffer, 1987; Pfeffer & Salancik, 2003; Fowles, 2014; Bolsmann & Miller, 2008; Williamson 2000, 2005). In fact, many strands in the empirical and policy-based literatures (Hartnett et al., 2004; Niles, 1995; Barron, 2006; sawir, 2013; De Vita & Case, 2003) suggest that universities face large academic workloads especially with regard to helping international students transition to UK teaching-learning regimes. These authors also provide evidence to show how international students often disproportionately occupy interaction times in the research facilities. Arguably this is what is being seen in my negative research performance impact. Elsewhere, authors (Volet & Ang, 1998; Pittway et al., 1998; Lebcir et al., 2008; Rienties et al., 2013) find evidence for lack of academic cohesion in the laboratories especially due to the increasing presence of international fee-paying students. At another level my result also supports the culture and Quality Assurance (Anyanwu, 2004; Jones & Soo; Freeman 2015; Brown, 2004) contention that international students might force a dumbing down of academic standards both in the classroom and in the research lab. This is echoed by (Trice, 2003; Delaney, 2002; Barron, 2006; Bright, 2004, Furedi, 2004) who document how domestic students are often resentful of this decline in academic standards and suggest that it contributes to their own lower research productivity.

Yet there are contrarian evidences in other empirical work. For For example, (Sawir, 2013; Morrison et al., 2005; Wright & Cochrane, 2005) find that international students bring new

ideas in to both research and teaching in the classroom thus enriching the academic environment of the UK university. Similarly Wilcox et al. (2005), Pittway et al. (1998), Volet & Ang (1998, pg. 21) and Spencer-Rodgers & McGovern (2002) underline how there are positive network externalities associated with growing numbers of international students. Both staff and students find many benefits out of the rich diversities in knowledge and experience shared in international classrooms and research labs. Obviously, my results do not provide support to these strands of earlier empirical work.

My negative result also seems to fly in the face of UK policy scholar exhortations (Hillman, 2014; Li et al., 2010; Bolsmann & Miller, 2008) that international students are no longer just an option for universities but actually a mandatory strategy. There have been growing debates about the revenue generating model of UK HEI and its fixation on attracting international fee-paying students in political and economic discourse (Li et al., 2010; Iannelli & Haung, 2014; OECD, 2004). So on the one hand, while the entire system of higher education in the country seems focused around increasing the numbers of international students my evidence seems to highlight the academic problems associated with such an approach.

On the other hand, postgraduate student places show a finer and subtler impact on UK university research. From a culture/quality assurance and legitimacy perspective (Cremonini et al., 2015; Stensaker, 2018; Brown, 2004, 2009; Kim, 2008; Trowler, 2008; Alvesson, 2012; Filippakou & Tapper, 2008) higher postgraduate students as predicted by theory lead to a richer academic ambiance that directly improves research quality at the institutions in my result. Empirical scholarship largely concurs with this positive impact of postgraduate intensities on university research performance. Angell et al. (2008), Priporas & Kamenidou (2011) and Stanton et al. (2009) find evidence that both students and staff at institutions with high numbers of postgraduate places benefit from the keener academic environment in such institutions and are thus able to both learn and research better. Balmer & Liao (2007) suggest that students gravitate towards universities with larger post graduate places as they believe that they will benefit from the richer academic inputs and exchanges as well as the academic brand of such places. Elsewhere, many voices (Callen et al., 2010; Verbruggen et al., 2001; Iannelli & Huang, 2014) argue that students and researchers generally gain richer academic networks in postgraduate places than they do at their undergraduate peers. It may be these networks that show up in intensive and value-added research ideas that subsequently translate into the better published research quality seen in my result.

This positive impact on research quality can surely be understood in other ways. After all (Igraduate, 2013; Staurt et al., 2008, Donaldson & McNicholas, 2004) find evidence that potential postgraduate students themselves often use post graduate intensity of a university as short hand for academic excellence. These potentials often filter down universities based on this criterion and so one could argue that these higher post graduate based institutions attract the more serious academic candidate. After entering such universities of their choice these serious students are impelled to contribute richly to the academic performance of the institution. This is mirrored in my positive research performance impact. Perhaps this also explains why a large normative literature (Smith et al., 2010; Leitch, 2006; Roberts, 2002; House, 2010) commend postgraduate courses as the very basis of the UK HEI academic advantage. These scholars argue that it is these post graduate students who provide the cutting edge to UK university research performance.

Yet my result also shows an optimality element here that substantiates an important optimal stakeholder prediction (Williamson, 2000, 2005; Jacobson & Andereosso-O'Callaghan, 1996; Mitchell et al., 1997; Freeman, 1984; Leisyte & Westerhejden, 2014). Too many postgraduate places might reduce research quality in the same way as too few such places might do. The negative element in my result is surely providing some support to the resource dependence angle that too many postgraduate students impose resource burdens on the pedagogical processes. In fact this is robustly corroborated in empirical arguments of Barnes (2007) and Adee (1997) who strongly opine that institutions which fall short of the extra investments required to support post graduates might experience a loss in university research quality. My result, thus, clearly underlines an optimal level of postgraduate places that each university would need to carefully determine. In this connection it may be useful to note how House (2010), Smith et al. (2010) and Donaldson & McNicholas (2004) recognize this trade-off that is crucial to the question of how many post graduate courses/students a UK university should admit. Many of the debates here highlight why this decision might have to be supported by adequate infrastructural investments before the university is able to reap the benefits.

At a final level my optimality-based result read in synch with the above strands of empirical and normative literature is arguably highlighting some keen process like trade-offs that play out here. Universities cannot just decide on this governance aspect of postgraduate places in isolation. The university's entire strategic investment plan of the future is directly and

indirectly implicated within this governance decision. Educational facilities and staff resources will need to be effectively calibrated in consonance with this PGINT level and only this will help the university gain the benefits here.

The above tangential and complex insights when read jointly pose yet another complex governance trade-off. Taking on more postgraduate and/or international students both enhances a university's reputational legitimacy and also provides it with extra streams of student fee revenues to help bridge budgets. This explains the strong incentives that UK universities display in this sample for increasing either of these. But the effects of such unbridled increases on research performance can be mixed. The central message of the two results seems to be that while both types of students might need careful pruning it is international students that must be the focus of attrition at most UK universities. Yet this is easier said than done and will prove to be the most pressing challenge facing university governors and regulators.

The final missing dimension of **Strategic choices in Asset/Revenue Structures** proves itself to be a very important and complex influence on university research performance.

I begin here with Endowments and their unique role in research performance highlighted in my results. First here is the negative association flagged in my research quality performance model. Larger endowment levels seem to dampen the published research quality of a UK university. Although this seems to support public accountability and legitimacy concerns (Butt, 2019; Squire, 2014; Parker, 2012; Ashforth & Gibbs, 1990; Suchman, 1995; Scherer et al., 2013) with the problematic corporate and vested interests associated with endowments and rejects the resource independence argument (Washburn, 2008; Carrington et al., 2018) still the meaning of the result is not straightforward. This is reflected in the opposite sensitivities recorded even within my result. It also fits with the insignificant association recorded in my second university research performance measure.

Earlier normative and empirical work here argues for a largely positive impact of this dimension on research activity and performance. For example (Bolivar, 2015; Ntim et al., 2017) highlight how older established universities generally exhibit both higher endowments and higher research activity. Similarly Frazackerly (2013) and Rogerson (2013) underline that irrespective of Russell Group status high endowment universities are the ones that produce the best research. My result thus stands out within this context and is hard to explain. Yet at one

level it can be argued here may be some evidence of the vested interests associated with higher levels of endowments. Perhaps it is this that is showing up in my result. Be that as it may one clear message from the result here is that UK universities face a complex challenge in calibrating their endowment levels.

TFEE is a strategic financial choice by university governors and it is unsurprising that the variable in this UK sample neatly captures the complex trade-off between the two distinctive functions of a university namely, research and teaching. Naturally there is no equivalent within the empirical corporate governance literature to compare here. But clearly within the context of UK higher education which is at cross-roads facing an increasing dependence on tuition fee due to drastic reductions in Government budgetary support and increased peer competition the variable and its findings are crucial here. Normative policy analysts Molesworth et al. (2012), Brown, R., & Carasso (2013), Rowlands (2013) and Shattock (2013) have often made the case that the balance independence and quality of UK university research has suffered due to this increasing dependence on student fees. For the first time then in this sample there seems to be clear proof that this is indeed the case.

My results in tuition fees show that universities that depend highly on these tend to perform worse at research. This is to be expected especially because such universities would wish to work towards legitimating themselves to student resource providers and thus tend to privilege the teaching function (Neves & Hillman, 2016; Jabbar et al., 2018; Fabrice, 2009; Blackmore, 2016). After all it is these instrumental stakeholders who would be the focus of attention given the universities' dependence on their fee contributions (Nixon et al., 2018; Fowles, 2014; Foskett, 2010; McGettigan, 2013). It is in this vein that Molesworth et al. (2009) argues that excessive TFEE dependence is a serious concern especially within the context of a UK HEI on the hunt for funding sources in a rapidly marketizing sector. Universities so dependent will naturally focus their spending and academic efforts on teaching and its facilitation. This will likely lead to a neglect of the knowledge creation function in research. This is exactly what my negative research quality result seems to be flagging up. A similar argument is advanced by Fowles (2014), Collini (2004) and Alderman (2010) who argue that excessive tuition fee dependence in a university creates incentives to spend inordinately on teaching facilitation and perversely reduces research spending and orientation. Perhaps this is why research processes and mechanisms take a backseat resulting in a lowered research

performance. So governors of UK universities face a hard choice between increasing student places i.e. higher fees and likely dwindling research quality.

The third insight here relates to Service & Facilities spend of the university. The sample suggests that such spending has a small yet visibly negative impact on research quality. This contradicts many of the expectations of Optimal Contracting, Stewardship and Resource Dependence theories. For example my negative result does not support the prediction that high levels of educational facilities imply effective husbanding of resources and should produce better research (Davis et al., 1997; Donaldson & Davis, 1991, pg. 82; Donaldson, 1990). Nor does it support the contention that higher facility spending should attract the best research students and faculty to join and produce the best research (Edmans & Gabaix, 2009; Price et al., 2003; Mallin et al., 2015; Murphy, 2012). Empirically, earlier research has focused around the improvement in student academic experience and learning outcomes associated with a university's higher facility spending Earthman (2002), Ganyaupfu (2013), Mushtaq and Khan (2012) and Kirmani & Siddiquah, (2008) Karemera et al. (2003) and Young (1999). Other strands of such literature have been focused around the fact that better knowledge facilities attract motivated students and skilled staff (Dao & Thorpe (2015), Migin et al. (2015) and Wiers-Jenssen et al. (2002). Normative and policy studies have recently stressed the importance of training benefits for higher education institutions (Gayle et al., 2003; Trakman, 2008; Collini, 2005; Ritzer, 2002; Trowler, 2008). Yet my negative result only documents a small negative impact on direct research quality at a UK institution. One way of explaining this is by highlighting the very small impact here. Perhaps it is this and the likelihood that such facilities spend is more strongly linked to teaching rather than research that is the central message here.

Finally, universities holding too much cash perform poorly in research. The insight that emerges here is one that is mirrored in Optimal Contracting and Stewardship theories (Davis et al., 1997; Donaldson & Davis, 1991; Jensen, 1986; Clarke, 2004; Williamson, 2005, 2000; Jacobson & Andreosso-O'Callaghan, 1996). Holding too much cash in a public institution like a university is a clear indication of financial constraints (Bates, Kahle & Stulz, 2007; Gao et al., 2013). Such cash is held for meeting routine and regular payments (Brigham et al., 2004; Taylor, 2013a; Parker, 2013, 2012). Research payments are discretionary and can be postponed. This explains why high levels of cash might signal poor research performance in the sample. . Earlier policy and empirical work seems to stress the indebtedness of UK universities and their growing dependences on private loan sharks (UK Universities, 2015;

Grant Thornton; 2016; HESA, 2016; 2019; Ferry & Eckersley, 2012). It is not difficult to draw the link between such loans and high cash levels especially because these funds are generally held over years and drawn down in stages related to project investments. A further logical inference here would be on the nature of conditionalities that private lenders might impose on excessive borrowings by universities. Surely university research projects, their discretionary payments and lack of future revenue streams would appear as red flags to these lenders. Perhaps this is what is showing up in the negative association in my result. It might also be the reason for extensive regulatory initiatives recently seen with regard to fiscal prudence optimal cash levels and financial sustainability in UK HEI (HEC, 2014; OFS, 2019a; CUC, 2017; Browne, 2010; House of Commons of Public Account, 2012).

In sum university research performance in these hitherto underresearched and underexplored missing dimensions of governance show the true contours of the challenge facing these institutions. Complex trade-offs emerge in every dimension that are clearly linked to all the others. Universities have to forge their own unique governance path while emphasizing difference yet maintaining the internal balance and cohesion so important to effective research.

7.3.3 University Research Performance in Board & Audit related Governance

Research performance in this sample shows rich patterns of relationships with the usual Board and Audit related governance often studied by earlier scholars. The important similarities and differences with earlier findings make for at least seven insights here.

First and foremost, my result of a positive and significant association of board size with university research performance is in line with the predictions of the four core theories. Larger boards bring rich resources (Pfeffer & salancik, 2003; Fowles, 2014; Pfeffer, 1987), generate greater legitimacy (Ashforth & Gibbs, 1990; Suchman, 1995), allow better stakeholder integration (Davis et al., 1997; Wise et al., 2020; Freeman et al., 2004) and foster a public orientated academic stance (Coy et al., 2001; Coy & Dixon, 2004) all of which lead to better research performance. There is no evidence in my result for the predictions of optimal contracting or stewardship that larger boards might become dysfunctional and thus reduce research performance (Saltman et al., 2000; Swansson et al., 2005; Mallin et al., 2015; Williamson, 2005). Empirically this positive association is largely unsupported in the corporate

governance literature where many scholars find a negative or even a U-shaped association between board size and firm performance (Yermack, 1996; Eisenberg et al., 1998; Conyon & Peck, 1998; Loderer & Peyer, 2002; Tomasic et al., 2003; Hermalin & Weisbach; Adam & Mehran, 2005; Cobham & Subramaniam, 1998). By contrast in university governance Lokuwaduge (2011) finds no significant association between size of the board and university academic performance while Olson (2000) finds a positive association with endowment levels. Ntim et al. (2017) finds a negative and insignificant association between board size and university voluntary disclosure. The result has clear implications for the regulatory context in UK HEI. Recently there have been several prescriptive mandates from the CUC and OFS that board sizes would best be restricted to 25 or below (CUC, 2009; Shattock, 2004a, b, 2013, a, b). My results do not support such a policy stance. It does seem that UK universities across the years have been benefiting from a larger board which seem to have been bringing greater academic and experiential resources to the internal governance decisions. This is why my results have been unambiguously positive here. Perhaps this also explains the general reluctance of older established and generally higher research performing universities in my to reduce board sizes sample (see Appendix 1).

Second board diversities generally show a negative association with research performance in my results but the only significant association here is with respect to ethnic diversity.

Taking account of board gender diversities my insignificant result does not support either the positive or negative predictions within the seven theories. So there seems to be no support for the positive public echo of a gender rich board that contributes towards better research (Singh et al., 2008; Jensen, 1993; Coy et al., 2011; Neslon, 2013). Neither is there any support for female board members either raising the legitimacy or the resource richness by bringing diverse ideas, experience and business contracts thus contributing to higher research performance (Pfeffer, 1987; Verbreggen et al., 2011). Similarly, there is no evidence in my sample that the instrumentalities associated with female stakeholders necessarily improve the institution's research performance (Mitchell et al., 1997; Donaldson & Preston, 1995; Liesyte & Westerheijden, 2014). At the same time, one must acknowledge that the result also does not find any support for the optimal contracting or stewardship contentions that gender diversity might actually reduce cohesion in the board and thus produce lower research (Williamson, 2000, 2005; Jacobson & Andreosso-O'Callaghan, 1996; Davis et al., 1997; Donaldson & Davis, 1991).

Empirically my result does not seem to fit with corporate governance results (Erhardt et al., 2003; Luckerath-Rovers, 2013; Ntim, 2015; Terjesen et al., 2015; Carter et al., 2003) that largely find a positive association between gender diversity and firm performance as well as voluntary disclosure (Ntim et al., 2017; Brako & Brown, 2008). Unfortunately, there are less studies in university governance on this linkage. However, the meaning of my result should be carefully interpreted. The insignificant association leaves room for the argument that gender balance may not only be the moral, public and politically correct governance stance of a public university but also it might still have other rich contributions to the overall functioning of the university which must not be gainsaid. Perhaps this is why a range of regulatory directives (CUC, 2009, 2014; UUK, 2011; Davies-Report, 2011; FSSG, 2011) have been stressing the importance of gender balance on boards.

Taking account of the significant and negative association in board ethnic diversity, my result seems to largely support the predictions of optimal contracting and stewardship (Williamson, 2000, 2005; Jacobson & Andreosso-O'Callaghan, 1996; Davis et al., 1997; Donaldson & Davis, 1991) both of which argue for homogenous and cohesive boards. There is no evidence for the resource rich idee generating expertise, or the legitimacy raising aspects of higher levels of ethnic board members (Pfeffer, 1987; Pfeffer & salancik, 2003; Suchman, 1995; Stillman, 1974; Scherer et al., 2013; Melville-Ross, 2010). Neither do my results support either the stakeholder predictions (Donaldson & Preston, 1995; Wise et al., 2020; Polonsky, 1996; Mitchell et al., 1997) of ethnic stakeholders improving ethnically orientated research or the public accountability contentions of the ethnically diverse boards raising the public profile and thus improving research performance (Coy et al., 2001; Kreysing, 2002; Coy & Dixon, 2004; Carter et al., 2003). Empirically my result is at odds with earlier corporate literature (Erhardt et al., 2003; Ntim, 2015) that has largely found a positive association here while the solitary university study by Ntim et al. (2017) documented a positive association with voluntary disclosure.

The negative significant association in my result gives less leeway than gender diversity. There is no hiding from the fact that at least in my UK sample ethnically diverse university boards seem to have a negative impact on research. Perhaps this can be traced to the very low levels of ethnic representation that are evident in every year of the sample. UK university boards do not seem to have made any efforts to improve their ethnic fractions. At the extremely low levels

of ethnicity (see Chapter 5, table 6) it is extremely likely that these board members will not have any effective voice in the board. This is why my result shows a negative and significant association. In fact other empirical voices in the literature like Hewitt (2020), Brammer et al. (2007) and Khan et al. (2019) argue how unlike gender ethnicity continues to be a sensitive point where universities seem less enthusiastic in implementing reform.

Third my insignificant result in board independence generally seems to support the nuanced arguments of resource dependence and stakeholder (Pfeffer, 1987; Pfeffer & Salancik, 2003; Fowles, 2014; Donaldson & Preston, 1995) but there is no support for public accountability or legitimacy (Scherer et al., 2013; Dowling & Pfeffer, 1975; Shore, 2004; Coy et al., 2001; Banks et al., 1997). Clearly it is in the resource richness of lay board members or their representation of salient stakeholders that their beneficial impact on research performance seems to originate. By contrast there is no evidence for the public-spirited research contributions or legitimating research benefits of lay members in my result. Neither is there any evidence for the efficacy of the so-called checks and balances role of these independent board members or for the fresh ideas and avoidance of “group-think” advanced by stewardship, managerial power and optimal contracting. Empirically corporate governance (Cobham & Subramaiam, 1998; Mishra & Nielson, 2000; Skully & Wickrammanayake, 2007) has found a predominantly positive association between board independence and firm performance. However, in university studies Lokuwaduge (2011) finds a negative association between board independence and university research performance. Elsewhere other scholars link board independence to better decision making (Pathan et al., 2007; Chhaochharia & Grinstein, 2009) within the institutions or with voluntary disclosure (Ntim et al., 2017) or revenue generation (Harris, 2014) and find positive associations.

This mixed picture of associations especially in university research lends support to my insignificant result. It does seem that although UK universities have been largely following regulatory mandates (CUC, 2009, 2014) and recruiting more than 50% lay members this has not been having the salutary impact on research performance that was expected. It is also noteworthy in this regard that Russell Group and older pre-92 institutions have been generally recruiting significantly lower numbers of lay board members than their peers (see Appendix 1). On the whole then board independence is clearly less impactful as an antecedent of research performance. One could argue that my result is rather pointing in the direction of the quality and types of lay board members recruited and the skills and contributions that they bring to the

institution that will improve research performance. Just the fact that more lay members are recruited does not necessarily imply this.

Fourth my results show that UK university boards that meet more frequently achieve better research performance. This is in consonance with the predictions of all the core theories of university governance. Boards that meet frequently seem to bring a zeal for monitoring and calibration to public purpose that helps their research performance (Vafeas, 1999; Lipton & Lorch, 1992; Sonnenfield, 2002). These boards also seem to follow resource dependence advice that frequent meetings help resource rich members to exchange ideas and thus improve research mechanisms and this helps research performance (Reverte, 2009; Schofield, 2009). My positive result also seems to echo stakeholder predictions Freeman & Reed (1983) that frequent meetings help universities to generate new innovative ideas that help research governances and consequent performance. There is also evidence here that universities generate greater legitimacy through these meetings that help them raise their research profile, image and consequently performance (Ashforth & Gibbs, 1990; Suchman, 1995; Melville Ross, 2010).

In fact, the positive result here differentiates universities from their corporate counterparts. The agency and stewardship corporate argument advanced by Jensen (1993), Shivasani & Zenner (2004) and Vafeas (1999) that meeting more often may be counter-productive seems irrelevant to this unique knowledge institution. Here there is evidence that frequent board meetings actually allow the rich interaction of various factors and thus enable the institution to raise its credibility and profile with research sponsors. These frequent board meetings seem to generate confidence all around that the university is on top of its research agenda and this naturally shows up in its higher research performance.

Most university empirical research such as Lokuwaduge (2011) and Lokuwaduge & Armstrong (2015) support my result and find a similar positive association in their Australian sample. In the UK Ntim et al. (2017) confirm a positive linkage of board meeting frequencies and university voluntary disclosure. Corporate empirical evidence is mixed with scholars like Rodriguez-Fernandez et al. (2014), Vafeas (1999), Christensen et al. (2015) and Hahn & Lasfer (2007) findings a negative association while others like Chen & Chen (2012), Hu et al. (2010) and Karamanou & Vafeas (2005) discovering a positive one.

Other theoretical arguments against frequent board meetings also do not seem to apply to universities. For example, remaining hands-off except in emergencies, as suggested by, a host of corporate governance scholars (Kohli & Saha, 2008; Shivdasani & Zenner, 2004; Bebchuk, Cohen & Farrell, 2009) might singularly harm the ability of the university to attract research sponsors. Similarly, the corporate picture of analysis paralysis and dysfunctionality often evoked by corporate scholars (Lipton, M & Lorsch, 1992; Lipton, 2003) in frequently meeting firm boards seem inapplicable to universities. The university board is primarily an academic body and thus seems to achieve its best results in the frequent interaction between board members.

Fifth the institution of a special governance committee has a decided negative impact on university research performance in my sample. My result is clearly at odds with the public accountability argument of prioritization of governance through a unique governance committee achieving better university performance (Coy et al., 2001; Bedard & Gendorn, 2006; Jetty & Bertie, 2012). It also does not support the resource dependence view that such a unique committee will help identify and correct deficiencies in internal governance through the resource expertise of committee members and help achieve higher performance (Pfeffer & Salancik, 2003; Marginson, 2006). While such a committee might show regulators that the university is indeed serious about its academic role but there is no evidence that this on its own helps it achieve higher research performance (Gibbs, 2001; Bradley et al., 2009; Osborne M & Bell, 2009; Weir, Laing & McKnight, 2002). Finally stakeholder predictions that minority interests and competing concerns will get thrashed out in such special committees which will consequently raise academic performance is not seen in my sample (Donaldson L & Davis, 1991; Wicks & Parmar, 2004; Donaldson T & Preston, 1995; Freeman, 2010).

In fact, my negative result seems to concur with the stewardship concern that special committees might just turn into another layer of redtape that actually detracts from research performance (Marginson & Considine, 2000; Mow & Bartos, 2004). It also seems to align with the optimal contracting and managerial power contentions of dysfunctionality and excessive bureaucracy (Marginson & Considine, 2000; Mow & Bartos, 2004; Edmans & Gabaix, 2009; Bebchuk et al., 2002; Van essen et al., 2015; Kalyta & Magnan, 2008; Byrd et al., 2010).

Earlier empirical work (Datar et al., 1991; Wang et al., 2008; Ntim et al., 2012) finds some positive effects of oversight committees especially in corporate governance. In university work

Ntim et al. (2017) document that UK universities with unique governance committees voluntarily disclose more information. Elsewhere Lokuwaduge (2011) and Lokuwaduge & Armstrong (2015) find in their Australian sample that universities with larger number of committees perform better at research. On the whole then my negative finding here seems to throw open the question of the true merit of a unique governance committee.

Sixth my insignificant association between university use of BIG4 audit firm and research performance seems to contradict the predictions of all theories of university governance. Thus there is no evidence of research performance gains arising out of the robust fulfilment of a public remit through employment of a BIG4 audit firm (Coy et al., 1997; 2001). Similarly, notwithstanding the agency benefits of using BIG4 audits there seems to be no evidence of a salutary research performance impact (Davis et al., 1997; Saltman et al., 2000; Marginson & Considine, 2000; Swansson, Mow & Bartos, 2004; DeAngelo, 1981a, b). While the university may be gaining a halo of credibility and trust and gaining access to resources due to BIG4 audits these do not seem to translate to better research performance here (Deegan, 2004; Suchman, 1995; Hybels, 1995; Tilling, 2004; Kesner & Johnson, 1990; Lorsch & MacIver, 1989; Pfeffer & Salancik, 2003). Stakeholder representation and voice may be improved due to the interventions of BIG4 audits but in these UK universities there is no evidence of resulting better research performance (Donaldson & Davis, 1991; Freeman, 2010, 1999). Finally even optimal contracting and managerial power contentions of a higher level of optimality internally or a more effective balance of power in the institution do not seem to result in better research performance (Donaldson & Davis, 1991; Jacobson & Andreosso-O'Callaghan, 1996; Williamson, 2005; Bebchuk et al., 2002; Van Essen et al., 2015; Kalyta & Magnan, 2008).

Empirical work in corporate literature largely finds that firms financially benefit from employing BIG4 audits. In university literature while Lokuwaduge (2011) does not use such a variable, while Ntim et al. (2017) and Gordon et al. (2002) discover a positive association but with university voluntary disclosure. My result thus contributes here with this finding of a negative impact of BIG4 audits on university research performance. Perhaps given the largely financial remit of such audits it is rational to find such a negative association here.

Finally, my insignificant association between VC pay and university research performance is at odds with both the positive and negative sides of the theoretical debate. This insignificance seems to neither support the accountability tenets of Public Accountability or Legitimacy

(Ashforth & Gibbs, 1990; Tilling, 2004; Judge et al., 2008; Donaldson & Davis, 1994; Kreysing, 2002; Coy et al., 2001) nor the stewardship expectation of better chief executive alignment when paid appropriately (Daily et al., 2003; Christopher, 2010; Dedman, 2000) or the stakeholder argument of better pay leading to governance alignment with stakeholders (Ogden & Watson, 1999; Berman et al., 1999; Wicks, Berman & Jones, 1999; Kiel & Nicholson, 2003) or even the managerial power argument of high VC pay (Bebchuk & Fried, 2003; Finkelstein, 1992; Lucey et al., 2020). However, there is some proof that the result may be suggesting the value for money argument of resource dependence (Fowles, 2014; Pfeffer & Salancik, 2003; Marginson, 2006; Morgan, 2017; Shackleton, 2017) or the right sizing of VC pay argument of optimal contracting.

Earlier empirical work (Tarbert et al., 2008; Bachan & Reilly, 2015; Gschwandtner & McManus, 2018) in university governance draws a direct link between VC pay and fulfilment of university mission critical performances whether in research or in teaching. It is their finding that universities reward VCs for hitting mission critical performance objectives. Bachan & Reilly (2015) and Baimbridge & Simpson (1996) even documents how VCs in their sample get rewarded for achieving higher levels of research grants. But my result does not corroborate this effect at least with published research quality. Other strands of work here (Johnes & Virmani, 2019; Bosetti & walker, 2010; Walker et al., 2019; Lucey et al., 2020; Soh, 2007; Shackleton, 2017) document the fact that VCs are underpaid in relation to their corporate counterparts largely due to legitimacy concerns. Policy commentators and regulators in the UK have repeatedly raised the issue of high VC remuneration and its anomaly in a public institution such as a university (Hubble & Bolton, 2019; CUC, 2018; OFS, 2018a; Morgan, 2017; Grove, 2018; OFS, 2019a, b; Baker, 2017; Department of Education, 2017). Yet there are voices here that also raise the reward-talent conundrum arguing that the best VCs might exit a sector where their skills are undervalued (Soh, 2007; Shackleton, 2017, 2019; Simon, 1957; Blanchflower, 2017; Ross, 2018b, Grove, 2018b, Bennet, 2019; Richarrdson, 2017; Oxford University, 2018). My insignificant result must be seen in this growing fractitious context. There is perhaps a neutral element here i.e. universities may well be not fully considering a VCs contribution to university research performance while deciding his/her remuneration and this does not bode well for the governance of a largely academic institution.

7.4 UK University Teaching Performance and its Governance Antecedents

University Teaching Performance too emerges as a highly complex construct from the univariate bivariate and multivariate analyses conducted on this UK HEI sample in Chapters 5 (pg. 230-236) and Chapter 6 (pg. 285-287). This section coalesces, qualitatively, the findings drawn from the two different advanced Teaching performance models in Chapter 6.2. However, it intersperses many of the discussions here with evidences previously highlighted in the univariate and bivariate stages of the overall analysis (see Chapter 5). The intention is to fit together and weave the many complexities that obviously emerge here and thus present a comprehensive yet detailed picture of the governance antecedents of UK University Teaching Performance.

The section neatly divides into three main sub-sections. Sub section 7.4.1 discusses the multiple dimensions of University Teaching Performance as captured in the two different constructs of TPI and TGF identified in the factor analysis in Chapter 5. 7.4.2 summarises insights extracted from Chapter 6 about how university teaching performance associates with the missing dimensions of university governance. The final sub-section 7.4.3 discusses similar summary insights about how university teaching performance associates with the usual board and audit related governances.

7.4.1 Multiple Dimensions of University Teaching Performance

University Teaching Performance is also multi-dimensional. It is this multi-dimensionality that makes it so difficult to measure as suggested by empirical scholars (Jongbloed et al., 2018; Pollitt, 1990; Patrick & Stanley, 1998; Nuemann & Guthrie, 2006; Asif & Searcy, 2014). Hence, there is a need to coalesce the various interpretation in Chapters 5 and 6 about university teaching performance to fully understand them. For the very first time in extant UK HEI empirical literatures this thesis uses two distinct measures of university teaching performance. While this is unlike research performance which was mapped by three constructs it still adequately covers the important dimensions here. Teaching Performance Index (TPI) is a composite indicator combining and weighting scores from four separate variables (SATIS, CR, GHONR, GPRO) as per a factor analysis in Chapter 5. Graduate Prospects (GPRO), Good Honours (GHONR) and Completion rates (CR) reflect the university's ability to advance student academic outcomes and thus reflect one dimension of teaching performance. By

contrast student satisfaction SATIS measured through feedback mechanisms collated from students by each university at the end of a course captures the perspective of the student consumer. This is a second dimension of teaching performance. However, students are uninformed consumers of the credence good of university's teaching and so their ratings are questionable (Woodall et al., 2014; Nixon et al., 2016; Molesworth et al., 2009; Baldwin & James, 2000; Abbar et al., 2018). This is why the thesis separately measures teaching performance from the perspective of teaching grant providers in TGF. These providers arguably present a fresh independent perspective on the teaching of a university. The use of two significantly different performance constructs in teaching thus maps the important dimensions of this academic performance.

The multiple dimensions of University Teaching performance are distinctly highlighted in the choice of these two different constructs i.e. TPI and TGF. Two notable examples suffice here to show some keen insights. For instance, tuition fee dependence of universities shows a positive relationship with TPI reflecting how universities instrumentally align their performances to those fee-paying stakeholders who support them. By contrast providers of teaching grants decrease funds to such universities on grounds of inadequate legitimacy or skewed teaching protocols favoring high fee payers or even a neglect of public accountability-based student coverage and fair access. Thus, the use of two different constructs makes for a keen understanding of the challenging trade-offs faced by the university in teaching performance. Similarly, staff level gender diversity reveals its rather complex multi sided relationship with university teaching performance. TPI suggests that more women on the academic staff might not matter that much but TGF shows that fund providers feel that universities with higher numbers of female faculty are deserving of support. So, while some theoretical contentions are weakly supported there are many others like resource dependence, quality assurance, legitimacy and instrumental versions of stakeholders that receive robust support in the TGF result. Therefore, the use of these two different constructs highlights difficult challenges faced by university governors in calibrating the many sides of university teaching performance.

7.4.2 University Teaching Performance in the Missing Dimensions of University Governance

University teaching performance positively associates with **entry standards** which is in line with earlier empirical evidence (Johnes & Soo, 2013; Ayoubi & Massoud, 2012; Boliver, 2015; Bachan, 2017). Such a relationship shows why top UK universities lack incentive to lower ES. Faced with a difficult choice of who to admit the UK university would only be happy to admit the best and brightest since there is evidence that this makes easy its ability to outperform in teaching. This implies that the easy path for the university is to ignore its transformational role and simply focus on delivering academic excellence to incoming students who are already excellent. Empirical and normative arguments (Jerrim & Vignoles, 2015; Boliver, 2013:2015; Zimdars et al., 2009; Chowdry et al., 2008; 2013; Jones & Thomas, 2005) of fair access, student body diversity in class rooms and student academic transformations are thus put in the spotlight by this result. The public nature of the university and its legitimate role as an institution that admits students from all segments of society is now threatened (Higgins & Foster, 2009; Boliver, 2015; Zimdars et al., 2009; Fulton, 1988; Ayoubi & Massoud, 2012; Willetts, 2017; Johnes & Soo, 2013). If selecting lower academic level students will directly have such a negative impact on teaching performance as my result seems to suggest it is unlikely that top universities will do so.

The result also appears to explain why some theorists see UK universities as catering exclusively to elite student and parent stakeholders (Willetts, 2017; Brown & Carasso, 2013; Marginson, 2016; Tapper, 2007; Sutton Trust, 2007b; Baker, 2008; Boliver, 2011; 2013). After all when teaching performance is improved only through a high entry standard then parents/students from privileged middle class intellectual backgrounds become highly salient to universities. There would be an incentive to pander to these groups and neglect other students/parents from underprivileged and less intellectual backgrounds. Similarly given this high ES high teaching association universities would surely be driven to court the vested elite intellectualized and resourceful elements of society as argued by (Marginson, 2018; Freeman, 2015; Callen et al., 2010; Verbruggen et al., 2011; Verschuere & De Corte, 2014; Sutton Trust 2004; 2007a; 2007b) Some of these groups are also the ones who perversely will be able to provide universities with donations or higher fees and bridge the funding gap. Large tracts of theoretical and empirical debate have often expressed concern about the elitist nature of UK higher education (Tapper & Palfreyman, 2010, 2012; Freeman, 2015; Waller et al., 2017;

Schwartz, 2004; Margison, 2018; Ogga et al., 2009; Shattock, 2012) and nowhere does this seem more exemplified than in my result. Such a strong positive association between ES and teaching performance implies that top universities seem to reap performance rewards from teaching in silos of the best and the brightest.

Yet the ES-Teaching performance positive linkage is worrying for another important reason. After all teaching is arguably a more transformative function than research (Blanden & Machin, 2004; Coy et al., 2011; Nelson et al., 2002; De Villiers & Van Staden, 2000). If there are no direct rewards to transformation, then universities will be tempted to ignore it. They will admit only the crème de la crème of the student population by setting high entry requirements and undoubtedly perform in their knowledge dissemination but will surely fail in their overall societal obligation. This explains why in the normative and policy related university governance literature (Shattock, 2013a; Ntim et al., 2017; Parry, 2013; Rowlands, 2012; Middlehurst, 2012; Clark et al., 2009; Waller et al., 2017) improving student skill sets by taking in students at lower skill levels and then transforming them to higher skill levels is set up to be an important university role. This is why Boliver (2013, 2015) take issue with the fact that in their sample studies Pre-1992 institutions have such a selective approach to student recruitment. In fact, even QAA, CUC, OFA, OFS and other regulatory mandates (CUC, 2009; OFFA, 2004, 2012; BIS, 2011b; Harris, 2010, 2011) regularly emphasize the importance of this. Yet UK universities do not seem to have any performance-based incentive to do this.

Thus, the sample results seem to imply that UK HEI regulators cannot and must not avoid intervention now. A well calibrated and inclusive entry standards regime is the need of the hour especially within the transformational function of teaching and it is time that universities are guided and supported to step up to this challenge.

Instruction/Interaction intensity in the student staff ratio and its strongly negative relationship with university teaching performance is a sample highlight. UK universities that keep class room interaction levels high with lower SSRs are able to demonstrate better teaching both in terms of student satisfactions as well as in student academic outcomes. The result does not seem to support Optimal contracting suggestions of achieving an optimal balance in SSR (Edmans & Gabaix, 2009; Williamson, 2005; Mallin et al., 2015; Murphy, 2012; Trowler, 2008; Gayle et al., 2003). Low SSRs are the main way of improving teaching performance and there is less evidence of need for optimality. Similarly, resource dependence views (Fowles,

2014; Pfeffer, 1987; Shattock, 2013a, b; Parry, 2012; Rowlands, 2013) about the effectiveness of staff utilization to teaching performance do not seem supported in this result. Public imperatives of covering student populations (Coy et al., 2011; Deem & Baird, 2019; Coy & Dixon, 2004; Blackmore, 2016) can only lead to lower teaching performance as per this result. While Stakeholder perspectives (Mitchell et al., 1997; Freeman, 2010, 1999; Leisyte & Westerheijden, 2014; McDonald, 2013; Hagenauer & Volet, 2014; Koenig et al., 2015) detail the likely conflicts between staff work life balance concerns, student/parent academic quality requirements and the university's need to balance its budgets and the presence of a likely triangular trade-off here, my result does not find any evidence of this. However, the result does squarely support the quality assurance contentions (Yorke, 2009a, b; Varouchas et al., 2018; Vidovich, 2002; Stansaker, 2018; Brown, 2004, 2009; Parker, 2011; Collini, 2012; Collis, 2004) that to achieve higher teaching performance low SSRs are essential.

But despite this clear unambiguous result there are several unresolved questions about how this lower SSR is to be achieved. Lowering SSRs involve universities having to face an incredibly hard triangular trade-off as stressed by stakeholder perspectives (Freeman, 2010, 1999; Wise et al., 2020; Donaldson & Preston, 1995; Collini, 2005). For instance, hiring more staff or recruiting less students or doing a bit of both can lower SSR. But this is easier said than done as this would surely lead to higher salaries and/or lower student fee income or both and raising resource dependence concerns (Callen et al., 2010; Verbruggen et al., 2011; Verschuere & De Corte, 2014; Nagy & Robb, 2008). Further the fact that the university would recruit less students implies a neglect of its public-spirited student coverage mandate. This is an unenviable triple bind. Similarly hiring less staff and recruiting even lesser students could achieve the same goal but culture and quality assurance would suggest that academic work load and work life balance might eventually cancel any gains in teaching performance (Gayle et al., 2003; Alderman, 2010; Kezar & Eckel, 2004; Alvesson, 2002; Trowler, 2008; Albatch et al., 2005). Clearly calibrating SSR is no easy task and each university and its governors will have to take a careful decision that will largely be individually rooted in the specific trade-offs faced by them.

This challenge is reflected at various levels in the empirical work undertaken to date. There are at least three strands of studies here. In one SSRs are conflated with teaching performance instead of governance. Lokuwaduge (2011), Ayoubi & Massoud (2012) and Lokuwaduge & Armstrong (2015) are the prime studies here. Although SSR does indicate the quality of student

to staff interaction it is primarily the result of a discretionary choice in both levels of staff and students which are in the hands of university governors. In the second strand (Edmonson & Mulder, 1924; SRFICSSL, 2004; Kennedy & Siegfried, 1997; Zietz & Cochran, 1997; Lopus & Maxwell, 1995; Haslett, 1976) several scholars find evidence that SSR is difficult to define and/or model. This leads to confusion and ambiguity with the signs of association often linked to the methods used to analyse the data. Finally, the largest strand of empirical studies (Gannaway et al., 2018; McDonald, 2012; Biddle & Berliner, 2002; Glass & Smith, 1979; Kokkelenberg, 2008; Johnson, 2010; Gleason, 2012; Koenig et al., 2015) supports our sample finding that lower SSRs improve teaching performance although one in the US and one in Australia (Bedard & Kuhn, 2008; Bradley et al., 2008; March et al., 1979) seem to suggest a negative but non-linear U-shape association.

Teaching performance and its significantly stronger negative association with SSR as opposed to research in this sample is not unexpected. Normative scholars in UK governance (Hagenauer & Volet, 2014; Lamport, 1993; Denzine & Pulos, 2000; Palmer et al., 2009; Halawah, 2006; Pascarella & Terenzini, 2005; Cuseo, 2007; Davern et al., 2006; Dillon et al., 2002; Harfitt & Tsui, 2015) have long argued that low SSRs allow for greater range of interactions between staff and students. This is robustly reflected in my result. In fact this is why an important Government report by Deering in 2002 emphasized the need for lower SSRs.

University teaching performance is richly influenced by **staff contractual diversities**. The five different types of contracts once again demonstrate why they remain an important way to unpack teaching and gender modalities in university governance.

The omnibus tenure track contract remains a significant negative influence on university teaching performance. In this sample UK universities that employ large fractions of TRST staff attract lower levels of teaching grants. This is largely in line with the theoretical predictions of culture & quality assurance (Collinson, 2004; McLeaod & Malcomson, 1988; Bexley et al., 2013; Bryson & Barnes, 2000a, b; MacFarlane, 2011; Locke, 2012; Bryson, 2004) that predict that onerous academic burdens in dual contracts may encourage staff to focus on rewarding/lucrative/prestigious research activities at the expense of teaching ones. In fact, many empirical, normative and policy-based studies (Probert, 2013; Ackers & Brostorm, 2015; DfES, 2003, pg. 19; Nyamapfene, 2019) find evidence that given a choice between research and teaching academics would indeed privilege the former due to its career and monetary

incentives. It was this likely imbalance between research and teaching within TRST roles that saw UK regulators forward the Teaching Excellence Framework (TEF) as a balancing mechanism (BIS, 2016a, 2015; Dfe, 2017a; Gibbs, 2016; French & O’leary, 2017; Cui et al. 2019; O’leary et al., 2019). Yet Blackmore (2016) stresses how this might still not succeed in redressing the imbalance. My result of a straight negative association here seems to be underlining this growing problem in TRST contracts. At another level my result also seems to highlight the motivational issues connected with TRST. Macfarlane (2011) suggests how TRST staff are swimming against the tide of change and might lack incentives to perform. This fits within the argument that such a contract is cosy and secure and staff might not feel the need to outperform especially with regard to teaching. Therefore, once again the sample seems to be pointing in the direction of a complete overhaul of the tenure track contract which in teaching just as in research seems to be out of synch with the changing UK HEI academic context.

Research only staff are seen to have a negative impact on teaching performance among UK universities. This fits the instrumental concerns of such staff (Fung & Gordon, 2016; Oxford, 2008; PREST, 2000) who are after all hired to do only research and hence do not have any role in generating teaching grants for the university. Gaining legitimacy (Suchman, 1995; Ashforth & Gibbs, 1990; Shelton et al., 2001; Locke, 2012; Polat et al., 2019) through the research only staff naturally reduces the ability of the university to pay full attention to teaching and impress teaching grant providers. There is the added issue that universities who employ too many such research only staff are sending out a signal that downplays the more public-spirited aspect of teaching/transformation within their academic function (Tatlow, 2012; Williams, 1997; Kim, 2008). Perhaps this is why external observers of the institution like teaching grant providers feel less confident in granting teaching funds to it.

This brings us to my negative result in PTTSR which seems to robustly corroborate the predictions of culture quality assurance and optimal stakeholder theories. The fact that these part time staff lack the morale and motivation to effectively contribute to the academic function has been extensively echoed in earlier empirical work too (Allen-Collinson, 2004; Purcell et al., 1999; Bryson & Blackwell, 2006). But within a teaching context it seems my result is highlighting another peculiarity. After all Locke et al. (2016) underline how such part-time staff are less available to students. Student surveys (Kezar & Maxey; 2014, 2015) often cite this staff non-availability as one of the main negatives of this contract. Given their need to be in more than one institution since they only earn a part of their income from one university it

is but natural to assume that such PTTSR staff will be less available for intensive and repeated teaching-based interaction with students. It may be this aspect which is showing up in the negative association of my result. Elsewhere in the empirical literature (Ackers & Oliver, 2007; Thewlis, 2003; Allen-Collinson, 2004) argue that Part-time staff suffer from job insecurities and fears that do not allow them to interact effectively with either other staff members or students. These insecurities would surely translate into the classroom where such an insecure staff would be less motivated to fully contribute to the teaching learning routine. A related argument voiced in the literature (Ackers & Oliver, 2007; Locke, 2016) is the fact that universities invest less in upgrading teaching skills of Part time staff. So, the consequence of this underskilling may be showing up in the negative association with teaching performance in my result.

Female staff levels in universities show definite signs of a rich gendered and positive contribution to university teaching performance. This is a clear divergence from university research performance. There is some support for the public accountability, stakeholder and culture/quality assurance arguments (Acker, 1994; Mestre et al., 2009; Ferber & Huber, 1975; Kaschak, 1978; Mackie, 1976; Donaldson & Preston, 1995; Leisyte & Westerheijden, 2014; Stensaker, 2018; Trowler, 2008) that female staff are inclusive/empathetic by nature and thus create a teaching enabled academic ambience. This is perhaps why independent assessors of teaching performance i.e, teaching grant providers opine that universities employing higher levels of female staff are indeed fulfilling the mandates of the TEF (DfW, 2016; DBIS, 2016; Gunn, 2018; Deem & Baird, 2019; O'leary et al., 2019) and thus ought to be supported with more teaching grants. The narrative here is also further supported and embellished by widespread empirical findings (Ferber & Huber, 1975; Mackie, 1976; Kaschak, 1978) that female students necessarily feel more satisfied with teaching instruction/interactions with female staff than their male counterparts. Surely this is evidence of the empathy factor that may be at play in my result.

But there is a deeper insight that emerges when we consider this positive FSF association jointly with the negative PTTSR one above. Empirical scholarship (Barrett et al., 2011; O'Brien & Hapgood, 2012; Thorton, 2013; Bexley et al., 2013; Chalmers, 2010; HESA, 2014) finds that most of the female staff employed by UK universities are on part-time and teaching only roles. One can therefore draw the link that to the extent that these institutions employ female staff they do obtain some positive teaching benefits as seen in my FSF result. However,

to the extent that such female staff are then employed on inconsequential and part-time roles they are unable to fully bring their unique gendered contributions to the classroom. Universities employ more women but they push them largely into inconsequential part-time roles where their unique teaching abilities are not put to effective use. This feeds into the discourse of why women are unable to show their distinctive capabilities fully even in university teaching performance.

Staff contractual diversities represent a different challenge to university governors in teaching. Deciding on the different types of staff contracts is more nuanced here. Undoubtedly similar trade-offs just as in research performance are faced in deciding tenure track in relation to other types of staff contracts. But universities face singular challenges in recruiting part-time, research only and female staff here. The impact of such contracts is more severe in teaching and there is an important need to rationally consider and allocate the academic teaching burden. New types of sharing contracts may need to be devised and there is even greater need for innovation here. Gender empowerment in staff contracts in UK HEI is definitely at the cross roads. Even in teaching where women are widely perceived to be better equipped than men there is much evidence that universities are employing them largely on part-time and inconsequential roles. There is a rich opportunity for UK HEI to step up and change the contours of female empowerment at least beginning with teaching.

Revenue and asset structure choices of universities affect their teaching performances in distinct ways. I begin here with TFEE or the extent to which universities derive their income from fee paying students. My results in the two teaching models provide rich contrast to the earlier research performance negative association. Here is some evidence at least in the TPI model that tuition fee skews the inter-se prioritisation between research and teaching governances in UK universities. Institutions displaying higher dependence on tuition fees neglect research and focus on teaching and this interferes with their original knowledge creation function but aids their dissemination function an observation often stressed by normative scholars (Nixon et al., 2016; Neves & Hillman, 2016; Balckmore, 2016; Collini, 2005; Parker, 2011; Middlehurst, 2013; Shattock, 2013a, b). There is also some support to the empirical findings of some governance studies (Foskett, 2010; Brown, 2010; Brown & Ramsden, 2009; Jabbar et al., 2018; Alderman, 2010; Molesworth et al., 2010) in UK HEI that ever since the quasi-market like conditions and restricted public funds have been imposed, universities have been forced to rely on students as their most important source of funds. This

explains the rising levels of TFEE. It also explains why under the pressure of the consumerised student stakeholder the internal governance focus has shifted towards teaching and perhaps this is what is being seen in my positive TPI impact.

My result can also be seen from the perspective of culture and quality assurance (Trowler, 2008, Mouwen, 2000; Alvesson, 2012; Nuninger, 2016; Tang et al., 2004; Filippakou & Tapper, 2008). High levels of TFEE may be working in a different way to improve teaching performance. When the student consumer in UK pays such a high fee for his education it may be argued that he/she is more charged up about receiving the full value/quality assured of higher education services delivered by the institution (Jabbar et al., 2018; Woodall et al., 2014; Nixon et al., 2016). This puts him in the most robust state to improve his/her learning and this is what may be showing up in the higher levels of teaching performance seen here. This positive TPI TFEE association also seems to robustly fit the globalization narrative of UK HEI (Davies et al., 2008; Callender & Jackson, 2008; McGuinness, 2003; Adnett, 2006; Chevalier & Conlon 2003; O'Leary & Sloane 2005; OECD, 2015; Hazelkorn, 2015; Mangan et al., 2010a, b). After all UK universities are increasingly searching to bridge their budgetary deficits by attracting the most paying segments of students including international ones (McGettigan, 2013; OECD, 2004, Li et al., 2010).

Yet some studies seem to highlight the problems associated with this increasing fee focus (Dunnet et al., 2012; Flowes, 2014; Boliver, 2013; Mangan et al., 2010a, b; Sutton Trust, 2004) trace the link between this pernicious chase for fees and domestic student inability to even consider applying to such high ranked performing institutions. This is exactly what public accountability and legitimacy theories have been warning against (Callender & Jackson, 2008; Boliver, 2013; Mangan et al., 2010a, b; Suchman, 1995; Ashforth & Gibbs, 1990; Scherer et al., 2013; Stensaker, 2018; Department for Education, 2017; Coy et al., 2001). My positive TPI result may actually be masking this simmering problem of fee-based access and exclusion fast emerging in the UK. Serious questions about the moral legitimacy of such institutions can no longer be ignored. The OFS might need to step in with corrective policy action and support.

This is exactly what my second result here in TGF also seems to neatly highlight. Independent assessors of university teaching i.e. TGF providers seem to take cognizance of these moral and legitimacy-based concerns (Suchman, 1995). They reduce funding to institutions with high levels of TFEE. Perhaps one of their arguments here could be that a higher education institution

so dependent on tuition fees would put its portals out of reach of the vast multitudes of students from average backgrounds.

In services and facilities spend my positive teaching performance result fully corroborates theoretical predictions. The fact that a university spends on student stakeholder interests naturally legitimates them to these important stakeholders, strongly suggests effective husbanding of resources and thus improves student satisfaction with the knowledge services provided (Davis et al., 1997; Donaldson & Davis, 1991, pg. 82; Williamson, 2000, 2005; Donaldson, 1990; Pfeffer & Salancik, 2003). It is also an indication that the institution is optimally spending on the assets that truly matter to teaching facilitation (Edmans & Gabaix, 2009; Mallin et al., 2015; Jacobson & Andreosso-O'Callaghan, 1996; Murphy, 2012; Middlehurst, 2004; 2013; Bennett, 2002; Knight, 2002).

Empirical work in UK governance richly corroborates this result. The largest strand (Ganyaupfu, 2013; Mushtaq & Khan, 2012; Kirmani & Siddiquah, 2008; Karemera et al., 2003; Young, 1999) find that universities that spend heavily on knowledge assets help students achieve the best learning outcomes and grades. At least three papers (Dao & Thrope, 2015; Migin et al., 2015; Wiers-Jenssen et al., 2002; Price et al., 2003; Tang et al. 2004; Joseph & Joseph, 2000) find evidence that UK students gravitate towards institutions with the best IT and knowledge facilitating assets. Elsewhere (Metcalf et al., 2015; Price et al., 2003) collate evidence that UK academics too favour universities that invest heavily in knowledge infrastructure. Overall, the sample results then confirm that UK universities that display a strategic intent towards larger fractions of knowledge assets not only demonstrate their academic credentials but also create a facilitative academic ambience and thus improve teaching performance.

High endowment levels are not seen in a positive light by independent assessors of university teaching performance i.e. the teaching grant providers. Echoes of public accountability and legitimacy concerns with too many endowments and their likely donor biases can be seen in this (bebchuk et al., 2002; Van Essen et al., 2015; Butt, 2019; Squire, 2014; Parker, 2012; Brown et al., 2010; Shattock, 2008, Trakman, 2008). Empirical work in respect of the endowment association with university teaching performance is very limited however many policy and normative voices such as Butt (2019), Squire (2014) and Parker (2012) raise several concerns about rising university endowment levels in UK. These authors suggest that such

higher endowments many make universities subservient to corporate/donor interests forcing them to neglect their public minded teaching/transformation mandate (Ashforth & Gibbs, 1990; Dowling & Pfeffer, 1975).

Finally, cash levels in my teaching performance results do not show any significant association. Although this contradicts my ex-ante expectations in this variable it is not surprising within the context of a UK HEI sector that is undergoing significant shifts in terms of strategic mergers and excessive borrowing (Hillman, 2018; McGettigan, 2013; IRF, 2018; Jack, 2018b). May be it is this heterogeneity in the cash levels of institutions in my sample and their fluctuating levels that is reflected in this insignificant result (see Appendix 1).

Overall, this unique governance dimension of strategic asset/revenue structure choices of UK universities shows its singularities in my teaching performance results. The extent to which a university depends on tuition fees naturally impels greater spending on services and facilities but the combined impact in this sample makes for an exclusionary ambiance in UK university teaching (Bradley et al., 2008; Bachan, 2017). This governance challenge corrodes the true legitimacy of higher education as a vehicle of societal transformation (Suchman, 1995; Ashforth & Gibbs, 1990). UK university governance will have to seek innovative ways that balance between the replacement of government support by attractive student fee revenues and the resultant deleterious marketization of university teaching.

7.4.3 University Teaching Performance in the Board and Audit related University Governance

My results in teaching performance highlight many salient associations in board and audit related university governance.

In Board size I find a negative association here that is a complete contrast to my university research performance results. Theoretically, the result seems to support the nuanced views that balanced boards provide the cohesion in policy that helps improve teaching governance. Not only do these smaller boards avoid the policy logjam and analysis-paralysis associated with their larger counterparts but also such boards seem to suggest a teaching policy focus that impresses external assessors of university teaching performance (Lipton & & Lorch, 1992; Jensen, 1983; Yermack, 1996; Vefas, 1999; Nelson, 2002a, b). Such boards also arguably pay

more attention to the teaching related credentials of their board members and this pays off in terms of teaching at the institution (Coy & Dixon, 2004; Lipton & Lorch, 1992; Jensen, 1983; Yermack, 1996). At another level my result also does seem to suggest that smaller boards may allow greater independence to plural and teaching advocacy voices on the board and make board members effectively contribute to decision making. This is what helps improve teaching performance (Collis, 2004; Yermack, 1996).

Empirically for the first time then here is proof at least in university teaching functionality in the UK, CUC mandates of limits on board size between 12 and 25 seem to make sense (CUC, 2009, 2014). Perhaps it is the extra functionality of smaller boards with every board member's effective participation in decisions that is at play in my result. Earlier literature in corporate governance has confirmed a similar negative or even a U-shaped association with firm performance (Yermack, 1996; Eisenberg et al., 1998; Conyon & Peck, 1998; Loderer & Peyer, 2002; Tomasic et al., 2003; Hermalin & Weisbach, 1988; Pathan et al., 2007; Adam & Mehran, 2005; Cobham & Subramaniam, 1998). But my result contradicts university studies such as Lokuwaduge (2011) and Lokuwaduge & Armstrong (2015) who finds an insignificant and negative association with university teaching performance, and Ntim et al. (2017) who finds an insignificant negative association with voluntary disclosure. Yet surveys of UK universities recently have flagged the generally larger board sizes in universities but have noted how many have been reducing sizes in response to regulatory mandates (Ntim et al., 2017; CUC, 2014).

This negative result in teaching must be contrasted with my earlier positive result with research. Clearly then university governance faces a challenge in terms of calibrating board size which may have such opposing effects on the two main functions of a university. The approach in this variable has to be university specific and cannot be universal. UK universities would be well advised to take account of their peculiarities, heterogeneities and evolutionary particularities, and only then decide board sizes. At the same time the research versus teaching trade off must also be accounted for here.

Board ethnic diversities do not materially improve university teaching performance in my sample. This is disappointing and seems to contradict theoretical expectations of an ethnic resource enriching teaching performance (Pfeffer, 1987; Verbruggen et al., 2011) or of an ethnic stakeholder representation incorporating ethnic teaching functionalities (Mitchell et al., 1997; Roberts, 1992; Leisyte et al., 2014; Wise et al., 2020). Similarly there is no evidence that

ethnic board members alleviate public accountability concerns of fairness and neutrality in the teaching function (Coy et al., 2001; Hoecht, 2006) or that they improve the credibility of the university's teaching in the eyes of external assessors of this function (Suchman, 1995; De Villiers and Van Staden, 2006). In fact my result seems to only favor the dysfunctionality arguments of optimal contracting, stakeholder and managerial power (Williamson, 2000; 2005; Chizema & Buck, 2006; Jacobson & Andreosso-O'Callaghan, 1996; Edmans & Gabaix, 2009; Roberts, 1992; Freeman & Reed, 1983) that ethnic diversities may interfere with board cohesion reducing the effectiveness of teaching related decisions.

Yet my result must be seen in the light of the growing normative and policy concerns across both UK HEI and even in the corporate sector that ethnic representations at the highest organisational levels are woefully inadequate (Brammer et al., 2007; Garratt, 2005; Huisman et al., 2007). Corporate studies have found both positive (Erhardt et al., 2003; Ntim, 2015; Carter et al., 2003) and negative (Pitts & Jarry, 2007; Churchill & Valenzuela, 2019) impacts on firm financial performance. While earlier empirical work in UK HEI on the board member ethnicity angle is rare with Ntim et al. (2017) being the sole recent study confirming a positive association with voluntary disclosure, my univariate statistics (see Chapter 5, table 6) shows how UK university boards have remained largely exclusive consistently recruiting less than 7% board members from ethnically disadvantaged groups across the decade. So, it is not surprising to find that at these very low levels of representation these ethnic board members hardly have any voice in governance policy making and so are unable to contribute their ethnic insights to teaching facilitation at the university.

As in ethnicity board gender diversity in my results is insignificant in its association with university teaching performance. This too is uninspiring and disappointing. Most corporate governance research (Carter et al., 2003; Erhardt et al., 2003; Luckerath-Rovers, 2013; Ntim, 2015; Singh et al., 2008) as already mentioned has found that gender diversity improves firm performance. Earlier empirical research in university governance did find a positive association between board gender diversity and financial performance (Harris, 2014), as well as voluntary disclosure (Ntim et al., 2017). However, none of these studies were directed towards mapping the link with teaching performance specifically.

Many qualitative and normative scholars within the culture and quality assurance strand (Trowler, 2008; Alvesson, 2002; Brown, 2004, Salter & tapper, 2000; Sagaria, 2007; Leisyte

& Westerheijden, 2014; Stensaker, 2018) in university governance argue that teaching is strongly dependent on empathy. It is also behaviourally well known (Mestre et al., 2009; Kaschak, 1978; Ackers, 1994; Mackie, 1976; Ferber & Huber, 1975) that women display higher emotional quotients greater empathy and thus higher teaching facilitation. At the board level a higher proportion of female members should be expected to have a gendered contribution into appropriate Teaching and Learning Regimes (TLRs) that particularly enable better teaching performance overall. This would also be especially expected in the case of female student learning and adaptation to university pedagogy. Therefore, the lack of any sample association in the result remains puzzling.

One way of explaining this result may be to refer to the “unconscious bias” and “glass ceiling” arguments ubiquitous in the general university literature (Santos & van Phu, 2019; David, 2017; Moss-Racusin et al., 2012; Hewitt, 2020, Prena, 2005). It does seem that even at fairly healthy 33% female representation on the board recently (see Chapter 5, table 6) these members still face a difficult obstacle in terms of making their voice count. Their inability to tackle the bias against them is possibly the reason for their weak and uninspiring impact on teaching performance in the sample. Perhaps the result also shows that gender diversity and empowerment directives in UK HEI need to persist well into the future to really make a difference on the ground.

Independent assessments of teaching performance associate positively with the fractions of lay members on UK university boards. Clearly my result here accords with the theoretical argument that there is a neutral public impact that lay board members bring to the teaching governance at the university which positively impacts its performance (Coy et al., 2011; Nelson et al., 2003). It also seems to corroborate the prediction that the legitimacy derived from independent board members makes a positive impression on independent assessors of the university’s teaching performance (Nagy & Robb, 2008; Parker, 2013; Suchman, 1995; Vidovich & Glassman, 1979). At another level the obvious lessening of agency conflict due to these independent board members seems to reflect in my positive result (Donaldson & Davis, 1991; Donaldson T & Preston, 1995). Similarly it does seem that independent board members are indeed bringing in fresh ideas and preventing “group think” within the university and this is helping teaching performance to improve (Chhaochharia & Grinstein, 2009; Haniffa & Hudaib, 2006; Bebchuk & Fried, 2003; Mallin et al., 2015; Yermack, 1996).

Board independence has been seen to positively associate with corporate firm financial performance Cobham & Subramaniam (1998), Mishra & Nielson (2000) and Pathan, Skully & Wickramanayake (2007). Earlier work in university governance such as Harris (2014) and Lokuwaduge (2011) find a positive association between board independence and student retention rates and teaching performance respectively. Policy based and normative strands of literature often stress that independent board members are likely to provide a useful checks mechanism on internal governance and also bring new ideas and expertise to the organisation. This is perhaps what my result is mirroring here.

At another level culture and learning narratives in university governance stress how independent and fresh voices at the board level might be essential to support evolution of appropriate teaching and learning regimes (Trowler & Cooper, 2002; Trowler, 2019, 2008; Alvesson, 2002; Gayle et al., 2003). Teaching infrastructure and budgets will tend to be neglected in universities because unlike research, teaching does not draw in resources or raise academic reputations. Due to their status and focus on the long term independent lay board members would act as an effective check on such tendencies to neglect teaching infrastructures and budgets (Trowler, 2008; Tennat & Duggan, 2008; Jack, 2008). My result seems to echo such narratives and explanations.

Elsewhere in the empirical literature it is stressed that lay board members can be expected to contribute to quality induced changes in university teaching and research governance (Schofield, 2009; Greatbatch, 2014; Shattock, 2013a; Gompers et al., 2003; Beiner et al., 2006a; Bozec & Bozec, 2012). As outsiders more interested in their own long-term reputation rather than pursuing narrow vested interests in the institution they would want the university to focus on raising its overall academic credentials in both teaching and research. After all corporate governance scholarship (Gompers et al., 2003; Beiner et al., 2006a; 2006b; Bozec & Bozec, 2012) has found important links between the quality of firm performances and the number of laypersons on its boards. My result here is a robust corroboration of a similar quality induced effect in universities too.

In this connection it may be apposite to note how a growing number of studies and scholars (Bachan, 2017; Bright, 2004; Anyanwu, 2004; Furedi, 2004; Jones & Soo, 2013) have been stressing the dwindling quality of academic education in UK HEI. Perhaps lay board members are the best way to enforce higher quality. After all their outsider neutral and independent

reputations should act as an effective check on tendencies towards grade inflation or duimming down of standards at universities (Fama, 1980; Fama & Jensen, 1983; Michelon & Parbonetti, 2012; Pincus et al., 1989). My positive result here seems to support such a likely positive influence.

In totality my board independence teaching performance positive result is a robust confirmation that at least in so far as the teaching function in the UK university is concerned regulators seem to have got the equation just right. By insisting on at least 50% lay board members CUC (CUC, 2009, 2014) seems to have done yeoman service to the teaching function at universities.

My negative VC pay result is a robust confirmation of the generally widespread legitimacy and accountability concerns (Bachan, 2008; Bachan & Reilly, 2015; Tarbert et al., 2008; Ogden & Watson, 2004; Bargh et al., 2000; Suchman, 1995) that high levels of such pay are a negative flag for independent assessors of university teaching performance. Recently VCPAY and its links with overall university performance has been widely debated in UK HEI (Bachan, 2008; Bennett, 2017; 2019; Hubble & Bolton, 2019; CUC, 2018; OFS, 2018a; Grove, 2018; Baker, 2017; Denmead, 2019). Research has been mixed. Some have found evidence for a positive association between VC pay and university academic performance (Dolton & Ma, 2003; Walker et al., 2019; Tang et al., 2000; Tarbert et al., 2008), while others have found the opposite with regard to financial performance (Dolton & Ma, 2003; Bachan & Rielly, 2015; Walker et al., 2019; Ehrenberg et al., 2001; Baimbridge & Simpson, 1996). There is also wide debate whether VCs should be paid large amounts with some (Morgan, 2017; Backer, 2017; OFS, 2018a, c; CUC, 2018; Hubble & Bolton, 2019) taking the legitimacy/public accountability angle mentioned above and arguing against it while others (Cornell, 2004; Blanchflower, 2017; Lucey et al., 2019) suggesting the global competitive nature of UK VC recruitment and arguing for it (Perkman et al., 2013; Tarbert et al., 2008). Elsewhere there are strands of arguments emerging from the “good steward” concept that suggest the conflict of interest that has been found in VC pay determination at some UK universities (Walker et al., 2019; daily et al., 2003; Bebchuk & Fried, 2003; Boyle & Roberts, 2013; Slawson, 2018). The dust is far from settled on this debate.

My negative result here cofirms that UK universities that pay their VCs highly fail to attract teaching grants. One way of explaining this result is to view it within the context of recently constituted UK university Teaching Excellence Framework. This framework seeks to improve

the profile of the teaching function at universities. The core argument here is that teaching unlike research is not lucrative and so it is the common tendency of institutions to neglect it. Perhaps teaching grant providers who closely follow the TEF logic view high levels of VC pay at a university as a red flag. VCs earning such high amounts may be forced to chase lucrative university contracts rather than focus on low profile teaching mechanisms in order to justify their own pay level. This may be the logic here. In fact, such problems with high VC pay levels are rife within normative and regulatory literature (Hubble & Bolton, 2019; CUC, 2018, 2017; OFS, 2018a; Morgan, 2017) with the OFS recently even suggesting a penalty for institutions that are unable to justify their high VC pays.

My result also raises the question of talent and reward within the VC pay. There are voices here (Lucey et al., 2019; Scackleton, 2017; walker et al., 2019) that question the wisdom of simply lowering VC pay without giving regard to the scope of the job and the talent of the incumbent. While negatively viewing universities that pay their VCs highly may be appropriate to encourage a teaching orientation in the institution if this comes with a talent drain from the institution would that be a price worth paying? Thus on the whole the question of what is an appropriate pay level for VCs remains a contested area and my negative result does not resolve the controversy. Obviously regulatory attention in UK HEI must focus on how universities are to achieve the right balance between rewarding their chief executives without fostering a neglect of the teaching function.

My final result that executive team meeting frequency insignificantly impacts teaching performance supports arguments in stewardship that stress how frequent board or executive teams may not be salutary. After all such meetings might make executives feel less empowered more directed and monitored and also impose burdens on them in terms of travel and time which could be counterproductive.

On the whole then board and audit related governance mechanisms show rich and varied influences in my sample that are insightful.

7.5 The complex governance trade-offs between university research/teaching performance

Research and teaching, the two main functions of a university, are not conducted in isolation (Pollitt, 1990; Neumann & Guthrie, 2006; Lokuwaduge, 2011). They are intricately interconnected yet separate and rich in their own multi-dimensionalities (Jongbloed et al., 2018; Gohari et al., 2019). It is in the dual yet interlinked character of these knowledge functions that universities face the biggest challenge. Important governance decisions within the university have multiple impacts on both research and teaching performances (Gayle et al., 2003; Trowler, 2008, 2019). But more often than not the decisions taken to improve one type of performance deteriorates the other and this is what makes governance in universities so much more complex than that in corporate firms (Johnes & Virmani, 2019; Vukasovic et al., 2018). The section uniquely teases out such trade-offs in the sample results to shed light on a different dimension of the governance performance debate in UK higher education.

Teaching and research differ in their student staff interaction levels. This is richly illustrated in this UK HEI sample. Universities with high levels of such interactions invariably achieve better teaching performance. But the same institutions are not guaranteed better research performance. The challenge facing the governance decision makers here seems to be ensure a reasonable level of interaction intensity that supports teaching without harming the important creative individual aspects of the research process. High staffing levels might reduce workload and improve teaching but prove redundant and unnecessary to research (Ackers & Oliver, 2007; Burgess et al., 2006; Locke, 2014). This may be the hidden meaning behind the two way impacts of interaction levels on research and teaching in this sample. Interaction intensities have another implication that may differ between research and teaching. When universities increase interaction levels this benefits current teaching but may actually harm future generations of research scholarship due to a neglect of the solo individualistic creative processes in the university (Locke et al., 2016; Bryson & Blackwell, 2006). In totality student staff interaction levels have complex effects on research and teaching performances that cannot be resolved without considering both current and future likely trade-offs.

Both types of university academic performances benefit from a selective student entry regime in this UK sample. But rather surprisingly and worryingly it is research rather than teaching

performance that is less sensitive to student entry criteria (see Table 16 & Table 22). This makes the task of calibrating this governance across research and teaching that much more difficult. After all some universities with lower entry standards are becoming trail blazers in published research but are suffering the consequences in lowered teaching performances. This might force them to reverse their inclusivity but there is a need to obstruct such a tendency. Inclusivity and diversity must become the central theme of UK HEI and this rather stronger cycle of higher entry standards leading to higher teaching performance must be cut. This then is the challenging trade-off here. University decision makers need to find the optimal level of entry standards here that fulfils their transformational mandate even at the risk of some slight deterioration in their overall ratings on teaching.

Improving research and teaching performance face another challenging trade-off in staff contractual choices. Three key insights must be mentioned. First female staff levels improve a university's teaching but deteriorate its research (see Chapter 7.3.2, pg. 345-347; Chapter 7.4.2, pg. 369-370). UK universities that wish to improve both face a challenge. Either lose the rich gendered teaching inputs of female staff or accept the lower research ambience arising from public gender biases. Neither choice may be fully acceptable.

Second too many research-only staff reduce teaching performance while too many teaching-only staff reduce research performance. So, despite the gain in reputation due to large numbers of research-only staff there remains the problem of how to tackle the deficits in the teaching function (Probert, 2013; DBIS, 2015, pg. 8; Nyamapfene, 2018; Shelton et al., 2001). Similarly, despite a fortified teaching regime due to large numbers of teaching-only staff what must be done about the severe loss in research reputation and ambience that result from this. There are no easy answers to either question. A related but important question has to do with the very nature of these single function research only contracts. It seems reasonable to assume that universities that use many such contracts are likely to be focused on applied rather than basic research (Geschwind & Brostrom, 2015; Thornton, 2013; Fung & Gordon, 2016; Blackmore, 2016). The very time bound and commercially orientated nature of such research requires distribution of workload i.e. many research-only short-term contracts. This would clearly have negative impacts on the core basic research ambience of the institution. Once again, this question is not easy to resolve.

Finally, part-time contracts might facilitate research in some ways but definitely do not benefit teaching. This implies that part-time staff may actually be employed just for their research benefits although they interfere with teaching. In addition, given the fact that research is lucrative and more prestigious signalling the research-intensive pedagogy through large numbers of part time staff who are on research-only contracts may seem to be the easy way for the university (Blackmore, 2016; Shelton et al., 2001).

A final trade-off between research and teaching performances must be mentioned. Higher levels of dependence on tuition fees have direct instrumental impacts on faculty who focus on teaching and delivering to their fee-paying student consumers (Jabbar et al., 2018; Nixon et al., 2016; Foskett, 2010; Fowles, 2014; Brown & Carasso, 2013). But clearly this reduces faculty time and effort in idea generation and refinement processes vital to published research quality. The UK university thus faces a tricky decision. Using larger proportions of fee-paying students and particularly international ones will force higher focus on services/facilities and teaching governance regimes (Trowler, 2019; Taylor, 2013a, b; Molesworth et al., 2010). This will undoubtedly have a positive impact on its teaching ambience and student learning facilitation (Mushtaq & Khan, 2012; Kirmani & Siddiquah, 2008, Karemera et al., 2003; Young, 1999). Yet the adverse impact of this on research quality will mean that in the next round the university is unable to attract the very same international students that made it choose this policy in the first place (Turner, 2019; Jack, 2018b). So, in this increasingly marketized UK HEI universities need to still resist the overweening tendency to use uninformed fee-paying student consumers as their yard sticks for revenue and asset structure choices (Marginson, 2004; Molesworth et al., 2010). Instead there is a clear need to consider the fine research teaching trade-offs that emerge here.

7.6 UK University Financial Performance and its Governance Antecedents

In its financial performance the UK university displays a rich and variegated picture. Both the hitherto unexplored missing dimensions of university governance as well as the board level and audit related governances effect the financial well being and sustenance of this institution in a range of complex ways. The sample uses university asset turnover as the main indicator of university financial performance. Given the fact that UK universities are predominantly public sector institutions they fall squarely within the gambit of not-for-profit institutions. Profit based metrics do not make such sense here. Instead a metric that directly compares the gross incomes earned by the institution to the assets it used to generate these incomes is the most appropriate one here.

7.6.1 University Financial Performance in the missing dimensions of Governance

The CTA-AT negative and significant association confirms my earlier expectations. Liquidity levels in universities have a dampening effect on their asset turnovers. The public role and profile of the university (Taylor, 2013a,b; Shattock , 2010; Kelleher, 2004; Coy et al., 2001) and the widely discussed funding issues of this institution in UK (Foskett, 2010; Kim, 2008; Trakman, 2008; Shattock, 2013a, 2010; Brown, 2010; McDonald, 2013; Brown & Carasso, 2013; Temple, 2015; Belfield et al., 2017; Melville-Ross, 2010) may be marshalled to explain this result. Holding too much cash often reflects deeper agency problems at an institution (Bates, Kahle, and stulz, 2007; Gao et al., 2013). It suggests the short-term ad-hocism rampant in financial decision making at the highest levels. At another level the financial constraints (McGettigan, 2012; Callender & Jackson, 2008; IFR, 2018; OFS, 2019; JACK, 2018; CUC, 2019) that already seem to characterize UK universities in their high levels of indebtedness seem to be mirrored here (see Chapter 3, pg. 137-139). Universities that generate lower levels of revenues on their asset bases (i.e. low AT) take higher levels of debt (i.e. high DTA) and this unsurprisingly shows up as higher cash (i.e. high CTA) on their balance sheet (Hillman, 2018; Jack, 2018b; Iman, 2018).

The result is at odds with earlier empirical research in corporate governance. Scholars there (Mikkelson and Partch, 2003; Kim et al., 1998; Opler et al., 1999) find that firms holding as much as a quarter of their assets in cash perform better than their peers. There is hardly any

empirical work on cash levels and their link to asset turnovers in the HEI governance literature. Here is a golden opportunity to contribute in this area. CTA is a negative influence on the revenue generating ability of firms. Universities that hold too much cash are displaying their poorer financial judgment by not investing adequately and therefore tend to be unable to generate adequate revenues.

My leverage association is insignificant although the negative sign does align with a large strand of corporate governance that does find a similar negative association between debt levels and firm performance. But the insignificance of the association is also not without precedence at least in the corporate literature where (Siddik et al., 2017; Al-Taani, 2013; Ebaid, 2009; Jensen & Meckling, 1975) too find such an insignificant association. The result does not lend support to public accountability concerns with high debt (McGettigan, 2013; Hayes & Wynyard, 2002; CUC, 2017; HEC, 2014; OFS, 2019a,b) or its delegitimizing influence on student/staff constituents (Jabbar et al., 2018; Toutkoushian, 2001; Taylor, 2013a). There also is no substantiation for the stewardship balance in leverage argument (Dalton & Kesner, 1987; Donaldson & Davis, 1991; Kenser & Johnson, 1990) or the optimal contracting principle (Williamson, 2000; 2005; Chizema & Buck, 2006; Jacobson & Andreosso-O'Callaghan, 1996).

Explaining this insignificant but negative association requires a circumspect marshalling of the empirical policy normative and corporate governance scholarship. There are many firm studies that find either a positive (Champion, 1999; Gosh et al., 2000; Hadlock and James, 2002; Abor, 2005; Arbiyan & Safari, 2009; Taun, 1975; Nerlove, 1968; Baker, 1973; Petersen & Rajan, 1994) or a negative (Pathak 2011; Wiwattanakantang, 1999; Haung & Song, 2006; Chakraborty, 2010; Salim & Yadav, 2012; Abor, 2007; Hammes, 2003; Mesquita & Lara, 2003; Fama & French, 1998; Ramdan & Ramdan, 2015) association of debt with firm performance. This is some proof that debt levels in any type of institution may be both a financial boost or a drag depending on the individual circumstances. In addition, large strands of policy based and normative university literature warns against the growing incidence of debt in the UK HEI sector with many scholars even suggesting deleterious impacts on university student attraction and retention levels (Mcgettigan, 2013; UCU, 2019; HEPI, 2019; Moody, 2019). In fact, surveys of UK students have repeatedly proved how many of them closely examine the debt levels of institutions and avoid those with high debt levels (UCU, 2019; OFS, 2019b). Perhaps my insignificant result has more to do with the nature of asset turnover which

is after all constructed from revenues that are a pre-costs variable. In that sense there may be some merit in referring to my sensitivity regressions where the association is negative and significant. Read in totality then my results in this variable should be carefully interpreted. Regulatory prescriptions (OFS, 2019a, b; HEC, 2014; Hillman, 2018; House of Commons Committee of Public Account, 2012) and growing concerns with excessive debt in universities are not misplaced. This is perhaps why OFS has gone to the extent of stating that if university debt levels unwind then these institutions are on their own and the regulator will not intervene or save them from bankruptcy.

My insignificant association in FTA-AT association does not fit with resource dependence expectations (Vegas & Coffin, 2015; Pfeffer & Salancik, 2003) of higher resource efficiencies in higher fixed asset proportions and a likely positive association with university financial performance. Neither does my result support Optimal Contracting and stewardship precept (Williamson, 2000; 2005; Chizema & Buck, 2006; Jacobson & Andreosso-O'Callaghan, 1996; Davis et al., 1997; Bachan, 2017; Bradley et al. 2008) indications that it is lower fixed asset proportions that may help institutions to flexibly design optimal contracts or husband resources more effectively and thus achieve better financial performance. My result can only be explained by extending Kotsina & Hazak's (2012) argument advanced in the corporate governance literature. The authors suggest that their insignificant result may be attributed to the economic business cycle related fluctuations which might be making firm investments in fixed assets at the end of a boom or a recession ineffective when examined at a later stage. Perhaps this is what is being seen in my result too. UK universities too have been going through a rapidly transforming phase with budget cuts, extensive marketisation, changing regulation and so on especially during the period 2009-2012 (Browne, 2010; McGettigan, 2013; Molesworth et al., 2010; Foskett, 2010; Brown & Carasso, 2013; Middlehurst, 2013). The insignificant fixed asset to Asset Turnover association in the decade 2005-2015 in my sample can potentially be explained within this turbulent cyclical sectoral context.

My positive and significant result in service and facilities spend corroborates most theoretical predictions. A UK university that spends and husbands its resources wisely by intelligently spending on libraries, facilities and other knowledge assets is seen to improve its attractiveness to potential students and staff and this shows up in its growing asset turnovers (Edmans & Gabaix, 2009; Price et al., 2003; Mallin et al., 2015; Murphy, 2012; Binsardi & Ekwulugo, 2003; Knight, 2002; Hamsley-Brown & Oplatka, 2006; Davis et al., 1997; Donaldson & Davis,

1991, pg. 82; Donaldson, 1990). It is also seen to fulfil its public role by providing society with a well-equipped educational institution (Farr, 2003; Coy et al., 2001; Mcgettigan, 2013). These societal constituents signal their acceptance by joining and paying fees and this shows up in rising turnovers in my sample.

Policy related debates also seems to support this result (QAA, 2005, 2009, 2011; Gunn, 2018; hayes, 2019; Nixon et al., 2016). Several scholars (Gayle et al., 2003; Trakman, 2008; Collini, 2005; Ritzer, 2002; Trowler, 2008) stress how universities must pay close heed to educational facilitation as they are in the knowledge creation and dissemination role. Such facilitation obviously includes effective spending on knowledge infrastructure and so these policy scholars seem to underline its importance to university financial performance.

My finding is in line with some strands like Dao & Thorpe (2015), Migin et al. (2015) and Wiers-Jenssen et al. (2002) find that the services and facilities provided in a university plays an integral part in the student decisions to join. Perhaps this higher student attraction is what is mirrored in the growing asset turnovers in my result. Elsewhere Metcalf et al. (2015) finds that state of art facilities and equipment are an important incentive to highly skilled academic staff to join a university. Others like Earthman (2002) and Ganyaupfu (2013) underline how such investments often have a positive impact on teachers, teaching and student academic achievements. Unsurprisingly Mushtaq and Khan (2012) Kirmani & Siddiquah, (2008) Karemera et al. (2003) and Young (1999) demonstrate how a student's better performance is directly linked to the expanded library and facilities provided in the university. In all of these empirical findings there is substantiation for my positive and significant association.

My final result in endowment levels of UK universities shows an insignificant association with financial performance. To explain this result one can find some support in Resource dependence arguments Hillman & Dalziel, 2003; Borgatti & Foster, 2003; Bouwman, 2011 that institutions that are not as dependent on certain income sources due to possessing a buffer such as an endowment may not aggressively chase them. This is what the result seems to be mirroring. This insignificant ENDWTA_AT association also seems to echo managerial power (Williamson, 2000; 2005; Chizema & Buck, 2006) arguments. Having these higher endowments university governors feel secure and less worried about chasing revenues to ensure the financial sustainability of the institution. This is perhaps why AT levels do not show any significant association with growing endowment levels. Governors at these institutions

have a managerial stance that is relatively independent and self-assured due to the presence of these high levels of endowment.

Earlier empirical work in corporate governance (Al-Ani, 2014; Olatunji & Adegbite, 2014; Okwo et al., 2012; Rashid et al., 2008; Reyhani, 2012; Azadi, 2013; Iqbal & Mati, 2012; Inyama et al., 2017) referred to before has often documented the positive impact of financial independence and flexibility in the corporate firm on its asset turnover/financial performance. Given the lack of any endowment like mechanism in firms this financial independence and flexibility is inevitably the closest comparison here. Earlier empirical work in universities (Boliver, 2015; Fazackerley, 2013; Rogerson, 2013) has already documented a positive association between ENDWTA and academic performance but there is hardly any work associating it with university financial performance. My result here is thus a useful contribution expanding the insight of how endowments allow universities to become independent of the need to chase revenues.

In the UK there have been several calls for universities to improve their financial self reliance and sustainability. Recent reform efforts, policy white papers and even CUC guidelines have emphasized how universities should adopt a range of best financial practices to avoid typical financial profligacy, enhance accountability to stakeholders, improve legitimacy in society and demonstrate their effective stewardship (CUC, 2017; OFS, 2019a; HEC, 2014; House of Commons Committee of Public Account, 2012; Browne, 2010). This sample puts the spot light on such concerns and debates. Indebted universities and those holding large cash on their balance sheets reflect a lower ability to generate revenues and this is worrying. After all, if the university takes on debt and holds cash to mitigate its inability to generate revenues it only makes a bad problem worse. CUC and other regulators are right to be concerned with financial sustainability of the UK university revenue model. But when one considers sample evidence that endowment levels too simply do not matter to revenue generation or that higher service and facilities spend improve it, these concerns are amplified. If universities are taking on more debt to spend on higher facilities that attract fee paying students and help in generating higher revenues then this is surely unsustainable in the long run (IFS, 2018; Hillman, 2018; Turner, 2019; Iman, 2018; Jack, 2018b). This is then the governance challenge before UK universities i.e. to improve revenue generation without too much leverage and/or service/facility creation.

My results for **staff contractual forms** of RONLY, TONLY and TRST display weak and insignificant associations with university financial performance. In the the case of research staff positions this is surprising and goes against theoretical predictions of legitimacy and stakeholder each of which argue that this contract does have reputational advantages that should show up in higher student recruitments and fees (Whelan, 2017; Farr, 2008; Proberts, 2013; Suchman, 1995; Vidich & Glassman, 1979; Polat et al., 2019; Balmer et al., 2007). Yet there is no significant impact on asset turnovers. There is no evidence in my result of even the instrumental version of stakeholder argument (Wise et al., 2020; Woodward et al., 1996; Geschwind & Brostrom, 2015; Nyampfene, 2018; Oancea at al., 2010; Locke, 2012; Locke & Bennion, 2011; Brennan et al., 2007; Jenkins, 1995; Jenkins, 1995) which predicts that research only staff may actually be productive to generate research grants and funds and this should increase revenues on the same asset base. To explain this theoretically unjustifiable result one might refer to the empirical evidence (Chapter 5, table 5; HESA, 2015) that suggest that revenue grants only represent smaller proportions of the total income of the UK university and so it is likely that although there is some positive effect of RONLY on research grants this may not be large enough to make a significant difference to the total income of the institution.

My result in TONLY on the other hand is in line with the general predictions of legitimacy resource dependence and stakeholder (DfES, 2003; Cashmore et al., 2013; Strike, 2010; Oancea et al., 2010; DfES, 2003, pg. 51; Harley, 2002; Wood, 2002; Adam et al., 2005; Purcell, 1999; Pfeffer & Salancik, 1978; Fowles, 2014; Woodward et al., 1996) all of which underline the lack of income generation associated with the teaching. This contract is after all widely perceived even in the policy and contextual literature (Bryson, 2004; Cummings et al., 2014; DfES, 2003, pg. 51; Brennan et al., 2007; Bryson & Blackwell, 2001; Kogan et al., 1994) to be a stop gap arrangement generally designed to meet the growing academic teaching burden. Many scholars (Locke et al., 2016; UCU, 2014; UCEA, 2015; Duflo, 2009) even suggest that teaching only staff are young inexperienced and even students prefer being instructed by staff with an active research profile. Naturally the contract does not attract students and their fee revenues and this is what is reflected in its insignificant impact on asset turnover.

Finally, the insignificance of PTTSR in my result actually seems to conform to arguments of Stakeholder and Legitimacy theories which argue that too many part-time staff might act as a negative signal to potential students (Callender, 2008; Kezar & Maxey, 2014, 2015; Campaign for the future of higher education, 2015; Yorke, 2009a). Seeing these higher levels of part time

staff these potentials might question the efficacy of the academic function at this institution and prefer to join its peer. In fact many qualitative student surveys in UK HEI (Neves & Hillman, 2017; Locke et al., 2016; Kezar & Maxey, 2014, 2015) confirm that students prefer continuous and day to day engagement with teaching instructors and so are rightly wary of institutions with high levels of PTTSR. At another level although PTTSR is essentially a device to economise on staff costs my dependent variable does not capture this angle since it is based on revenues before any staff costs are taken into account. Therefore, while universities may be benefiting in terms of lower costs due to higher PTTSR my result naturally does not capture this.

In sum staff contracts even in their largely insignificant associations with university financial performance in my results nevertheless demonstrate some important governance policy implications. Universities should pay careful attention to their levels of single function and part time contracts. There is some evidence supporting the unpopularity of the part time staff contract among students. On the other hand research only staff positions do not necessarily lend enough prestige to a university so as to attract more students. As always the teaching only staff remain at best a stop gap arrangement and might actually be harming the academic reputation of the institution. Therefore my financial results once again put the spot light on staff contractual structures and much needed reform in them.

UK universities signal their pedagogical orientations particularly in the numbers of international students they recruit. My result shows that higher fractions of such students have a significant positive impact on the asset turnover of UK universities. Clearly there is evidence that by focusing resource-based marketing efforts on this segment of fee-paying international students the universities gain a boost to their revenue generating ability as predicted by resource dependence and stakeholder (Fowles, 2014; Foskett, 2010; Pfeffer, 1987; Pfeffer & Salancik, 2003; Wise et al., 2020; Leisyte & Westerheijden, 2014; Freeman, 2010; Rolfe, 2003; Dolton & Ma, 2003; Pittaway et al., 1998; Li et al., 2010). After all such students pay the highest level of uncapped fees in the student bodies of UK universities. The legitimacy and credibility gains of an international student-based university academic profile too are very much in evidence in this result (Scherer et al., 2013; Dowling & Pfeffer, 1975; Suchman, 1995). Ianneli & Huang (2014) shows how the UK has adopted the most liberal norms with regard to international student visa and entry to help support universities in their drive to become both financially sustainable as well as globally relevant. The author cites the OECD evidence in robust support

of his claim (OECD, 2004). My result here is the proof that this move has proved richly financially rewarding to the universities. The entire host of policy initiatives under the umbrella of “The UK Education Brand” (1999) aggressively pedalled by the Government seem to be working for these institutions (Li et al., 2010).

My results however do not support empirical voices that take issue with rising levels of international students. Broadly concurring with culture & quality assurance as well as resource dependence theoretical strains (Trowler, 2008; Alvesson, 2002; Fowles, 2014; Pfeffer & Salancik, 2003; Verschuere & De Corte, 2014; Filippaku & Tapper, 2008; Sawir, 2013; Bright, 2004; Bachan, 2017; Anyanwu, 2004; Barron, 2006) these scholars question the wisdom of taking on so many international students because of the extra workloads and declining academic standards including instruction/assessment quality that such students seem to engender. In fact, this is corroborated in my university academic performance result which shows a negative association here. On the whole then the meanings of my positive result here should not be taken as a *carte blanche* for higher numbers of international students. Governors have to be conscious of the fact that higher levels of such students are likely to have a deleterious impact on the academic standards and impose higher academic workloads (Trice, 2003; Niles, 1995; DEET, 1990, pg. 72; Bolsmann & Miller, 2008). UK universities kept unchecked will ignore their domestic clientele and focus on international fee-paying students (Coxoy et al., 2001; Callan, 2000; Anyanwu, 2004; Trice, 2003; Spencer-Rodgers & McGovern, 2002). After all this helps them meet their financial sustainability issues and arguably avoid taking debt. Therefore, there is little doubt that UK governance faces a serious challenge here in terms of this inordinate trend towards recruiting higher levels of international students. Careful regulatory guidance is indeed the need of the hour.

My financial performance results show that the level of post graduate students at a given UK university does not have a positive impact on its revenue generation. Regardless of the higher reputational legitimacy, academic ambience and quality assured by higher numbers of postgraduate students (Parker, 2008; Angell et al., 2008; Donaldson & McNicholas, 2004; House, 2010; Smith et al., 2010; Dolton & Ma, 2003) PGINT by itself does not seem to increase Asset Turnover.

To explain this result, one needs to examine the empirical literature which has many studies (Angell et al., 2008, Smith et al., 2010; HESA, 2015; House, 2010; Wilson, 2012; Universities

UK, 2015) that underline how postgraduate students generally constitute a minority of the student body at most universities. This is a fact confirmed even in this sample (see Chapter 5, table 4). This lower fraction may be at the root of why their fees do not matter significantly to the university's asset turnover. Elsewhere, studies (Harris, 1996; House, 2010; Smith et al., 2010) also suggest that at least some streams of postgraduates such as research postgraduates at UK universities tend to be funded by bursaries and scholarships. Hence, they pay less fees in general. There is also empirical evidence (Donaldson & McNicholas, 2004; HESA, 2015; House, 2010; Smith et al., 2010) that many postgraduate students tend to work and pursue study only part time and thus pay less fees. All of this combined together seems to explain the lack of association between PGINT and AT.

The seemingly insignificant coefficient here must not be taken to imply that this variable is not important. As argued by several normative and empirical governance scholars (House, 2010; Tarbet et al., 2008; Rudd, 2018; Stanton et al., 2009) PGINT signals the pedagogical orientation of a university. It is a highly visible signal especially to potential students who view it as a filtering mechanism when deciding their university of choice. Universities with high levels of post graduates are considered to be academically superior institutions and this aspect should not be under emphasised.

On the whole pedagogical orientations seem to be an important missing dimension of university governance that has important impacts on its financial performance. There is need for carefully considered regulatory guidance by the authorities to UK universities on how they should choose levels of international and post graduate student places and courses.

7.6.2 University Financial Performance in Board level & Audit related Governances

University financial performance exhibits a rich range of patterns in the usual board and audit related governance of the institution. My positive association between UK university VC pay and financial performance generally meets at least three theoretical expectations. Higher levels of VC remuneration seem to align the incumbent's interests with those of the institution and thus motivate him/her to aggressively pursue the financial well being of the university (Tarbet et al., 2008; Bachan & Reilly, 2015; Walker et al., 2019; Baker, 2017). Similarly paying VCs highly seems to ensure that the university gains a person with rich set of resources and expertise

that consequently improve its financial performance (Simon, 1957; Jensen & Meckling, 1976; Pfeffer, 1987; Pfeffer & Salancik, 2003; Johnes & Virmani, 2019; Becker, 1993; Ehrenberg & Bognanno, 1990; Blanchflower, 2017; Shackelton, 2017). Universities paying their VCs highly also seem to be contracting optimally and thus ensuring the incumbent has the right incentives to generate financial performance (Bebchuk et al., 2002; Mallin et al., 2015; Van-Essen et al., 2015; Edmans & Gabaix, 2009; Edmans et al., 2009; Gabiax & Landier, 2008).

Earlier work in universities seems to support this result (Brown & Lee, 2010; Fahlenbrach, 2009; Joubert & Fakhfakh, 2012;). Yet my result needs to be read in line with the negative association with teaching performance and insignificant association with research already discussed earlier (see Chapter 7.3.2 & 7.4.2). The implication here seems to be that UK universities have indeed been prioritising financial performance in general. There have been growing indications in the policy and normative literatures that VCs are generally being rewarded based on their mission related performances as underlined by Walker et al. (2019) on account of student recruitments/retentions and in the competitive league tables. Perhaps this is what is mirrored in my positive association here. Within the context of a sector that is increasingly starved of funds and forced to depend on internal sources to bridge growing budget deficits it is not surprising to find that universities are paying VCs highly and reaping the rewards of fee incomes on a priority basis (Hillman, 2018; Foskett, 2010; Fowles, 2014; Molesworth et al., 2010; Brown & Carasso, 2013). Yet what must not be lost sight of here is the fact that such VCs do not really seem to bring their promised academic rewards. My sample seems to strongly suggest that VC pays are only positively associated with financial performance. A certain commercially oriented mindset seems to have set in to the sector and this is perhaps why at least some scholars have issues with the legitimacy and publically justifiable aspects of such high pay. A case in point here is the recent case of the VC of Bath university who was forced to resign in the wake of very high pay awards (Bennett, 2017; Slawson, 2018).

Yet the challenge of VC pay remains centre stage. There are voices in the literature that have been arguing that VCs are underpaid in relation to their talent and job scope (Johnes & Virmani, 2019; Blanchflower, 2017; Soh, 2007). After all these authors claim they are managing a very complex multi-dimensional institution with several keen trade-offs that cannot be resolved even as easily as in the corporate sector (Simon, 1957). So, universities and their regulators face an unenviable challenge to achieve an optimal remuneration level that achieves both a

retention of the best talent in the sector while at the same time supporting all round university performance especially in academics. It does seem that the stage is set for the OFS to step in with detailed guidelines that can shed light on how universities can step up to this challenge.

The positive association between board meeting frequency and asset turnover is similar to my result in research performance, and confirms that a frequently meeting board balances stakeholder concerns, improves legitimacy, allows resource rich board members to contribute, makes for optimality in all revenue contractual mechanisms and thus on the whole improves the financial performance of the institution (Reverte, 2009; Schofield, 2009; Ashforth & Gibbs, 1990; Suchman, 1995; Melville Ross, 2010; Freeman & Reed, 1983; Donaldson & Davis, 1991). My result does not support any dysfunctionality arguments for frequently meeting boards stressed in optimal contracting, stewardship or managerial power theories. The meaning of this result is obvious. In consonance with many empirical voices (Vefas, 1999; Sonnenfeld, 2002), director diligence and monitoring abilities are indeed enhanced in my sample and this is what seems to result in higher turnover amongst these UK universities. Perhaps here is more robust proof in line with earlier studies like (Hillman, 2018; Turner, 2019; McGettigan, 2013; Jack, 2018b; Inman, 2018) that within the context of heightened uncertainty in UK HEI the CUC's directive of at least 4 board meetings per annum seems to be helping universities address financial shortfalls and thus achieve higher turnover (CUC, 2009; 2014). Universities would be well advised to meet more frequently with a heightened focus on achieving better academic and financial performance.

Audit committee size in my results has a positive and significant association with university financial performance. This echoes many theoretical predictions. In my UK sample it seems that larger audit committees enforce public purposes of financial sustainability (CUC, 2008; Dewing & Williams, 1995; De Simone & Rich, 2019; Browne, 2010; Scherer et al., 2013; Montondon & Fischer, 1999), internal process control/transparency (Weir, Laing & McKnight, 2002; Osborne & Bell, 2009), ensure higher stakeholder inclusion as well as quality/optimality focus (Donaldson L & Davis, 1991; Wicks & Parmar, 2004; Donaldson T & Preston, 1995; Freeman, 2010; Marginson, 2006). It does seem as though my result in this variable ratifies CUC recommendations that stress better internal audit mechanisms in UK universities (CUC, 2017, 2008). There is now empirical evidence that bigger audit committees are indeed more effective. Such larger committees seem to be able to scrutinize executive actions better, engender transparency all around, bringing a heightened financial focus and this is what is

showing up in higher turnovers in my sample (Bedard & Gendorn, 2010; Ghafran & O'Sullivan, 2013). Elsewhere in the empirical literature Ditternhofer (2001) and Goodwin (2004) claim that internal audit is emerging as an important component of management and governance mechanisms both in private and public sector, and Ntim et al. (2017) highlights how the audit committees are in themselves new to the sector but an effective means to demonstrate to outside agencies that the university is indeed serious about internal financial mechanisms. My positive result here may be showing this explicitly. Grant providers and other external agencies are indeed impressed by robust audit committee functions and thus sanction higher levels of grants to such universities.

Finally, my sample shows an insignificant association between the presence of a unique governance committee in a university and its financial performance. Unlike how research performance is negatively impacted the financials of a university do not seem to be directly impacted by such committees. There is support for optimal contracting stewardship and managerial power arguments that adding layers of bureaucracy and redtape do not effectively improve the financial performance of a university. My result robustly questions the wisdom of adding layers of bureaucracy in terms of a unique governance committee. Read together it does seem that such committees either negatively impact research performance or do not materially alter financial performance. While earlier work by Ntim et al. (2017) has found a positive impact on university voluntary disclosure my result here does not extend that positivity into university financial performance.

On the whole the discussion above shows how UK university financial performance is impacted in a varied manner in the board and audit related governance mechanisms of this institution too.

7.7 Governance Trade-offs, inter-relationships and Controls in University Performance

This final section of the Discussions and Conclusion Chapter tackles the important research objective of understanding and explicating the key trade-offs between UK university academic and financial university performances as well as their governance-based antecedents. In the

process the thesis also attempt to flag important differences in the sample in relation to the four different types of university mission, age region and size controls.

The discussions in the earlier sections of this chapter identify at least three important trade-offs that UK universities face in terms of their academic and financial performances. First in attracting international students, while UK universities seem to significantly benefit in my results such students seem to impose academic workloads and reduce academic especially research performance (Trice, 2003; Niles, 1995, DEET, 1990, pg. 72; Bolsmann & Miller, 2008). So, university governors face a tricky trade-off in terms of how many such students should really be admitted. They have to take care of the financial sustainability of the institution by seeking out these high tuition fee paying segments but be consciously aware of the academic implications alluded to by Sawir (2013) and Li et al. (2010). Second VC pay levels in my results have a clear negative impact on university teaching performance but are simultaneously seen to improve financial revenue generation and performance. Once again here the university is faced with the tricky choice of recruiting the best talent for the top job in the institution by paying liberally while at the same time avoiding any loss in legitimacy and student satisfaction arising from such a pay policy (Walker et al., 2019; Lucey et al., 2019; Tarbert et al., 2008; gabiax & Landier, 2008). Finally, even in the use of TONLY RONLY and PTTSR contracts there is evidence that such contracts have no decided impact on university financial performance they do indeed have significant negative impacts on different types of university academic performance (see Chapter 7.6.2). Thus, within a scenario of budget difficulties and cost optimisations largely prevalent in the UK HEI sector universities nevertheless face the dilemma of allowing use of single function and cost saving contracts but with the proviso of facing academic shortfalls due to their use (Bryson, 2004; Burgess et al., 2006; McGettigan, 2013). In sum, then my results show how university governors have to face up to these different trade-offs and perform a delicate balancing act while deciding such key governances.

At another level across all my results there is evidence of crucial inter-relationships between university governances. For example, it is apparent that universities that postulate higher entry standards generally might also choose lower student staff ratios in line with a reduced student academic burden (see Chapter 7.3.2, pg. 338-341). Similarly, there seem to be a logical and likely inter-relationship between a UK university's spend on services and facilities and its ability to attract fee paying international students that may improve financial performance but impose higher academic burdens (Dao & Thrope, 2015; Migin et al., 2015; Wiers-Jenssen et

al., 2002; Nixon et al., 2016). Finally, student body coverage may fulfil a university's public and societal mandate but force the institution to choose higher levels of single teaching-only or part-time staff with a direct deteriorating quality implication (Scott, 1995; Molesworth et al., 2010; McGettigan, 2013; Sawir, 2013; Bright, 2004; Barron, 2006). Such interrelationships between governances show their nuances within many of my results and there is clearly an important need to further investigate these in UK HEI.

My results also highlight a range of different patterns among governance dimensions of UK universities in terms of their age, mission, location and size. For example, Pre and post 1992 UK universities differ significantly in all the governance dimensions. The pre-92 universities generally exhibit higher entry standards, lower student staff ratios, lesser prevalence of single function and part time staff contracts, higher endowment levels, higher board sizes, less diversity and independence in boards. A similar pattern is seen in terms of Russell and non-Russell Group comparisons (see Appendix 1). Such differences are also seen in university research teaching and financial performances. Pre-92 universities generally outperform their peers in research and financial performances but there is a mixed picture in terms of teaching performances (see Chapter 6.1 & 6.3). Russell Group universities seem to outperform their peers in academic performance but do not significantly differ in terms of financial performances (see Chapter 6.1, 6.2 & 6.3). Larger universities generally outperform in academic performances but do less well than their smaller counterparts in asset turnovers. Finally, regionally English universities outperform in both academic and financial performance. There is a clear drop in the performance as one moves towards Wales, Scotland and Ireland. This discussion clarifies that there is further need for in depth investigation of the heterogeneity in the UK university sector in terms of size, age, mission and region.

7.8 Chapter Summary

This chapter has qualitatively discussed the six regression models of university governance and performance developed and interpreted in Chapter 6. Linking each of the earlier findings back to the theories of university governance and the vast empirical normative and policy-based literatures the chapter drew out a set of key novel insights here. In so doing the chapter has contributed in several different ways including identifying and explicating missing dimensions of university governance and their performance associations; identifying and explaining a range of complex trade-offs embedded in the multiple dimensions of university governance and performance and assessing the status of current regulatory and policy based initiatives in UK HEI. The next chapter brings all of this discussion together to answer both the research question and related research objectives posed in Chapter 1.

8. Chapter Eight: Conclusions & Recommendations

8.1 Introduction

The Chapter concludes this multi-dimensional exploration of university governance and performance in the UK. A brief foregrounding of why such a study remains important within a rapidly changing higher education context in the country is appropriate here. The winds of change that have been blowing through the sector have left none of the governance structures, processes and mechanisms or performance predilections of these unique knowledge institutions untouched (See Chapter 1, pg.16-36). Marketisation of the university, the growth of a global higher education ethos, a drastic reduction in Government funding, deteriorating academic quality standards, a growing multiplicity of players in the sector and the emerging expectations among publics of a multiple role fulfilling institution have put the spotlight on the UK university and its multi-dimensionality as never before (Foskett, 2010; Brown & Carasso, 2013; Molesworth et al., 2010; Shattock & Horvath, 2019; McGettigan, 2013; Kim, 2008; Middlehurst, 2013, Collini, 2012; Hayes, 2002; Trowler, 2012). Now more than ever there is a growing consensus within the general academic and policy discourse in UK HEI that governance studies of this institution must step up to the task of truly transforming it.

In what follows, in section 8.2 the chapter answers the research question posed in the introduction. The next section 8.3 details the novel contributions of this thesis to the body of knowledge in university governance and performance. Recommendations to policy and practice follow in the next section. In section 8.5 the main limitations of this study are delineated. Research directions for the rapidly expanding field of university governance studies are indicated in section 8.6. The final section 8.7 is a chapter summary.

8.2 Summary of Findings

From the insights gleaned in the previous Chapter, the following important conclusions can be stated to the crucial research objectives set out in the Introductory Chapter.

RO1: To identify and uncover missing dimensions of university governance in the UK.

First and foremost, the thesis mined the rich theoretical, policy-based and empirical scholarship in university governance to **identify five distinct relatively new dimensions of university governance** that have been largely ignored (Lokuwaduge, 2011; Ntim et al., 2017; Olson, 2000; Harris, 2014; Lokuwaduge & Armstrong, 2015; Collini, 2004; Middlehurst, 2013; Shattock, 2013a,b, 2012; Molesworth et al., 2010; Kim, 2008; McNay, 2005, 2010; Hillman, 2018, 2014; Watson, 2014; Blackmore, 2016). These are Selectivity in Entry Standards, Instruction Intensity in Student Staff Ratio, Research/Teaching/Gender Modalities in Staff Contracts, Pedagogical Orientations in Student Body Diversities and Strategic Choices in Asset/Revenue Structures. The thesis found much evidence in the policy narratives and changing governance context of UK HEI for many of these dimensions and particularly the last one (Dearing, 2012; CUC, 2016, 2017; OFS, 2019a,b; HEC, 2014; House, 2010; Hillman, 2014; Fowles, 2014; Taylor, 2013; Gayle et al., 2003; Melville-Ross, 2010; Collini, 2012; Scott & Callender, 2013; Brown & Carasso, 2013; Mcgettigan, 2013; Shattock, Shattock & Horvath, 2019; Shattock, 2010, 2008, 2001). The first two of these new dimensions are in themselves single variables whereas the last three are composite constructs aggregating into 13 new variables.

In uncovering each of these dimensions, related singular features were discovered in this UK sample that further confirmed and corroborated the governance challenges embedded in them (See Chapter 7.2, pg. 332-336).

In the first two dimensions the distinctive yet widely varying patterns found in the sample reflected the difficult research teaching and financial trade-offs embedded in these choices. Optimality in these two closely linked dimensions was clearly found to be uniquely individually rooted within each university (Murdoch, 2002; Schwartz, 2004; Hillman, 2014). In their complex calibrated choices of research, teaching and gender-based staff contracts UK universities were seen to be trading off several sets of opposing and complex concerns resulting in a variety of such choices. Here is where the important policy challenges faced by university

governors were expressed (Metcalf et al., 2005; Blackmore, 2016; Locke, 2016, 2009; Ackers & Oliver, 2007; Brew et al., 2017; Geschwind & Brostorm, 2015). In the fourth missing dimension UK universities were found to be searching for the right mix of international and postgraduate students in their student bodies. Once again, the university-based differences in the sample richly underlined the complex academic ambience and reputational implications of this dimension (House, 2010; Trice, 2003; Angell et al., 2008; Lowrie & Hemsley-Brown, 2013). Finally, UK universities were found to be richly different to corporate firms in their strategic financial choices of revenue sources and asset structures (Fowles, 2014; Taylor, 2013a, b, c; Toutkoushian, 2001; Parker, 2012, 2013; Festo & Nkote, 2007; Marginson, 2004; HEC, 2014). Here much evidence was discovered that these institutions needed to grapple with the opposing problems of financial sustainability and financial independence.

RO2: To evaluate how all dimensions of university governance impact on this institution's research, teaching and financial performances.

Second in evaluating the impacts of all the multiple dimensions of university governance on the research, teaching and financial performance many interesting conclusions were found. Among the missing dimensions of university governance, Selectivity in Entry Standards exemplified the enormous challenge facing UK universities. The evaluation showed how inclusivity-elitist divides have ruptured these institutions (See Chapter 7.3.2, pg. 339-341; 7.4.2, pg. 365-366; Results in Table 16, 22 & 6; Appendix Table 1, pg. 419-422). They need a much higher degree of sensitive calibration of the dimension in order to truly achieve academic performances that effect knowledge creation and dissemination in the best and most socially responsible manner. From the evaluation of Instruction intensity in Student Staff Ratios an even greater challenge emerged for the UK university. Lowering the level of this dimension was indeed salutary to teaching performance but this proved to be a very small part of the problem (See Chapter 7.3.2, pg. 341-342; 7.4.2, pg. 366-368; Results in Table 16, 22 & 6; Appendix 1, pg. pg. 419-422). The institution's main challenge was in calibrating this dimension to tackle the tricky trade-offs of staff utilization, staff morale and student recruitment in the most optimal way without compromising either academic quality/integrity or student inclusion.

In the third missing dimension of research/teaching/gender modalities in staff contracts the evaluation revealed richly complex and varied impacts on academic and financial performances of UK universities (See Chapter 7.3.2, pg. 342-349; Chapter 7.4.2, pg. 368-371;

Chapter 7.6.1, pg. 389-390; results in Table 16, 18, 20, 22, 24 & 26; Appendix 1, pg. 419-422). Whether it was in the growing need for a rethink of the nature and types of academic staff contracts in use in the sector, or, in the calibrated use of part-time or single function contracts, or even in the manner of gender inclusion strategies at staff levels there were clear indications of exaggerated and differentiated impacts on research, teaching and financial performances of these institutions. Here is where the evaluation seemed to bring home each university's strategic challenge in not only choosing its academic/financial priorities through staff contract levels but also effectively expressing them in staff contract templates.

The evaluation of the fourth missing dimension of pedagogical orientations in student body diversities revealed how the UK university needed to carefully think through the numbers of international and post graduate places it chose each academic season (See Chapter 7.3.2, pg. 349-352; Chapter 7.6.1, pg. 390-392; Results in table 16, 18 & 26). Important revenue raising considerations had to be traded off against academic resource burdens, potential academic standards decline, research reputational advantages, subject specialism benefits, facility investment requirements and the institution's overall academic ambience. Finally, the evaluation of the fifth missing dimension of strategic choices in Asset/revenue structures revealed nuanced and complicated impacts on university research, teaching and financial performance (See Chapter 7.3.2, pg. 352-355; Chapter 7.4.2, pg. 371-374; Chapter 7.6.1, pg. 384-388; Results in table Table 16, 18, 20, 22, 24 & 26). Questions of university dependence on tuition fees or endowments, university spending on services/facilities, university management of cash or debt stood revealed as highly complicated inter-linked strategic governance puzzles. It was in the complex answers to these puzzles that the UK university's broader challenge lay. A need was seen for this institution to maintain independence, sustainability, academic integrity and overall performance in a scenario of dwindling government support and rapid marketization of the sector.

Even among the usual board level and audit related governance aspects of universities patterns of performance influence **were revealed to be varied** (See Chapter 7.3.3, pg. 355-362; Chapter 7.4.3, pg. 374-380; Chapter 7.6.2, pg. 392-395; Results in table 16, 18, 20, 22, 24 & 26). Although under regulatory pressures most UK universities were moving to the corporate norm of smaller boards there were unmistakable signs of the academic enrichment engendered in universities who defied this norm and maintained larger boards. Board independence and various audit related structures were revealed to function and influence performance in nuanced

ways among UK universities. The increasing trend towards larger numbers of lay members, engagement of external reputed audit firms and institution of specialised governance committees under regulatory pressures although pervasive across these institutions were seen to be weak antecedents of performance. This corporate trend was further revealed in VC pay where universities seemed to ape firms and remunerate their chief executives on the basis of their achievement of financial rather than academic missions.

RO 3&4: To critically unpack the trade-offs and interrelationships within each dimension of university governance – To analyse how the governance interrelationships and trade-offs identified in objective 3 impact upon a university’s research, teaching and financial performance.

Third, the many findings of this thesis highlight a series of **inter-governance trade-offs and their myriad impacts on university performance**. Here is where the challenge facing universities were revealed to be unique and unlike those in any other sector of the economy. For instance, a combined calculus of performance impacts was clear in how UK universities tackled the inter-linked decisions of student entry standards and subsequent student staff ratio. The decision made in one dimension here narrowed or complicated the trade-offs in deciding the other. Similarly, even within a dimension such as that of Staff Contracts UK universities were seen to be facing a singular series of internal trade-offs as levels/types of one contract chosen made such choices in the others more restricted (McNay, 2005; McDonald, 2012; Bradley et al., 2008). Elsewhere evidence emerged that student body choices put academic resource burdens on universities that made some types of single function or part time staff contracts inevitable even while they helped the financial sustainabilities of these institutions (Iannelli & Huang, 2014; Furedi, 2004; Bright, 2004; Barron, 2006; Bryson & Blackwell, 2006). Even within the board and audit related governances many performance-based trade-offs emerged. Board sizes needed a balance that nevertheless encompassed diversity and independence issues yet improved academic performance. Vice-Chancellor pay needed greater alignment with academic achievements rather than financial milestones (Gschwandtner & McManus, 2018; Lucy et al., 2019; Hubble & Bolton, 2019; Bachan & Reilly, 2015; Tarbert et al., 2008).

RO5: To assess the role played by external governance regulation of the UK Higher Education in all these inter-relationships and associations.

Finally, throughout the evaluations the central picture of external regulation that emerges in UK HEI seemed to highlight several inconsistencies and weaknesses. Mass student body coverage mandates issued by regulators nevertheless failed to grasp the full import of likely academic and financial governance burdens of such directives (Scott, 1995; Scott & Callender, 2013; Molesworth et al., 2010; McGettigin, 2013; Kim, 2008). Moves to make universities financially sustainable through unchaining tuition fee/student cap restrictions and/or allowing more international student places changed repeatedly without much regard to funding imperatives or ensuing academic governance challenges (Hillman, 2014, 2016; Fowles, 2014; Foskett, 2010; Brown, 2004, 2013). Surprisingly large areas of internal governance trade-offs especially with regard to student entry standards, student staff ratios or nature/types of staff contracts have been left largely unaddressed by the regulations. Despite fair access issues being repeatedly bandied in policy literature there was little evidence that actual policies mandating it were ever implemented (OFFA, 2004, 2012; Harris, 2010; Jones & Thomas, 2003; Schwartz, 2004; Adnett et al., 2011). The nature and types of staff contracts have rarely been discussed or regulated on. This is despite the clear evidence that emerged about the importance of such constructs and their complicated impacts on university performance (Whitchurch, 2016; Whitchurch & Gordon, 2013; Thewlis, 2003; Blackmore, 2016, 2006; Cui et al., 2019; Locke, 2016). Even within the several regulations (CUC, 2009; 2016; 2017; House of Commons Committee of Public Account, 2012; Higher Education Committee, 2014) mandating board sizes, diversities, independences, financial sustainabilities and VC pay there was a disconcerting trend towards corporate style pronouncements and managerial/efficiency perspectives that did not seem entirely appropriate to higher education.

8.3 Research Contributions

This thesis has fundamentally shifted the contours of the debate in university governance and performance. Veering away from a corporate governance paradigm it has discovered a rich and complex panoply of insights that differentiate the governance performance relationships of UK universities across the years from their corporate peers. Not only is there now a deeper and richer understanding of why these institutions' have unique multi-dimensional governance needs but also the thesis has demonstrated the existence of a range of complex trade-offs within

these governance needs that impact on their performance (Chapter 7.5, pg. 380-382; 7.7, pg. 394-296. Thus, it has singularly highlighted and substantiated the difficult challenges facing university governors when calibrating internal governances. For the first time, there is now empirical evidence supporting the many normative calls to fundamentally rethink the way universities are governed and regulated (Collis, 2004; Frankel, 2011; Harrison & Lockett, 2019; Jongbloed et al., 2018; Parker, 2011; McGettigin, 2013; Trakman, 2008; Middlehurst, 2013; Collini, 2012; Shattock, 2008, 2006; 2013; 2012 Buckland, 2004; Watson, 2014; Brown & Carasso, 2013; Knight, 2002). At least six fundamental and novel additions by the thesis to the body of knowledge here must be detailed. Table 28 below provides a summary of key findings in congruence with the gaps and key contributions.

At another level the thesis has comprehensively studied a full range of quantitative indicators mapping the governance and performance of universities making full use of the existing databases now being expanded by the HESA (Chapter 4, section 4.6.1). This is much needed and in line with normative calls across the multi-polar debates in UK university governance (Parry, 2011; Rowlands, 2013; Horden, 2013; Parker, 2011; Shattock, 2010, pg. 105). It is also arguably the first attempt to support substantiate and embellish the UK government's recent Higher Education legislation with factual and quantitatively rigorous analysis (See Table 1, pg. 19-21). The thesis must therefore be viewed in this light as a novel attempt to bring together many different dimensions embedded in university governance and performance and establish their complex inter-relationships. As with any knowledge domain much research remains and many of these future directions have been indicated in the previous sections. Yet such future research effort now does have a very systematic rigorous and quantitatively complete docket sheet of conclusions against which to map progress.

First and foremost, the thesis has conceptualised university governance and performance in the most comprehensive manner. Crafting an encompassing yet holistic definition of either construct that fully captures their multiple dimensions it has restructured the focus towards the key aspects that are in need of elaboration (Chapter 2.2, pg. 45-50; 2.3, pg. 45-56). In that sense the thesis has arguably expanded the lexicon of university governance and performance. No longer can these constructs be either identified with with solely apex level mechanisms and processes nor can they exclude crucial academic cultural and quality-based imperatives. Both constructs within higher education stand revealed as highly complex yet unified entities in their own right. Forthcoming scholarship in university governance will be able to use this expansive

conception to further investigate the multi-dimensional associations between university governance and performance.

Second, based on a systematic theoretical scrutiny of an eclectic seven theory framework, the study has expanded the vocabulary of university governance performance by showing how five missing governance dimensions are crucial to a deeper understanding of the multi-dimensional associations between them (See Chapter 2.4, pg. 56-92). From the 4-core and 3-ancillary theories used here these missing dimensions were explicitly related through a range of key hypotheses to academic and financial performances of the university (See Chapter 3.2, pg. 103-165). In doing so the study has fundamentally altered the theoretical template of university governance by including these important missing dimensions and their important performance impacts.

Third, by collating a rich and expanded panel data set of institution-wide governance/performance quantitative indicators in UK HEI covering a recent full decade the thesis contributes to the empirical literature in university studies. For the first time this has shed unique light on how data newly made available to the sector by institutions such as HESA can be optimally utilized to reveal important multi-dimensional insights. Surely, the detailed longitudinal panel analyses here can be viewed as a unique inflexion point in HEI studies which have hitherto been narrowly focused on corporate governance style board and audit related governance mechanisms (Ntim et al., 2017; Lokuwaduge, 2011; Olson, 2000; Harris, 2014).

Fourth, the robust empirical findings from the rich panel data set of UK HEI in this study provides different degrees of confirmation, corroboration and contradictions for the many theoretical associations indicated by the multi-theoretical framework used here (Chapter 2.4.1 & 2.4.2). These findings are a robust check list of university governance performance relationships that will surely help both university governors and future researchers. The former will be able to chart their institution's progress towards a better internal governance mechanism while the latter will be able to evaluate the impact of governance reform in the sector.

Fifth, the study breaks new ground in the verification/attestation of UK HEI policy changes. The longitudinal analyses here arguably represent the first attempt to support substantiate the UK government's recent Higher Education legislation with factual and quantitatively rigorous analysis (CUC, 2001; 2006; 2008; 2014; 2018; 2019; OFS, 2018b, c; 2019a; Chapter 1.1.1,

table 1). The thesis thus sets the stage for further investigation into the effectiveness of existing regulations. Given the important regulatory changes introduced especially in the decade included within the study a valuable opportunity presented itself and has been used to test the credibility and efficacy of some of these newly introduced changes. At the same time the thesis also contributes by showing some important missing regulations especially in terms of staff job descriptions and board member recruitments that empirically seem critical antecedents of university performance. In totality all of these will surely aid in the cogent formulation of an empirical data base of regulatory insights that can be utilized by future regulators and researchers.

Sixth, the thesis provides an empirical basis for certain key concepts that have long formed an intricate part of the university governance policy normative and argumentative literatures. In the many levels of analyses in the study there have been indications of culture/quality-assurance based trade-offs and process-like characteristics in university governance and performance (Gayle et al., 2003; Trowler, 2008, 2019; Trowler & Cooper, 2002). Teaching and Learning regimes have also been seen to be implicated in many of the quantitative indicators chosen and their inter-relationships. A valuable first attempt at obtaining quantitative insight into these crucial aspects of governance has been obtained here. Surely this can aid in the enrichment of future empirical work in the sector.

On the whole the brief discussion above has established the wide scale and scope of knowledge contributions provided by the thesis. Within the context of a UK HEI sector buffeted by rapid and transformative change these knowledge contributions are vital. They hold up a mirror to the sectoral policy and regulatory apparatus to assess the extent to which current regimes are fit for purpose. They have the potential to help all sector participants, policy makers and researchers understand and evaluate their actions. Yet a lot remains to be done here and in that too this thesis provides a preliminary but rigorous basis for future work.

Table 28: A summary of gaps, key findings and contributions

Theoretical/ Empirical gaps	Key findings	Key contribution
<p><i>Empirical Gap 1</i></p> <p>The missing multiple dimensions of university governance and performance</p>	<ul style="list-style-type: none"> • The study found 5 new dimensions in university governance apart from the usual board level and audit related ones generally studied in extant literature (Ntim et al., 2017; Harris, 2014; Olson, 2000; Lokuwaduge, 2011; Lokuwaduge & Armstrong, 2015). These are: Entry Standards (selectivity in intake); Student Staff Ratio (Instruction intensity); Research/Teaching/Gender modalities in staff level contracts; Pedagogical orientations in student body diversities; Strategic financial choices in asset/revenue structures • In order to unpack these new dimensions and their interlinked associations with university performance the thesis uses 15 hitherto unused governance variables (Chapter 4.6.1 & 5.2.1). By doing so it finds rich evidence for these interlinked complex associations. • To make explicit the above complex associations the thesis also spliced university performance into two separate constructs namely Academic and Non Academic. Academic performance was decomposed into research and teaching while non-academic performance was interpreted to be largely financial. From a wider variable selection research performance was measured in terms of one RPI index (composed of 5 separate variables) and two distinct variables viz. RQ and RGF. Similarly Teaching Performance was measured using one TPI index and one distinct variable TGF. Financial performance was measured in terms of Asset Turnover. Each of these different variables were found to have many of the 	<ul style="list-style-type: none"> • Uncovering these dimensions has allowed us to shift the debate of university governances and performance away from the corporate governances paradigm. It is now amply clear that universities are governed in multiple ways and a focus merely on the board or audit structures as in a corporate firm is far from adequate here. Thus, expanding the definition for university governance and performance. • Also it reveals a rich and complex picture that differentiates the governance-performance relationships in UK universities across the years and highlights/substantiate the difficult challenges facing university governors when calibrating internal governances (Vukasovic et al., 2018). For the first time there is now empirical evidence for the many normative arguments for fundamentally rethinking the way universities are governed and regulated.

Empirical Gap 2

Missing cultural and quality assurance aspects in extant university governance and performance

- Governance and performance are both outcomes as well as processes. This is especially true in Higher Education (Laband & Lentz, 2004; Vukasovic et al., 2018). through the use of a very wide range of gov-per-variables this thesis finds evidence of performance-governance endogeneity and continuum type aspects. Where governance ends and performance begins or vice-versa is difficult to pin down and this is seen in many of the results.
 - All the 5 new missing dimensions the thesis finds different processes at work leading to underperformance of the HEI sector as a whole. Notable examples here include the adverse selection problems engendered by existing ES/SSR policy fixations and regulatory weaknesses; staff level contractual gap strengthened by lack of human resource regulation planning and vision; pedagogical syndromes encouraged by a mindless marketisation of HEI sector and so on.
 - The thesis in several of the findings highlights for the very first time the importance of the construct of each university's (TLRs) because it play a vital role in university governance-performance processes. Although TLRs and their importance have been stressed in the normative university governance literature time and again this is the first time my thesis shows empirical proof of it.
 - The thesis **finds** evidence for deep and abiding cultural/regional impacts within UK university governance-performance processes. In all empirical results the mission, location and status of universities is seen to play a vital and moderating role. Simultaneously the sample evidence proves many of the normative
- By identifying process like characteristics in university governance and showing their multiple complex impacts on performance the study forges a new academic trajectory. Future research scholarship would, it is hoped, take this on board and design new research methods to unravel these processes further.
 - The focus on processes in university governance performance has also established several important regulatory gaps that need urgent remediation in the UK HEI sector. Therefore this thesis has succeeded in showing how intricate and detailed knowledge of governance processes should form an important input into all HEI regulatory design.
 - The constructing of "Teaching and Learning Regimes" now finds an important place in the empirical debates of university governance and performance.
 - Governance processes culture and Quality Assurance now emerge as important influences on university research teaching and financial performance. The future debates in UK HEI must now incorporate these new facets in any investigation of governance performance relationships.
-

contentions of quality assurance scholars right and some of them wrong. Notably the importance of new regulations related to the five missing dimensions of university governance and major corrections to restrictive controls on board and audit related governances are highlighted in this sample. In both these findings in different ways TLRs are once again highlighted as formative influences.

Empirical Gap 3

Missing/Inadequate longitudinal analysis

- The thesis examined the impact of university governance on university performance using a 10 year panel data sample for 132 UK universities. The use of a 10 year sample allowed for a detailed consideration of intra-year inter-university differences. It is through this detailed longitudinal insight that this thesis supports many of the earlier findings.
 - The five missing dimensions of university governance and their different impacts on R/T/F performance are validated only because of the heterogeneity among UK universities that has been growing across the decade (See Chapter 5, table 4 & Appendix Table 1). This is now highlighted in this in-depth longitudinal analysis.
 - Even the usual board level governances and the existing regulation gets highlighted only because of the cross-section of UK universities being studied across several years. This allowed us make comparisons between top, medium and poor performances and have allowed for a rigorous interpretations which strengthen all the findings.
 - Finally the thesis tests many of the existing regulatory prescription of the UK higher education sector and recommends important corrections based on longitudinal findings. In respect of Board Size, Board Diversity and
- All the empirical findings of this thesis stemming from detailed longitudinal analyses raise the level and nature of debates in university governance and performance. The body of knowledge now has a comprehensive set of rigorously tested findings that can serve as a guide to future research in this field.
 - The thesis comprehensively studies a wide range of antecedents mapping out university governance and performance making full use of the existing databases now being expanded by the HESA and other agencies. This can be viewed as an inflection point in governance-performance studies in UK HEI and can be a robust template for future research.
 - The longitudinal analyses here is also arguably the first attempt to support substantiate the UK government's recent Higher Education legislation with factual and quantitatively rigorous analysis, and this also set the stage for further investigation into the effectiveness of existing regulations (CUC, 2018; 2014; 2008; 2006; Browne, 2010; Lambert, 2003; OFFA, 2004; 2012; OFS, 2018a,b, c; 2019a, b; HEA, 2009; 2004). The thesis make important contribution to empirical understating by showing how some important regulations are missing such as those in terms of staff
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Board Independence the robust findings allow for a better insight into what works and what does not.

job descriptions and board member recruitments. This will allow for a clear data based regulatory insight to be generated.

Theoretical Gap 1

Existing university governance and performance studies are under-theorized

- Using the contextual theoretical literature encompassing higher education culture governance and performance in conjunction with my 7-theory-framework the study **found** 5 important missing dimensions of university governance.
- And referring back to this 7-theoretical-framework these 5 missing dimensions were then **found** to have complex interlinked associations with university Research/Teaching/Financial performances.
- In deciphering these complex associations, many of theoretical and largely normative explanations and arguments in the wider contextual literature were **found** to be justified (Chapter 2.4 & 3.2).
- And finally, Expanding the theoretical-framework allowed a detailed illustration of key trade-offs that faces almost every university governance decision.

- This study has expanded the vocabulary of university governance performance studies by showing how five missing dimensions need to be incorporated in them. This has extended the theoretical scope.
- The 4-core and 3-ancillary theories used jointly in the explanations, have helped expand the scope of theoretical analysis of university governance and performance relationships. The new theoretical-framework have also resulted in identification of new governance and performance variables.
- What has emerged here is a fresh perspective showing the complex trade-offs embedded in university governance and performance.

8.4 Recommendations & Policy Implications

University performance emerges in the sub-sections above as a complex construct influenced by a collage of different dimensions of university governance. For the first time five very important unique dimensions of governance articulated at different levels and in different ways across the university are shown to be the prime antecedents here. These are Entry Standards, Student Staff Ratio, Teaching/Research/Gender modalities in Staff level diversities, Pedagogical orientations in student body diversities and Strategic financial choices in Asset/Revenue structures. Apart from the board level and related governance dimensions prescribed by corporate governance it is these new hitherto unexplored dimensions of university governance that require effective calibration by UK universities. Five important recommendations need delineation here.

First and foremost, calibrating selectivity in entry standards and the student staff ratio is very vital to effective university academic performance. Each of these two governance dimensions have very important multiple effects and trade-offs that need careful consideration. But it is rather surprising that none of the governance policy planners whether inside UK universities or in the HEI regulatory apparatus even explicitly consider these (Hillman, 2014; Boliver, 2013; Gorard et al., 2006; Harris, 2010; BIS, a,b; DfES, 2003, 2004; OFFA, 2004, 2012; Adnett, 2011; Schwartz, 2004). One of the major recommendations then is to incorporate both these variables in policy and practice. First, the toolkit of governance in universities must be explicitly expanded to include them. Using this toolkit board and departmental university governors across UK universities must set into motion new sets of policy initiatives that address the challenging trade-offs here. These must effectively calibrate both variables in the context of each institution's evolution, mission and resource complexities to achieve higher academic performance. Second the regulatory policy discourse in UK HEI must address these dimensions and importantly consider the exclusivity concerns, the resource utilization and staff morale predicaments and the student's need for high value-added knowledge-based interactions in the sector. The many trade-offs that universities face in this regard need effective guidelines and it is the duty of policy planners to step up to this task.

Second, the specific form of the staff contract is a vital governance policy variable that requires important attention among all UK universities. The nature of this contract especially with

regard to academic mechanisms, priorities, and gender diversities has been seen above to have very important influences on university performance. Universities need to decide levels of part time, research only and teaching only staff paying careful heed to the trade-offs that they face in each (Metcalf et al., 2005; Locke, 2009; Locke et al. 2016; Adams et al., 2005; Brew et al., 2017). The very nature and detail of the standard omnibus tenure contract needs to be changed to incorporate clear incentives for staff performance. Here is where there is an express need for policy framers to take this up on a country wide HEI basis so that a new contractual form template relevant to the fast-changing needs of the UK HEI sector is quickly designed and rolled out as a best practice guideline. In this connection there is also the important issue of female representations in university staff that bear consideration (Blake & La Valle, 2000; Metcalf et al., 2005; Santos & Van Phu, 2019; Nyamapfene, 2019). The results in this thesis highlight how surface level non discriminatory staff policies mask a sector that remains highly disparaging of women and their academic credentials and contributions. Universities still employ them on inconsequential contracts and consider them unsuitable for substantial research roles. There is a clear need for engaging with this at the highest levels both within universities as well as in external regulation.

Third, Universities need specific guidance on how to calibrate their student recruitment policy. Pedagogical orientations in this regard need careful attention and the trade-offs in this governance must be explicitly considered at all levels. There is a great tendency to copy high performing peers which must be avoided. Not all UK universities need to be international or post graduate. Some can indeed be finishing schools with an applied orientation as in Europe and the US. Universities themselves need to decide such pedagogical priorities based on a full consideration of their internal academic strengths and weaknesses. There is an explicit need to halt the widespread hubris amongst university governors to take on large numbers of international students just to meet financial sustainability targets. The clear danger to the academic quality and integrity of these institutions must be clearly understood and governors must not ignore this. This is why OFS too needs to step in here with policy guidance aimed at protecting the academic reputation of UK HEI.

Fourth, Endowment levels and tuition fee dependence need active consideration by university governance policy planners. Within the growing marketisation of the sector and its depletion of Government support, the sustainability of the university itself is under a severe threat (Parker, 2011; Molesworth & Nixon, 2010; Foskett, 2010; Brown & Carasso, 2013; Collini,

2005; Brown, 2015). Never before have endowment levels or tuition fees taken on such an exaggerated importance. The results in this thesis have shown a range of potential pernicious effects that policies encouraging too much dependence on either can have on this academic institution. There is a need for governors to engage with these aspects and ensure that the institution does not face serious problems within its academic independence simply because it has gone too far in attracting tuition fee paying students or research sponsoring donors (Turner, 2019; Hillman, 2018; Britain, 2019; Watson, 2012; HEC, 2014). At the same time these governors must also not neglect legitimate knowledge facilitating investments that are crucial to the ultimate academic role of the university. This is particularly relevant since there seems to be growing evidence that UK universities have been fighting a largely losing battle with debt and financial sustainability (CUC, 2019; Jack, 2018a, b). While there are some indications that the OFS has begun the process of restraining universities from excessive profligacy much more remains to be done here (OFS, 2019a, b, 2018). Policy guidelines must achieve a better balance between the university's challenging conundrums here. The complexity of this balance between fund raising, academic integrity/independence and wise spending on the right academic facilitation must be fully addressed by policy pronouncements. At the same time some fragile institutions might need to be supported both financially and otherwise during these challenging times.

Finally board composition in terms of size, diversities and independence remains an important influence on university research performance. However instead of prescribing limits on size regulatory attention must be focused on how to recruit board members to meet the network/resource needs and diversities of universities (CUC, 2014; Pfeffer, 1972; Pfeffer & Salancik, 1978). Further there is evidence that larger board sizes seem to be salutary in UK universities unlike in corporate firms (See results in Chapter 6, table 14, 16 & 22; Chapter 7.3.3, pg. 354-355; 7.4.3, pg. 373-375). Arguably the ability to accommodate more academics with experiential insights on the highest governing body in such an institution is at play here. Therefore, a detailed best practice guidelines issued by OFS that stressed how larger boards might be beneficial would serve UK HEIs better. Similarly, in terms of external lay persons once again rather than stipulating specific percentages of such members (50%) it would be far more useful to detail methods to select the most relevant external lay members. At another level VC pay policies in universities need much higher levels of policy guidance. This should address the obvious trade-offs between a healthy motivation level for the incumbent, talent-reward relation and legitimate concerns with overpayment. The UK HEI sector can neither

afford pervasive profligacy in payment levels across universities nor mass talent drain from the sector (Shackleton, 2017; Walker et al., 2019; Blanchflower, 2017; Bosetti & Walker, 2010; Lucey et al., 2020). Here is where there is a need for considered and active judgment by the university boards. Policy guidance should also be forthcoming. Just stipulating as the OFS has done that all salary levels above 150K will need detailed justifications is not enough (Hubble & Bolton, 2019; Morgan, 2017; OFS, 2018a). More guidance needs to be provided to alert universities to the talent and job scope burdens issue.

8.5 Research Limitations

At least five limitations attend this section and must be mentioned here. First and foremost, whether it be university research performance or its governance antecedents the variables used for each are debatable. While every effort has been made to make this analysis robust such as by measuring research performance by at least two different variables and a composite (5 variable) index or by using sets of more than 20 governance variables it can always be argued that these still do not capture the myriad complexities in these constructs. The answer to this limitation is that it is a robust beginning wherein for the first time in extant UK university governance-performance research an extensive longitudinal data set of 132 universities comprising 24 governance antecedents and 5 research performance variables is investigated.

Second the data used in this study is entirely sourced from annual financial reports of universities, the TIMES university guides and UK HEI specialist databases such as those collated by HESA (Botosan, 1997, pg. 331). However, university governance and performance are conducted in the theatre of the university and so it can be argued that many other sources of real data are plausible such as questionnaire surveys of students, policy makers and governors or face to face interviews with expert practitioners and stakeholders (Tregida et al., 2007). In so far as this thesis has not utilized such data sources it has to be admitted that rich perspectives on governance and performance may have been overlooked here.

Third the methodology of this research is quantitative. The uni/bi/multivariate analyses performed here are taken to be the full basis of all the research findings, conclusions and recommendations. This is in line with many other studies in university governance such as (Lokuwaduge, 2011; Lokuwaduge & Armstrong, 2015; Ntim et al., 2017; Bachan & Reilly,

2015; Olson, 2000; Harris, 2014). It is arguable that such a quantitative methodology might miss rich explanations/corroborations/contradictions emerging from other types of methodology such as a qualitative one or a mixed method approach. However, given the resource and time constraints involved in such combined approaches it was deemed inappropriate here.

Fourth, it can be argued that the entire data set here is riddled with several abnormalities outside the classical assumptions of the least squares methodology. While the implementation of four GLS and two IV regressions combined with an extensive univariate/bivariate analyses do indeed raise the level of robustness of the findings here, still, it could be argued that other more advanced methods should have been used. However, it must be remembered that existing university governance research has not even done as much. Therefore, this study should be viewed in this context i.e as an extensive and comprehensive pilot study in the body of knowledge here.

Finally, the data set in this thesis had several variables with relatively accepted proportions of missing data. Clearly this posed some methodological challenge here. Nevertheless, the research did not attempt to window dress this aspect in any way so as to retain integrity in the findings. Many other studies (Pustiens et al., 2007; Raymond & Roberts, 1987; Dong & Peng, 2013) have maintained that levels of missing data below 40% can still be considered accurate although some of them have taken a more manipulative stance here.

8.6 Future Research Directions

University governance performance relationships needs much greater unpacking. This thesis is rightly viewed as a seminal inflexion point in the body of knowledge. Future research needs to take this much further using more tailored variables and advanced methods to understand the true mechanisms of how the newly discovered governance dimensions presented in this thesis; selectivity in entry standards, instruction intensity in student staff ratio, research/teaching/gender modalities in staff diversities, pedagogical orientations in student body diversities and strategic financial choices in asset/revenue structures, affect university performance. This might involve the crafting of new variables, new indices and even new techniques to organize and splice the data. These new forthcoming research innovations of

future scholars will benefit fundamentally from the existence of this formal and large body of quantitative work embodied in this thesis.

Second each of the new dimensions of university governance unwrapped in this thesis need a far greater level of theoretical and empirical engagement in the overall discourse. There is need for copious qualitative, argumentative and normative debate on entry standards, student staff ratios, staff contractual structures and so on in the UK HEI literature. Now that these new missing dimensions have been made explicit the lexicon of university governance can now move forward and populate these concerns richly so as to enable a standard template of university governance studies to emerge.

Third, the challenging and complex trade-offs highlighted in how these missing dimensions impact university research, teaching and financial performance require their own research trajectories. Future scholars should carry the torch forward and bring to bear a host of new research methods as well as data gathering strategies to shed light on these complex trade-offs. While doing so it is to be hoped that fresh light will be shed on the process like characteristics pervading university governance performance relationships. This would surely lead to a fuller understanding of these relationships as well as the vital place of teaching/learning regimes of universities in them.

Fourth, it is important within this context to highlight some data challenges that future scholars are likely to face in their quest for robust quantitative insights within UK HEI. Throughout this thesis singular challenges were faced in terms of several important board level as well as other level governance and performance variables. Even the existing regulatory and data collating bodies like HESA, were unable to help in redressing the large levels of missing values here. This needs to be addressed squarely by the newly formed OFS, HESA and related regulators. It is high time that such an important UK HEI sector which needs informed debate and decision is equipped with the data needed for the job. Therefore, it is recommended that some research projects of the future take up this challenge of independently collecting and organising the vast data base of research governance and performance variables across UK HEI.

8.7 Chapter Summary

This Chapter finalized the thesis. After a brief foregrounding it presented the main conclusions to answer the research question. The novel contributions of the thesis to the body of knowledge in university governance and performance were detailed next. This was followed by an elucidation of the main recommendations to university governors and policy makers in UK HEI to help improve the governance and performance of these institutions. Limitations of the research were then summarized. Finally, the chapter made explicit a series of future research directions that would help define and extend future research work in this academic area.

APPENDICIES

APPENDIX TABLE 1: Descriptive Statistics Russell Group/Non-Russell Group – Pre-1992 and Post-1992 Universities

Summary Descriptive Statistics of All Governance Variables for All 132 UK HEIs								
Variables	Mean	Median	STD	CV	Minimum	Maximum	Russell Group - Non Russell Group	
							Mean Diff.	Median Diff.
<i>Panel A: Governance Variables Based on All 131 UK HEIs</i>								
BFSIZE (no.)	24.24	24	4.76	0.19	11	43	2.47	2
BGDIV (%)	0.2911	0.2857	0.0945	0.3246	0	0.5789	-0.0104	-0.0059
BEDIV (%)	0.0691	0.0513	0.067	0.980	0	0.36	-0.0217	-0.0092
IGOV (%)	0.5857	0.5769	0.1289	0.2202	0.0434	0.8888	-0.1292	-0.0783
GBMFS (no.)	4.90	5	1.46	0.29	3	13	0.79	1
ETMS (no.)	26.30	24	15.67	0.59	0	52	7.64	12
SSR (no.)	17.52	17.65	3.43	0.19	32.9	7.1	-4.19	-4.35
ES (no.)	58.54	54.13	14.71	0.25	28.94	100	23.15	25.51
PTTSR (%)	0.3338	0.3261	0.1612	0.4830	0	0.8639	-0.1724	-0.1954
FSF (%)	0.4471	0.4444	0.070	0.1575	0.2164	0.70	-0.0668	-0.0614
TRST (%)	0.5810	0.5487	0.22	0.38	0	1	-0.1503	-0.1344
TONLY(%)	0.2566	0.2174	0.2132	0.8310	0	1	-0.1449	-0.1341
RONLST	0.1482	0.0793	0.1590	1.072	0	0.8	0.3065	0.3164
PGINT (%)	0.2333	0.2202	0.0951	0.4076	0.0060	0.6027	0.0994	0.0887
TFEE (%)	0.3778	0.3506	0.1579	0.4180	0.0215	0.8229	-0.1377	-0.1249
INTS (%)	0.1757	0.1605	0.1119	0.6371	0	0.7536	0.0928	0.091
ENDWTA (%)	0.0468	0.0074	0.0890	1.90	0	0.6325	0.1055	0.0931
VCPAY	12.36	12.38	0.2421	0.01957	11.36	13.05	0.23	0.22
BIG4	0.7735	1	0.4187	0.5412	0	1	0.1949	0
UGCOM	0.2232	0	0.4166	1.86	0	1	-0.1962	0
SFSPEND	1157.14	1127	599.08	0.5177	0	4090	577.66	482
CTA	0.0782	0.0486	0.0828	1.05	-0.0013	0.6049	-0.0281	-0.0246
DTA	0.1563	0.1470	0.1092	0.6986	0	0.6772	-0.0308	-0.0251
FTA	0.7661	0.7752	0.1063	0.1388	0.0596	0.9882	-0.0113	-0.0276
<i>Panel B: Governance Variables Based on Russell Group UK HEIs</i>								
BFSIZE (no.)	26.19	25	4.59	0.17	18	42	-	-
BGDIV (%)	0.2828	0.2857	0.0941	0.3326	0	0.52	-	-
BEDIV (%)	0.0516	0.0434	0.0475	0.9205	0	0.2	-	-
IGOV (%)	0.4836	0.5217	0.1418	0.2932	0.0952	0.76	-	-
GBMFS (no.)	5.52	5	1.79	0.32	3	13	-	-
ETMS (no.)	31.89	36	19.02	0.59	0	52	-	-
SSR (no.)	14.20	14.05	2.80	0.19	7.10	25.20	-	-
ES (no.)	76.91	76.70	12.70	0.16	33.20	100	-	-
PTTSR (%)	0.1944	0.1772	0.087	0.4525	0.0548	0.5615	-	-
FSF (%)	0.3931	0.3966	0.037	0.0958	0.2643	0.5033	-	-
TRST (%)	0.4595	0.4698	0.072	0.1575	0.2581	0.6260	-	-
TONLY (%)	0.1394	0.1341	0.087	0.6276	0	0.4338	-	-
RONLY	0.3961	0.3698	0.1075	0.2714	0.183	0.728	-	-
PGINT (%)	.3137	.2937	.0834	.2659	.1532	.6027	-	-
TFEE (%)	0.2665	0.2470	0.1030	0.3865	0.0215	0.5563	-	-
INTS (%)	0.2507	0.2297	0.1121	0.4473	0.0894	0.6845	-	-

ENDWTA (%)	0.1321	0.0973	0.120	0.9102	0	0.635	-	-
VCPAY	12.55	12.56	0.2141	0.0170	12.04	13.05	-	-
BIG4	0.9285	1	0.2580	0.2779	0	1	-	-
UGCOM	0.0655	0	0.2479	3.78	0	1	-	-
SFSPEND	1622.52	1554	720.11	0.4438	0	4090	-	-
CTA	0.0549	0.0313	0.0570	1.03	0	0.2577	-	-
DTA	0.1315	0.1274	0.0867	0.6592	0	0.3738	-	-
FTA	0.7570	0.7534	0.0925	0.1222	0.0596	0.9193	-	-
<i>Panel C: Governance Variables Based on Non Russell Group UK HEIs</i>								
BSIZE (no.)	23.72	23	4.66	0.19	11	43	-	-
BGDIV (%)	0.2932	0.2916	0.0945	0.3224	0.0243	0.5789	-	-
BEDIV (%)	0.0733	0.0526	0.0712	0.9708	0	0.36	-	-
IGOV (%)	0.6128	0.60	0.1105	0.1803	0.0434	0.8888	-	-
GBMFS (no.)	4.73	4	1.32	0.27	3	12	-	-
ETMS (no.)	24.25	24	13.73	0.56	0	52	-	-
SSR (no.)	18.39	18.40	3.03	0.16	8.90	32.90	-	-
ES (no.)	53.76	51.19	10.97	0.20	28.9	95.93	-	-
PTTSR (%)	0.3668	0.3726	0.1570	0.4279	0	0.8639	-	-
FSF (%)	0.4599	0.4580	0.070	0.1528	0.2164	0.70	-	-
TRST (%)	0.6098	0.6042	0.233	0.3836	0	1	-	-
TONLY (%)	0.2843	0.2682	0.224	0.7897	0	1	-	-
RONLST	0.0896	0.0534	0.1029	1.1478	0	0.8	-	-
PGINT (%)	.2143	.2050	.0875	.4083	.0060	.4966	-	-
TFEE (%)	0.4042	0.3719	0.1572	0.3890	0.0981	0.8229	-	-
INTS (%)	0.1579	0.1387	0.1043	0.6605	0	0.7536	-	-
ENDWTA (%)	0.0266	0.0042	0.065	2.44	0	0.485	-	-
VCPAY	12.32	12.34	0.2252	0.0182	11.36	13.02	-	-
BIG4	0.7336	1	0.4422	0.6028	0	1	-	-
UGCOM	0.2617	0	0.4397	1.68	0	1	-	-
SFSPEND	1044.86	1072	505.90	0.4841	0	2625	-	-
CTA	0.083	0.0559	0.0869	1.03	-0.0013	0.6049	-	-
DTA	0.1623	0.1525	0.1131	0.6974	0	0.6772	-	-
FTA	0.7683	0.7810	0.1093	0.1422	0.2492	0.9882	-	-

Notes: The table reports summary descriptive statistics for all internal governance variables, and mean/ median differences for Russell group and non-Russell group UK HEIs, respectively. Variables are defined as follows: governing board size (GBSIZE); board gender diversity (BGDIV); board ethnic minorities (BEDIV); independent governors (IGOV); frequency of governing board meetings (BMFS); frequency of executive team meetings (EFMs); student to staff ratio (SSR); entry standards (ET); part-time to total staff ratio (PTTSR); female staff fraction (FSF); teaching and research staff (TRST); teaching only staff (TONLY); postgraduate intensity (PGINT); tuition fee (TFEE); international students (INTS); endowment to total assets (ENDWTA); vice-chancellor pay (VCPAY); audit firm size (BIG4); and governance committee (GCOM). Table 1 fully defines all the variables used. *, **, ***, **** Mean/median difference between Russell group and non-Russell group HEIs for the respective is significant at 5, 1, 0.1 and 10 per cent levels, respectively.

Summary Descriptive Statistics of All Governance Variables for All 132 UK HEIs

Variables	Mean	Median	STD	CV	Minimum	Maximum	Pre-1992-post-1992	
							Mean Diff.	Median Diff.
<i>Panel A: Governance Variables Based on All 131 UK HEIs</i>								
BSIZE (no.)	24.24	24	4.76	0.19	11	43	3.9	3
BGDIV (%)	0.2911	0.2857	0.0945	0.3246	0	0.5789	-0.035	-0.0316
BEDIV (%)	0.0691	0.0513	0.067	0.980	0	0.36	-0.0232	-0.0212
IGOV (%)	0.5857	0.5769	0.1289	0.2202	0.0434	0.8888	-0.1198	-0.0982
BMFS (no.)	4.90	5	1.46	0.29	3	13	0.266	1
ETMS (no.)	26.30	24	15.67	0.59	0	52	6.884	7
SSR (no.)	17.52	17.65	3.43	0.19	32.9	7.1	-3.961	-4.25
ES (no.)	58.54	54.13	14.71	0.25	28.94	100	19.505	20.225
PTTSR (%)	0.3338	0.3261	0.1612	0.4830	0	0.8639	-0.078	-0.123
FSF (%)	0.4471	0.4444	0.070	0.1575	0.2164	0.70	-0.0738	-0.0672
TRST (%)	0.5810	0.5487	0.22	0.38	0	1	-0.2006	-0.1994
TONLY (%)	0.2566	0.2174	0.2132	0.8310	0	1	0.0127	-0.0392
RONLST	0.1482	0.0793	0.1590	1.072	0	0.8	0.1968	0.2396
PGINT (%)	0.2333	0.2202	0.0951	0.4076	0.0060	0.6027	0.1052	0.0995
TFEE (%)	0.3778	0.3506	0.1579	0.4180	0.0215	0.8229	-0.0992	-0.1029
INTS (%)	0.1757	0.1605	0.1119	0.6371	0	0.7536	0.1126	0.1070
ENDWTA (%)	0.0468	0.0074	0.0890	1.90	0	0.6325	0.0906	0.0539
VCPAY	12.36	12.38	0.2421	0.01957	11.36	13.05	0.133	0.111
BIG4	0.7735	1	0.4187	0.5412	0	1	0.1945	0
UGCOM	0.2232	0	0.4166	1.86	0	1	-0.1901	0
SFSPEND	1157.14	1127	599.08	0.5177	0	4090	349.23	284
CTA	0.0782	0.0486	0.0828	1.05	-0.0013	0.6049	-0.025	-0.0227
DTA	0.1563	0.1470	0.1092	0.6986	0	0.6772	0.0025	0.004
FTA	0.7661	0.7752	0.1063	0.1388	0.0596	0.9882	0.0164	0.0097
<i>Panel B: Governance Variables Based on pre-1992 UK HEIs</i>								
BSIZE (no.)	26.580	25	4.718	0.1775	17	43	-	-
BGDIV (%)	0.2704	0.2727	0.093	0.3463	0.0243	0.5555	-	-
BEDIV (%)	0.0572	.0454	.0572	1.000	0	0.3333	-	-
IGOV (%)	.5164	.5333	.1186	.2297	.0952	.84	-	-
BMFS (no.)	5.080	5	1.519	.298	3	13	-	-
ETMS (no.)	29.513	30	16.11	.545	0	52	-	-
SSR (no.)	15.262	15.2	2.773	.1817	7.1	25.2	-	-
ES (no.)	69.609	69.230	12.878	.1850	33.209	100	-	-
PTTSR (%)	.287	.249	.149	.521	.037	.704	-	-
FSF (%)	.4024	.4049	.0496	.1233	.2164	.5247	-	-
TRST (%)	.4793	.4718	.1312	.2737	0	.9918	-	-
TONLY (%)	.2481	.1956	.1771	.7137	0	1	-	-
RONLY	.2663	.2828	.1515	.5691	0	.728	-	-
PGINT (%)	0.2970	0.2847	0.0824	0.2774	0.0739	0.6027	-	-
TFEE (%)	.3288	.2964	.1407	.4280	.0215	.7772	-	-
INTS (%)	.2472	.2281	.1099	.4447	.0694	.7536	-	-
ENDWTA (%)	.1017	.0564	.1178	1.1582	0	.6325	-	-
VCPAY	12.461	12.452	.2329	.0186	11.55	13.05	-	-
BIG4	.8851	1	.3191	.3605	0	1	-	-
UGCOM	.1150	0	.3194	2.776	0	1	-	-
SFSPEND	1405.86	1355	588.73	.4187	0	3506	-	-
CTA	.0620	.0359	.0658	1.0623	0	.3544	-	-
DTA	.1625	.1551	.1136	.6988	0	.4604	-	-
FTA	.7764	.7797	.08914	.1148	.05964	.9460	-	-

Panel C: Governance Variables Based on post-1992 UK HEIs

BSIZE (no.)	22.68	22	4.119	0.1815	11	38	-	-
BGDIV (%)	0.3054	0.3043	0.0926	0.3032	0	0.5789	-	-
BEDIV (%)	.0804	.0666	.0735	.9140	0	.36	-	-
IGOV (%)	.6362	.6315	.1142	.1796	.0434	.8888	-	-
BMFS (no.)	4.814	4	1.402	.291	3	12	-	-
ETMS (no.)	22.629	23	14.177	.626	0	52	-	-
SSR (no.)	19.223	19.45	2.760	.1435	9.4	30.2	-	-
ES (no.)	50.104	49.005	9.493	.189	28.946	93.506	-	-
PTTSR (%)	.365	.372	.160	.440	0	.863	-	-
FSF (%)	.4762	.4721	.0635	.1335	.2990	.7	-	-
TRST (%)	.6799	.6712	.2042	.3003	0	1	-	-
TONLY (%)	.2354	.2348	.1973	.8383	0	1	-	-
RONLST	.0695	.0432	.0992	1.4260	0	.6156	-	-
PGINT (%)	0.1918	0.1852	0.0785	0.4093	0.0060	0.4959	-	-
TFEE (%)	.4280	.3993	.1557	.3638	.09814	.8229	-	-
INTS (%)	.13458	.12106	.0846	.62900	0	.4792294	-	-
ENDWTA (%)	.0111	.0025	.0298	2.6846	0	.2160	-	-
VCPAY	12.328	12.341	.2080	.0168	11.3621	13.023	-	-
BIG4	.690583	1	.462	.6698	0	1	-	-
UGCOM	.3051	0	.460	1.510	0	1	-	-
SFSPEND	1056.63	1071	504.4	.477	0	4090	-	-
CTA	.0870	.0586	.0913	1.050	-.0013	.6049008	-	-
DTA	.160	.1511	.1056	.6603	0	.677	-	-
FTA	.760	.770	.111	.146	.249	.9882	-	-

Notes: The table reports summary descriptive statistics for all internal governance variables, and mean/ median differences for Russell group and non-Russell group UK HEIs, respectively. Variables are defined as follows: governing board size (GBSIZE); board gender diversity (BGDIV); board ethnic minorities (BEDIV); independent governors (IGOV); frequency of governing board meetings (BMFS); frequency of executive team meetings (EFMs); student to staff ratio (SSR); entry standards (ET); part-time to total staff ratio (PTTSR); female staff fraction (FSF); teaching and research staff (TRST); teaching only staff (TONLY); postgraduate intensity (PGINT); tuition fee (TFEE); international students (INTS); endowment to total assets (ENDWTA); vice-chancellor pay (VCPAY); audit firm size (BIG4); and governance committee (GCOM). Table 1 fully defines all the variables used. *, **, ***, **** Mean/median difference between Pre-1992 and Post-1992 universities group HEIs for the respective is significant at 5, 1, 0.1 and 10 per cent levels, respectively.

APPENDIX TABLE 2: Bivariate Quartile regressions

Selective Quartile Regressions for Research Performance Index				
<i>Variables</i>	RPI		Variable	
	Lower Quartile	Upper Quartile	Lower Quartile	Upper Quartile
Board size	2.343 (3.112)	-0.494 (5.908)	33.056 (17.555)*	115.726 (25.292)***
Board gender diversity	-13.374 (6.438)**	41.759 (11.32)***	-150.633 (54.848)***	-50.796 (57.005)
Board ethnic diversity	-30.017 (7.217)***	-72.950 (20.195)***	There was no lower quartile, 0	-111.619 (35.942)***
Board independence	12.570 (6.368)**	-83.360 (7.587)***	-208.22 (20.433)***	-35.278 (33.43)
Board meeting frequency	-3.378 (1.965)*	23.350 (3.378)***	No result	51.702 (15.858)***
Executive team size	0.716 (1.778)	-18.707 (3.611)***	-7.794 (11.472)	-8.494 (22.488)
Audit committee meeting frequency	4.019 (3.203)	-7.238 (3.226)**	-92.133 (10.700)***	-5.483 (12.266)
Vice-chancellor pay	-2.450 (2.672)	16.972 (4.170)***	-4.364 (18.792)	98.294 (19.483)***
Presence of a unique governance committee	-1.071 (1.165)	-6.681 (3.565)*		
Big-4 auditor	1.586 (1.165)	14.793 (3.788)***		
Student staff ratio	-0.861 (0.201)***	-3.721 (0.366)***	-8.046 (0.937)***	-0.900 (0.667)
Entry standard	0.939 (0.089)***	1.547 (0.049)***	1.235 (0.247)***	2.072 (0.072)***
Part-time to full time staff	5.666 (3.407)*	-52.841 (6.433)***	-12.973 (79.484)	33.592 (23.881)

Teaching and research staff	2.355 (2.557)	-53.069 (9.900)***	69.884 (37.007)*	-26.976 (15.562)*
Teaching only staff	0.663 (2.546)	-55.388 (5.597)***	276.473 (108.436)**	-19.503 (21.029)
Research only staff				
Female staff diversity	49.4778 (8.162)***	-146.442 (18.759)***	-223.398 (70.880)***	-110.597 (33.828)***
Postgraduate intensity	-0.625 (2.461)	34.694 (6.065)***	167.653 (31.860)***	-39.165 (11.094)***
Fraction of international students	6.892 (4.433)	55.476 (11.175)***	152.391 (54.335)***	-69.994 (26.297)***
Tuition fee fraction	1.744 (3.542)	-68.143 (7.511)***	-323.563 (55.978)***	-62.190 (16.763)***
Service and facility spend per student	-0.000 (0.001)	0.012 (0.001)***	0.069 (0.020)***	0.043 (0.004)***
Endowment to total assets	-19.760 (16.286)	52.723 (7.422)***	-3405.883 (3452.376)	81.186 (14.541)***
Cash to total assets	-21.357 (5.0993)***	-29.638 (16.362)*	527.970 (546.809)	-125.132 (31.117)***
Debt to total assets	6.652 (5.221)	-23.502 (8.701)***	157.560 (119.785)	53.194 (34.214)

Selective Quartile Regressions for Research Quality

<i>Variables</i>	RQ		Variable	
	Lower Quartile	Upper Quartile	Lower Quartile	Upper Quartile
Board size	Not sig.	Not sig.	20.479 (11.550)*	93.349 (17.596)***
Board gender diversity	Not Sig.	Not Sig.	-127.534 (39.167)***	Not sig.
Board ethnic diversity	11.162 (2.284)***	-31.626 (14.805)**	zero	-58.840 (24.295)**
Board independence	0.673 (1.901)	-42.713 (4.595)***	-119.632 (14.590)***	-11.803 (25.773)
Board meeting frequency	1.699 (0.596)***	8.050 (2.099)***	Omitted	30.078 (10.631)***

Executive team size	-0.378 (0.514)	-16.124 (2.391)***	-2.916 (7.773)	3.662 (15.459)
Student staff ratio	0.0713 (0.062)	-1.388 (0.187)***	-5.288 (0.697)***	-0.165 (0.597)
Entry standard	0.0944 (0.016)***	1.040 (0.044)***	0.322 (0.123)***	1.226 (0.089)
Part-time to full time staff	1.756 (1.076)	-9.923 (4.045)**	-3.065 (51.739)	13.097 (19.077)
Teaching and research staff	1.204 (.701)*	-30.413 (5.113)***	84.269 (19.165)***	-37.282 (11.907)***
Teaching only staff	-.618 (.721)	-12.123 (3.668)***	-12.123 (3.668)***	-39.501 (13.442)***
Research only staff				
Female staff diversity	-2.139 (2.455)	-2.139 (2.455)	-143.189 (46.402)***	-113.564 (22.868)***
Postgraduate intensity	2.4918 (.773)***	13.103 (3.568)***	119.215 (23.095)***	-20.802 (7.853)***
Fraction of international students				
Tuition fee fraction	.2351563 (1.035)	-61.519 (5.250)***	-146.346 (38.638)***	-62.264 (10.242)***

APPENDIX TABLE 3: NORMALITY TEST

Table: Test of Normality Model 1

Variables	Skewness	Kurtosis	Prob>chi2
RPI	0.0000	0.0000	0.0000
ES	0.0000	0.0615	0.0000
INTS	0.0000	0.0000	0.0000
BSIZE	0.7400	0.0198	0.0633
TRST	0.0000	0.0036	0.0000
GCOM	0.0000	0.0790	0.0000
SSR	0.2449	0.0980	0.1301
IGOV	0.0000	0.0000	0.0000
FSF	0.0000	0.0000	0.0000
CTA	0.0000	0.0000	0.0000
TST	0.0000	0.0000	0.0000
PRE1992	0.0000	-	-
REGION	0.0000	0.0000	-
YEAR	1.0000	0.0000	0.0000
CODE	1.0000	0.0000	0.0000

Notes: *RPI* denotes research performance index; *ES* denotes entry standards; *INTS* denotes fraction international students; *GBSIZE* denotes governing board size; *TRST* teaching and research staff; *GCOM* denotes the existence of a separate governance committee; *SSR* student to staff ratio; *IGOV* denotes independent governors; *FSF* denotes female staff fraction; *CTA* denotes cash to total assets; *CONTS* denotes control variables for university size (*TST*), university age (*PRE1992*), university region (*REGION*), university code (*CODE*) and year (*YEAR*).

Table: Test of Normality Shapiro-Wilk Test Model 1

Variables	W	Prob>chi2
RPI	0.95014	0.00000
ES	0.94915	0.00000
INTS	0.91629	0.00000
BSIZE	0.99724	0.03635
TRST	0.91374	0.00000
GCOM	0.99550	0.00157
SSR	0.99634	0.00975
IGOV	0.94569	0.00000
FSF	0.99104	0.00000
CTA	0.83072	0.00000
TST	0.94317	0.00000
PRE1992	0.99930	0.88816
REGION	0.02060	0.00000
YEAR	0.98142	0.00000
CODE	0.95851	0.00000

Notes: *RPI* denotes research performance index; *ES* denotes entry standards; *INTS* denotes fraction international students; *GBSIZE* denotes governing board size; *TRST* teaching and research staff; *GCOM* denotes the existence of a separate governance committee; *SSR* student to staff ratio; *IGOV* denotes independent governors; *FSF* denotes female staff fraction; *CTA* denotes cash to total assets; *CONTS* denotes control variables for university size (*TST*), university age (*PRE1992*), university region (*REGION*), university code (*CODE*) and year (*YEAR*).

Table: Test of Normality Model 2

Variables	Skewness	Kurtosis	Prob>chi2
RPI	0.0000	0.0000	0.0000
ES	0.0000	0.0615	0.0000
INTS	0.0000	0.0000	0.0000
TRST	0.4768	0.8427	0.7600
GCOM	0.0000	0.0790	0.0000
SSR	0.2449	0.0980	0.1301
IGOV	0.0000	0.0000	0.0000
FSF	0.0000	0.0000	0.0000
CTA	0.0000	0.0000	0.0000
TA	0.0000	0.0005	0.0000
PRE1992	0.0000	-	-
REGION	0.0000	0.0000	-
YEAR	1.0000	0.0000	0.0000
CODE	1.0000	0.0000	0.0000

Notes: *RPI* denotes research performance index; *ES* denotes entry standards; *INTS* denotes fraction international students; *TRST* denotes teaching and research staff; *GCOM* denotes the existence of a separate governance committee; *SSR* student to staff ratio; *IGOV* denotes independent governors; *FSF* denotes female staff fraction; *CTA* denotes cash to total assets; *CONTS* denotes control variables for university size (*TA*), university age (*PRE1992*), university region (*REGION*), university code (*CODE*) and year (*YEAR*).

Table: Test of Normality Shapiro-Wilk Test Model 2

Variables	W	Prob>chi2
RPI	0.95014	0.00000
ES	0.94915	0.00000
INTS	0.91629	0.00000
TRST	0.97349	0.00000
GCOM	0.99550	0.00157
SSR	0.99634	0.00975
IGOV	0.94569	0.00000
FSF	0.99104	0.00000
CTA	0.83072	0.00000
TA	0.98578	0.00000
PRE1992	0.99930	0.88816
REGION	0.02060	0.00000
YEAR	0.98142	0.00000
CODE	0.95851	0.00000

Notes: *RPI* denotes research performance index; *ES* denotes entry standards; *INTS* denotes fraction international students; *GBSIZE* denotes governing board size; *GCOM* denotes the existence of a separate governance committee; *SSR* student to staff ratio; *IGOV* denotes independent governors; *FSF* denotes female staff fraction; *CTA* denotes cash to total assets; *CONTS* denotes control variables for university size (*TST*), university age (*PRE1992*), university region (*REGION*), university code (*CODE*) and year (*YEAR*).

Table: Test of Normality Model 3

Variables	Skewness	Kurtosis	Prob>chi2
RQ	0.0000	0.0000	0.0000
ES	0.0000	0.0615	0.0000
BIG4A			
BSIZE	0.7400	0.0198	0.0633
FSF	0.0000	0.0000	0.0000
BGDIV	0.3930	0.9951	0.6931
VCPAY	0.0049	0.0043	0.0006
ENDWTA	0.0000	0.0000	0.0000
PGINT	0.0000	0.0000	0.0000
PGINT ₂	0.0000	0.0000	0.0000
TFEE	0.0000	0.4537	0.0000
SFSPEND	0.0000	0.0000	0.0000
TI	0.0000	0.0085	0.0000
PRE1992	0.0000	-	-
REGION	0.0000	0.0000	-
YEAR	1.0000	0.0000	0.0000
CODE	1.0000	0.0000	0.0000

Notes: *RQ* denotes research quality; *ES* denotes entry standards; *BIG4A* denotes if HEI is audited by a big 4 auditor; *BSIZE* denotes governing board size; *FSF* denotes female staff fraction; *BGDIV* denotes governing board gender diversity; *VCPAY* denotes vice-chancellor emolument; *ENDWTA* denotes endowment to total assets; *PGINT* denotes postgraduate intensity; *TFEE* denotes tuition fee fraction; *SFSPEND* denotes service and facility spend per student; *CONTS* denotes control variables for university size (*TI*), university age (*PRE1992*), university region (*REGION*), university code (*CODE*) and year (*YEAR*).

Table: Test of Normality Shapiro-Wilk Test Model 3

Variables	W	Prob>chi2
RQ	0.93065	0.00000
ES	0.94915	0.00000
BIG4A	0.99701	0.01983
BSIZE	0.99724	0.03635
FSF	0.99104	0.00000
BGDIV	0.99856	0.49881
VCPAY	0.99486	0.00031
ENDWTA	0.60558	0.00000
PGINT	0.97922	0.00000
PGINT ₂	0.83557	0.00000
TFEE	0.95476	0.00000
SFSPEND	0.96707	0.00000
TI	0.98416	0.00000
PRE1992	0.99930	0.88816
REGION	0.02060	0.00000
YEAR	0.98142	0.00000
CODE	0.95851	0.00000

Notes: *RQ* denotes research quality; *ES* denotes entry standards; *BIG4A* denotes if HEI is audited by a big 4 auditor; *BSIZE* denotes governing board size; *FSF* denotes female staff fraction; *BGDIV* denotes governing board gender diversity; *VCPAY* denotes vice-chancellor emolument; *ENDWTA* denotes endowment to total assets; *PGINT* denotes postgraduate intensity; *TFEE* denotes tuition fee fraction; *SFSPEND* denotes service and facility spend per student; *CONTS* denotes control variables for university size (*TI*), university age (*PRE1992*), university region (*REGION*), university code (*CODE*) and year (*YEAR*).

Table: Test of Normality Model 4

Variables	Skewness	Kurtosis	Prob>chi2
RGF	0.0000	0.0311	0.0000
BMFS	0.0000	0.0215	0.0000
BEDIV	0.0000	0.0000	0.0000
TRST	0.4768	0.8427	0.7600
PTTSR	0.0000	0.0000	0.0000
TONLY	0.0000	0.0000	0.0000
ENDWTA	0.0000	0.0000	0.0000
FSF	0.0000	0.0000	0.0000
TST	0.0000	0.0000	0.0000
RGROUP	0.0000	0.0000	0.0000
YEAR	1.0000	0.0000	0.0000
CODE	1.0000	0.0000	0.0000

Notes: *RGF* denotes research grant fraction; *BMFS* denotes governing board meeting frequency; *BEDIV* denotes governing board ethnic diversity; *TRST* denotes teaching and research staff; *PTTSR* denotes part-time to total staff ratio; *TONLY* denotes teaching only staff; *ENDWTA* denotes endowment to total assets; *FSF* denotes female staff fraction; *CONTS* denotes control variables for university size (*TST*), university mission (*RGROUP*), university region (*REGION*), university code (*CODE*) and year (*YEAR*).

Table: Test of Normality Shapiro-Wilk Test Model 4

Variables	W	Prob>chi2
RGF	0.83981	0.00000
BMFS	0.98897	0.00000
BEDIV	0.92987	0.00000
TRST	0.97349	0.00000
PTTSR	0.96883	0.00000
TONLY	0.94243	0.00000
ENDWTA	0.60558	0.00000
FSF	0.99104	0.00000
TST	0.94317	0.00000
RGROUP	0.99476	0.00006
YEAR	0.98142	0.00000
CODE	0.95851	0.00000

Notes: *RGF* denotes research grant fraction; *BMFS* denotes governing board meeting frequency; *BEDIV* denotes governing board ethnic diversity; *TRST* denotes teaching and research staff; *PTTSR* denotes part-time to total staff ratio; *TONLY* denotes teaching only staff; *ENDWTA* denotes endowment to total assets; *FSF* denotes female staff fraction; *CONTS* denotes control variables for university size (*TST*), university mission (*RGROUP*), university region (*REGION*), university code (*CODE*) and year (*YEAR*).

Table: Test of Normality Model 5

Variables	Skewness	Kurtosis	Prob>chi2
TPI	0.0001	0.0000	0.0000
ES	0.0000	0.0615	0.0000
SSR	0.2449	0.0980	0.1301
TFEE	0.0000	0.4537	0.0000
CTA	0.0000	0.0000	0.0000
BEDIV	0.0000	0.0000	0.0000
BGDIV	0.3930	0.9951	0.6931
SFSPEND	0.0000	0.0000	0.0000
TA	0.0000	0.0005	0.0000
PRE1992	0.0000	-	-
REGION	0.0000	0.0000	-
YEAR	1.0000	0.0000	0.0000
CODE	1.0000	0.0000	0.0000

Notes: *TPI* denotes teaching performance index; *ES* denotes entry standards; *SSR* student to staff ratio; *TFEE* denotes tuition fee fraction; *FSF* denotes female staff fraction; *CTA* denotes cash to total assets; *BEDIV* denotes governing board ethnic diversity; *BGDIV* denotes governing board gender diversity; *SFSPEND* denotes service and facility spend per student; *CONTS* denotes control variables for university size (*TA*), university mission (*PRE1992*), university region (*REGION*), university code (*CODE*) and year (*YEAR*).

Table: Test of Normality Shapiro-Wilk Test Model 5

Variables	W	Prob>chi2
TPI	0.98251	0.00000
ES	0.94915	0.00000
SSR	0.99634	0.00975
TFEE	0.95476	0.00000
CTA	0.83072	0.00000
BEDIV	0.92987	0.00000
BGDIV	0.99856	0.49881
SFSPEND	0.96707	0.00000
TA	0.98578	0.00000
PRE1992	0.99930	0.88816
REGION	0.02060	0.00000
YEAR	0.98142	0.00000
CODE	0.95851	0.00000

Notes: *TPI* denotes teaching performance index; *ES* denotes entry standards; *SSR* student to staff ratio; *TFEE* denotes tuition fee fraction; *FSF* denotes female staff fraction; *CTA* denotes cash to total assets; *BEDIV* denotes governing board ethnic diversity; *BGDIV* denotes governing board gender diversity; *SFSPEND* denotes service and facility spend per

student; *CONTS* denotes control variables for university size (*TA*), university mission (*PRE1992*), university region (*REGION*), university code (*CODE*) and year (*YEAR*).

Table: Test of Normality Model 6

Variables	Skewness	Kurtosis	Prob>chi2
TGF	0.0020	0.0000	0.0000
TFEE	0.0000	0.4537	0.0000
FSF	0.0000	0.0000	0.0000
PTTSR	0.0000	0.0000	0.0000
RONLY	0.0000	0.0000	0.0000
ENDWTA	0.0000	0.0000	0.0000
TRST	0.4768	0.8427	0.7600
ETFS	0.0011	0.0861	0.0025
BSIZE	0.7400	0.0198	0.0633
VCPAY	0.0049	0.0043	0.0006
IGOV	0.0000	0.0000	0.0000
RGROUP	0.0000	0.0000	0.0000
PRE1992	0.0000	-	-
YEAR	1.0000	0.0000	0.0000
CODE	1.0000	0.0000	0.0000

Notes: *TPI* denotes teaching performance index; *TFEE* denotes tuition fee fraction; *FSF* denotes female staff fraction; *PTTSR* denotes part-time to total staff ratio; *RONLY* denotes research only staff; *ENDWTA* denotes endowment to total assets; *TRST* denotes teaching and research staff; *ETFS* denotes executive team meeting frequency; *BSIZE* denotes governing board size; *VCPAY* denotes vice-chancellor emolument; *IGOV* denotes independent governors; *CONTS* denotes control variables for university mission (*RGROUP*), university age (*PRE1992*), university code (*CODE*) and year (*YEAR*).

Table: Test of Normality Shapiro-Wilk Test Model 6

Variables	W	Prob>chi2
TGF	0.97575	0.00000
TFEE	0.95476	0.00000
FSF	0.99104	0.00000
PTTSR	0.96883	0.00000
RONLY	0.86026	0.00000
ENDWTA	0.60558	0.00000
TRST	0.97349	0.00000
ETFS	0.95971	0.00000
BSIZE	0.99724	0.03635
VCPAY	0.99486	0.00031
IGOV	0.94569	0.00000
RGROUP	0.99476	0.00006
PRE1992	0.99930	0.88816

YEAR	0.98142	0.00000
CODE	0.95851	0.00000

Notes: *TPI* denotes teaching performance index; *TFEE* denotes tuition fee fraction; *FSF* denotes female staff fraction; *PTTSR* denotes part-time to total staff ratio; *RONLY* denotes research only staff; *ENDWTA* denotes endowment to total assets; *TRST* denotes teaching and research staff; *ETFS* denotes executive team meeting frequency; *Bsize* denotes governing board size; *VCPAY* denotes vice-chancellor emolument; *IGOV* denotes independent governors; *CONTS* denotes control variables for university mission (*RGROUP*), university age (*PRE1992*), university code (*CODE*) and year (*YEAR*).

Table: Test of Normality Model 7

Variables	Skewness	Kurtosis	Prob>chi2
AT	0.0000	0.0000	-
FTA	0.0000	0.0000	0.0000
DTA	0.0000	0.1711	0.0000
CTA	0.0000	0.0000	0.0000
SFSPEND	0.0000	0.0000	0.0000
ENDWTA	0.0000	0.0000	0.0000
RONLY	0.0000	0.0000	0.0000
TONLY	0.0000	0.0000	0.0000
UGCOM	0.0000	0.0790	0.0000
PTTSR	0.0000	0.0000	0.0000
GBMFS	0.0000	0.0215	0.0000
VCPAY	0.0049	0.0043	0.0006
INTS	0.0000	0.0000	0.0000
PGINT	0.0000	0.0000	0.0000
ADSIZE	0.1419	0.0000	0.0000
TA	0.0000	0.0005	0.0000
RGROUP	0.0000	0.0000	0.0000
PRE1992	0.0000	-	-
REGION	0.0000	0.0000	-
YEAR	1.0000	0.0000	0.0000
CODE	1.0000	0.0000	0.0000

Notes: *AT* denotes asset turn over; *FTA* denotes fixed to total assets; *DTA* denotes debt to total assets; *CTA* denotes cash to total assets; *SFSPEND* denotes service and facility spend per student; *ENDWTA* denotes endowment to total assets; *RONLY* denotes research only staff; *TONLY* denotes teaching only staff; *UGCOM* denotes the existence of a unique governance committee; *PTTSR* denotes part-time to total staff ratio; *BMFS* denotes governing board meeting frequency ; *VCPAY* denotes vice-chancellor emolument; *INTS* denotes fraction international students; *PGINT* denotes postgraduate intensity; *ADSIZE* denotes number of audit committee members; *CONTS* denotes control variables for size (*TA*); university mission (*RGROUP*), university age (*PRE1992*), university code (*CODE*) and year (*YEAR*).

Table: Test of Normality Shapiro-Wilk Test Model 7

Variables	W	Prob>chi2
AT	0.50566	0.00000
FTA	0.94275	0.00000
DTA	0.97250	0.00000
CTA	0.83072	0.00000
SFSPEND	0.96707	0.00000
ENDWTA	0.60558	0.00000
RONLY	0.86026	0.00000
TONLY	0.94243	0.00000
UGCOM	0.99550	0.00157
PTTSR	0.96883	0.00000
GBMFS	0.98897	0.00000
VCPAY	0.99486	0.00031
INTS	0.91629	0.00000

PGINT	0.97922	0.00000
ADSIZE	0.96246	0.96246
TA	0.98578	0.00000
RGROUP	0.99476	0.00006
PRE1992	0.99930	0.88816
REGION	0.02060	0.00000
YEAR	0.98142	0.00000
CODE	0.95851	0.00000

Notes: *AT* denotes asset turn over; *FTA* denotes fixed to total assets; *DTA* denotes debt to total assets; *CTA* denotes cash to total assets; *SFSPEND* denotes service and facility spend per student; *ENDWTA* denotes endowment to total assets; *RONLY* denotes research only staff; *TONLY* denotes teaching only staff; *UGCOM* denotes the existence of a unique governance committee; *PTTSR* denotes part-time to total staff ratio; *BMFS* denotes governing board meeting frequency ; *VCPAY* denotes vice-chancellor emolument; *INTS* denotes fraction international students; *PGINT* denotes postgraduate intensity; *ADSIZE* denotes number of audit committee members; *CONTS* denotes control variables for size (*TA*); university mission (*RGROUP*), university age (*PRE1992*), university code (*CODE*) and year (*YEAR*).

Table: Test of Normality Model 7

Variables	Skewness	Kurtosis	Prob>chi2
ES	0.0000	0.0615	0.0000
YEAR	1.0000	10.0000	0.0000
CODE	1.0000	10.0000	0.0000
RGROUP	0.0000	0.0000	0.0000
TST	0.0000	0.0000	0.0000
REGION	0.0000	0.0000	-
BSIZE	0.7400	00.0198	0.0633
BEDIV	0.0000	0.0000	0.0000
BGDIV	0.0000	0.0000	0.0000
IGOV	0.3930	0.9951	0.6931
GBMFS	0.0000	0.0215	0.0000
SSR	0.2449	0.0980	0.1301
TRST	0.4768	0.8427	0.7600
SFSPEND	0.0000	0.0000	0.0000

Notes: *RPI* denotes entry standard (ES); Variables are defined as follows: governing board size (BSIZE); governing board ethnic diversity (BEDIV); governing board gender diversity (BGDIV); independent governors on the board (IGOV); governing board meeting frequency (GBMFS); student staff ratio (SSR); teaching and research staff (TRST); service and facility spend per student (SFSPEND); total staff (TST); russell group university (RGROUP); region (REGION); year (YEAR); and code (CODE).

Table: Test of Normality Shapiro-Wilk Test Model 7

Variables	W	Prob>chi2
ES	0.94915	0.00000
YEAR	0.98142	0.00000
CODE	0.95851	0.00000
RGROUP	0.99476	0.00006
TST	0.94317	0.00000
REGION	0.02060	0.00000
BSIZE	0.99724	0.03635
BEDIV	0.92987	0.00000
BGDIV	0.94569	0.00000
IGOV	0.99856	0.49881
GBMFS	0.98897	0.00000
SSR	0.99634	0.00975
TRST	0.97349	0.00000
SFSPEND	0.96707	0.00000

Notes: *RPI* denotes entry standard (ES); Variables are defined as follows: governing board size (BSIZE); governing board ethnic diversity (BEDIV); governing board gender diversity (BGDIV); independent governors on the board (IGOV); governing board meeting frequency (GBMFS); student staff ratio (SSR); teaching and research staff (TRST); service and facility spend per student (SFSPEND); total staff (TST); russell group university (RGROUP); region (REGION); year (YEAR); and code (CODE).

APPENDIX TABLE 4: MULTICOLLINEARITY TEST

Table : Test of Multicollinearity - Model 1 Research Performance Index (RPI)

Variables	VIF	Tolerance
ES	3.61	0.276720
SSR	2.49	0.401978
PRE1992	2.42	0.414051
REGION	2.16	0.461977
CODE	2.07	0.483555
TST	1.92	0.521183
FSF	1.73	0.576529
TRST	1.65	0.604635
IGOV	1.65	0.607302
INTS	1.57	0.635718
BSIZE	1.42	0.703281
YEAR	1.25	0.801972
CTA	1.19	0.842079
UGCOM	1.19	0.840934
Mean VIF	1.88	

Notes: Entry standards (ES); fraction international students (INTS); governing board size (GBSIZE); teaching and research staff; the existence of a separate governance committee (GCOM); student to staff ratio (SSR); independent governors (IGOV); female staff fraction (FSF); cash to total assets (CTA); total staff (TST); pre-1992 (PRE1992); region (REGION); year (YEAR); and code (CODE).

Table : Test of Multicollinearity - Model 2 Research Quality (RQ)

Variables	VIF	Tolerance
PGINT	22.86	0.043741
PGINT ₂	20.60	0.048547
YEAR	3.95	0.252926
ES	3.81	0.262366
TFEE	3.41	0.293004
SFSPEND	3.04	0.329039
TI	2.91	0.343501
REGION	2.65	0.377993
PRE1992	2.49	0.402219
VCPAY	2.32	0.431635
CODE	2.12	0.472280
FSF	2.06	0.486331
ENDWTA	1.73	0.579376
PTTSR	1.59	0.627308
BGDIV	1.25	0.802127
BIG4A	1.23	0.812852
Mean	4.88	

Notes: Entry standards (ES); if HEI is audited by a big four auditor (BIG4A); governing board size (GBSIZE); female staff fraction (FSF); board gender diversity (BGDIV); vice-chancellor emolument (VCPAY); endowment to total asset (ENDWTA); postgraduate intensity (PGINT); part-time to total staff ratio (PTTSR); tuition fee fraction (TFEE); service and facility spend per student (SFSPEND); total income (TI); pre-1992 (PRE1992); region (REGION); year (YEAR); and code (CODE).

Table: Test of Multicollinearity - Model 3 Research Grant Fraction (RGF)

Variables	VIF	Tolerance
TONLY	6.30	0.158760
TRST	5.94	0.168354
RGROUP	2.79	0.358397
PTTSR	2.51	0.397733
TST	1.72	0.581081
FSF	1.67	0.598010
ENDWTA	1.62	0.615501
GBMFS	1.16	0.859637
BIDIV	1.15	0.869919
CODE	1.13	0.884663
YEAR	1.09	0.921190
Mean	2.46	

Notes: Board meeting frequency (BMFS); board ethnic fraction (BEDIV); teaching and research staff fraction (TRST); part-time to total staff ratio (PTTSR); teaching only staff fraction (TONLY); endowment to total assets (ENDWTA); female staff fraction (FSF); total staff (TST); russell group university (RGROUP); year (YEAR); and code (CODE).

Table: Test of Multicollinearity - Model 4 Teaching Performance Index (TPI)

Variables	VIF	Tolerance
ES	4.18	0.239299
YEAR	4.11	0.243454
TFEE	3.61	0.276860
SFSPEND	3.04	0.329159
SSR	2.46	0.405922
REGION	2.36	0.423726

TA	2.15	0.466054
PRE1992	2.10	0.476931
CODE	1.97	0.507046
FSF	1.70	0.588339
BGDIV	1.21	0.828455
BEDIV	1.20	0.833862
CTA	1.16	0.860580
Mean	2.40	

Notes: Entry standards (ES); student staff ratio (SSR); tuition fee fraction (TFEE); female staff fraction (FSF); cash to total assets (CTA); board ethnic diversity fraction (BEDIV); board gender diversity fraction (BGDIV); service and facility spend per student (SFSPEND); total assets (TA); pre-1992 (PRE1992); region (REGION); year (YEAR); and code (CODE).

Table: Test of Multicollinearity - Model 5 Teaching Grant Fraction (TGF)

Variables	VIF	Tolerance
RONLY	11.17	0.089527
TFEE	3.98	0.251322
PTTSR	3.65	0.273879
PRE1992	3.43	0.291481
RGROUP	3.28	0.304760
FSF	3.16	0.316037
YEAR	2.98	0.335677
TRST	2.71	0.369120
VCPAY	2.31	0.432936
ENDWTA	2.25	0.444757
IGOV	1.77	0.566153
CODE	1.52	0.657830
ETMFS	1.51	0.664353
BSIZE	1.49	0.670816
Mean	3.23	

Notes: Tuition fee fraction (TFEE); female staff fraction (FSF); part-time to total staff ratio (PTTSR); research only staff fraction (RONLY); endowment to total assets (ENDWTA); teaching and research staff fraction (TRST); executive team meeting frequency (ETFS); governing board size (BSIZE); vice-chancellor pay (VCPAY); independent board governors (IGOV); russell group university (RGROUP); pre-1992 universities (PRE1992); year (YEAR); and code (CODE).

Table : Test of Multicollinearity Model 6 Asset Turnover (AT)

Variables	VIF	Tolerance
RONLY	5.87	0.170220
TA	4.85	0.206306
PTTSR	4.29	0.233097
REGION	4.04	0.247353
SFSPEND	3.38	0.296051
RGROUP	3.30	0.302935
CODE	3.18	0.314219
TONLY	2.76	0.361803
VCPAY	2.71	0.368355
YEAR	2.49	0.401164
INTS	2.33	0.429887
PRE1992	2.11	0.472974
PGINT	2.09	0.478123
ENDWTA	1.99	0.503612
CTA	1.79	0.557813
DTA	1.47	0.682481
FTA	1.45	0.688841
UGCOM	1.30	0.768994
GBMFS	1.23	0.809854
ADSIZE	1.16	0.864172
Mean	2.69	

Notes: Fixed to total assets (FTA); debt to total assets (DTA); cash to total assets (CTA); service and facility spend per student (SFSPEND); endowment to total assets (ENDWTA); research only staff (RONLY); teaching only staff (TONLY); presence unique governance committee (UGCOM); part-time to total staff ratio (PTTSR); governing board meeting frequency (GBMFS); vice-chancellor pay (VCPAY); fraction of international students (INTS); postgraduate intensity (PGINT); audit committee size (ADSIZE); total assets (TA); russell group university (RGROUP); pre-1992 universities (PRE1992); region (REGION); year (YEAR); and code (CODE).

Table : Test of Multicollinearity Model 7 Entry Standard (ES)

Variables	VIF		Tolerance	
SFSPEND	2.54	0.393719	2.54	0.393719
TST	2.22	0.450467	2.22	0.450467
SSR	2.20	0.453962	2.20	0.453962
REGION	2.18	0.458396	2.18	0.458396
CODE	2.13	0.470013	2.13	0.470013
RGROUP	2.01	0.496883	2.01	0.496883
YEAR	1.98	0.504492	1.98	0.504492
IGOV	1.56	0.642529	1.56	0.642529
TRST	1.50	0.664872	1.50	0.664872
BSIZE	1.34	0.748646	1.34	0.748646
BGDIV	1.25	0.802734	1.25	0.802734
GBMFS	1.21	0.826438	1.21	0.826438
BEDIV	1.14	0.877597	1.14	0.877597
MEAN	1.79			

Notes: Governing board size (BSIZE); governing board ethnic diversity (BEDIV); governing board gender diversity (BGDIV); independent governors on the board (IGOV); governing board meeting frequency (GBMFS); student staff ratio (SSR); teaching and research staff (TRST); service and facility spend per student (SFSPEND); total staff (TST); russell group university (RGROUP); region (REGION); year (YEAR); and code (CODE).

APPENDIX TABLE 5: HETEROSCEDASTICITY TEST

Table: Heteroscedasticity Test for all Models

<i>Dependent Variable</i>	Breusch-Pagan Test	White Test
Research Performance Index (RPI)	Chi2(1) = 5.54 Prob > Chi2 = 0.0186	Chi(117) = 193.85 Prob > Chi2 = 0.0000
Research Quality (RQ)	Chi2(1) = 3.43 Prob > Chi2 = 0.0639	Chi2(167) = 401.21 Prob > Chi2 = 0.000
Research Grant Fraction (RGF)	Chi2(1) = 228.73 Prob > Chi2 = 0.0000	Chi2(76) = 591.58 Prob > Chi2 = 0.0000
Teaching Performance Index (TPI)	Chi2(1) = 17.30 Prob > Chi2 = 0.0000	Chi2(103) = 234.36 Prob > Chi2 = 0.0000
Teaching Grant Fraction (TGF)	Chi2(1) = 0.40 Prob > Chi2 = 0.5256	Chi2(116) = 184.80 Prob > Chi2 = 0.0001
Asset Turnover (AT)	Chi2(1) = 1724.17 Prob > Chi2 = 0.0000	Chai2(227) = 506.83 Prob > Chai = 0.000
Entry Standard (ES)	Chi2(1) = 0.25 Prob > Chi2 = 0.6191	Chai(103) = 337.74 Prob > Chi2 = 0.0000

APPENDIX TABLE 6: ENDOGENEITY TEST - Durbin–Wu–Hausman (DWH)

Table: Endogeneity Testing

<i>Dependent: Research Performance Index (RPI)</i>	Prob > F
Entry Standards (ES)	0.0000
International Students Ratio (INTS)	0.3360
Board Size (BSIZE)	0.5711
Teaching and Research Staff (TRST)	0.7264
Unique Governance Committee (GCOM)	0.4892
Student Staff Ratio (SSR)	0.3215
Independent Board Members (IGOV)	0.5455
Female Staff Fraction (FSF)	0.3723
Cash to Total Assets (CTA)	0.5172

Table: Endogeneity Testing

<i>Dependent: Research Quality (RQ)</i>	Prob > F
Entry Standards (ES)	0.0000
Big-4 Auditor (BIG4A)	0.3969
Board Size (BSIZE)	0.0669
Female Staff Fraction (FSF)	0.0205
Board Gender Diversity (BGDIV)	0.403
Vice-Chancellor Pay (VCPAY)	0.358
Endowment to Total Assets (ENDWTA)	0.051
Postgraduate Intensity (PGINT)	0.0275
Postgraduate Intensity (PGINT ₂)	0.0237
Part-time to Total Staff Ratio (PTTSR)	0.0643
Tuition Fee Fraction (TFEE)	0.553
Service and Facility Spend per Student (SFSPEND)	0.193

Table: Endogeneity Testing

<i>Dependent: Research Grant Fraction (RGF)</i>	Prob > F
Board Meeting Frequency (BMFS)	0.076
Board Ethnic Diversity (BEDIV)	0.4719
Teaching and Research Staff (TRST)	0.0000
Part-time to Total Staff Ratio (PTTSR)	0.144
Teaching Only Staff (TONLY)	0.0000
Endowment to Total Assets (ENDWTA)	0.7678
Female Staff Fraction (FSF)	0.2118

Table: Endogeneity Testing

<i>Dependent: Teaching Performance Index (TPI)</i>	Prob > F
Entry Standard (ES)	0.0000
Student Staff Ratio (SSR)	0.263
Tuition Fee Fraction (TFEE)	0.1701
Female Staff Fraction (FSF)	0.0719
Cash to Total Assets (CTA)	0.4951
Board Ethnic Diversity (BEDIV)	0.7389
Board gender Diversity (BGDIV)	0.1651
Service and Facility Spend per Student (SFSPEND)	0.5098

Table: Endogeneity Testing

<i>Dependent: Teaching Grant Fraction (TGF)</i>	Prob > F
Tuition Fee Fraction (TFEE)	0.0000
Female Staff Fraction (FSF)	0.1486
Part-time to Total Staff Ratio (PTTSR)	0.0209
Research Only Staff (RONLY)	0.0000
Endowment to Total Assets (ENDWTA)	0.6571
Teaching and Research Staff (TRST)	0.2185
Executive Team Meeting Frequency (ETFS)	0.2915
Board Size (BSIZE)	0.6582
Vice-Chancellor Pay (VCPAY)	0.6999
Independent Board Members (IGOV)	0.9195

Table: Endogeneity Testing

<i>Dependent: Asset Turnover (AT)</i>	Prob > F
Fixed to Total Assets (FTA)	0.0000
Debt to Total Assets (DTA)	0.2646
Cash to Total Assets (CTA)	0.0642
Service and Facility Spend per Student (SFSPEND)	0.4357
Endowment to Total Assets (ENDWTA)	0.0070
Research Only Staff (RONLY)	0.0000
Teaching Only Staff (TONLY)	0.0480
Unique Governance Committee (UGCOM)	0.0972
Part-Time to Total Staff Ratio (PTTSR)	0.0395
Board Meeting Frequency (GBMFS)	0.1137
Vice-Chancellor Pay (VCPAY)	0.1570
International Students Ratio (INTS)	0.7509
Postgraduate Intensity (PGINT)	0.0234
Audit Size Committee (ADSIZE)	0.9746

Appendix Table 7: Fixed-Effects (FE) and Ordinary Least Square (OLS) comparison

	RPI			RQ			RGF	
<i>Governance Variables:</i>	Panel OLS Model	GLS FE	<i>Governance Variables:</i>	Panel OLS Model	GLS FE	<i>Governance Variables:</i>	Panel OLS Model	GLS FE
ES	2.005(.054)***	.3291(.129)***	ES	0.881(.048)***	-0.073(.084)	BMFS	-0.032(.004)***	0.006(.003)**
INTS	15.356(5.404)***	-46.184(17.541)***	BIG4A	1.873(.799)**	1.378(1.534)	BEDIV	-0.033(.012)***	-0.017(.010)*
BSIZE	4.999(2.383)***	7.662(4.720)*	BSIZE	9.971(2.261)***	6.400(3.821)*	TRST	-0.459(.022)***	-0.100(.023)***
TRST	-4.289(2.542)*	0.102(4.286)	FSF	-43.510(6.619)***	-90.104(22.074)***	PTTSR	-0.044(.012)***	-0.022(.009)**
GCOM	-2.221(.953)**	-5.637(2.516)**	BGDIV	9.339(3.926)**	-2.544(4.672)	TONLY	-0.429(.025)***	-0.094(.024)***
SSR	-0.641(.198)***	0.015(.273)	VCPAY	-4.977(2.135)**	0.242(2.459)	ENDWTA	0.012(.024)	0.008(.028)
IGOV	-7.620(3.821)**	2.884(7.768)	ENDWTA	26.757(5.040)***	-33.280(19.349)*	FSF	-0.077(.023)***	0.037(.045)
FSF	20.730(7.878)***	-	PGINT	103.630(15.226)***	99.782(46.112)**			
		180.745(29.939)***						
CTA	-14.128(5.740)**	-28.023(10.310)***	PGINT ₂	-175.398(24.972)***	-172.097(84.887)**	<i>Controls Variables:</i>		
			PTTSR	13.787(2.972)***	-11.419(5.775)**	TST	0.021(.002)***	0.006(.005)
<i>Controls Variables:</i>			TFEE	-6.859(3.604)*	-9.788(4.802)**	RGROUP	0.020(.005)***	-
TST	2.496(.825)***	7.290(3.931)*	SFSPEND	0.003(.000)***	-0.006(.001)***	YEAR	0.001(.000)***	-
PRE1992	13.579(1.282)***	-	<i>Controls Variables:</i>			CODE	0.000(.000)**	-
REGION	-1.827(.735)***	-	TI	1.886(.765)**	-29.120(3.452)***	Constant	-2.377(.686)***	0.114(.037)***
YEAR	-1.772(.143)***	-	PRE1992	12.298(1.177)***	-	Number of Obs	1,042	1,042
CODE	-0.014(.0146)	-	REGION	-3.665(.627)***	-	F-Value	585.36	6.65
Constant	3623.785(.194)***		YEAR	-3.090(.220)***	-	R ₂	0.8900	0.8354
Number of Obs	827	827	CODE	0.039(.011)***	-			
F-Value	899.34	10.92	Constant	6197.516(433.996)***	411.119(44.521)***			
R ₂	0.9257	0.5547	Number of Obs	883	883			
			F-Value	471.67	42.13			
			R ₂	0.8819	0.1821			

	TPI			TGF			AT	
<i>Governance Variables:</i>	Panel OLS Model	GLS FE	<i>Governance Variables:</i>	Panel OLS Model	GLS FE	<i>Governance Variables:</i>	Panel OLS Model	GLS FE
ES	1.188(.036)***	0.277(.096)***	TFEE	-0.773(.035)***	-0.876(.027)***	FTA	-1.109(.132)***	-0.039(.085)
SSR	-0.272(.134)**	-0.372(.169)**	FSF	-0.386(.078)***	0.336(.108)***	DTA	-0.188(.113)*	-0.126(.082)
TFEE	13.408(2.660)***	18.730(4.181)***	PTTSR	-0.260(.034)***	-0.115(.043)***	CTA	0.472(.241)*	-0.289(.137)**
FSF	26.855(5.018)***	-5.365(17.151)	RONLY	-0.735(.043)***	-0.403(.104)***	SFSPEND	-0.000(.000)	.00004(.0001)***
CTA	-6.708(3.304)**	-0.968(5.913)	ENDWTA	-0.060(.023)**	-0.051(.051)	ENDWTA	-0.639(.143)***	-0.138(.159)
BEDIV	-9.529(4.433)**	1.860(5.772)	TRST	-0.085(.019)***	-0.044(.018)**	RONLY	1.603(.363)***	-0.330(.298)
BGDIV	-6.396(2.608)**	2.080(3.304)	ETFS	-0.017(.005)***	-0.004(.004)	TONLY	-0.305(.132)**	-0.044(.065)
SFSPEND	0.000(.000)	0.002(.001)*	BSIZE	0.027(.015)*	-0.039(.011)***	UGCOM	-0.069(.027)**	-0.008(.019)
<i>Controls Variables:</i>			VCPAY	0.021(.016)	-0.026(.010)**	PTTSR	0.457(.180)**	-0.044(.157)
TA	0.859(.426)**	3.354(2.304)	IGOV	-0.011(.024)	0.045(.019)**	GBMFS	0.103(.039)***	0.081(.030)***
PRE1992	3.110(.694)***	(omitted collinearity)	<i>Controls Variables:</i>			VCPAY	0.160(.079)**	0.091(.030)***
REGION	0.736(.483)	(omitted collinearity)	RGROUP	0.022(.010)**	-	INTS	-0.084(.141)	0.822(.241)***
YEAR	0.305(.162)*	-	Pre1992	-0.158(.007)***	-	PGINT	-0.609(.217)***	-0.143(.140)
CODE	-0.024(.008)***	-	YEAR	0.001(.001)	-	ADSIZE	0.001(.040)	0.056(.022)**
Constant	-	109.639(26.111)***	CODE	0.003(.000)***	-	<i>Controls Variables:</i>		
Number of Obs	536.552(323.354)*		Constant	-2.754(2.813)	1.300(.143)***	TA	-0.303(.050)***	-0.402(.030)***
F-Value	849	849	Number of Obs	273	273	RGROUP	-0.045(.039)	-
R ₂	571.69	17.69	F-Value	491.11	275.12	Pre1992	0.063(.026)**	-
	0.8784	0.6923	R ₂	0.9200	0.5865	REGION	-0.097(.0186)***	-
						YEAR	-0.003(.005)	-
						CODE	0.001(.000)***	-
						Constant	10.173(10.711)	4.364(.489)***
						Number of Obs	543	543
						F-Value	14.44	24.56
						R ₂	0.6291	0.1231

Notes: The tables reports regressions comparing panel ordinary least square (Panel OLS model) and generalised least square fixed-effects (GLS FE) in all six models. governing board size (GBSIZE); board gender diversity (BGDIV); board ethnic diversity (BEDIV); independent governors (IGOV); frequency of governing board meetings (GBMs); frequency of executive team meetings (EFMs); student to staff ratio (SSR); entry standards (ES); part-time to total staff ratio (PTTSR); female staff fraction (FSF); teaching and research staff (TRST); teaching only staff (TONLY); research only staff (RONLY); postgraduate intensity (PGINT); tuition fee (TFEE); international students (INTS); endowment to total assets (ENDWTA); vice-chancellor pay (VCPAY); vice-chancellor (VCG); audit firm size (BIG4); and governance committee (GCOM); service and facility spend (SFSPEND); cash to total asset (CTA); debt to total asset (DTA); fixed to total assets (FTA); number of governance sub-committees (SUBCOM); audit committee size (ADSIZE); total assets (TA); total income (TINC); total staff (TST); russell group (RGROUP); pre-1992 university (PRE92); region (REGION). The table fully defines all the variables used. *, **, ***, **** Correlation is significant at 5, 1, 0.1 and 10 per cent levels, respectively.. *, **, *** indicate significance at 10, 5, and 1 per cent levels, respectively.

Appendix Table 8: Asset Turnover (AT) and Return on Equity (ROE) Comparison

Financial Performance Indicators		
Variable	Asset Turnover	Return on Equity
BFSIZE	0.0658**	-0.0361
BGDIV	-0.0154	0.1244***
BEDIV	-0.0689**	-0.0047
IGOV	0.0493	0.1007***
GBMS	0.0361	-0.0327
ETMS	0.2310***	0.1351**
SSR	-0.0061	0.1016***
ES	-0.1253***	-0.0856***
PTTSR	-0.1088***	0.0726***
FSF	-0.0964***	0.0998***
TRST	-0.1095***	0.0379
TONLY	-0.0712***	0.0385
RONLY	0.1192***	-0.0999***
PGINT	-0.1474***	-0.0322
TFEE	-0.1754***	0.2462***
INTS	-0.1267***	-0.0529*
ENDWTA	-0.0604**	-0.0586**
VCPAY	-0.1697***	0.1120***
BIG4	-0.0067	-0.1037***
UGCOM	-0.0768***	0.0167
SFSPEND	-0.2153***	0.1236***
CTA	0.2704***	0.2725***
DTA	-0.1567***	0.0172
FTA	-0.3722***	-0.3046***
SUBCOM	0.0573**	0.0418
ADSIZE	0.0695*	0.0817**
TA	-0.3836***	-0.0605**
TINC	-0.1055***	-0.0289
TST	-0.3125***	-0.0829***
RGROUP	-0.0742***	-0.0186
PRE92	-0.0510*	-0.0806***
REGION	0.1450***	-0.0806***

Notes: The table contains Pearson's parametric correlation coefficients for independent variables with the teaching variables. Variables are defined as follows: governing board size (GBFSIZE); board gender diversity (BGDIV); board ethnic diversity (BEDIV); independent governors (IGOV); frequency of governing board meetings (GBMs); frequency of executive team meetings (EFMs); student to staff ratio (SSR); entry standards (ES); part-time to total staff ratio (PTTSR); female staff fraction (FSF); teaching and research staff (TRST); teaching only staff (TONLY); research only staff (RONLY); postgraduate intensity (PGINT); tuition fee (TFEE); international students (INTS); endowment to total assets (ENDWTA); vice-chancellor pay (VCPAY); vice-chancellor (VCG); audit firm size (BIG4); and governance committee (GCOM); service and facility spend (SFSPEND); cash to total asset (CTA); debt to total asset (DTA); fixed to total assets (FTA); number of governance sub-committees (SUBCOM); audit committee size (ADSIZE); total assets (TA); total income (TINC); total staff (TST); russell group (RGROUP); pre-1992 university (PRE92); region (REGION). The table fully defines all the variables used. *, **, ***, **** Correlation is significant at 5, 1, 0.1 and 10 per cent levels, respectively.

APPENDIX TABLE 9: LIST OF UNIVERSTIES

	University Names
1	Anglia Ruskin University
2	Aston University
3	Bath Spa University
4	The University of Bath
5	University of Bedfordshire
6	Birmingham City University
7	The University of Birmingham
8	Bishop Grosseteste College- University College Lincoln
9	The University of Bolton
10	The Arts Institute at Bournemouth
11	Bournemouth University
12	The University of Bradford
13	The University of Brighton
14	The University of Bristol
15	Brunel University
16	Buckinghamshire Chilterns University College
17	The University of Buckingham
18	The University of Cambridge
19	Canterbury Christ Church University
20	The University of Central Lancashire
21	University of Chester
22	University of Chichester
23	City University
24	Coventry University
25	The University College for the Creative Arts at Canterbury, Epsom, Farnham, Maidstone, Rochester
26	Cumbria Institute of the Arts-University of Cumbria
27	De Montfort University
28	University of Derby
29	University of Durham
30	The University of East Anglia
31	The University of East London
32	Edge Hill College of Higher Education
33	The University of Essex
34	The University of Exeter
35	University College Falmouth
36	University of Gloucestershire
37	Goldsmiths College
38	The University of Greenwich
39	Harper Adams University College
40	University of Hertfordshire
41	The University of Huddersfield
42	The University of Hull
43	Imperial College of Science, Technology & Medicine
44	The University of Keele
45	The University of Kent

46	King's College London
47	Kingston University
48	The University of Lancaster
49	Leeds Metropolitan University-Leeds Beckett University
50	The University of Leeds
51	Leeds Trinity and All Saints University
52	The University of Leicester
53	The University of Lincoln
54	Liverpool Hope University
55	Liverpool John Moores University
56	The University of Liverpool
57	University of the Arts, London
58	London Metropolitan University
59	London South Bank University
60	London School of Economics and Political Science
61	Loughborough University
62	University of Luton
63	The Manchester Metropolitan University
64	The University of Manchester
65	Middlesex University
66	The University of Newcastle-upon-Tyne
67	Newman College of HE-University
68	The University of Northampton
69	The University of Northumbria at Newcastle
70	The Nottingham Trent University
71	The University of Nottingham
72	Oxford Brookes University
73	The University of Oxford
74	University College Plymouth St Mark and St John
75	The University of Plymouth
76	The University of Portsmouth
77	Queen Mary and Westfield College
78	The University of Reading
79	Ravensbourne University London
80	Roehampton University
81	Royal Holloway and Bedford New College
82	The University of Salford
83	The School of Oriental and African Studies
84	Sheffield Hallam University
85	The University of Sheffield
86	Southampton Solent University
87	The University of Southampton
88	Staffordshire University
89	The University of Sunderland
90	The University of Surrey
91	The University of Sussex
92	The University of Teesside
93	Thames Valley University

94	University College London
95	The University of Warwick
96	University of the West of England, Bristol
97	The University of West London
98	The University of Westminster
99	The University of Winchester
100	The University of Wolverhampton
101	University of Worcester
102	York St John College
103	The University of York
104	University of Wales, Aberystwyth
105	University of Wales, Bangor
106	Cardiff University
107	University of Wales Institute, Cardiff-Cardiff Metropolitan University
108	University of Glamorgan
109	Glyndŵr University
110	The University of Wales, Lampeter
111	The University of Wales, Newport
112	University of Wales, Swansea - Swansea University
113	Trinity College, Carmarthen-University of Wales Trinity Saint David
114	University of South Wales
115	The University of Aberdeen
116	University of Abertay Dundee
117	The University of Dundee
118	Edinburgh Napier University
119	The University of Edinburgh
120	Glasgow Caledonian University
121	The University of Glasgow
122	Heriot-Watt University
123	The University of Paisley
124	Queen Margaret University College, Edinburgh
125	The Robert Gordon University
126	The University of St Andrews
127	The University of Stirling
128	The University of Strathclyde
129	UHI Millennium Institute-University of the Highlands and Islands
130	The University of the West of Scotland
131	The Queen's University of Belfast
132	University of Ulster

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