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Budgeting and Financial Planning in UK Universities: Accuracy, Caution and Control in an Era of Financialisation

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**Budgeting and Financial Planning in UK Universities:  
Accuracy, Caution and Control in an Era of  
Financialisation**

**Paul Cropper**

**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**

**July 2018**

## **Abstract**

The UK higher education (HE) sector is experiencing a high level of turbulence arising from the introduction of the variable fee regime and the removal of student number controls for full-time HEU (Home/EU) undergraduates, increased competition for overseas students in an unsupportive domestic policy context, and greater government intervention in the name of marketisation and competition – which can be viewed as part of the worldwide ‘financialisation’ of universities (Parker, 2013). In such an environment, the accuracy of budgeting and financial forecasting might be expected to take on increased significance.

The purpose of this study was to identify and understand the contingent factors that influence the accuracy of budgeting and forecasting in UK universities and the characteristics of financial scenario modelling in the sector. A mixed methods approach was adopted, with data collected through a comprehensive questionnaire survey of UK HE institutions and supplemented by interviews.

The results reveal a degree of inertia in spite of the more dynamic and competitive external environment; traditional methods of budgeting and forecasting have been maintained and more sophisticated approaches are little in evidence. Overall, there appears to be general satisfaction with the level of budgeting accuracy, with the most significant factors affecting this found to be: the perceived accuracy of student number estimating and forecasting (where a problematic relationship with the student number planning function is evident); the difficulties caused by allowing unspent budgets to be carried forward; and the time taken to prepare budgets. Where there is a demand for greater budgeting accuracy, this seems more likely to emanate from lending banks than from senior management or governing bodies. Scenario models incorporate common drivers, but preference is shown for a simple approach – sometimes less than appears to be required by the current funding body, HEFCE.

A possible explanation for the overall findings lies in the manner in which the new fees regime has played out and the growth in overseas student numbers, which have led to a period of relative financial strength for many universities, in spite of the limited availability of capital grants during a period of austerity. Thus the focus of any ‘financialisation’ has tended to be on income rather than cost control – though how long this will continue is debateable, particularly in the case of universities with a relatively weak market position.

This research contributes to the limited literature on management accounting in universities, particularly in the changing UK environment, and provides additional insights to Parker’s description of financialisation. In focusing on budgeting accuracy, it also highlights an issue that, though implicit, is rarely discussed in the management accounting literature.

## **Acknowledgements**

I would like to thank the many individuals across the HE sector who generously spared the time to take part in this research and to share their thoughts and experiences. The promise of anonymity prevents the naming of specific individuals but their contribution and valuable insights are much appreciated. Many have gone well beyond the level of assistance I originally sought and have stayed in contact throughout the period of the study. I will, however, give a special mention to John Newton (former Assistant Finance Director at Cardiff University) who kindly shared with me his 40 years of experience in the HE sector during this reaserch and has become a good friend.

Thanks are also due to the supervisory team (which at various points in the study included Kerry Barker, Wayne Fiddler and Peter Slee) and in particular to Professor Chris Cowton who kindly led on the supervision throughout and Wayne who was always there to offer advice. Their help and guidance was invaluable at various stages of undertaking the research and preparing this thesis.

The University of Huddersfield kindly sponsored this research, and the senior staff in the Financial Services Department together with my own team were generous in supporting me through some busy times.

Last but not least, I extend my appreciation to my wife who shared with me all the highs and lows I encountered throughout the research and showed never ending patience with the long hours of study. It is with much sadness that the journey undertaken on this research project could not also be shared with our parents (Arthur and Lily Cropper and Rita and Ted Whitfield) who are no longer with us.

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## **Chapter 1**

### **Budgeting and financial planning**

#### **1.1 Introduction**

The Higher Education world has been changing over recent years, characterised by increasing class sizes, greater academic teaching loads, the use of cheaper staff at lower grades, reduced library and student support services and the rebalancing of subject portfolios in favour of low cost, low effort and high volume/revenue courses which produce work-force ready graduates. Students are increasingly viewed as ‘customers’ due to their obligation to pay full fees and the enhanced choice they have regarding their selection of institution, program and subjects. Furthermore, it is argued that universities are being encouraged to seek out research partnerships with private sector corporations in order to maximise financial gains at the expense of research conducted in the public interest, with research grants and publications viewed as quantifiable commodities moving universities further towards commercialisation (Parker, 2012a; Matthews, 2017). Against this background, this research considers the accuracy of budgeting and forecasting of institutions and the nature of financial scenario modelling (used for ‘what if’ analysis based on projections of the future).

This first chapter explains why budgeting, forecasting and scenario modelling is important in a changing higher education environment and the difficulties faced by universities in achieving an effective approach. It outlines the framework for this study as well as setting out the aim, objectives and questions that the research attempts to answer.

#### **1.2 Why is budgeting and forecasting accuracy important?**

The higher education sector has been estimated to contribute £73 billion to the UK economy and supports more than 700,000 jobs nationally (Universities UK, 2015a). It “is among the top 20 most valuable export products in the UK generating £2.2 billion in non-EU student tuition fees and an estimated further £2.3 billion in off-campus expenditure” (McCormack, Propper & Smith, 2014, p.535). The ability of higher education institutions to adequately undertake financial forecasting and planning is key to both their own success and that of the economy. However, in a changing

sector, Wolf (2015a, p.26) describes future-gazing as “a pursuit for the deluded”. Universities are seen as being “rubbish at predicting the future” (Petford, 2017).

Organisations “want forecasts which will enable them to be successful in an environment which is increasingly complex, interdependent, and uncertain. To produce accurate and credible forecasts, forecasters need an appreciation of factors which influence the forecasting process” (Jones, Bretschneider & Gorr, 1997, pp.241-242). Poor forecasts lead to poor planning.

PricewaterhouseCoopers (2012b, p.9) explain that “too often organisations do not understand or have not identified the financial cost of poor budgeting / financial forecasts”. Furthermore, “it is not clear to many in senior management that good budgeting accuracy can identify and deliver efficiencies, improve resource allocation and allow for a better informed strategic planning process”.

The application of budgeting and forecasting has been criticised for not being particularly successful (Hansen, Otley & Van der Stede, 2003). In an ideal world budgeting in a university would take little time to prepare and be inexpensive to operate. It would carefully examine each activity, discourage dysfunctional behaviour and result in an accurate projection. Whilst many have demonstrated that the budget is important in terms of control, co-ordination and decision-making within commercial enterprises even if it contains flaws, little attention appears to have been directed to the accuracy of budgetary and forecasting in UK universities.

The importance of financial planning in higher education can be traced back to sector changes over the last 60 years. The Anderson Report (1960) and the subsequent Robbins Report (1963) led to an expansion in higher education. At that time, finance officers were mainly concerned with book keeping. There was little emphasis on encouraging “generalism” (Taylor 2013, p.145), whereby “finance officers are seen as creative and positive colleagues who contribute to strategy positively rather than merely putting up financial roadblocks”.

However, the 1980s saw severe reductions in grants with financial planning taking on more significance, which some found challenging (Sizer, 1988). The Edinburgh Study Report (CVCP 1985a) identified dysfunctional budgetary behaviour at Edinburgh University and recommended

zero-based budgeting. Furthermore, the Jarratt Report (CVCP, 1985b) explained that there was room for significant improvement in planning, resource allocation and monitoring in the sector. Indeed, a number of specific management accounting problems were identified by the CVCP reports and Jones (1994a) noted that it was not uncommon for budgets to be agreed six months beyond the start of the academic year.

The financial difficulties encountered by University College, Cardiff (UCC) in the 1980s illustrate the past inadequacies of financial forecasting. In UCC's case, financial information was not drawn from the University's own ledgers and forecasts had little relationship with reality (Shattock, 1988). The UCC example reinforces the need for good systems of budgeting and forecasting as well as effective management during periods of financial turbulence.

The importance of forecasting accuracy is further explained by Taylor (2013, p.143) using an example of a new teaching building funded by a mortgage which will be amortised against projected extra overseas fee income "...if those overseas fees forecasts turn out to be incorrect five years or so down the line, the university may find itself in financial difficulties in meeting the mortgage payments". Conversely, an inadequate ability to forecast potential income streams could "lead to a rejection of the project on pure economic grounds" which may not be justified. Thus illustrating that financial position may drive the need for forecasting accuracy.

### **1.3 Current difficulties in accurate budgeting and forecasting**

Student numbers are viewed as the lifeblood of a university (Hodson, 2017). In theory forecasting in the sector should be relatively easy as it is not technically difficult to estimate the largest element of income for many institutions by applying a forecast number of students to a known tuition fee rate to arrive at a tuition fee income prediction. Expenditure can then be managed based on the expected income. However, the operating environment and circumstances of individual institutions can make the process challenging.

For example, Liverpool University reported a £13.2m deficit in the year to 31 July 2009 when the institution had budgeted for a surplus of £2.3m, with most of the deficit due to lower than budgeted research income. The same institution had recognised that there was a need for sound

financial systems and the carefully monitoring of progress against budgets as long ago as 1994 (Report of the Treasurer, financial statements for the year ended 31 July 1994).

As reported by Newman (2010, p.11), Liverpool was “the latest in a number of institutions that have uncovered major errors in financial planning”. The University of Leeds admitted that its forecasts for the period 2008-13 were over-optimistic by £20m per year due to spreadsheet errors, which resulted in a delay in seeking to make £35m of savings (Roberts, 2009), while the University of Cumbria significantly under-estimated its deficit of £13.2m in 2008-09 which led to a breach of a loan covenant, thereby demonstrating that inaccurate budgeting and forecasting can have serious consequences. More recent instances of inadequacies include potentially unrealistic student rent forecasts at the University of Dundee, resulting in concerns over the sustainability of a £56m private finance initiative used to build new halls of residences (Grove, 2014) and the failure to accept pessimistic assumptions at the outset for commercial projects at Glyndwr University which later proved to be accurate (Matthews, 2014a). The latter institution getting in to financial difficulties and delaying the publication of its 2013-14 accounts (Havergal, 2015). The University of Central Lancashire put aside £2.8m in its 2013-14 accounts to guard against further losses on its Cyprus campus due to disappointing recruitment (Morgan, 2015), whilst the Open University failed to anticipate a collapse in part-time student numbers and higher than predicted student withdrawals (Parr, 2015).

The Dearing Report (1997) laid the foundation for the change from government funding to student tuition fees, and the Browne Review (2010) allowed British universities to charge a tuition fee of up to £9,000 for home and EU undergraduate students from 2012-13. It also allowed students the freedom to migrate to universities which they preferred. Thus forcing institutions to give increasing attention to revenue forecasting.

In the first year of operation there were unpredicted student recruitment shortfalls at a range of institutions, including Russell Group universities that had expected to perform well under the new arrangements. Indeed, the sector as a whole under-recruited with an estimated loss of income of £1.3bn over three years (Snaith & Stephenson, 2013).

As student behaviour shifts in the future, student number forecasting may prove more difficult. Previous trends in applications and enrolments cannot be sufficiently relied on. Customerisation of the sector has resulted in a growth in vocationally oriented degrees (Parker, 2013), increased competitive pressures from new providers (Barber, Donnelly & Rizvi, 2013) and greater recruitment volatility (UUK, 2014). These changes and the trend towards marketisation (McGettigan, 2014; Marginson, 2014a; Palfreyman & Tapper, 2016) increase the uncertainties faced by universities.

Moreover, government indicated that there would be less protection for inefficient institutions which have failed to manage their costs (Cable, 2010; BIS, 2011). Indeed, the government also set out proposals to protect students if an institution exited the market (BIS, 2015). The subsequent 2016 White Paper (BIS, 2016) made it clear that there would be no bail-out for failing institutions.

Financial management in universities will inevitably be placed under strain by the new competitive environment and Taylor (2013, p.141) emphasises that good financial management is “more critical than ever in determining whether a university will survive, let alone thrive, in the new increasingly harsh and competitive higher education environment”.

Standard & Poor’s (2013, p.2) offered the view that the reforms in the HE sector “will widen the divergence between universities’ credit profiles”, primarily because the environment “is now less stable and predictable”. Student demand may also fluctuate as a result of demographic trends (Standard & Poor’s, 2008; Universities UK, 2013; HEFCE, 2015a). It is increasingly difficult to predict what proportion of an institution’s offers will result in student enrolments.

Research on the effects of the liberalisation of Student Number Controls (SNCs) in England since 2012 by Capita (2015, p.5) suggested an “increasingly competitive and more volatile recruitment environment” and that rather than the SNC being a constraint on growth, it had actually served to “protect institutions from competitors higher up the pecking order and prevent market share being eroded”. Wolf (2015b) provides evidence that Russell Group institutions have been ‘winners’ in funding terms and suggests that old universities will increase their market share at the expense of ex-polytechnic institutions. Indeed, the universities and science minister, Jo Johnson, spoke of creating “the capacity for more rapid market share shifts between universities” which may lead to

financial instability for institutions with falling recruitment (Morgan, 2016a, p.6) and could transform the sector (Morgan, 2016b). McCaig and Taylor (2017) argue that the SNC was abandoned because it did not produce the required market differentiation quickly enough. The Teaching Excellence Framework (TEF), Brexit, overseas visa policy and increasing global competition could all affect future student demand (Baker, 2017; Hodson, 2017; HEFCE, 2017a). The difficulty for universities is that income tends to be volatile whilst the cost base is fairly fixed, particularly in respect of pay expenditure (Davies & Jackson, 2016).

Institutions generally over-achieve their budgets and forecasts (NAO, 2011), and the sector currently has access to significant cash resources, which means that universities are seen as a safe investment (Humphreys, 2016). This perhaps explains why even during turbulent times there have only been isolated instances of concerns being expressed about inadequate financial planning. Indeed, Ruckenstein, Smith and Owen (2016) argue that change in universities is likely to be through small incremental steps and not seen as urgent whilst such financial security exists. Furthermore, finance officers may be risk averse, preferring a cautious approach rather than risk under-achieving budgets and forecasts or implementing new methods. Key performance indicators other than finance may be viewed as more important, such as performance in the Research Excellence Framework (REF), Teaching Excellence Framework (TEF), the National Student Survey (NSS) or various league tables.

Whilst university leadership may express concerns about accuracy, there is perhaps little urgency to address the situation when the financial results are better than forecast. This cautiousness insulates institutions from disturbances in the environment. It gives them breathing space in order to preserve their core academic work with less exposure to the vagaries of the marketplace. Laughlin (1991) explains that unwanted economic intrusions can be resisted by organisations, but without a cautious approach to budgeting there is no buffer against adverse changes. Indeed, the word 'cautious' is often defined as being careful to avoid potential problems or dangers. It was noticeable that at the outset of this study the pilot institutions (discussed in Chapter 4) expressed a preference for definitions of accuracy which referred to an approach which was 'cautious' rather than 'pessimistic'. The latter being associated with a gloomy outlook or an expectation of the worst outcome which was not necessarily the view of university finance officers.

Achieving accuracy has advantages in terms of optimising the distribution of resources and in supporting arguments to the government that the sector is not over-funded. Despite this, greater resources will only be devoted to achieving accuracy if significant benefits result from an improvement (PricewaterhouseCoopers, 2012b).

The changing landscape for UK universities has led to increasing demands “around forecasting, planning and modelling in areas such as student numbers, personnel and finance” Deloitte (2009, p.3). Indeed, forecasting and planning have long been seen as having a crucial role in the successful management of an education institution. For example, Brinkman and McIntye (1997, p.67) noted that: “Enrolment forecasts are fundamental elements of planning and forecasting at any higher education institution” and Kotler and Murphy (1981, p.470) stated that: “If colleges and universities are to survive in the troubled waters ahead, a strong emphasis on planning is essential”.

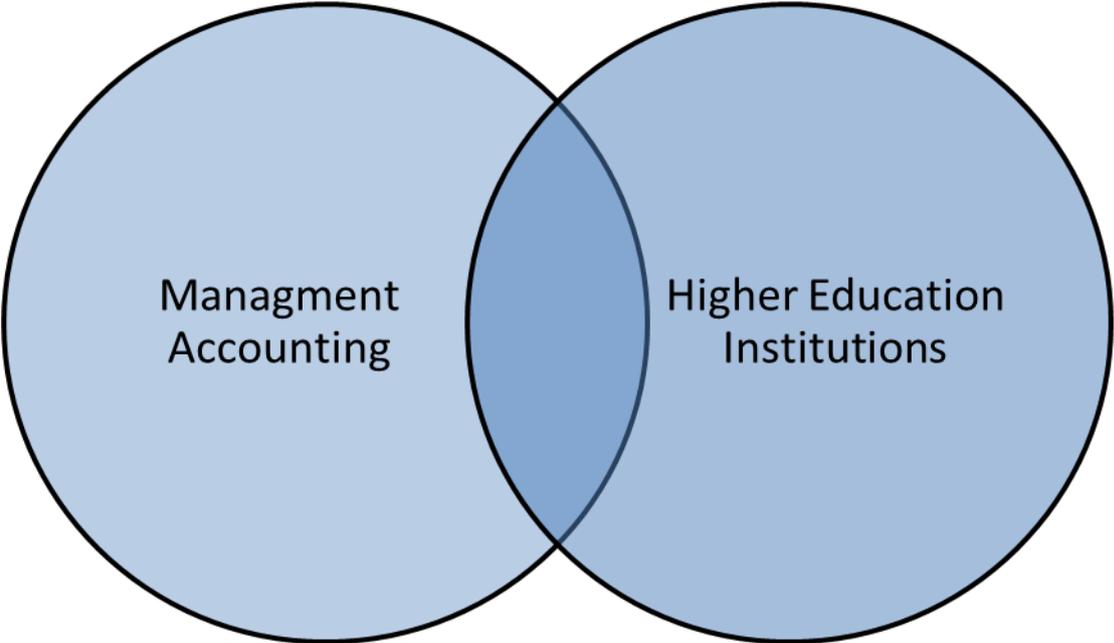
#### **1.4 Research framework**

Budgeting is possibly the most studied area of business administration research (Covaleski, Evans, Luft & Shields, 2003) and it would be impossible to review all publications. However, a significant proportion of this literature is over-simplified, does not deal with the more complex problems and is not sufficiently grounded in practice. Furthermore, there has been little published on the practices of universities and how effective they are. We do not therefore know how inaccurate budgeting is or what contributes to inaccuracy. In a similar context to budgeting, numerous publications cover financial modelling, but few address university practices.

The funding cuts imposed on universities in the 1980s and the requirement for efficiencies led to much interest in the sector’s approach to management accounting, particularly as institutions faced financial difficulties. That interest has not been sustained and although the sector is once again in the midst of significant change there has been little attempt to undertake research on the financial management of universities. Only a small number of surveys of management accounting practices in universities have been undertaken over the past two decades and none have addressed the issues of budgeting accuracy or scenario modelling.

The Venn diagram below considers how the key management accounting literature reviewed in Chapter 2 intersects with Higher Education Institution (HEI) specific articles. The region where the circles meet indicates publications which combine these two aspects of the literature. The main subjects covered and the relevant authors are identified below the diagram. Contingency theory, behavioural aspects of budgeting and the asymmetrical loss function all assist in explaining why universities fail to achieve accuracy in their budgeting and forecasting and why some use more sophisticated scenario models than others. Linking these theories with publications specific to universities such as the efficiency studies of the 1980s, budgeting and resource allocation practices, scenario modelling exercises and articles addressing the changed environment should result in the emergence of studies of management accounting in universities which highlight the practices and processes employed. However, there are few such studies.

Figure 1.1 Research framework



**Table 1.1 Significant Literature**

Management Accounting	Authors
Contingency theory	Hopwood, 1980; Otley, 2016
Budget gaming behaviours and budget slack	Merchant, 1985
Asymmetrical loss function	Voorhees, 2006
Strategy	Miles & Snow, 1978; Porter, 1980; Miller & Friesen, 1982; Gupta & Govindarajan, 1984
Control and performance aspects of budgeting	Cyert, March & Starbuck, 1961; Hofstede, 1968; Hopwood, 1976; Emmanuel & Otley, 1985
Profit-conscious style of evaluation	Hopwood, 1976
Budget methods	Drury, 2004
Criticism of traditional budgeting	Ekholm & Wallin, 2000; Hope & Fraser, 2003, Barrett & Hope, 2006; Libby & Murray Lindsay, 2010; Dugdale & Lyne, 2010
Scenario modelling	Wack, 1985a & 1985b

HE Institutions	Authors
Efficiency studies	Jarratt Report, 1985; Sizer, 1988; Jones 1986, 1994a & 1994b
University College, Cardiff	Shattock, 1988
Budgeting and forecasting in universities	Fielden & Lockwood, 1973; Prowle & Morgan, 2005; Foskett & Brindley, 1991; Shattock, 2010; Taylor, 2013; Dai, 2016
Resource allocation	Rubin, 1977; Shattock, 1981; Scapens & Ormston, 1992, Angluin & Scapens, 2000; Lewis & Pendlebury, 2002
Scenario modelling	Gee, 1988; Richards, O'Shea & Connelly, 2004; Sayers, 2010
Changed environment	Taylor, 2013; McGettigan, 2014; Thompson & Bekhradnia, 2014; Wolf, 2015a, 2015b
Financialisation	Parker, 2012a, 2012b, 2013

Combined	Authors
Management accounting in universities	Cropper & Drury, 1996; Lyne & Alhatabat, 2015;
Financial management practices in universities	Berry, Clements & Sweeting, 2004; Holloway, 2006
Financial decision-making in universities	Newton, 1997

More analysis and guidance might have been expected in the published literature. But there is little addressing university budgeting, forecasting and financial scenario modelling which identifies practices employed within the current changing environment despite interest from members of the British Universities Finance Directors Group (BUFDG). The identification of scenario models used by universities and the link to budgeting and forecasting through the use of key drivers would help to fill this gap.

Universities are somewhat unique in that they have been able to maintain their financial health during a period of austerity when other parts of the public sector have suffered financial strain. Accurate revenue forecasting, or at least an understanding of why inaccuracies arise, can assist universities to make informed decisions on planning, resourcing and sustainability. Inaccuracy can place the credibility of the finance function in doubt.

## **1.5 Research aim**

This research aims to identify and understand the contingent factors which influence the accuracy of budgeting and forecasting in UK universities and the characteristics of financial scenario modelling in the sector including important variables during a period of turbulence and uncertainty.

To achieve this, the research seeks to discover what budgeting and forecasting practices are employed and their perceived accuracy. It considers the processes and methods used and the characteristics of an institution which are associated with budgeting and forecasting accuracy.

Starkey and Madan (2001, p.24) claim that there is a relevance gap in the accounting literature and suggest that “learning is less than half complete if it does not enhance our capacity to take action”. In explaining this view they refer to two types of knowledge: Mode 1 (more concerned with theory than practice) and Mode 2 (knowledge sought in the context of application). It is argued that the former results in academic work which is out of touch with practitioners and is not therefore sustainable. Although practices may come and go, underlying theories can be identified from practice which may allow better decisions to be made by practitioners. This research therefore attempts to provide a bridge between theory and practice, and is of Mode 2 type.

There is a continuing ‘practice gap’ whereby theory is addressed without also considering the impact and value of research findings on practitioners (Guthrie & Parker, 2017). Evidence for this view can be identified in the work of Tucker and Parker (2014, p.126) who found that senior academics “agree that academic research is indeed divorced from practice, and perceive this to be less than an optimal state of affairs”, and from Tucker and Lowe (2014) who claim that the accounting profession has difficulty understanding research papers and view them as lacking relevance to their concerns. Broadbent, Laughlin and Alwani-Starr (2010, p.462) emphasise the importance of considering both “practice and academic frameworks” in order to “find a conduit between the practitioner views and academic research”.

## **1.6 Research objectives**

The objectives of the research are to:

1. Investigate and describe the budgeting, forecasting and scenario modelling practices in the university sector
2. Understand the thoughts and perceptions of finance officers in relation to budgeting, forecasting and scenario modelling processes
3. Reflect upon the findings of the research in order to contribute to the management accounting literature on the influence of contingent factors on budgeting and forecasting in universities in a period of financialisation and the use of financial scenario modelling.

The issue of accuracy is implicit within budgeting and forecasting literature, but is rarely discussed or analysed. In order to assess the accuracy of budgeting and forecasting in universities it would have been useful to undertake a variance analysis on the forecasting data submitted to the Funding Councils annually as part of their financial monitoring process. When contacted on 28 January 2013, none of the UK Funding Councils indicated their willingness to release institutional data. Given the confidential nature of the data it was considered unlikely that a general request for such a release would be met with a favourable response even under a Freedom of Information request.

Furthermore, whilst HEFCE expect individual institutions to comment on the forecasts and modelling techniques they employ they have no intention of publishing details. Neither do they

intend to provide prescriptive guidance on how institutions should undertake scenario modelling other than offering advice such as “scenario planning will need to consider potential changes in student demand, availability of public funding, and pay and pension pressure” (HEFCE, 2012a, p.7) and by asking specific questions such as “What scenario planning or modelling have you carried out in respect of longer-term rises in pension cost?” (HEFCE, 2014b, p.3). The academic literature on scenario modelling lacks detail and examples in a university context, such as that by Gee (1988), are infrequent and do not reflect the current changing environment.

To undertake the research it would therefore be necessary to obtain information from individual institutions (see Chapter 4).

## **1.7 Research questions**

The primary questions that this research seeks to address are:

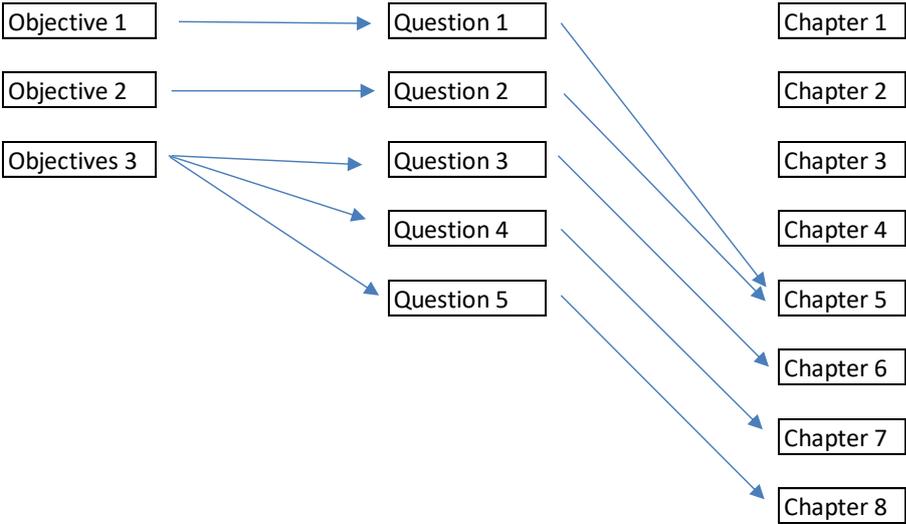
1. What budgeting, forecasting and financial scenario modelling practices are currently used by universities?
2. What is the perception of central finance officers of budget and forecasting accuracy?
3. Which contingent factors influence the perceived accuracy of budgeting?
4. Has the ‘financialisation’ of universities had a significant effect on budgeting, forecasting and financial scenario modelling practices?
5. What conclusions can be drawn about the state of budgeting, forecasting and financial scenario modelling within universities?

Significant changes to budgeting, forecasting and scenario modelling practices might be expected in a turbulent and challenging environment. Management accounting theory would suggest the need for increasingly sophisticated systems in order to manage in an uncertain environment, particularly as institutions face financial constraints (Gordon & Narayanan, 1984; Chenhall & Morris, 1986; Gul & Chia 1994; Baines & Langfield-Smith, 2003; Haka & Krishmann, 2005). The results might provide evidence to support the argument of an emerging financialisation of universities. PricewaterhouseCoopers (2012b) advise that organisations which are under financial pressure need to move away from incremental to alternative (so called ‘sophisticated’) budgeting approaches, primarily in areas which are volatile or where forecasting accuracy has been

historically low. Answers to the research questions should indicate whether practices remain largely unaffected by the changing external environment, indicating a lack of concern and a limited perceived threat. The application of contingency theory in the construction of the research questions assists in identifying the dimensions of budgeting and the importance of meeting the budget, as well as shedding light on the characteristics of scenario modelling in universities. Examples of contingent factors addressed in management accounting literature include the effect of the external environment, competitive strategy, organisational structure and processes employed (Drury, 2015).

Figure 1.2 below shows diagrammatically how the research objectives and questions primarily link to the following chapters.

Figure 1.2  
Link between research objectives and questions to chapters



Whilst the diagram identifies the primary linkages the literature reviewed in Chapter 2 is referred to throughout the thesis.

**1.8 Conclusion**

The limited range of literature addressing budgeting and forecasting in universities, which mostly concentrates on the methods and processes adopted for management accounting and resource

allocation, makes it difficult to draw any conclusions about accuracy. The literature on scenario planning in universities also has limitations as it tends to explore examples of ‘game-playing’ exercises whereby individual institutions consider a wide-ranging set of changed circumstances and their reaction to them rather than specifically addressing financial planning models. HEFCE ask institutions to adopt a ‘what-if?’ approach to considering how the institution’s finances would be affected by changes to significant streams of income and expenditure. Publications exploring university financial planning models in detail are largely absent from both the academic and practice literature. Even the university funding bodies choose not to offer examples of good or bad practice.

Publications on the financial health of the sector by HEFCE show that forecasting is prudent and that the sector achieves operating surpluses higher than anticipated. Indeed, forecasting by institutions seems to be marginally more prudent under the new fee regime (i.e. higher fees and changes to the student number controls after the Browne Review, 2010 implementation) and further demonstrates the risk averse nature of the sector. There is little evidence of a greater degree of uncontrolled volatility when compared with previous years’ forecasts, with no increase in the number of institutions being placed at ‘Higher Risk’ by HEFCE despite a shortfall in student recruitment in 2012-13. However, whilst the sector as a whole appears to be relatively stable financially, the uncertainty faced by individual institutions is high and increasing.

An institution is unlikely to get themselves into such financial difficulty that they go out of business without the Funding Council stepping in beforehand. There have been instances of institutions asking for an advance on their grants, in order to address cash flow issues, and this has immediately resulted in much closer monitoring. The effective use of budgeting, forecasting and scenario modelling should enable an institution to identify foreseeable difficulties and how they might be addressed in order to avoid the need to approach their Funding Council for assistance.

Despite the sector generating healthy surpluses, increasing uncertainty makes it difficult for individual institutions to predict their future income and expenditure, but there appears to be little concern about the accuracy of budgeting and forecasting. There is no best practice guidance for institutions to follow and few sector publications addressing budget and forecasting accuracy and

scenario modelling. Although the majority of variances had been favourable in the recent past this could change in future years as funding comes under further pressure.

This chapter has argued that universities are facing a period of unprecedented change in a turbulent environment. Under such circumstances it might be expected that institutions would look to improve their management accounting systems in order to provide effective control and forward planning. However, the fact that most institutions over-achieve their budgets and forecasts, and have sufficient cash resources to meet their current needs, may negate the urgency for any significant change. The issue of whether budgeting and forecasting methods and systems are sufficiently robust has received little consideration and indeed other activities may be of more concern. The aim of this research is therefore to investigate the budgeting, forecasting and scenario modelling practices employed.

The following chapter reviews the published theory and practice of budgeting, forecasting and scenario modelling.



## **Chapter 2**

### **Literature review**

#### **2.1 Introduction**

The purpose of this chapter is to examine some of the key literature in order to understand what influences the accuracy of budgeting and forecasting and also the characteristics of scenario modelling before moving on to consider the few publications that consider the application of these techniques in the HE sector.

Contingency theory is considered as it offers some explanation as to why practices differ between universities and from other types of organisation. Whilst this theory may call in to question the reasons for looking outside the sector for evidence of practices applicable to universities, it also serves to explain why some practices are adopted and others not.

#### **2.2 Background to budgeting, forecasting and scenario modelling**

##### **2.2.1 Definition and role of budgets and forecasts**

A budget is “a financial plan for implementing the decisions that management has made” (Drury, 2015, p.9) and plays an important role in planning, co-ordinating, communicating, controlling, motivating and evaluating performance, whereas a forecast is a prediction of the events that are likely to occur (Horngren, Sundem & Stratton, 1999).

Vadasz explains that:

To create a budget is to set the aspired to targeted outturn for a period, together with the planned events, activities, and interventions required to achieve it. To create a forecast is to articulate an objective and realistic assessment of the organisation’s likely outturn on the basis of actual trends, current assumptions, plans and budgets, in the absence of additional management interventions (Vadasz, 2005, p.60).

Although there is a distinction between ‘budgets’ and ‘forecasts’ (Vadasz, 2005; Horngren, Sundem & Stratton, 1999; PricewaterhouseCoopers, 2012b; Fildes & Hastings, 1994) the terms

within the university sector are not necessarily separate and distinct. The first and second year of the 'forecasts' contained in the HEFCE Annual Accountability Return documentation are generally prepared after undertaking a detailed analysis of planned income and expenditure and summarise the budgets of an institution. Thus the words 'budget' and 'forecast' tend to be inter-mixed by both universities and the Funding Councils without a clear sector-wide distinction between the two. However, that distinction between budgeting and forecasting is equally applicable to universities as it is to any other form of organisation.

The ideal conditions for budgetary control within a university would include having a stable operating environment, a clearly defined organisational hierarchy with well specified responsibility centres, clear definitions of what is controllable by centre managers and a minimum of interdependence with other parts of the organisation. In practice, external environments change, responsibilities are often unclear and overlapping, controllable areas merge imperceptibly into those that are not, and different parts of the organisation tend to be highly interdependent (Drury, 2004). However, despite such imperfections, budgets remain an important tool and Otley (1978) found that those who placed a high emphasis on meeting the budget usually achieved greater budgetary accuracy. Thus, budgets have a significant role in guiding an organisation.

### **2.2.2 Dysfunctional budgeting**

The dilemma faced by those wishing to implement effective budgetary control systems is described by Hofstede (1968). He found that where budgeting was used extensively as a means for performance evaluation it engendered all kinds of harmful behavioural effects. Indeed, Hopwood (1976) and Emmanuel and Otley (1985) suggest that it is the way in which senior managers actually use budget systems, rather than the systems themselves, that determine how effective they are, and they should be used in a flexible way (Frow, Marginson & Ogden, 2010). A fundamental conflict of budgeting is the motivational/aspirational effects of budgets on individuals and the resulting prediction. Demanding budgets which are used to motivate, but which may not be achievable, are unsuitable for planning purposes. Despite this, there is a paradox in that managers confronted by uncertainties may react by increasing their commitment to achieving a tight budget as it offers structure and certainty (Marginson & Ogden, 2005).

The predominant theme in recent literature has been that the planning and budgeting process is dysfunctional (Hope & Fraser, 2003) and contributes to a lack of accuracy. The major criticisms of budgets can be found in literature reviews by Ekholm and Wallin (2000) and Dugdale and Lyne (2006). In particular, the influence exerted by individuals in the budgetary process can lead to poor outcomes, primarily due to bias. However, despite imperfections in the budgeting process, universities would seem to view the technique as helpful as there is little evidence in the literature to suggest that they are abandoning it.

### **2.2.3 Budgeting and bias**

Various studies demonstrate that when managers are able to influence the budgeting process they may introduce bias (Lowe & Shaw, 1968; Schiff & Lewin, 1970; Merchant, 1985; Young, 1985; Dunk & Nouri, 1998; Fisher, Maines, Peffer & Sprinkle, 2002; Church, Hannan & Kuang, 2012). Such bias is different from budgeting error as it is premeditated.

There are many behavioural aspects to budget setting. For instance, Cyert, March and Starbuck (1961) ascertained that individuals perceived that less harm was done by setting conservative sales predictions and over-stated expenditure estimates. Lowe and Shaw (1968) found that a pessimistic budget increases the likelihood of future success. During periods of high economic uncertainty a certain level of slack may be perceived as skilful financial management in order to exploit opportunities (Sharfman & Dean, 1997; Van der Stede, 2000; Bradley, Shepherd & Wiklund, 2011; Wiersma, 2017) or to allow operations to continue when adversely affected by unexpected events (Lyne, 1990). Conversely, an optimistic budget may initially please but runs the risk of future disapproval (Otley, 1985). One consequence of such behaviour is that it may adversely distort the information used for decision-making (Govindarajan, 1986; Nouri, 1994). Despite this, budgets remain useful during periods of uncertainty (Hartmann, 2000) and “slack is not in and of itself either beneficial or harmful” but it depends on how it is used by managers (Wiersma, 2017, p.446). Van der Stede (2000, p.614) suggests that organisations demonstrate a “tolerance for slack in good times and the attenuation of slack during bad times”.

The organisational structure may also play a part in the resulting inaccuracy of budgets. The more organisational review structures that exist the greater the conservatism added at each level (CFO

Research Services, 2011). Agency theory would view this as a problem as the manager's goals are not necessarily aligned with those of the organisation (Ghosh & Willinger, 2015). However, there are studies to suggest that the participation of managers in the budgeting process can reduce the presence of slack (Schiff & Lewin, 1970; Cammann, 1976; Merchant, 1985; Dunk, 1993; Dunk & Perera, 1997).

The debate over the benefits of a close partnership between the central finance team and internal business units remains active and the effect on performance is still undecided (Derfuss, 2016). Business partners (typically management accountants) usually “take responsibility for monitoring and working with a specific area/division on their budgeting and financial reporting throughout the year”, acting as a “bridge which links finance and the rest of the business as it seeks to increase the understanding of the business within the Finance function and also to increase financial awareness and competence across the business” (PricewaterhouseCoopers, 2012b, p.8).

The greater the number of individuals involved in the process the more difficult it can be to coordinate and the greater the chance of some form of bias creeping in. However, despite the possibility of budget bias being introduced in terms of conservative planning which may lead to missed opportunities, those closer to the marketplace are viewed as offering a more effective insight in to future trends (CFO Research Services, 2011; Robert Half, 2012).

The need for a reasonable degree of accuracy is recognised by Jain (2007, p.19) when commenting that: “Every decision is based on some kind of forecast about the future. The more accurate our forecasts, the better would be our decisions”. A survey of corporate leaders by CGMA found that “two-thirds felt that significant improvements were needed to the accuracy and reliability of data” in their companies, but recognised that: “It is impossible to have a 100% accurate forecast, which may happen once in a blue moon, but not all the time” (CGMA, 2013, p.15). There are dangers in pursuing accuracy as a target as advised by the Finance Director of London Underground, Andrew Pollins: “Forecast accuracy speaks to credibility. But be careful not to drive accuracy to 100%; people start spending to budget or slowing down, which is sub-optimal” (Sawers, 2014, p.18). Indeed, Drury (2015, p.418) suggests that: “To motivate the highest level of performance, demanding budgets should be set and small adverse variances should be regarded as a healthy sign and not something to avoid”.

Lukka (1988) devised a model to explain the reasons why slack is introduced. Others have offered suggestions as to how budget slack might be addressed including using budgets in a more flexible profit-conscious style of evaluation (Hopwood, 1976), incorporating the use of responsibility centre budgeting (Vonasek, 2011), the constant probing of assumptions and figures derived during the process rather than merely at the approval stage (Schiff & Lewin, 1970), shifting the focus away from control (CFO Research Services, 2011) or the use of more sophisticated management control systems including non-financial measures (Ghosh & Willinger, 2015).

Bias is perhaps a natural consequence of human intervention in the budgeting process and it should therefore be expected that some inaccuracy will arise. Recognition of the fact should enable organisations to anticipate it and assess whether it is likely to cause difficulties.

#### **2.2.4 Forecasting and bias**

Budgets are the detailed annual plan of income and expenditure, whereas forecasts tend to be prepared at a higher-level, are more summarised and may cover the same period as the budget or a longer period. CIMA and the ICAEW (2004, p.3) found that some companies now view forecasting as more important than budgeting because the assumptions on which detailed budgets are based change very quickly but the budget is not necessarily updated whereas high-level forecasts tend to be updated more frequently. However, budgeting can have a significant advantage as the: “Setting of objectives and targets for the year ahead can only be done through a great deal of inter-functional co-ordination” which draws on the knowledge held by those closer to the activities (West, 1994; Mentzer & Khan, 1997). In a fast changing environment, this advantage may be negated by the need to prepare updated forecasts quickly in order to react to new opportunities or threats.

A study by Mahmoud, Rice and Malhotra (1988) found that accuracy was rated as the most important criterion for the forecasting technique selected. However, few companies appear to have dedicated forecasting/planning staff to prepare forecasts (Drury, 1990, p.326) and the use of the finance function to undertake the task probably reflects “the necessity of linking forecasts with plans and especially budgets”.

Bias also exists in forecasting as a result of financial prudence in order to create a 'buffer' against future uncertainty (Larkey & Smith, 1984, 1989; Feenberg, Gentry, Gilroy & Rosen, 1989; Bretschneider & Gorr, 1992; Galbraith & Merrill, 1996; Havergal, 2014a). Voorhees (2006, p.61) attributes this bias to the asymmetrical loss function and explains that: "Because forecasters are subject to a greater loss when they overestimate revenue than when they underestimate revenue, there is an incentive for forecasters to under forecast revenues and thus avoid losses they may encounter with overestimated revenue".

Bretschneider and Gorr (1992) discovered that the design of an organisation, its culture, its political environment and the general economic uncertainty all contributed to bias in the forecasting of revenues. Forecasting processes therefore need to "fit into the overall organisational set-up" (Fildes et al., 2003, p.37). Forecasts are frequently modified in response to a variety of personal and corporate motivations and objectives (Morrison, Renfo & Boucher 1984; Fildes & Hasting, 1994; Galbraith & Merrill, 1996).

Human behaviour can have an adverse effect on forecasting in the same way as it can result in dysfunctional budgetary control. An example of the motivation consequences of inaccurate forecasting within a UK university setting was detailed by Ezzamel (1994) who noted that the use of inaccurate forecasts by senior management allowed a group opposed to change to mount a significant challenge to the top-policy makers of the institution.

In general, there appears to be a sector-wide tendency towards conservatism in the forecasts reported by English universities which commonly under-estimate income and over-estimate expenditure, as detailed in the annual sector financial health reports issued by HEFCE (HEFCE 2016a; HEFCE 2016b). They have previously explained that "Historically the sector has been pessimistic in its short-term (one-year) forecasting, with the actual results always better than expected" (HEFCE, 2014c, p.27). Therefore, higher surpluses may be achieved than predicted, but they also noted that the sector operated on limited margins and that relatively small changes to forecasts could have a significant adverse effect on those surpluses.

Unfortunately, there does not appear to be any perfect solution to the issue of bias. Indeed, some slack may be perceived to be beneficial in order to counter unexpected adverse changes in operational circumstances so that activities can be maintained at planned levels (Gabriel, 1978; Merchant & Manzoni, 1989). Similar forms of inaccuracy might therefore be expected in the use of both budgeting and forecasting and can perhaps be anticipated.

### **2.2.5 Budgeting and forecasting accuracy**

It is useful to be able to accurately forecast the effects that changes in variables can have on revenue streams in order to plan and budget for the future with sufficient certainty. This point is emphasised by Agostini (1991, p.13) when stating: “In public-sector budgeting, the availability of resources circumscribes decisions of all expenditure considerations. As these decisions intensify in the face of mounting fiscal duress, reliable and informative revenue forecasts become critical elements on the [effective] budget process”.

The maintenance of records to assess forecasting accuracy on a regular basis is not universally undertaken by organisations (Rothe, 1978) and many do not have systems and procedures for analysing forecasting errors (Drury, 1990). Formally assessing accuracy can lead to improvements (Mentzer et al., 1999; Cassar & Gibson, 2008), but the preparer needs to participate in the process (Mentzer & Cox, 1984b).

Forecasting consistency is of greater importance as firms “feel they can get along all right as long as their forecasts fall within familiar margins” (White, 1986, p.11). The latter is echoed by HEFCE in terms of forecasts submitted by universities. Although the funding body would prefer accuracy, it is still able to effectively analyse the likely outturn compared to the forecasts submitted in the Annual Accountability Return where there is past evidence of consistent favourable or adverse variances.

In considering acceptable tolerances for variances from forecast, Wheelwright and Makridakis (1980, p.9) explain that: “For some decision makers, anywhere between plus or minus 10% may be sufficient for their purposes, but in other cases a variation of as much as 5% could spell disaster for the company”. In general, the higher the investment in testing, refining and developing the

forecasting methods, the greater the accuracy achieved (Doyle & Fenwick, 1976) and the more confidence users will have in the forecasting process.

Forecasting accuracy has been shown to be greater in larger and in older firms. This is most likely due to such firms having more resources to devote to the process, and a greater history of trends, market behaviour and knowledge of the business environment (Winklhofer, Diamantopoulos & Witt, 1996; Jelic, Saadouni & Briston, 1998; Diamantopoulos & Winklhofer, 1999; Cheng & Firth, 2000). However, some studies also show that an increase in market area can have an adverse effect on forecasting accuracy (Dalrymple, 1975; Rothe, 1978). Many universities have strategies to grow and to diversify their income streams, particularly in the current competitive environment, which may result in less accurate forecasting.

Furthermore, preparing forecasts at a higher level in the company hierarchy, better formal training of forecasters, seasonally adjusting forecasts, employing consultants and computers, and using forecasts for various applications have all been shown to increase accuracy (Mentzer & Cox, 1984a; Dalrymple, 1975; McHugh & Sparkes, 1983). Moreover, there appears to be some correlation between desired and achieved accuracy (Pan, Nichols & Joy, 1977).

Neeley, Sutcliffe and Heyns offer the view that:

If budgets and forecasts are built upon explicit and well-founded assumptions and assertions, and they, in turn, are regularly challenged and questioned, then the company is likely to make realistic forecasts that it can deliver against. Specific techniques such as rolling forecasts, are particularly important in this regard because more frequent planning and budgeting enable more accurate forecasts as do forecasts covering time periods shorter than the annual budgeting cycle (Neeley, Sutcliffe & Heyns, 2001, p.18).

A balance has to be struck between complexity and transparency. Disaggregated figures do not necessarily produce better forecasts than aggregated data (Bavnea & Lakonishok, 1980; CFO Research Services, 2011; Hoffelder, 2013). Too much detail can lead to the conclusion that the forecast is accurate simply because it is complex. As explained by Parmenter (2014, p.48): “Forecasts are rarely right, and forecasting at a detailed level does not lead to a better prediction of the future”.

New technology can have an important part to play in ensuring accurate and timely budgets and forecasts. Standardising, automating and formalising processes can reduce budgetary slack (Chenhall, 2003). The use of a single data set can assist in aligning budgets and forecasts to operational plans and strategic objectives, increase the speed of preparation and accuracy, and reduce the instances of data ‘silos’ whereby some areas of the business are disconnected from others and need to be reconciled. However, universities tend to use multiple systems for retaining data.

A lack of a working knowledge of complex forecasting techniques does not appear to prevent effective forecasting (Makridakis, Wheelwright & McGee, 1983; Sparkes & McHugh, 1984) particularly as judgement is commonly incorporated within forecasting. Indeed, firms demonstrate a preference for judgemental and unsophisticated techniques (McHugh & Sparkes, 1983). Pant and Starbuck (1990, p.442) noted that: “A general law seems to be at work: More complex, subtle, or elegant techniques give no greater accuracy than simple, crude or naive ones”. However, a lack of market research data hinders the production of valid forecasts (Fildes & Hastings, 1994).

Whilst many of the factors which forecasters view as influencing the accuracy of their forecasts are outside of their control, such as instability in the economy (McHugh & Sparkes, 1983; Sanders & Manrodt, 1994), there are areas that can be addressed, including improved data quality, greater management support and better training (Sanders, 1992; Sanders & Manrodt, 1994). Using a combination of forecasts prepared under differing methods may also improve accuracy (Mahmoud, 1984).

The literature demonstrates that differing approaches are adopted in the pursuit of accuracy, but that there is no single approach that would ensure it is achieved.

### **2.2.6 Scenario modelling**

Thus far the literature review has mostly concentrated on budgeting and forecasting, but there is a clear connection between budgets, forecasts and scenario modelling. Bourn and Ezzamel (1987, p.29) noted that budgets “contribute to planning by providing indications of the level of performance necessary to achieve stipulated objectives, and of the likely performance achievable,

together with a framework for answering ‘what if’ questions”. The setting of the budget may therefore assist in providing a base-line from which to do scenario modelling.

Grant Thornton and APQC (2015, p18) claim that “those organisations that do use scenario analysis or predictive analysis are better aligned with unfolding business strategy, are more effective at business analysis, derive greater value from their budgeting process, and have more reliable forecasts than those who do not use them”. However, a forecast offering a single view of a planned future should not be confused with scenarios which offer multiple views of a future which is not predictable with any degree of confidence (CGMA, 2015b).

The technique is sufficiently important to appear in the CIMA global management accounting principles, which note that: “By using scenario planning, forecasting and other predictive tools, management accounting also provides foresight to guide the crafting of strategy” (CIMA, 2014, p.11).

The technique can fall outside of the annual planning/strategy cycle, although survey evidence indicates that it is used in conjunction with budgeting and forecasting (Bergstrom, Axson & Timofeeva, 2012). An organisation’s official view of the future, often reflected in its forecasting, can take on a ‘business-as-usual’ outlook based on a human tendency to see familiar patterns and not unexpected events. Scenario modelling has therefore been put forward as means to address this (Wright & Goodwin 1999; Wright, 2001; Hodgkinson & Wright, 2002).

Scenario modelling can help to establish the boundaries for the uncertainties affecting an organisation’s operations and “prevent effort being wasted in forecasting the wrong events, or predictions being based on erroneous assumptions about the nature of the real world” (Wright & Goodwin, 2009, p.814). Scenarios can complement forecasting and highlight the key drivers and assumptions underlying a forecast (Pierone, 2013), thus allowing managers to consider uncertainties in a structured way. However, as Schoemaker (1991, p.550) explains, they are only useful if the appropriate alternatives are considered: “Changing one variable without recognizing how others might change as well can yield highly misleading results”.

Scenario planning has its critics and there have been claims that it is a practitioner-derived method with limited supporting evidence for its usefulness (Hodgkinson, 2001; Hodgkinson & Sparrow, 2002). Accounts of its deployment tend to be restricted to successful implementations such as those detailed by Wack (1985a, 1985b). Mintzberg (1994, p.250) noted that: “The Wack account does not point out how commonly such exercises fail”.

As part of a review of scenario planning literature, Varum and Melo (2010) identified the industries and geographical areas which had been addressed in articles published in peer review journals going back to 1945. These make no reference to the use of scenarios in a university setting. Given the potential benefits of using scenario modelling it is perhaps surprising that the technique has not received more attention in universities which are complex multi-million pound organisations.

The literature review so far demonstrates that although considerable empirical research has focused on the practices of firms, universities have been largely ignored. The following section therefore considers the limited literature that has been published on universities.

## **2.3 Literature on university practices**

### **2.3.1 Budgeting methods**

Incremental budgeting is common in universities (Hills & Mahoney, 1978; Lee & Van Horn, 1983; Davies & Davies, 1984; Hackman, 1985; Jones, 1994b; Ezzamel and Bourn, 1995; Grant Thornton, 2016a). It is viewed as a safe approach, requiring little effort and causing the least disruption.

Fielden and Lockwood (1973) explained that during periods of national prosperity and satisfaction with higher education's share of available resources, the 'incremental' approach to planning went largely unchallenged. It is much easier to agree on a small addition or decrease than to compare the worth of one program of activity to that of another. Conflict is minimised by an incremental approach because the area open to dispute is reduced (Good, 2011). Furthermore, the burden of calculation is eased because no one has to undertake a comprehensive review (Schick, 1983). This

comes at the expense of a potential loss of accuracy and equity in terms of what should be funded. However, unpredictable consequences are avoided (Atkinson, 2011).

Alternative approaches to incremental budgeting have been advocated. For example, Fielden and Lockwood (1973) suggested that each activity or programme of a university should be planned and budgeted separately using a Planning, Programming, Budgeting System (PPBS). However, they recognised the difficulties of such an approach when universities have multiple and inseparable objectives. Whilst there appears to be no successful on-going application of a comprehensive PPBS in a higher education institution (Schroeder, 1973; Dufty, 1976; Massey & Hopkins, 1979), Borgia and Coyner (1996) found that many of the characteristics of PPBS were popular with American institutions, such as the emphasis placed on achieving goals, objectives and future outcomes. Zierdt (2009) also notes that it provides an effective link with an institution's priorities and vision, but the arbitrary allocation of costs can adversely influence a program's outcome and the resulting performance assessment.

Zero-Based Budgeting (ZBB) and Priority Based Budgeted (PBB) have been developed to overcome the weaknesses of an incremental approach. Carr (1994, p.51) explained that: "Without the use of priority based budget reviews colleges run a real risk of perpetual year on year incremental increases without the benefit of a fundamental appraisal". This approach would re-establish the need for the activity or service, ensure value-for-money and provide a consideration of alternatives. In essence, a budget is created from first principals every year. As well as being useful to assess costs it can also be used as a tool to encourage managers to think strategically (McCann & Donnelly, 1992).

Although ZBB was fashionable in the 1970s (Phyrr, 1976), and was the topic of many budgeting articles (Suver & Brown, 1977), it rapidly declined and became a rarity by the 1980s. Prowle and Morgan (2005, p.9) explain why, "the procedures are cumbersome and time consuming and it will probably be difficult to switch resources between areas of activity without retraining staff and/or making redundancies". Grant Thornton (2016a, p.12) also note that: "Some institutions say they are using zero-based budgeting, but in reality they can't effectively judge each programme freshly every year because it would take too much time and effort". Furthermore, the characteristics of an

organisation's accounting system may also hamper the identification of resources used for specific purposes (Maccarrone, 1998).

Drury (2004, p.621) offers the view that "many organizations tend to approximate the principles of ZBB rather than applying the full-scale approach outlined in the literature. It can be applied selectively to those areas about which management is most concerned and used as a one-off cost reduction programme". PricewaterhouseCoopers (2012b) found evidence of a trend towards a targeted one-off use of ZBB, particularly in areas of high materiality and volatility. An example is Aston University Library which benefited from a ZBB exercise undertaken in 1984-85, resulting in a detailed analysis of all library tasks and the assignment of costs to each. They found the task difficult and time-consuming, but it provided a greater understanding of the Library's functions and activities. It also improved relationships between the Library and both the Information Services department and the Finance Office, as well as giving staff an improved knowledge and awareness of the costs and trade-offs in information provision (Foskett & Brindley, 1991).

Others have suggested that the large amount of detail required for ZBB to be usefully maintained means that it may not be beneficial to use it throughout a large library facility (Johnson, 1994). This view is reflected in the conclusions of Foskett and Brindley (1991, p.33) who state that "although it is too time-consuming to undertake a ZBB exercise annually and undesirable for many reasons, a more likely continuing approach at Aston is the use of ZBB within a particular area that is appropriate to examine in detail", which is consistent with Drury's comment above. However, this has not been subsequently undertaken at Aston University.

Boyd (1982, p.437) found that ZBB "had no real effect on the allocation of funds for a state supported university in Texas" when compared with the methods that preceded it. Indeed, this journey of discovery may actually be one of the key advantages of ZBB. A ZBB exercise at Colorado Mountain College, using formula to calculate the expenditure budgets for faculties, professional development (based on grade) and repairs and maintenance (using square footage), led the institution to identify significant differences between best and worst practices in areas such as tutoring, the duplication of activities and the undertaking of tasks which did not tie in with the strategic plan. Other institutions in America have introduced a modified form of Activity Based Budgeting (ABB), rather than ZBB, which analyses specific areas of expenditure (Porter, 2012).

The Education Advisory Board in Washington DC (2009) commissioned a review of ZBB. This identified a few universities who had adopted ZBB in detail across all areas. However, the review found that as the majority of faculty budgets (upwards of 80 per cent) were comprised of recurring salaries it made little sense to apply ZBB principles and therefore concluded that ZBB did not suit the financial needs of higher education as it did not provide any significant financial planning or strategic benefit.

Overall, there is evidence to suggest from the literature that the more complex methods, such as ZBB, are shunned or not fully implemented by universities in favour of a traditional incremental approach because of the resources required to undertake the process and the limited perceived benefits. Good budgeting in a university would go beyond an incremental approach but would perhaps not involve overly sophisticated methods because of the resources required to implement and maintain, particularly as other performance and control mechanisms (e.g. REF, TEF, NSS, etc.) may be viewed as more important.

### **2.3.2 Budgetary devolution**

The general philosophy seems to be that many budget allocation decisions are better taken close to their point of impact (Fielden & Lockwood, 1973), but there must be accountability (Jeffries, 1993). However, budgetary devolution might be thought less economic in a small university than a large one, since the new administrative tasks and responsibilities may absorb a substantial amount of academic staff time. Invariably some of those expected to fulfil such duties may resent the burden or feel ill-trained. Furthermore, there can be a lack of connection between the budgeting process and key performance measures (Broad, Goddard & Von Alberti, 2007).

A study by Berry et al. (2004, p. viii) found a lack of trust between financial managers and academics due to inadequate and inaccurate budgetary information, which has also been found in more recent studies (Simmons, 2012; Dai, 2016; Deering & Sá, 2017). Webber (2014, p.66) suggests that: “In many universities, the drive towards devolution appears to have run ahead of the ability to provide budget holders with the information that they need (or think they need) to manage their business units”. Such problems might be expected to diminish over time if the

process is managed well. However, staff in central finance need to be aware of the consequences of initiatives to improve financial accuracy on staff outside of their department.

Financial devolution can lead to an increased awareness of resource implications and a more conservative approach by those working in faculties (Fielden & Lockwood, 1973). However, Jones (1994b, p.248) noted that at the universities of Edinburgh and UCL there was evidence of “departmental heads spending up to agreed limits in order to maintain the base for the next budget, even though some expenditure would ideally have been deferred or not incurred”. A ‘use it or lose it’ philosophy. Such difficulties might be overcome by carrying forward unspent budgets. Indeed, this mechanism has been used as a means of motivating staff to engage in commercial contracts where the surpluses on such activities are carried forward (Tomkins & Mawditt, 1992) and is recommended in respect of responsibility centre budgeting in universities (Vonasek, 2011).

A study of three universities by Dugdale and Dai (2013) found a reluctance to allow the carry forward of unspent allocations for reasons such as “the income statement would be affected adversely by the extra outlay in the next financial year” (p.14). In this instance, the desire for accurate forecasting was demonstrated to have an adverse impact on the institution’s financial flexibility despite the potential benefits from more efficient spending. No consideration appeared to be given to how these unspent balances could be accurately budgeted for. A reluctance to allow budget centres to retain financial surpluses and spend them at their discretion was also found in an earlier study of universities by Angluin and Scapens (2000).

In terms of achieving accuracy, Simmons (2012, p.6) noted that many academics explained the fact that actual financial results would vary from budget: “One emphasised the inevitability that budget numbers would not match the actual numbers, that ‘rapidly changing external conditions overwhelm...’ and there is no way to (determine) an accurate estimate of costs and revenues”. Some felt that budget variances were only of value in terms of providing a focus for discussion. This might lead to improved control, re-planning or performance evaluation.

The literature suggests a move towards budgeting devolution but without signifying an improvement in accuracy, and a reluctance to adopt more complex practices.

### **2.3.3 Resource allocation**

The CIMA global management accounting principles explain that there should be a; “clear connection between resource allocation and plans, budgets and forecasts” (CIMA, 2014, p.40). Resource allocation models provide the means for distributing budgets across an institution in an appropriate manner.

The importance of revenue forecasting and resource allocation in the HE sector is emphasised by Caruthers and Wentworth (1997, p.88): “Linking revenue forecasts and institutional-planning exercises is important because the level of available revenue is likely to affect the development of new programmes; the use of private contractors; the next tuition fee adjustment; and the repair, renovation, or construction of campus facilities”. Thus "a more efficient allocation is achieved by expanding operations with high marginal benefits and contracting or qualitatively modifying those with low ones" (Razin & Campbell, 1972, p.308). It is also claimed that the optimal allocation of resources may address administrative inefficiencies in the sector (Casu & Thanassoulis, 2006).

However, Virdee and Keeble (2017) suggest that from a university strategic planner’s perspective the workings of the resource allocation model and the forecasts of income that underpin it are of less importance than how the model is used to deliver the strategic plan. This perspective is perhaps different from finance officers seeking to deliver a model which incorporates realistic income projections and an effective allocation process.

Budgets have a great potential as a means for resource allocation, but the widespread use of incremental budgeting implies that they are not effective and limit the possibility for making significant changes. As Shattock (1981) noted, in periods of expansion ‘equity’ tends to rule and committees concentrate on cutting up the academic cake fairly. Successful strategies for the future, however, will almost certainly depend on making accurate and informed choices about which academic areas to support and which to run down. When: “Facing gradual decreases in higher education funding, resource allocation plays a crucial role in maintaining and even improving the performance of a university” (Ho, Dey & Higson, 2006, p.335). As resources become scarce their allocation comes under greater scrutiny (Schick, Sherr & Tuggle, 1982). This may lead to conflict

between the areas of a university that 'earn' it and central support departments (Groves, Pendlebury & Newton, 1994).

A study of the resource allocation practices of five universities by Rubin (1977, p.250) illustrated the problems of moving from an incremental basis to a more targeted approach during a period of retrenchment, with the re-allocation of scarce resources from shrinking to growing departments. The reduction in budgets led to a distorting of information. As Rubin explained "individuals began to make conservative estimates of resources and exaggerate expenditures".

Conversely, the expansion of student numbers has in the past encouraged the extensive use of formulae driven budgets (Shattock, 1981; Scapens & Ormston, 1992; Liverpool, Eseyin & Opara, 1998). Formula budgeting has taken some of the potential for disagreement out of the decision making process, making it less time-consuming, and also made forward planning much easier at the departmental level (Jones, 1994b; Borgia & Coyner, 1996).

Formula budgeting represents a combination of technical judgements and political agreements (Meisinger, 1976) which can break-down when conditions change. Shattock (1981) gives an example of two universities which allocated resources virtually automatically against enrolment driven formulae. This worked well until the formulae required more funds for allocation than the universities could provide and the central committee sought to withdraw funds from underperforming departments. In each case the result was across-the-board cuts and the reduction in spending freedoms. Although many universities adopt some form of formulae funding in allocating resources (Schick, 1985; Williams, 2012; CIPFA, 1997 & 2012), the unique characteristics of institutions can limit the usefulness of formulae based approaches (Lee & Van Horn, 1983).

A study by Thomas (2000) of the change from a historic centralised system of resource allocation to a devolved formula-based system at two UK universities found that micropolitical activity based on self-interest existed. Furthermore "a move towards a more numerate, analytical and systematic base for decision-making can place an increased responsibility on institutional managers for the accuracy of that information" (Spathis & Ananiadis 2004, p.204). Indeed, the pursuit of accuracy may be used to justify constant changes to a model leading to "a situation

where very few people understand the model any more, with new staff totally perplexed” (Field & Klingert, 2001, p.87).

Elaborate formulae have been jettisoned by some institutions either because they proved to be too expensive or the judgements they incorporated were no longer relevant (Shattock, 1981). There has also been a tendency for temporary expedients to be incorporated, often very uncomfortably. The dangers of this situation are only too obvious. Constant small-scale adaptations may keep procedures going on a short-term basis but can lead to those procedures being less reflective of longer term external changes. Moreover, the credibility of the decision-making process is increasingly eroded as the accuracy and equity of allocating resources to where they are generated or needed becomes increasingly flawed.

The model adopted should be continually reviewed and deficiencies highlighted so that remedies can be found. Essentially, models incorporate a balance between ease of use and understanding by managers and the need for sufficient complexity to incorporate key variables. As explained by Locke (2007, p.95) the model adopted “needs to be intuitively understood and perceived to be fair”, although Bublitz and Martin (2007) cautioned that it may need to incorporate cross-subsidies if significant programmes in expensive areas are to be maintained.

Cross-subsidies can create tensions within an institution. Liefner (2003) explained that resources should be allocated to areas which have been successful and continue to show promise in the future. Lewis and Pendlebury (2002, p.36) found that finance directors of HEIs were less tolerant of cross-subsidies to support areas in deficit than other senior staff. Furthermore, in commenting on the methods used to allocate overheads, they noted “the importance that is often attached to accounting numbers, even when these numbers are known to be of limited accuracy”.

Taylor (1982), when describing resource allocation in UK universities, noted that although methods of resource allocation had a number of identifiable patterns, there was still a great deal of diversity, and this appears to still be the case today. The method employed has the potential to over or under-allocate resources which may lead to budget variances and therefore perceived inaccuracy

### **2.3.4 Financial planning scenario models**

Scenario modelling is rarely addressed in the context of financial sensitivity analysis within a university and there is an absence of guidance from the university Funding Councils on the approach to take.

An important aspect of developing university scenario models is the ability to identify key variables. These might be considered to be areas of significant risk or opportunity for universities and can be found in publications by Grinold, Hopkins and Massy (1978), Fearn (2009), Grant Thornton (2016a), Davies and Jackson (2016) and KPMG (2017).

The importance of scenario modelling is explained by Grant Thornton (2016a, p.8):

The higher education sector no longer operates in a static environment. By the time an institution understands and documents the current state, the environment most likely has changed. It is difficult to prognosticate, but a thorough process needs to postulate a variety of outcomes or scenarios to stay nimble.

Morrison et al. (1984, p.14) comment that higher education “institutions would do better to try to anticipate events that might differ from the economic, social, and political conditions of the present”. By running scenario models a university can ascertain whether or not it can operate viably in the future given changing circumstances.

To effectively construct scenario models it is necessary to determine the nature of fixed and variable cost behaviour patterns. Lenzen, Benrimoj and Kotic (2010, p.170) offer an example in a university context where they found that: “Increases in demand for research lead to about equal increases in wages and operating inputs, whereas increases in demand for teaching lead mainly to increases in wages and also to surplus”.

Sayers (2010) gives case study examples of universities who have undertaken scenario planning exercises, including Universiti Sains Malaysia (Malaysia) and Bemidji State University (USA). The foreword from Sayers document, written by the Vice-chancellor of Universiti Sains Malaysian (Professor Dzulkipli Razak), noted that universities throughout the world are facing “turbulent and

uncertain times” and that: “It is imperative in this environment to look forward to the future with both as much accuracy as possible, and as much imagination as possible” (Sayers, 2010, p.2).

Richards, O’Shea and Connelly (2004) reported on an example of scenario planning undertaken by the University of Glamorgan to move away from relying on techniques such as SWOT and PEST analysis, Porter’s ‘Five Forces’ and traditional market research to inform its strategic practices.

Morrison et al. (1984) and Morrison (1987) also suggested the use of ‘environmental scanning’ to identify emerging issues that may pose a threat or an opportunity to a higher education institution. Whilst they recommended the use of a specifically formed group within a higher education institution for identifying important emerging issues using a structured approach, this role is often undertaken by the senior management team or governing committee on an on-going basis at UK institutions. It may also be undertaken throughout an organisation by the effective use of business partnering and horizon scanning (CGMA, 2015a; O’Mahony & Lyon, 2015).

Gee (1988) set out to design a financial planning model applicable to a UK university. His work commenced by modelling the relationship between price and quantity. However, Gee (p.130) specifically avoided “formulae expressing fixed ratio linkages” that might be viewed as a potential flaw despite offering some benefits. The model was used in an exercise to restructure academic salaries at the University of Salford, following cuts in funding, and for providing financial forecasts to the University Grants Committee (UGC). However, the University of Salford has not used this model for a number of years.

Arguments advocating the creation of financial models in UK universities can be found in the work of Sizer (1981, pp. 230-231) and in one of the CVCP (1987) case studies in respect of Aston University where financial modelling was strongly recommended for effective planning. More recently, arguments in favour of financial modelling can be found in Prowle and Morgan (2005) and in guidance from HEFCE on the production of the Annual Accountability Return. The lack of further developments in the period between these publications is perhaps explained by the expansion in student numbers during the 1990s and the increased funding available to institutions which reduced the perceived need to undertake risk analysis using scenario modelling.

Recent publications on financial scenarios have tended to be limited to analyses concerning the outlook for higher education spending in England and the potential withdrawal of funding (Crawford, Crawford & Jin, 2013) and brief comments on modelling undertaken by individual UK universities (Morgan, 2014b, p.7). Deloitte (2013, p.12) conclude that universities need to ask themselves the question: “What scenario planning is undertaken, and how does it factor in sensitivity analysis?” in order to effectively prepare for the future.

Makridakis, Hogarth and Gaba emphasise that:

On the negative side, one could brainstorm about the different classes of events that might threaten student registrations, research funds, faculty appointments, access to facilities, and so on. The question then would not be how to predict future values of these uncertain quantities, but how to generate ideas and develop strategies that could neutralize sources of threats. However, the focus does not need to be on the negatives; positive outcomes could be envisaged. Here the question centres on what contingency plans need to be developed should the positive outcomes occur (Makridakis, Hogarth & Gaba, 2009, p.811).

Universities in England are encouraged to undertake scenario planning. HEFCE’s annual assessment of risk letter sent to institutions in March 2016 referred to sector volatility and the growing variability of the financial performance of institutions. To address this, HEFCE encouraged “all institutions to monitor the wider changes in the sector, and continue to assess the risks and opportunities that these present”. Furthermore, they stated that: “Your scenario planning with your governing body will need to consider the financial and non-financial impact of possible future changes in student recruitment and retention, and staff pay and pension pressures” (HEFCE, 2016a).

Whilst there appears to be a recognition of the importance of undertaking scenario modelling, literature on how it should be performed is rare and does not address the type of financial modelling requested of UK universities. Such modelling should address the key risks and opportunities faced by each university and allow the effect of changes in such variables to be realistically tested in a logical manner that addresses the effect on both income and expenditure.

### **2.3.5 Importance of forecasting**

Whilst institutions monitor performance against budget using a variety of reporting formats, there is little to suggest a consistent review of performance against medium-term forecasts in the published literature. Shattock explains its importance:

Effective financial management in the mixed economy mode of university finance depends on accurate forecasting. Forecasting has become more difficult because more variables have been introduced into the financial picture. Financial planning can never therefore be precise but it can be improved by rigorous reviewing of the quality of forecasts made in the past. Universities that plot the variances to past forecasts of income and expenditure under various key headings in a structured way, subjecting each five year forecast of the main lines of income and expenditure to scrutiny at the end of that period, will not only improve their forecasting over time but will give themselves greater confidence in the financial room they have to take development decisions (Shattock, 2010, p.68).

The changing nature of the market in which universities operate means that accurate forecasting is becoming ever more difficult. The importance of performance reporting is emphasised by Berry (2014, p.313) who explains that: “Forecasting, enrolment modelling and strong fiscally sound recruitment and retention strategies need to be supported by transparent and relevant performance reports for all areas of a university. Understanding an institution’s own biases and prejudices helps to inform future forecasting”. Although some sector-wide data on financial forecasting has been made available at an aggregated level, little has been published on the effectiveness of forecasting techniques within institutions. Whilst HEFCE may recognise that forecasting is cautious (HEFCE, 2016b) there is little explanation as to why or how it should be effectively undertaken.

## **2.4 Recent surveys of university budgeting and forecasting practice**

Writers such as Yorkstone (2014) suggest that useful information can be gained from studying practices at organisations outside of the higher education sector which might then be effectively applied to HE institutions. Indeed, PricewaterhouseCoopers (2012b, p.1) explain that many budgeting and forecasting challenges “are common across all sectors and jurisdictions”. Therefore, a review has been undertaken of recent surveys of budgeting and forecasting to assist in developing the questionnaire for this research and to inform the research findings. Many of the surveys were undertaken in respect of assessing best practice in a commercial setting, but some also considered a mix of private and public sector organisations (see Appendix I).

Furthermore, although detailed questionnaire surveys of budgeting and forecasting practice in universities have been noticeably absent there has been a limited number of studies which have considered elements of management accounting in UK HE institutions including aspects of budgeting and forecasting. These surveys are summarised in Table 2.1 below:

Table 2.1 Questionnaire surveys of UK university management accounting practice

Authors	University Survey	Method	Response rate	Respondents	Main finding	Publication status
Lyne and Alhatabat, 2015	Use of management accounting practices in British universities	Electronic questionnaire	48% (59 from 123)	University finance officers	University satisfaction with management accounting methods	Conference paper (from unpublished doctoral research)
Holloway, 2006	Financial management and planning in higher education institutions	Single e-mailed question	63% (81 from 129)	Directors of Finance	Inadequate resourcing models which are not based on expenditure needs	Doctoral thesis
Berry, Clements and Sweeting, 2004	Financial management practices in UK universities	Postal questionnaire and 11 case studies	44% (43 from 97)	Directors of Finance	Lack of trust between academic managers and finance officers	ICAEW refereed research report
Lewis and Pendlebury, 2002	Cross-subsidy in colleges of higher education	Postal questionnaire	60% (176 from 294)	Managerial staff at 53 Standing Committee of Principals institutions	Finance directors are less tolerant of cross-subsidies than other staff	Journal article
Angluin and Scapens, 2000	Transparency and perceived fairness in UK universities' resource allocation	Postal questionnaire	60% (52 from 88)	Senior academics	The transparency of resource allocation and operations differs	Journal article
Newton, 1997	Financial decision-making in British universities	Postal questionnaire	52% (59 from 113)	Directors of Finance	Differences exist between old and new universities	Master's thesis
Cropper and Drury, 1996	Management accounting practices in universities	Postal questionnaire and 15 interviews	63% (63 from 100)	Directors of Finance	Opportunities exist to enhance university decision-making and control	Trade journal article

The above table provides details of each questionnaire survey, but excludes case studies such as those by Deering and Sá (2017), Dai (2016) and Broad and Goddard (2010). Reference is made to

more detailed aspects of these surveys in later chapters when analysing the results of this research in order to compare current and past UK university practices. There are also a limited number of surveys addressing budgeting processes in overseas universities (Goodwin & de Gouw, 1997; Otley & Pollanen, 2000; Tayib & Hussin, 2003; Nasser, Mah'd, Nimer & Al-okdeh, 2011; Simmons, 2012). Where relevant, aspects of these surveys are also referred later.

Many of these HEI studies considered methods and processes used to meet resourcing and budgetary needs which are often set in the context of the overall financial management of institutions, their organisation structures and the individuals employed in the process. However, none specifically addressed the issue of budgeting and forecasting accuracy or the use of scenario models.

## **2.5 A 'contingency theory' approach**

In a changing environment effective management information systems are required in order to support accurate budgeting. When reviewing the Jarratt Report, Jones (1986, p.109) noted the suggestion that uniform control systems might be introduced similar to those in large commercial and industrial organisations. However, he also emphasised that universities possess organisational characteristics that are different from commercial enterprises and that "different structures are likely to be served better by a contingent rather than a universalistic approach to ACS [accounting control and information system] design".

As individual universities have distinct organisational structures and processes, a contingency approach to the design of management accounting systems may provide a framework for improving performance and control by identifying those circumstances that are most suited to the operation of certain budgetary techniques or processes. Otley (1980, p.413) argues that: "The contingency approach to management accounting is based on the premise that there is no universally appropriate accounting system applicable to all organisations in all circumstances". Merchant (1981a, p.816) takes this a step further by explaining that "for maximum effectiveness, the design and use of administrative systems such as budgeting must vary with the setting" and builds upon the observation of Bruns and Waterhouse (1975) that "universal policy prescriptions about how budgets should be prepared would be unwise" (p.197). The budgeting or forecasting

process therefore needs to match the organisational structure and culture if it is to operate successfully (Hofstede, 1968; Dugdale & Lyne, 2010) and be considered as a legitimate accounting system (Moll & Hoque, 2011).

Prowle and Morgan (2005, p.121) observed that “the view is sometimes (incorrectly) expressed that since all HEIs are in the same line of business there should be some standard budgetary arrangement which will be optimal and apply to all HEIs”. However, institutions have differing histories, cultures, missions, mix of activities and subjects, organisation structures, resources, external pressures, capacity for change, etc. and organisational needs can be moulded and changed by stakeholders (Broadbent & Laughlin, 2005). What is appropriate for one may not be appropriate for another (Hearn & Heydinger, 1985; McNay, 1995; Lee & Piper, 1998; Otley & Pollanen, 2000; Jarzabkowski, 2002; Lapsley & Miller, 2004; McChlery, McKendrick & Rolfe, 2007; Taylor, 2012).

Hopwood (1980, p.221) notes that “emphasis on the technical rather than the organisation has resulted in an appreciation of budgeting, which is detached from the organisation setting in which it operates”. However, the budget is a reflection of the political structure of an organisation and reflects the outcomes of power and influence exerted by individuals and committees (Tonn, 1978; Pfeffer & Salancik, 1974; Pfeffer & Moore, 1980). Lyne (1990, p.217) offers the observation that: “The budget does not exist in isolation from the organisation in which it is found”. Those in the central finance function may have interests which are very different to other areas of an organisation. Therefore, any advice on best practice should be tailored to the particular circumstances of the individual organisation or attempt to group similar types of organisations provided that the blend of ‘contingency factors’ is not unique to the organisation.

“Contingency theory attempts to identify specific aspects of an accounting system that are associated with certain defined circumstances” (Otley, 1980, p. 47). Contingency theorists (Khandwalla, 1972; Bruns & Waterhouse, 1975; Gordon & Miller, 1976; Hayes, 1977; Dermer, 1977; Daft & MacIntosh, 1978; Waterhouse & Tiessen, 1978; Piper, 1980) have tried to identify what those circumstances might be despite the fact that the potential range of contingency factors is very large and it is impossible to study each one separately. They tend to fall within three major categories; the environment (degree of predictability, extent of the competition, number of

differing products and markets, and the hostility of the environment), organisational structure (size, interdependence, decentralisation and resources available) and technology (nature of the production process, routine or non-routine, understanding of relationships and the task variety).

There is a considerable amount of literature on contingency theory and its relevance to organisations. Reviews of this literature have been undertaken Otley (2016), Islam and Hu (2012) and Chenhall (2007). Otley (2016, p.11) offers the view that although contingency theory successfully gives insights into how differing management control systems have resulted in a range of different consequences the findings have been “tantalising inconclusive and has produced little cumulative knowledge”. The field research does not establish what does and does not work for a specific type of organisation (Saulpic & Zarlowski, 2014).

There is evidence to suggest that the theory does apply to HEIs in the work of Prowle and Morgan (2005) and Shattock (2010) whereby variations in budget processes might be explained by differences in the history, culture, mission, organisation, people, etc. of individual HEIs. However, empirical testing by Lyne and Alhatabat (2015) did not find evidence of university attributes which might explain the adoption of certain management accounting practices, such as type (pre- and post-1992), size, activity and strategy. The difficulty of finding such evidence is that it is not possible to isolate a broad range of variables and then test the effect of each. Universities are complex organisations which do not lend themselves to such an exercise as variables tend to be inter-related. Furthermore, relationships between variables can be cyclical and any predictions derived from a contingency theory approach may be dependent upon the stage in a product or economic cycle. Survey results may therefore be relevant to a specific stage in the cycle as well as the perceptions and personality traits of the individuals who respond. However, tentative relationships can be explored which might be developed into a framework.

Aspects of contingency theory would seem to apply at two levels in respect of the higher education sector between individual universities which can differ considerably from each other and also better universities and organisations in other sectors. Examples of contingency factors in a university setting can be seen in the external environment and organisation structures. For instance, the greater the level of uncertainty in the environment the more difficult it is to prepare accurate budgets and forecasts, but the more important it is to do so in order to derive meaningful

information for decision making. Chapman (1997) proposed that contingency frameworks should concentrate on uncertainty as the central concept to explore. There is evidence to suggest that the university sector has continued to adopt a cautious approach, generally resulting in favourable variances against budgets and forecasts, despite significant changes in the external environment.

Differing competitive strategies can lead to differing management control systems, with contingency theory research tending to focus on the work of Porter (1980) [product differentiation-cost leadership], Gupta and Govindarajan (1984) [build-hold-harvest], Miller and Friesen (1982) [entrepreneurial-conservative] and Miles and Snow (1978) [prospectors-analysers-defenders]. Although the cost leadership / defender / conservative approach is generally associated with rigid budgetary control and a tendency to drive out slack, the research in this area is fragmented and sometimes conflicting (Langfield-Smith, 1997). There has been some suggestion that universities have tried to pursue both product differentiation and cost leader strategies even though they do not sit comfortably together (Parker, 2013) and is an approach seen in public sector organisations (Goddard & Simm, 2017). It is well known that university research activity in the UK is charged at below cost, generally subsidised by teaching activity (Olive, 2017), but seen as high quality. Universities do not however compete on cost in terms of recruiting full-time home and EU undergraduate students where the majority moved to the maximum fee chargeable as soon as possible.

Furthermore, various studies have found that larger organisations tend to use more sophisticated management accounting systems as they have more resources to spend on such systems. This is relevant to HEIs as recent history suggests a growth in the size of institutions (Tight, 2013; Estermann, Pruvot & Claeys-Kulik, 2013; Matthews, 2013).

Kolassa (2008, p.13) explains that “each industry and each company faces its own forecasting problems with its distinct time granularity product mix and forecasting process”. Control systems differ by industry type, and organisational culture can have a significant effect on how formal systems and processes operate in practice. Universities tend to have autonomous cultures with systems and processes tailored to the specific needs of each institution, but many of these systems are used to meet a common purpose, such as preparing and monitoring budgets and forecasts.

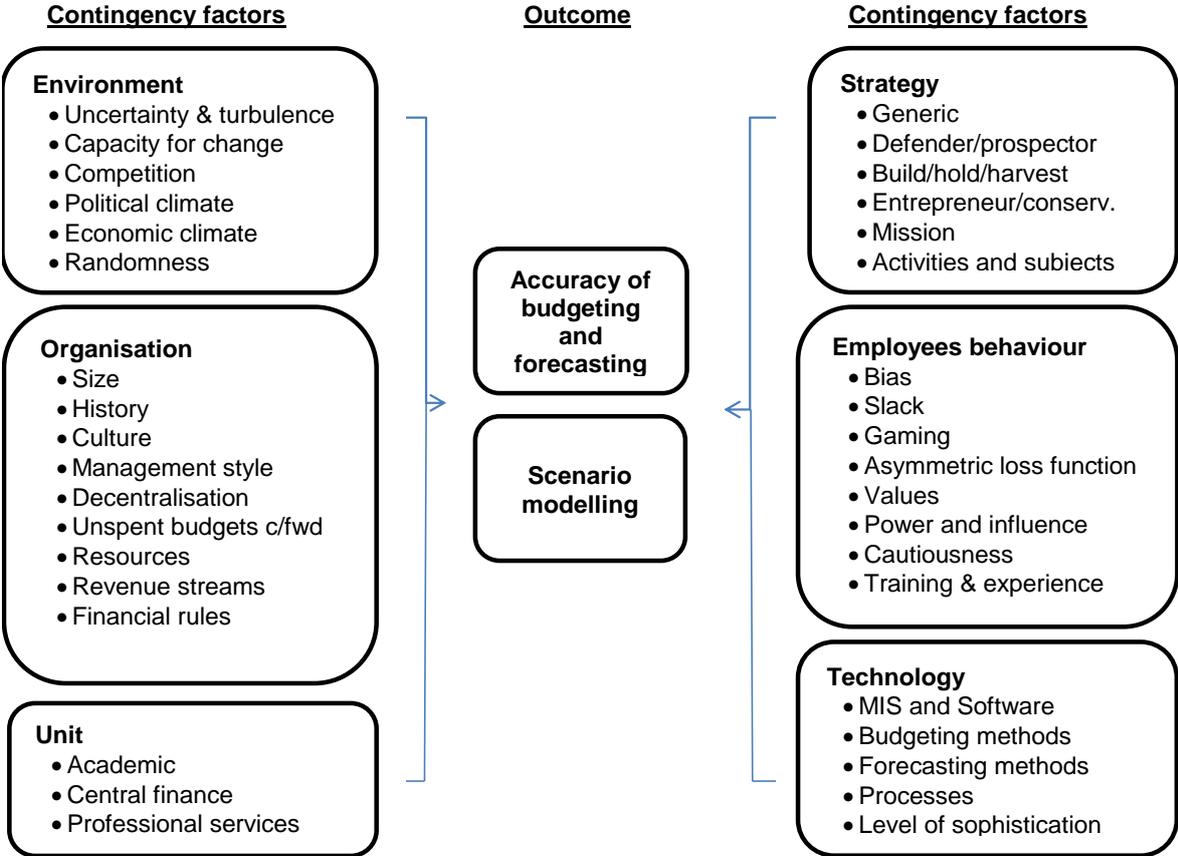
Overall, there appears to be no single best approach to budgeting and forecasting. For example, the Audit Commission have identified problems associated with inaccurate forecasting in the NHS, but have not provided guidance on how to address this. They emphasise that: “It is difficult to produce a standard guide for how forecasts should be prepared. NHS organisations, and management structures and styles, are simply too diverse” (CIMA 2007, p.3). Universities are similarly complex organisations.

Despite the lack of conclusive evidence that contingent factors explain the adoption of certain management accounting techniques, contingency theory does offer a means for assessing which variables may or may not influence the accuracy of budgeting and forecasting. It is also apparent from the literature that universities have rarely featured in published studies on contingency theory.

## **2.6 Framework on the influences of accuracy and use of scenario modelling**

Having considered the literature in relation to budgeting, forecasting and scenario modelling it is possible to set out a framework of the influences on accuracy and the use of scenario modelling in Figure 2.1 below, drawing on contingency factors identified in the academic literature and through previous surveys. These factors are grouped by theme.

Figure 2.1 Framework of influences on accuracy and scenario modelling



(Source: Author’s own analysis)

Contingency theory offers an explanation for the differing practices adopted by universities in terms of the environment, organisation and technology (expressed as contingency factors within Figure 2.1). Interaction with the external environment influences the organisation’s strategy and its desire to achieve success and legitimacy. Furthermore, employee behaviour (which leads to the introduction of bias or slack) and the technology used (in terms of management accounting methods and software applied) can both have an effect on the achievement of accuracy and the approach taken to budgeting, forecasting and scenario modelling. Identifying potential contingency factors, as shown above, provides guidance on the variables that might be investigated further as to their influence on budgeting and forecasting accuracy and the scenario modelling employed, particularly given the recent changes in university funding and increased importance placed on financial management.

## 2.7 Financialisation

Financialisation essentially defines the greater attention directed towards costs and other financially-oriented metrics, cost-revenue analysis and management, key financial performance indicators, benchmarking, budgeting, forecasting, and strategizing (Parker, 2013).

The term has been promoted in explaining that universities are becoming more financially self-sufficient and pursuing a wide range of income generating activities. Operation and cost efficiencies are viewed as a key objective alongside the traditional activities of teaching and research, with claims that performance accountability practices have been transformed as a result of the pursuit of changing strategies, leading to a greater focus on managing resources and generating surpluses for sustainability purposes (Morgan, 2014b). HEFCE explain that:

In an increasingly competitive environment, and with significantly reduced levels of publicly funded capital grants, institutions will need to generate surpluses and operating cash inflows to finance future investment in facilities sufficient to attract home and international students. Otherwise there is a risk that the quality of the infrastructure in the higher education sector will reduce, which will harm its long-term sustainability. (HEFCE, 2013b, p.18)

Of course, such changes are not just restricted to universities, they are now a global phenomenon under the New Public Management philosophy where the requirement to pay for services has moved away from central government towards the end user and organisations adopt commercially orientated business approaches to financial control. Such a market place has resulted in a convergence of homogenous missions, products, services and university profiles. Lee (2008) argues that quantitative performance measures, such as budgets, now occupy a prominent position in the pursuit of financial viability even though more significant qualitative measures should be the primary focus.

Universities world-wide have become much more commercially focused with strong global competition for fee paying students. The efficient use of resources through strategic planning, budgeting, financial control and effective reporting are seen as a key concern of the management who lead such institutions. Increasingly, universities are being permitted to at least partially set their own tuition fee rates whilst still being required by governments to conform to funding rules and systems of accountability which allow resourcing and output to be clearly monitored. The risk

is that quality will be driven down as a result of pursuing increased student numbers but with a reduced cost base.

The monitoring and application of resources and the resulting effect on quality is a complex issue. The management of those resources needs to be carefully controlled where it now drives organisational strategy. There is a greater focus on budgetary control in pursuing financial viability, with financial information being key to effective monitoring. Many university KPIs now include finance as an important component and financial targets are cascaded throughout an institution, which carries the risk of unintended dysfunctional behaviour. Coupled with this is the growth in managerialism with some arguing that the traditional managerial role of academics is being taken by professional managers (Bogt & Scapens, 2012). League tables have also influenced attitudes on the measurement of teaching and research performance, and often include financial data.

In pursuing this financialisation argument, Parker (2013, p.11) explains: “The picture of financial management and accountability in universities is now a highly complex one that contains significant contradictions and tensions”. He points to the reducing provision of resources from governments in many countries (Parker, 2012b), but argues that their demands for accountability have often been increasing. Furthermore, it is claimed that a drive by governments to expand university outputs in the pursuit of mass higher education has resulted in an increase in private providers to facilitate expansion at minimal cost.

Internally, universities use formalised systems for budgeting and control, with a focus on resource efficiencies, but performance can be masked by the cross-subsidisation of less attractive or more expensive teaching programs from those which are high earners (Angluin & Scapens, 2000). This cross-subsidisation prevents mission drift by allowing academic work to be preserved that might otherwise not be pursued due to a lack of resources. In addition, research accounting systems are seen as taking on an enhanced role in the monitoring and reporting of financial performance. There is also a focus on the generation of institutional surpluses to support initiatives such as the development of infrastructure, new buildings and facilities for students.

Accounting systems for budgeting, forecasting and scenario modelling are thus seen as gaining an increasingly important role in this new university world where institutions have been liberated to

pursue diverse income streams and manage their own resources, but are they really fit for purpose? They are increasingly relied on as being a facilitator of a change in universities from their core academic values to one which places emphasis on financial fundamentals. The point is not lost on Parker (2013, p.20) who argues that “the fundamental roles of universities, namely research and education, show every sign of having become contributory supports to an increasingly dominant financial strategy imperative”. It is claimed that less focus appears to be given to knowledge generation and transmission and more to revenue and surplus generation, although success in the two areas are clearly linked. Parker (2012b, p.263) claims that “we see financial management move from the margins of its traditional decision support role in higher education institutions, to centre stage”.

Changes in the global higher education market are also reflected in those taking place in the UK. Parker (2013) notes the use of extensive KPIs, incorporating financial measures, at institutions including Lancaster University. He also specifically refers to the expansion in the number of UK universities in the latter half of the twentieth century and the growth in student recruitment, which has come with increased class sizes and an emphasis on vocational subjects, as well as an increased focus on financial reporting. Thus leading to claims of a metamorphosis of universities into private-sector businesses (Hudson, Prialx & Guth, 2017).

As a result, Parker (2013) identifies an urgent need for research into the use of accounting systems and performance measurement, including the mode of implementation. If there is an increased level of importance attached to financial planning, a better understanding of attitudes towards budgeting, forecasting and scenario modelling might offer an insight in to whether such systems are keeping pace with the changing nature of universities or if outdated incremental approaches still dominate (Ezzamel & Bourn, 1995). Do budgets really reflect the likely performance of institutions as they strive to meet their changing objectives (Bourn & Ezzamel, 1987) or are they unreliable? If the latter is the case, what is the effect of such unreliable measures on UK universities? An increasingly risk averse approach could lead to unduly cautious budgeting and missed opportunities. Effective financial management within universities would appear to be dependent upon achieving accuracy (Shattock, 2010).

The emerging financialisation of universities would imply that there should be a drive towards the increased use of accurate and ‘sophisticated’ budgeting and financial planning methods. Therefore, evidence of financialisation should loom large in the findings of research into the practices employed by universities. It should be possible to find support for Parker’s argument that greater emphasis is being placed on financial performance when assessing propositions such as: universities are making greater use of alternative budgeting and planning approaches as they develop their practices and that accuracy is indeed considered to be important in budgetary control if this technique is to be used to assess performance.

If greater financialisation is not taking place in UK universities, in contrast to the global changes suggested by Parker (2012a, 2012b, 2013), there should be evidence to suggest why. For example, are there contingent factors which cause universities in the UK to concentrate on managing their income more than their costs which results in an incremental budgeting approach? In which case, financialisation may be incomplete and only partially applied in contrast to other countries such as Australia where more cost pressures may be evident. Universities may be going through differing stages of financialisation in different countries depending upon changes in their environment.

## **2.8 Conclusion**

This chapter considers some, but not all of the extensive literature on budgeting, forecasting and scenario modelling. The key literature indicates that bias is a primary cause of inaccuracy and may be introduced either intentionally or unintentionally. Human behaviour can lead to a cautious approach as it is perceived that less harm is done when favourable variances arise. Control and performance aspects of budgeting also have a key role in the extent of this bias, particularly where the individual has something to gain from setting an ‘easy to achieve’ budget or forecast.

Furthermore, these behaviour patterns can be perpetuated from one year to the next as a result of the methods adopted. The literature refers to the continued use of traditional and conservative approaches such as incremental budgeting despite calls for more radical methods along with the greater use of information technology to support processes. More specifically, the changing environment in which universities operate appears to have had little impact on the approaches adopted as there are few recent publications to indicate that more complex or less traditional

budgeting and forecasting methods are being used. This might be explained by the individual circumstances of each university which can have a bearing on the level of accuracy achieved. Contingency theory suggests that differing approaches may be taken due to a variety of internal and external factors affecting each university. This theory offers the basis for explaining why there are no specific and detailed guidelines for best practice that the HE sector could follow on budgeting, forecasting and scenario modelling. However, there should be sufficient commonality between universities to suggest approaches on a general basis that institutions might wish to consider even if these are ultimately rejected.

Many of the difficulties faced by both private and public sector organisations in achieving accuracy would also seem to be applicable to universities and these are explored in the research questionnaire results and interviews in subsequent chapters. In particular, certain themes emerge from the literature review which can be considered in a university context to determine if they influence accuracy. These include budget processes and methods, resource allocation, budget participation, financial reporting, use of IT, organisational strategies, internal organisational dynamics, the external environment, etc. Furthermore, gathering information on scenario modelling allows current practices to be assessed and shared with the sector in order to fill the void in this area.

## **Chapter 3**

### **Research hypotheses and propositions**

#### **3.1 Introduction**

The literature on budgeting, forecasting and scenario planning reviewed in the previous chapter made reference to the available publications on university finances. Sufficient evidence was available to develop a framework to assess and evaluate the current practices of universities, the accuracy of those practices and the effect of the external environment. The latter being regularly examined as a contingent factor in the study of organisations.

In response to the research questions stated earlier, this chapter identifies hypotheses and propositions to examine if budgeting and forecasting practices are perceived to be sufficiently accurate, the possible contingent factors influencing that accuracy and the characteristics of financial scenario models used by universities. This should assist in identifying if there is evidence of an emerging financialisation of universities, with greater attention directed towards costs and revenues through budgeting, forecasting and scenario modelling practices.

These hypotheses and propositions are grouped according to key themes which might be considered to have an influence on accuracy and the use of scenario modelling.

#### **3.2 Hypotheses and proposition development**

As noted in Chapter 2, previous studies of HEIs have looked at budgeting practices without considering accuracy or financial scenario modelling.

The survey questionnaire used to gather evidence to support or disprove the hypotheses and propositions below is shown in Appendix III and reference is made to individual questions in the following section. Where applicable, data is also drawn from the Higher Education Information Database for Institutions (HEIDI) to supplement the results of the questionnaire in testing the hypotheses and judging the propositions (Note: HEIDI is a benchmarking tool available to all HEIs on a subscription basis and offers bespoke comparison reports and data extraction facilities on a

broad range of data which is added through scheduled releases). This data covers institutional surpluses/(deficits), income streams, expenditure, staff and student numbers, and is used when assessing financial strength, institution size, structure and diversity of activity. Unfortunately, no data on budgets or forecasts is released in HEIDI.

Cooper and Schindler (2008, p.64) offer a definition of a proposition as “a statement about observable phenomena (concepts) that may be judged as being true or false”, whereas a hypothesis is a logical assertion which can be subjected to testing. Thus, propositions are of a qualitative nature and hypotheses involve quantitative analysis. In many instances, data from the questionnaire can be converted in to a quantitative analysis (e.g. where a Likert scale is used). In these cases a hypothesis is derived. In other instances such testing is not possible and a proposition is put forward.

The hypotheses and propositions were derived from identifying some of the key areas within a university which were considered to have a significant influence on the accuracy of budgeting and forecasting and the use of scenario modelling. These include the organisation’s finances and structure, together the processes, practices, systems and people involved. The discussion below identifies the key literature used for the development of the hypotheses and propositions, within the context of a contingency theory approach to test and explore contingent factors. ‘C1 Accuracy of budgeting’ appears in most of the hypotheses and propositions as it is the dependent variable.

The term ‘accuracy’ is considered in the context of being neither overly cautious nor optimistic, and its meaning is considered further in section 7.3.

The hypotheses and propositions are grouped as follows:

1. Accuracy
2. Financial strength
3. Institutional size, type and processes employed
4. Scenario models adopted
5. Level of importance, the use of IT and methods of resource allocation
6. People involved in budgeting and forecasting

### 3.3 Hypotheses and propositions defined

#### 1. Accuracy

- 1.1 An institution which adopts a cautious approach to budgeting (by including provisions, contingencies and slack) may also take a cautious stance when preparing other projections such as medium-term forecasts and when estimating student numbers. By adopting a consistent approach the user of financial information can place confidence in the consistency of the outcome (i.e. a favourable or adverse variance) even if the degree of accuracy is uncertain (White, 1986). A positive relationship may be found between accuracy of budgeting, forecasting and student number planning, demonstrating consistency.

Survey Questions: C1 Accuracy of budgeting, C2 Accuracy of student number estimates, E10 Accuracy of forecasting

*Hypothesis H1 - There is a significant positive relationship between the perceived accuracy of budgeting, forecasting and student number estimates [which contribute to the key income stream of most institutions].*

#### 2. Financial Strength

- 2.1 The university sector generally adopts a cautious approach to budgeting and forecasting as evidenced by various sector financial health reports (HEFCE 2012a; HEFCE 2012b; HEFCE 2013a; HEFCE 2013b; HEFCE 2014a; HEFCE 2014c; HEFCE 2015b; HEFCE 2015c; HEFCE 2016a; HEFCE 2016b). Thus, a negative association should be apparent between the financial strength of an institution and the accuracy of the budgeting process. Institutions with cautious budgeting methods may overstate predicted expenditure and understate anticipated income leading to higher surpluses than might have been authorised at the outset by the institution's governing committees. The surpluses of institutions with inaccurate budgets and forecasts, due to the cautious approach, may be

higher than those which have little opportunity to build in contingencies, provisions and slack because they require the resource to be released at the outset.

Survey Questions: C1 Accuracy of budgeting, C4 Accuracy impact of new fee regime, E17 Views on forecasting

HEIDI Data: Operating Surpluses/(Deficits)

*Hypothesis H2 - There is a significant negative association between the financial strength of an institution and perceived budgeting accuracy.*

- 2.2 In order to minimise variances from budget, organisations may exert tight budgetary control and use a number of differing approaches to avoid budget slack (Hopwood, 1976; Schiff & Lewin, 1970; Van der Stede, 2000; Vonasek, 2011; Kaye, 2012; Ghosh & Willinger, 2015). Top-down budget setting involves a non-participatory approach with subordinates having little influence on target setting unlike a bottom-up process where there is a great deal of subordinate involvement (Drury, 2015). A reason for a top-down approach could be that the organisation is not financially strong and finds it challenging to achieve a balanced budget or address adverse variances. In such instances, there may be a positive association between institutions with low surpluses or deficits (and perhaps low reserves) and the exertion of tighter budgeting controls particularly in an uncertain and competitive environment.

Survey Questions: B1 Budget approach, B2 Budget control period, C1 Accuracy of budgeting, D3 Ease of obtaining new resources

HEIDI Data: Operating Surpluses/(Deficits)

*Hypothesis H3 - There is a significant positive association between institutions with low surpluses or even deficits, perceived budgeting accuracy and the exertion of greater budgetary controls [in order to avoid a far worse position than originally planned].*

### *3. Institutional size, type and processes employed*

3.1 A contingent approach needs to be taken to the study of budgeting and forecasting accuracy. Merchant (1981, p.815) explains that “as organisations grow and become more diverse, they tend to decentralise and implement a more administratively-oriented control strategy which involves greater structuring of activities”. He classified ‘administrative control strategy’ as having the following characteristics; greater participation in the budgeting process by middle and lower level managers, increased importance placed on achieving the set budget, more formal communication and greater use of sophisticated budget systems. By testing areas such as the frequency of plan updates, the degree of information detail in the plan, the sophistication of computer support systems and the use of zero-based budgeting, etc. he concluded that there was some support for the hypothesis that larger, more diverse, decentralised firms used an administrative control strategy. Thus giving support to the general contingency theory notion. Merchant’s study of a single-industry (electronics) follows earlier evidence taken from a multi-industry setting by Bruns and Waterhouse (1975) that approaches to budgeting follow a corporate context. It may be the case that HEIs which claim to budget and forecast accurately have specific characteristics. If so, there may be a positive relationship between the size of the institution, the central finance staff employed, the budget approach, and the resulting accuracy. However, the data does not support a rigorous test for contingency theory. Instead, contingency theory is used as a means for explaining the level of accuracy achieved by universities.

Survey Questions: A1 Colleges, faculties and schools, A2 Support departments,  
A3 Central budgeting and forecasting staff, C1 Accuracy of budgeting

HEIDI Data: Expenditure, Student numbers and Staff numbers

*Hypothesis H4 - There is a significant positive relationship between (a) the size of the institution, (b) the staff employed in the central finance department and perceived budgeting accuracy.*

3.2 Many university activities are organised in to annual cycles (Dugdale, 2016). The date on which the budget cycle begins varies between universities. Some English institutions commence at the beginning of a ‘planning round’ in the late Autumn prior to the budget year, whilst others wait for the HEFCE grant letter to be issued after Christmas or when details of the institutional grant allocations are announced in March before undertaking detailed work on the budget. A shorter budget cycle which commences as close as possible to the beginning of the coming budget year may lead to greater accuracy as the data on which it is based is more up to date (Lawrence & O’Connor, 2000; CFO Research Services, 2011). Furthermore, an extended budget cycle may allow greater participation in the process with cautiousness being included at differing levels within the institution (Rubin, 1977; CFO Research Services, 2011). There may be an association between the time taken to complete the start of year budget and the degree to which a cautious approach is taken. As budgets and forecasts may quickly become out of date institutions might judge that a more cautious approach is necessary in order to counter the danger of assumptions becoming obsolete, particularly as favourable variances may be better received than adverse variances.

Survey Questions: B3 Budget preparation time, C1 Accuracy of budgeting

*Hypothesis H5 - There is an association between the time taken to complete the start of year budget and the degree to which a cautious approach is taken.*

3.3 Budget gaming behaviours have been identified as one of a number of criticisms of budgeting processes (Ekholm & Wallin, 2000; Dugdale & Lyne, 2006), but can also work to the benefit of organisations by providing resources to exploit opportunities (Wiersma, 2017). In a HE context, Kaye (2012) refers to the ‘budget game’, with faculties wanting a generous loose budget in contrast to the university’s corporate management which would like tight and stretching targets. Some adverse behaviours might be overcome by allowing the ‘carry-forward’ of unspent budgets, but this practice appears not to be common in the university sector (Angluin & Scapens 2000; Dugdale & Dai, 2013). Those unable to retain unspent balances are perhaps more likely to fully spend their budget, even where the expenditure becomes unnecessary, rather than risk losing resources. Therefore, a

negative relationship may exist between the accuracy of expenditure budgeting and the permission to carry forward unspent budgets. Those able to carry forward unspent budgets may be content to incur favourable expenditure variances.

Survey Questions: B6 Budget gaming, B7 Effect on accuracy, B8 Carry forward of unspent balances, B9 Effect on accuracy of carry forward, C1 Accuracy of budgeting

*Hypothesis H6 - There is a significant negative relationship between budget gaming behaviours, the permission to carry forward unspent budgets and perceived budgeting accuracy.*

- 3.4 There may be a negative relationship between the diversity of an institution's activities and the perceived accuracy of its budgeting. Teaching intensive institutions might budget and forecast more accurately than research intensive universities because they generally have fewer and more predictable activities, with courses running over a longer lifespan, on which to develop predictions and can therefore acquire a more in-depth knowledge of the estimated income and expenditure of those activities. By comparing the average income for each major stream of university funding over a two year period it might be possible to identify a correlation between accuracy and differing income streams.

Survey Questions: C1 Accuracy of budgeting

HEIDI Data: Income streams

*Hypothesis H7 - There is a significant negative relationship between the diversity of an institution's activities and perceived budgeting accuracy.*

- 3.5 Pre- and post-1992 institutions tend to have differences in terms of their management, resources and performance (McCormack, Propper & Smith, 2014; Grant Thornton, 2016b). Pre-1992 institutions have also been established in their current markets for longer and may therefore have a better understanding of those markets. Studies in other

sectors suggest that accuracy may be greater in longer established organisations due to their knowledge of the history of trends, market behaviour and understanding of the business environment (Winklhofer, Diamantopoulos & Witt, 1996; Jelic, Saadouni & Briston, 1998; Diamantopoulos & Winklhofer, 1999; Cheng & Firth, 2000). In which case, there might be an association between the type of institution (i.e. pre- and post-1992) and the development of more accurate budgeting and forecasting processes.

Survey Questions: B5 Budget and strategy, C1 Accuracy of budgeting, C2 Accuracy of student number estimates, C4 Accuracy impact of new fee regime, E10 Accuracy of forecasting, E11 Integrated software used for budgeting, E12 Software used for student number planning, G2 Budgetary system employed, G3 Use of funds checking, G4 Budgetary reporting

*Hypothesis H8 - There is a significant positive association between the type of institution (i.e. pre- and post-1992) in terms of (a) strategy and (b) IT employed and perceived accuracy.*

- 3.6 Writers such as Cammann (1976), Merchant (1981, 1985), West (1994), Dunk and Perera (1997) and Mentzer and Khan (1997) have indicated that there are benefits to be gained from greater participation in budgeting and forecasting, including accuracy. Therefore, a positive relationship may exist between participation in budgeting and forecasting and the accuracy achieved.

Survey Questions: B1 Budget approach, C2 Accuracy of student number estimates, E3 Preparers of financial forecasts, E4 Preparers of student number forecasts, E9 Impediments to forecasting, E10 Accuracy of forecasting

*Hypothesis H9 - There is a significant positive relationship between participation and perceived forecasting accuracy.*

- 3.7 The uncertain and dynamic environment in which universities operate (Randall-Paley, 2015; Gosling, 2016) means that past trends cannot be relied upon for forecasting

purposes (Brinkman & McIntyre, 1997). The environment has been undergoing dramatic change in recent years. There may be a positive association between recent changes in the environment and increased difficulty in preparing budgets accurately.

Survey Questions: C1 Accuracy of budgeting, C4 Accuracy impact of new fee regime, E17 Views on forecasting, G7 Proposed changes to budgeting and forecasting practices, G8 Time spent on planning, budgeting and forecasting

*Hypothesis H10 - There is an association between recent changes in the environment for HE institutions and perceived budgeting accuracy.*

#### 4. Scenario models

- 4.1 Developing a greater understanding of key drivers through modelling exercises has advantages (Jutras & Hatch, 2009, CFO Research Services, 2011; Pierone, 2013). Institutions are better able to create the conditions required to achieve the desired level of income and expenditure. Furthermore, improved accuracy of budgeting, forecasting and student number planning might be achieved because knowledge of key drivers can be applied in the creation of projections. Thus, a positive relationship may be found between the use of scenario models and the accuracy of budgeting and forecasting.

Survey Questions: C1 Accuracy of budgeting, C2 Accuracy of student number estimates, E10 Accuracy of forecasting, F1 Use of scenario modelling, F4 Variables used in scenario models, F5 Formulae used in scenario models

*Proposition P1 - There is a significant positive relationship between the use of scenario models and the perception of accuracy for budgeting, forecasting and student number planning.*

- 4.2 Certain types of institution may have more sophisticated and developed administrative systems and a more 'business' oriented focus. Post-1992 institutions may be more business-like because they are not as strong as pre-1992 institutions and are also more

resistant to academic culture than pre-1992 institutions. Newton (1997) found that new universities had more sophisticated computer systems for enhanced financial reporting. Therefore, a positive association may exist between the type of institution (i.e. pre- and post-1992) and the use of scenario modelling.

Survey Questions: C1 Accuracy of budgeting, C2 Accuracy of student number estimates, E10 Accuracy of forecasting, F1 Use of scenario modelling, F2 Purpose of scenario modelling, F4 Variables used in scenario models, F5 Formulae used in scenario models, F8 Integrated model for scenarios

*Proposition P2 - There is an association between the type of institution (i.e. pre- and post-1992) and the use of scenario modelling.*

- 4.3 The use of scenario modelling is common in many sectors, including higher education, with models adopted to meet the needs of each organisation. For English universities, the Funding Council has previously given an indication of what should be analysed when undertaking modelling exercises, such as changes in student demand, public funding, pay and pension costs (HEFCE, 2012a). It may be that there is sufficient consistency in the key issues identified within institutional scenario models to build a ‘standard’ model applicable for the sector.

Survey Questions: F1 Use of scenario modelling, F3 Updating of scenario model, F4 Variables used in scenario models, F5 Formulae used in scenario models, F6 Items excluded from scenario models, F7 System used for scenario modelling, F8 Integrated model for scenario modelling

*Proposition P3 - There is sufficient consistency in the key issues identified within institutional scenario models to build a ‘standard’ model applicable to the sector as a whole.*

## *5. Level of importance, the use of IT and methods of resource allocation*

- 5.1 Barrett and Hope (2006) suggest that in an uncertain environment it may be necessary to change methods, processes and systems to maintain forecasting accuracy. If accurate budgeting and forecasting is important to institutions, there should be evidence of efforts being made to ensure an effective approach and an emerging financialisation of universities.

Survey Questions: B5 Budget and strategy, C1 Accuracy of budgeting, C3 Changes to budgeting processes, C4 Accuracy impact of new fee regime, C5 Risk register, E1 Role of forecasts, E3 Preparers of financial forecasts, E5 Budget update following forecast update, E6 Forecasts prepared from budgets, E7 Period of forecasts, E8 Effect of FRS102 and FEHE SORP, E10 Accuracy of forecasting, E12 Software used for student number planning, E13 Review of forecasts, E14 Interest in benchmarking, E15 Attempts to benchmark accuracy, E16 Maintenance of aspirational targets, E17 Views on forecasting, E18 Techniques for forecasting

*Proposition P4 - Accurate budgeting and forecasting is important to institutions and efforts are made to ensure an effective approach.*

- 5.2 Management accounting theory would suggest the increasing use of more sophisticated systems as organisations try to cope with an uncertain and volatile environment (Gordon & Narayanan, 1984; Chenhall & Morris, 1986; Gul & Chia 1994; Haka & Krishmann, 2005; PricewaterhouseCoopers, 2012b). It may be found that universities use sophisticated tools, techniques and processes in deriving and maintaining budgets and forecasts.

Survey Questions: B4 Budget updating, B10 Budgeting methods, C3 Changes to budgeting processes, E2 Forecast updating, E17 Views on forecasting, E18 Techniques for forecasting, G1 Age of current financial software, G2 Budgetary system employed, G3 Use of funds checking, G4 Budgetary reporting, G6 Recent changes in budgeting and forecasting practices, G7 Proposed changes to budgeting

and forecasting practices, G8 Time spent on planning, budgeting and forecasting, G9 Use of Business Intelligence software, G10 Significant budgeting/forecasting problems, G11 Solutions to budgeting/forecasting problems

*Proposition P5 - Institutions use sophisticated tools, techniques and processes in deriving and maintaining budgets and forecasts, and increasing use is expected.*

5.3 The influential Jarratt Report (CVCP, 1985b) identified the need for improvements in resource allocation in universities and this topic has been the subject of a number of studies (Caruthers & Wentworth, 1997; Razin & Campbell, 1972; Rubin, 1977; Shattock, 1981; Lee & Van Horn, 1983; Schick, 1985; Watts, 1996; CIPFA, 1997 and 2012; Angluin & Scapens, 2000; Thomas, 2000; Field & Klingert, 2001; Lewis & Pendlebury, 2002; Casu & Thanassoulis, 2006; Ho, Dey & Higson, 2006; Holloway, 2006; Financial Sustainability Strategy Group and TRAC Development Group, 2011; Williams, 2012). A failure to appropriately allocate resources may result in some areas of an institution being over or under funded leading to budget variances, particularly in a changing environment. A positive relationship may therefore exist between the accuracy of budgeting and forecasting and the method of resource allocation employed.

Survey Questions: C1 Accuracy of budgeting, C2 Accuracy of student number estimates, D1 Resourcing model, D2 Resourcing linked to student number, D3 Ease of obtaining new resources, D4 Use of resourcing model for academic priorities, D5 Resource model changed due to new fee regime, E10 Accuracy of forecasting, G5 Sharing of budgeting and resources figures

*Proposition P6 - There is a significant positive relationship between the method of internal resourcing employed and perceived accuracy.*

## 6. People involved in the process

6.1 An employee's understanding of the sector, and of the institution at which they work, should assist the preparer of budgets and forecasts to achieve greater accuracy (Nasser et

al., 2011). It should also allow the individual to more easily identify and challenge budgets which appear to be inaccurate. Therefore, a positive relationship may exist between the experience of the person responsible for budgeting and the resulting budgeting accuracy achieved.

Survey Questions: C1 Accuracy of budgeting, and information about the respondent

*Hypothesis H11 - There is a significant positive relationship between the respondent's experience and perceived budgeting accuracy.*

- 6.2 Furthermore, a greater technical knowledge should assist the person to use the most appropriate methods and techniques well in order to increase accuracy. Therefore, a relationship may exist between the accounting qualifications of the persons responsible for budgeting and forecasting and the resulting accuracy achieved.

Survey Questions: A3 Central budgeting and forecasting staff, C1 Accuracy of budgeting, and information about the respondent

*Proposition P7 - There is a positive relationship between the respondent's qualifications and perceived budgeting accuracy.*

- 6.3 The greater the resource dedicated to the budgeting and forecasting process the more time that can be spent on developing an in-depth knowledge of the institution's activities and practices. Thus permitting a greater level of accuracy to be attained. Those who perceive a benefit from accuracy may employ more resources in this area (PricewaterhouseCoopers, 2012b). Therefore, a relationship might exist between the number of individuals employed centrally on budgeting and forecasting processes and the accuracy achieved (recognising that large institutions and those with diverse income streams are likely to employ more staff anyway).

Survey Questions: A3 Central budgeting and forecasting staff, A4 Finance staff in academic and service areas, C1 Accuracy of budgeting

*Hypothesis H12 - There is a significant positive relationship between the number of individuals employed centrally on budgeting and forecasting processes and perceived budgeting accuracy.*

Table 3.1 Summary of the hypotheses and propositions

Theme	Type	Hypothesis/Proposition	Questions	HEIDI
Accuracy	Hypothesis	The accuracy of budgeting, forecasting and student number planning are all correlated	C1, C2, E10	
Financial strength	Hypothesis	Cautious budgeting leads to higher surpluses	C1, C4, E17	Operating Surpluses/(Deficits)
	Hypothesis	Low surpluses or deficits lead to tighter budgeting controls	B1, B2, C1, D3	Operating Surpluses/(Deficits)
	Hypothesis	Institution size and structure of financial planning processes affects the accuracy of budgeting	A1, A2, A3, C1	Expenditure, Student numbers and Staff numbers
Institutional size, type and processes employed	Hypothesis	The time taken to prepare the budget affects the degree of cautiousness	B3, C1	
	Hypothesis	Permission to carry forward unspent budgets affects the accuracy of expenditure budgeting	B6, B7, B8, B9, C1	
	Hypothesis	The diversity of an institution's activities affects the accuracy of its budgeting	C1	Income streams
	Hypothesis	Certain types of institution (i.e. pre- and post-1992) have developed more accurate budgeting and forecasting processes	B5, C1, C2, C4, E10, E11, E12, G2, G3, G4	
	Hypothesis	Budgetary and forecasting participation affects the accuracy achieved	B1, C2, E3, E4, E9, E10	
	Proposition	Recent changes in the environment have increased the difficulty of achieving budgeting accuracy	C1, C4, E17, G7, G8	

Theme	Type	Hypothesis/Proposition	Questions	HEIDI
Scenario models	Proposition	Use of scenario models leads to more accurate budgeting and forecasting	C1, C2, E10, F1, F4, F5	
	Proposition	There is a positive association between the type of institution (i.e. pre- and post-1992) and the use of scenario modelling	C1, C2, E10, F1, F2, F4, F5, F8	
	Proposition	A consistent approach is adopted to the key drivers used within institutional scenario models	F1, F3, F4, F5, F6, F7, F8	
Level of importance, the use of IT and methods of resource allocation	Proposition	Accurate budgeting and forecasting is important to institutions and there is evidence of attempts to ensure an effective approach	B5, C1, C3, C4, C5, E1, E3, E5, E6, E7, E8, E10, E12, E13, E14, E15, E16, E17, E18	
	Proposition	Universities use sophisticated tools, techniques and processes in deriving and maintaining budgets and forecasts	B4, B10, C3, E2, E17, E18, G1, G2, G3, G4, G6, G7, G8, G9, G10, G11	
	Proposition	The method of resource allocation employed affects the accuracy of budgeting and forecasting	C1, C2, D1, D2, D3, D4, D5, E10, G5	
People involved in budgeting and forecasting	Hypothesis	The experience of the person responsible for budgeting and forecasting affects the accuracy achieved	C1, and information about the respondent	
	Proposition	The accounting qualifications of the persons responsible for budgeting and forecasting affects the budgeting accuracy achieved	A3, C1, and information about the respondent	
	Hypothesis	The number of staff employed centrally on budgeting and forecasting processes affects the budgeting accuracy achieved	A3, A4, C1	

### **3.4 Conclusion**

This chapter considered the development of hypotheses and propositions to investigate the accuracy of budgeting and forecasting and the use of financial scenario models. Key aspects of structure, size, practices and processes adopted by institutions were identified and reference was made to the relevant areas of the survey questionnaire where data might be used to judge the propositions and to test the hypotheses. Data from HEIDI also provides a useful source of information to enhance the analysis.

By referring to the literature identified in the previous chapter, the hypotheses and propositions in Chapter 3 provide a means for considering the data requirements to undertake this research study. A number of methods present themselves as routes for collecting the data to be tested and these are explained in the following chapter.

## **Chapter 4**

### **Research methodology and methods**

#### **4.1 Introduction**

This chapter explains the methodology and methods considered for gathering information to undertake this research. A number of options were identified prior to reaching a decision on the use of a survey questionnaire, supported by interviews. A mixed methods approach.

Mixed methods allow triangulation of the data. It is a popular approach (Bryman, 2006) and is recommended by some researchers (Tashakkori & Teddlie, 2003; Lapsley, 2004). An explanation is provided of each of the methods used together with how the data is analysed and the response rates achieved.

#### **4.2 Research approach**

Crotty (1998) explains that the research design should define the methodology and the rationale for the choice of methods. The former refers to the overall approach whereas methods are the means by which data is collected and/or analysed (Hussey & Hussey, 1997).

The methodology for this study is primarily positivistic. The justification for this is that the research is designed to examine key aspects of budgeting, forecasting and scenario modelling through a structured cross-sectional study which takes “a snapshot of an on-going situation” (Hussey & Hussey, 1997, p.60), with an emphasis on quantifiable observations to test defined hypotheses and judge propositions, and look for answers to questions more commonly expressed in the form of ‘what’ and ‘do you’ rather than ‘how’. Where possible, the results are subject to statistical testing for correlation in explaining causal relationships between variables (Saunders, Lewis & Thornhill, 2009), but the outcome is reviewed to consider whether a spurious relationship exists between variables (Bryman & Bell, 2011). A ‘deductive’ approach.

Data obtained from a survey might permit conclusions to be drawn about the sector. This assessment of current practices may provide the opportunity to offer recommendations for

improving the accuracy of university budgeting and forecasting systems, and the use of financial scenario models.

A survey could be undertaken using various methods, including:

1. A review of university websites and other published information
2. Self-completion questionnaire only
3. Self-completion questionnaire and follow-up interviews with all respondents
4. Self-completion questionnaire and follow-up interviews with a sample of respondents
5. Structured or semi-structured interviews only
6. Case study approach only
7. Case study, questionnaires and follow-up interviews

Options (3), (5) and (7) were discounted at any early stage as being resource intensive, but without necessarily adding significantly to what could be gained from other methods in addressing the research questions. Option (1) could be viewed as ‘archival research’ (Bryman, 1989). However, it would only be successful if institutions made sufficient information publicly available. It was impossible to discover specific and potentially sensitive information, such as the financial scenario modelling undertaken and the accuracy of budgeting and forecasting from university websites or published accounts. Whilst option (2) might result in a significant amount of data it was considered to offer only a partial analysis as the answers to the questionnaire could not be analysed further with respondents.

The remaining options gave a choice between a questionnaire and follow-up interviews, a case study approach and the use of a discussion group.

As individual universities tend to differ in their application of budgeting and planning practices, it was considered more appropriate to use a questionnaire and follow-up interviews than to use case studies of a few institutions. By collecting data from a large number of UK universities general conclusions might be drawn about the sector as a whole. A follow-up interview allows more specific questions to be asked which are appropriate to the particular respondent, and the interviewer can ensure all questions are answered. However, care must be taken to ensure that this

approach gives more than just a superficial view of practice (Ryan, Scapens & Theobald, 1992, 2002).

As an alternative to a questionnaire and follow-up interviews, case studies allow a more contextual approach to be taken, permitting a fuller understanding of the methods employed within the institution. However, as Otley and Berry (1994, p.108) note, case-based methods can be influenced by researcher bias and the findings can also “lack generalizability”.

The case study approach is particularly of value where there is already a broad understanding of the sector being researched. However, existing theories for this study are incomplete or inadequate. Information on budgeting and financial planning practice in the changing environment faced by the higher education sector is not available from the current literature.

Once it had been decided that a questionnaire should be used the instrument was constructed and tested with pilot universities (see section 4.3.2 below). The aim of the questionnaire was to collect some important information for a diagnosis of the present use and accuracy of budgeting, forecasting, resource allocation and scenario modelling methods in differing UK universities. Thus, finance officers were asked about the most important past, current and future tendencies of their institution, together with basic enquiries on the organisation structure and the individual completing the questionnaire. Officers from the central finance department were selected as they would likely be the decision-makers in respect of the management accounting practices adopted.

### **4.3 Survey questionnaire**

#### **4.3.1 Design**

Selltiz, Jahoda, Deutsch and Cook (1959) list a number of variables that can affect the response rate to survey questionnaires and the adequacy of the data collected including sponsorship of the questionnaire, attractiveness of the format, length of the questionnaire, nature of the accompanying letter, ease of filling out the questionnaire and returning it, inducements offered to reply, nature of the people to whom the questionnaire is sent, type of distribution and the nature of the follow-up.

Cluttered formats discourage responses, and Heberlein and Baumgartner (1978) conclude that even though a questionnaire may have to be longer, in terms of the number of pages, than average in order to avoid formatting problems it is just as likely to receive a response as a short instrument. However, other studies claim that length can affect response rates (e.g. Yammarino, Skinner & Childers, 1991).

Certain questions were designed to obtain factual information to permit an analysis of each university in its own context and structure, amassing a cross-section of comparable data. Others asked for details of possible future changes and opinions about practices employed. Despite the fact that opinions are to an extent subjective, they are important and it is possible with a large enough number of opinions to draw some conclusions.

It is difficult to analyse responses to open questions and only a limited number were included in the questionnaire (Bryman & Bell, 2011). Generally, descriptive answers were only required in order to explain more fully the responses to a preceding question.

Whilst a number of questions were included from similar questionnaires used for surveys of other organisations, it was nevertheless necessary to tailor the questionnaire to the specific circumstances of higher educational establishments. The majority of the questions were therefore unique to the survey conducted.

Recent conferences and sector specific publications (e.g. HEFCE reports) which addressed aspects of budgeting and forecasting in universities, as well as the researcher's own experiences working within a university, highlighted the areas where a cross-sectional analysis of current practices might be useful. Discussions with colleagues at the University of Huddersfield, and advice from practitioners at other institutions, helped to reduce, simplify and add to the questions raised. The source of each question in the questionnaire is detailed in Table 4.1 below together with the link of each section of the questionnaire to the research questions (RQs).

Table 4.1 Source of survey questions

Section	Question	Source of questions	Research question
(A) General information	A1-A5	Author	RQ3, RQ5
(B) Budgetary control and reporting	B1	Jutras and Hatch (2009); Develin and Partners (2009)	RQ1, RQ3, RQ5
	B2	Cropper and Drury (1996)	
	B3	Develin and Partners (2009); Libby and Murray Lindsey (2010)	
	B4-B6	Libby and Murray Lindsey (2010)	
	B7-B10	Author	
(C) Accuracy of budgeting	C1-C2	Author	RQ1, RQ2, RQ3, RQ4, RQ5
	C3	Dugdale and Lyne (2010)	
	C4-C5	Author	
(D) Resource allocation	D1-D2	Author	RQ1, RQ3, RQ4, RQ5
	D3	Libby and Murray Lindsey (2010)	
	D4-D5	Author	
(E) Forecasting	E1-E2	Economist Intelligence Unit (2007)	RQ1, RQ2, RQ3, RQ4, RQ5
	E3-E8	Author	
	E9	Economist Intelligence Unit (2007)	
	E10	CFO Research Services (2011)	
	E11	Financial Executives Research Foundation (2012)	
	E12	Author	
	E13	CIMA (2007)	
	E14-E16	Author	
	E17	Economist Intelligence Unit (2007); Libby and Murray Lindsey (2010)	
E18	Ahmad, Sulaiman and Alwi (2003)		
(F) Scenario planning	F1-F6	Author	RQ1, RQ5
	F7	Economist Intelligence Unit (2007); CFO Research Services (2011)	
	F8	Author	
(G) Current and future process	G1	Author	RQ1, RQ3, RQ4, RQ5
	G2	Financial Executives Research Foundation (2012); iGov (2013)	
	G3	Author	
	G4	Jutras and Hatch (2009)	
	G5-G6	Author	
	G7	Develin and Partners (2009)	
	G8	CFO Research Services (2009)	
	G9-G10	Author	

Relevance of the questions to the research aim and objectives was obviously important. The respondent's time is precious and should not be wasted on irrelevant, ambiguous, unnecessary or boring questions (Bryman & Bell, 2011). The questionnaire was designed so that respondents could omit questions that did not apply, particularly in the area of resource allocation where some of the pilot institutions indicated that they had no resource allocation (for distribution of expenditure budgets) or contribution model (for setting the required surplus for academic areas).

### 4.3.2 Piloting

Piloting a questionnaire is essential in order to check the validity and relevance of the questions, to remove potential flaws and check that instructions are clear and the data will be useable (Moser &

Kalton, 1985). It is best tested on the study population (Marshall, 2005). The draft questionnaire was therefore piloted with 20 universities ranging in size and type of institution between April 2013 and August 2014 to assess whether it could be improved. The institutions selected are shown in Table 4.2. These pilot institutions were primarily chosen because of previous contacts with the researcher and were of varying size and type.

Table 4.2 Pilot universities

Old University: Pre-1992	New University: Post-1992
Aberystwyth University	University of Central Lancashire
University of Bath	University of Cumbria
University of Birmingham	Edge Hill University
Cardiff University	Leeds Beckett University
University of Edinburgh	Liverpool Hope University
University of Hull	Manchester Metropolitan University
Lancaster University	Staffordshire University
University of Leicester	University of Sunderland
University of Liverpool	
Loughborough University	
Queen’s University Belfast	
University of Southampton	

Marshall (2005, p.135), in referring to previous pilot exercises, noted that: “It can be useful for the researcher to be present when the pilot sample completes the questionnaire”. Therefore, visits were made to the premises of 14 of the 20 pilot respondents in order to lead the person through the questionnaire and to observe any difficulties encountered. A further three meetings took place at the University of Huddersfield. As recommended by Hannabuss (1996), each respondent was given an assurance at the outset about confidentiality in respect of the information provided.

Finance officers at the three other institutions indicated that they did not wish to meet in person, but agreed to look at the questionnaire. One declined a meeting because of impending retirement, the other two offered no specific reason.

The University of Plymouth was also visited as they were implementing ‘beyond budgeting’ techniques. This visit was arranged in order to gather information on their progress and whether this might have a significant impact on the information being sought through the draft questionnaire.

A total of 16 institutions provided complete answers to the initial questionnaire. Two institutions visited only partially completed the questionnaire as the meeting ran-over the allotted time. A further two institutions offered comments on the nature and format of the questions without giving specific answers for their own institution.

The pilot study for this research took place over a 15-month period and resulted in greater emphasis being placed on forecasting and scenario modelling and less on budgeting practice. A total of 25 questions were deleted and 19 added. A number of questions were re-worded to aid clarity and alterations were also made to the general format and design of the questionnaire to enhance its readability. In some cases key words were changed, such as the replacement of 'pessimistic' with 'cautious'. Conclusions based on feedback addressing specific sections of the piloted questionnaire are contained in Appendix II.

Most pilot institutions indicated their willingness to complete the final version of the questionnaire when distributed or to provide updated responses at a later stage for those areas of the questionnaire that had been amended or where the question needed a more up-to-date response. The pilot institutions were therefore retained in the data collection for the overall population.

The final version was tested at two further institutions (one by a face-to-face meeting and one via telephone). No further changes were made to the questionnaire as a result of this final evaluation. Appendix III contains the distributed questionnaire.

Using responses from the pilot institutions a preliminary data analysis was prepared on an Excel spreadsheet which was updated as data was collected. Consideration was also given to how best to combine these results with data available from the HEIDI database in order to test for correlation. Furthermore, this exercise helped in deciding at an early stage how to categorise the responses to open ended elements of the questionnaire. More importantly, the results from the pilot stage, combined with information from the literature review and the researchers own knowledge, informed the content of the final questionnaire.

A *t*-test of the pilot data compared with non-pilot data from the main collection suggests that there was little difference between the two groups. The statistical analysis for the dependant variable of perceived budgeting accuracy demonstrates similar means and standard deviations. Furthermore, the pilots were of a similar proportion to the number of pre- and post-1992 institutions in the population surveyed. It therefore seems valid for the pilot data to have informed the questionnaire construction as it was representative of the non-pilot data and proportionate to the population.

### **4.3.3 Distribution and response rate**

There is a choice between mailing and electronically distributing questionnaires. An electronic self-completion survey instrument could be completed through a webpage established for this specific purpose (such as that offered by SurveyMonkey). Each has advantages and disadvantages. Although consideration was given to an electronic questionnaire, the views taken from a sample of institutions were that a paper-based survey was more likely to be completed.

To undertake any worthwhile analysis it is necessary to seek the collaboration of a representative sample of HEIs. As there were only 161 institutions in the UK who had submitted a Finance Statistics Return (FSR) to HESA and were listed on the HEIDI database for 2012-13 it was considered appropriate to survey all organisations in order to increase the possibility of obtaining responses from a representative number of the whole population. This population included 15 colleges of higher education. Although the primary objective of the research was to assess universities these colleges demonstrated some of the characteristics of a university in terms of funding, reporting requirements and financial management, as well as being members of the BUFDG. It was therefore decided to retain them within the population to be surveyed.

Questionnaires sent to named individuals who are part of special interest groups tend to encourage a higher response rate (Bailey, 1994). Therefore, a list of the names of appropriate finance officers was obtained from the BUFDG website. The questionnaire was primarily targeted towards those with responsibility for preparing and monitoring budgets, forecasts and scenario models. However, this role was potentially undertaken by a diverse range of individuals from the Director of Finance to the Management Accountant. Investigation of the individual's details on the webpages of BUFDG, LinkedIn and specific university sites offered some insight. In cases where it remained

unclear, the questionnaire was sent to the Director of Finance. Therefore, in some cases the respondent was different to the individual who had been sent the original. It was considered that a better response rate would be achieved from targeting the most appropriate recipient of the questionnaire at the outset rather than sending them all initially to the Director of Finance.

Members of the BUFDG have an interest in financial forecasting as part of their job responsibilities. Membership is voluntary, and on a subscription basis, and their principal activity is to influence factors affecting the finances of the sector. A signed covering letter was included with the questionnaire requesting the participation of the named individual.

The final number of institutions sent questionnaires was 163 rather than the 161 who had submitted a FSR in 2012-13. Some HEIs were removed from the HESA FSR list of institutions and some added. The three removed were the University of Glamorgan and the University of Wales – Newport (both merged to become the University of South Wales) and the University of Wales (central functions) which was running down its operations. The five added were Leeds College of Music (which had merged with Bradford University, but still maintained a separate finance function), Regent's College, London (which was not required to submit data to HESA but was an active member of BUFDG), the Royal Welsh College of Music and Drama (which was part of the University of South Wales, but maintained a separate finance function), the recently created University of South Wales, and the University Campus Suffolk.

Whilst the best inducement to gain a reply is to convince the respondent that the study is worthwhile and that their contribution is considered important, a small monetary reward can increase the response rate (Hancock, 1940; Scott, 1961). However, this was considered inappropriate for this survey as it was directed at well paid professionals. It was felt that the provision of a report on the main research findings would be of greater value, and this was offered as an inducement to reply.

The covering letter briefly outlined the purpose of the questionnaire and an explanation was given as to how the information would be used. Confidentiality was again promised. This was deemed to be of particular importance as a number of the pilot institutions had indicated a reluctance to

answer questions without an assurance of confidentiality despite the fact there appeared to be little in the questionnaire that might be considered controversial or commercially sensitive.

A study by Goldstein and Knoll (1957) found that a deadline in the covering letter and in follow-up letters produced a higher response than letters which excluded a set date. The advantage of a deadline is that it may keep the respondent from continually putting off completion and thus prevent an unplanned non-response. Questionnaires were distributed across the sector on 14 August 2014. A return date of 31 October 2014 was set as the dead-line, allowing finance officers sufficient time to complete the questionnaire. Questionnaires were returned between 26 August 2014 and 12 January 2015, mostly in the pre-paid envelope provided.

Between 24 October and 30 October 2014 (shortly prior to the 31 October 2014 dead-line) a follow-up e-mail was sent to all those who had not responded. In order to ensure that this reminder was only sent to non-respondents, a database was maintained, detailing who had been sent a questionnaire, who had returned the questionnaire, and who would be sent an e-mail reminder. The message contained details of the current response rate and the benefit to be gained from returning the questionnaire in order to demonstrate that participating would be a worthwhile exercise.

In order to avoid unduly 'harassing' potential respondents to this survey only one follow-up message was sent. A replacement questionnaire was only posted if specifically requested. It is unclear whether a replacement questionnaire included with the reminder letter enhances the response rate (Herberlein & Baumgartner, 1978). However, the reminder e-mails included an attachment of an electronic version of the questionnaire to allow the recipient to return a completed questionnaire using this version if they wished.

Following the distribution of the reminder e-mail, twelve institutions requested additional time to complete the questionnaire, while a further five indicated that they would not be taking part in the exercise. The primary reason given in these latter cases was a high workload. One explained that they were having difficulties with the implementation of their finance system software and were dedicating all available resources to this activity.

In total, 22 completed questionnaires were received after the original deadline of 31 October 2014. A further eight institutions indicated that they would respond, but subsequently failed to return the questionnaire. The response rate achieved was 52%, using the definition provided by Bryman and Bell (2011, p.189) of:

$$\text{number of usable questionnaires} / \text{total sample} \times 100$$

Responses are categorised according to institution type in Table 4.3 below.

Table 4.3 Analysis of survey population and respondents

	Population (Number)	Responses (Number)	Responses (%)	Late (Number)	Responses (%)
Pre-1992 Universities	79	40	50.6%	13	16.5%
Post-1992 Universities	69	40	58.0%	8	11.6%
Colleges of Higher Education	15	4	26.7%	1	6.7%
<b>Total</b>	<b>163</b>	<b>84</b>	<b>51.5%</b>	<b>22</b>	<b>13.5%</b>

Note: Classification of institutions was based on information from [http://en.wikipedia.org/wiki/List\\_of\\_UK\\_universities\\_by\\_date\\_of\\_foundation](http://en.wikipedia.org/wiki/List_of_UK_universities_by_date_of_foundation)

Job titles of those completing the questionnaire are summarised in Table 4.4:

Table 4.4 Classification of respondents by job title

Job Title	Frequency	Percentage
Director of Finance	29	34.5%
Deputy Director of Finance	14	16.7%
Head of Management Accounting or Management Accountant	9	10.7%
Associate or Assistant Director of Finance	7	8.3%
Head of Finance	3	3.6%
Faculty Accountant	2	2.4%
Financial Controller	2	2.4%
Director or Head of Financial Planning	2	2.4%
CFO	2	2.4%
Other	14	16.7%
<b>Grand Total</b>	<b>84</b>	<b>100.0%</b>

Note: The 'Faculty Accountant' title refer to posts either based in the central finance department or about to be line managed from that department.

None of the questionnaires received were so incomplete that they could not be usefully included in the data analysis. However, some respondents chose not to provide an answer to one or more of the questions. Despite this there was no evidence of certain questions being consistently ignored

which might have indicated a problem with a particular line of enquiry. Responses to the few questions not completed by all respondents are analysed using the slightly smaller but sufficient response rate.

Previous surveys of management accounting in the UK sector have achieved response rates ranging from 44% to 63% (Table 2.1). Babbie (1973) comments that a response rate of 50% is adequate for analysis and reporting. The response rate from this research is broadly in line with these other sector surveys. A satisfactory and representative response rate was therefore obtained. Of course, as with all such surveys, the respondents who are most interested in the subject are those who are most likely to respond, but given the response rate achieved this was not considered to be a significant problem.

#### **4.3.4 Non-response bias**

Non-respondents are different in several respects from those who answer questionnaires (Wallace & Mellor, 1988). For example, respondents (and particularly early respondents) tend to be interested in the objective of the survey or more involved with subject. Bryman and Bell (2011) explain that most surveys attract a certain amount of non-response and that it is important to assess the impact of non-responses and late responses. If the data is representative of the population being studied then inferences can be drawn from it and applied to the general population (Wallace & Cooke, 1990; Lessler & Kalsbeek, 1992). It is unreasonable to expect potential sources of non-response bias to be avoided in all instances (Van der Stede, Young & Chen, 2005).

The conventional method for testing non-response bias is to compare responses on one or more variables. Two alternative methods exist for comparing respondents with non-respondents. The first is to compare variables applying to the sample obtained with the original population surveyed. The second method is to compare early and late respondents. A significant difference would indicate the possible existence of non-response bias in terms of differing characteristics of those not responding or those returning early or late.

Both methods were used to test for non-response bias. The seven main variables tested were: annual income, annual expenditure, annual surplus, number of students (full time students), space

occupied (gross internal area), number of staff (full-person equivalent on permanent and fixed term contracts) and institution type (pre- and post-1992), using data obtained from institutional HESA returns available on the HEIDI database for 2013-14.

The Mann-Whitney test was used to conduct the analysis, comparing the data of the following:

1. Respondents with non-respondents
2. Respondents before the original deadline of 31 October 2014 and those who responded after this date

Tables 4.5 and 4.6 below suggest there are no significant differences between respondents and non-respondents, or between those who submitted their completed questionnaire before or after the deadline. Analysing the data using the Mann-Whitney non-parametric test produced figures for the two tailed probabilities that were large.

Table 4.5 Respondents measured against non-respondents

	Income	Expenditure	Surplus	Students	Space	Staff	Pre- & Post-1992
Mann-Whitney U	2,698.0	2,721.0	2,725.0	2,751.0	2,602.0	2,587.0	2,387.5
Wilcoxon W	5,624.0	5,647.0	5,651.0	5,677.0	5,528.0	5,513.0	5,547.5
Z	-1.455	-1.375	-1.361	-1.149	-1.672	-1.725	-0.834
Asymp. Sig. (2-tailed)	0.146	0.169	0.174	0.251	0.095	0.085	0.404

Note: The software Statistical Package for the Social Sciences (SPSS) was employed to test the data.

Table 4.6 Respondents submitting before the deadline against those submitting after

	Income	Expenditure	Surplus	Students	Space	Staff	Pre- & Post-1992
Mann-Whitney U	653.0	646.0	597.0	624.0	621.0	609.5	521.0
Wilcoxon W	906.0	899.0	2,427.0	855.0	2,512.0	840.5	2,232.0
Z	-0.073	-0.147	-0.659	-0.065	-0.207	-0.221	-0.781
Asymp. Sig. (2-tailed)	0.942	0.884	0.510	0.948	0.836	0.825	0.434

Size is considered to be an important criterion for distinguishing between universities because it is likely that as an organisation grows the level of sophistication required of its management information system will also increase.

## **4.4 Method for analysing the data**

The three approaches used to analyse the data are detailed below.

### **4.4.1 Descriptive statistics**

In many cases the respondent was required to complete closed-ended questions requiring boxes to be ticked or a circle drawn at the relevant place on a 5 or 10-point Likert scale.

Data from the completed questionnaires was entered into a spreadsheet as they were received to form a database. In order to undertake an analysis of this data, where possible the responses to each question were given a numerical value e.g. Yes = 1, No = 2, Sometimes = 3. The initial results were summarised in tables to record the overall responses to each question, in terms of units, percentages and ranking.

Responses to open ended questions were initially recorded in full and then condensed in to subject themes. Again these were summarised in tables and percentages used to identify the common themes. The use of 'frequency tables' allows for easy identification of how many responses fell into each category.

The database for survey responses was queried further by looking for underlying patterns and structures which might provide evidence of contingent factors associated with the accuracy of budgeting and forecasting and the use of financial scenario modelling. To enhance the investigation, data on key aspects of each institution (e.g. income, expenditure, surplus/(deficit), staff and students) was drawn from the HEIDI database and incorporated into the analysis along with the institution type. This permitted the characteristics of institutions to be compared with survey responses.

Chapter 5 provides an analysis of that data and follows the structure of the survey questionnaire in sub-dividing the chapter into sections. Each section includes a description of the questionnaire findings and a summary of the key points before incorporating commentary from the interviews detailed below. Descriptive statistics such as frequency, means and standard deviations were

mainly used, together with the ranking of items to emphasise their relative importance. The use of frequency tables and charts determined the data characteristics of the responses and gave insights into the shape of the distribution and variables that were used in the testing of hypotheses and assessment of propositions in Chapter 6.

#### **4.4.2 Method for analysing data – Exploratory Factor Analysis (EFA)**

Due to the large quantity of data collected, factor analysis was employed to indicate whether groups of variables bunch together to form clusters (Field, 2013). Where there is an underlying correlation between a number of variables they can be combined into factors because of this common relationship. The main purpose of the technique is to reduce the number of variables which have to be dealt with and is used in relation to multiple-item measures (e.g. Likert scales) to assess the degree to which there is an underlying structure to the large number of items which often make up the measures (Bryman & Bell, 2011).

There are two main forms of factor analysis, exploratory factor analysis and confirmatory factor analysis. An exploratory factor analysis explores the relationships among the variables and does not have a priori fixed number of factors. There may be a general idea about what might be found but there is no firm view on which variables will most likely load onto a factor or expectation based on published findings as with confirmatory factor analysis. An EFA was therefore undertaken for this research in-line with the procedure detailed in Chapter 6 using SPSS.

#### **4.4.3 Method for analysing data – Correlation and regression**

Correlation analysis (using Pearson and Spearman correlation coefficient tests) can be employed to indicate if a relationship between two variables exists and the strength and direction of that relationship. However, despite being a useful statistical method, a weakness is that it is bivariate and does not determine which is the dependent and which is the independent variable. In contrast, multiple regression analysis can identify which of several independent variables predict the dependent variable and by how much. It is a widely used and versatile data analysis technique (Hair, Black, Babin & Anderson, 2010).

Therefore, correlation analysis is used to test the research hypotheses by considering the relationship between variables and in some cases factors derived from the EFA. Furthermore, multiple regression is employed to determine which variables and factors were the strongest predictors of the dependent variable of perceived budgeting accuracy. Thus adopting a contingency theory approach by seeking the variables and factors which appear to be associated with budgeting accuracy.

## **4.5 Interviews**

### **4.5.1 Process**

Hussey and Hussey (1997, p.74) explain that questionnaire survey results accompanied by interviews “provide qualitative insight and illuminations”. They comment that triangulation “can overcome the potential bias and sterility of a single-method approach”. Such a view is also supported by others (Saunders, Lewis & Thornhill, 2009) and a mixed method approach was considered appropriate for this research.

The interview method was used to add depth to the questionnaire responses and further explore the practices employed by institutions. However, it is recognised that interviews can be criticised on the grounds that interviewees may offer the views that they believe the interviewer wishes to hear rather than what they really believe (Horton, Macve & Struyven, 2004). It was hoped that assurances about confidentiality and the engagement of a sufficient number of interviewees would assist in countering this potential bias even if the possibility could not be eliminated.

The interviewees were selected on the basis of the information contained within the responses to the questionnaire, the need to cover a cross-section of the respondents of differing types and size of institution, and the likelihood of a favourable response to an interview request.

The length of the interviews varied between 35 minutes and 4 hours 45 minutes (the latter involving an interviewee with a strong interest in the subject matter), with an average time of 2 hours. The frequency of length is shown in Table 4.7 below:

Table 4.7 Time period for interviews

Time (minutes)	30-60	61-90	91-120	121-150	151-180	181-210	211-240	241-270	271-300
Number of interviews	9	7	11	5	3	3	1	2	1
Percentage of interviews	21%	17%	26%	12%	7%	7%	2%	5%	2%

The interviews commenced with an introduction to explain the research and the progress made to date before moving on to address specific questions. The first of these was a ‘breaking-the-ice’ enquiry to put the interviewee at ease and commence a discussion, such as asking about their background or the key stages in their budget cycle.

A total of 25 post-questionnaire interviews were conducted over a 14 month period, following an initial 17 interviews undertaken during the pilot stage (section 4.3.2). Table 4.8 below identifies the types of institution interviewed.

Table 4.8 Analysis of survey population, respondents and interviewees

	Population (Number)	Population (%)	Responses (Number)	Responses (%)	Pilots Interview	Post-Survey Interview
Pre-1992 Universities	79	48.5%	40	47.6%	9	11
Post-1992 Universities	69	42.3%	40	47.6%	8	14
Colleges of Higher Education	15	9.2%	4	4.8%	0	0
Total	163	100.0%	84	100.0%	17	25

Whilst many researchers are in favour of recording interviews (Haynes & Mattimoe, 2004), no interview in this study was recorded. This was to ensure that the interviewee did not feel inhibited to respond freely to the questions raised. A number of pilot study respondents indicated that they would be uncomfortable having their views recorded and would be less willing to participate. This might partly be explained by the fact that the research was addressing an area containing commercially sensitive data, a view supported by the unwillingness of the Funding Councils to release forecasting data on individual institutions. The reluctance of interviewees to provide information in the presence of a recording device has been encountered in other studies (Bedard & Gendron, 2004). A view was taken that the potential loss in research rigour and validity was acceptable in order to gain a more detailed insight from interviewees. The possibility of secretly recording the interviews was rejected as unethical.

Notes were taken during the interview and interviewees generally recognised the need for brief pauses during the discussion for notes to be jotted down and allowed time for this. In order to ensure accuracy and comprehension of the interview, the notes were revised and reconstructed in a Word document within 24 hours. This allowed abbreviations and unclear handwriting to be converted in to a readable narrative whilst still fresh in the mind.

Although these notes reflect the discussion, they are not transcripts of the interview. In an attempt to counter loss of validity, interviewees were asked during the discussion to verify some of the notes that had been taken. Engaging an independent person to also attend the interview would have increased the validity of the notes but was not deemed to be practical. Interview notes were not sent to the interviewee for confirmation or signing-off as the material sometimes contained controversial or sensitive information. It could not be certain that the interviewee would be the only recipient of them or that they would not wish to withdraw what had been discussed having had time to reflect on their content.

A pre-interview set of questions covering certain themes, including items based on the interviewee's questionnaire responses, was prepared in order to undertake a semi-structured investigation. Some questions could not be easily addressed by the questionnaire as they potentially involved a detailed answer, such as 'How do you go about setting the University's annual budget?'. Other questions followed logically from the analysis of the pilot questionnaire results. For example, many took a cautious approach to their budgeting. Interviewees were therefore asked 'Is a favourable variance better than an adverse variance?'. Thus using qualitative data to complement the quantitative (Bryman & Bell, 2011).

This approach allowed interviewees some freedom in addressing enquiries on practices based on their expertise and experience, and to express their own opinions. Twenty one face-to-face interviews were held at the respondent's own institution, with a further four being telephone interviews. Easterby-Smith, Thorpe and Lowe (1991) suggest that semi-structured interviews are appropriate where the subject matter deals with commercially sensitive data and the interviewee may be reluctant to reveal the truth about the issue other than in a confidential one-to-one discussion. This approach allows responses to be probed further.

The interview questions were slightly improved throughout the period of the interview stage based on the experience gained from previous interviews. Although there are arguments for the same set of questions to be asked of all interviewees (Yin, 1983), the counter to this is that such iterations are important as new insights emerge (Marginson, 2004). The information gathered from the interviews stage was not used for rigorous hypothesis testing and it was therefore considered appropriate to make improvements to the questions raised. An example of a standard set of questions is contained in Appendix IV.

Confidentiality assurances were given at the outset that comments would not be attributed to any individual or institution. Hence, in order to preserve anonymity, the origin of quotations has not been identified. This inevitably leads to some loss of transparency in the analysis undertaken. However, an identifier is used for each interviewee so that connections can be drawn between different points made by the same interviewee, and whether emphasis has been placed on particular interviewees. The identifier starts with either OU (old university – Pre-1992) or NU (new university – Post-1992) and is followed by a number which is specific to the institution interviewed.

The interviews provided a rich source of additional information to complement the details obtained from the questionnaire. They helped to explain some responses and to develop areas of understanding particularly in relation to efforts made to improve processes and procedures. Part of the difficulty of this stage of the research was deciding how many interviews should be undertaken. Marginson (2004) explains that the optimal number is at the point of ‘saturation’ whereby there is minimal incremental gain as similar responses are received at further interviews, but that it is also dependent upon time and resource constraints.

#### **4.5.2 Method for analysing findings**

An effective approach to analysing interview findings is to group them into themes (Bryman & Bell, 2011) and to integrate them with survey questionnaire findings (Creswell & Tashakkori, 2007). In order to do this the notes from the interviews were colour coded according to main topics based on an overall review of the information gathered. These topics addressed organisation structure, reporting processes and practices, carry forward of unspent budgets, liaison and business

partnering activity, resource allocation and contribution models, budget processes, scenario modelling, budgeting and forecasting accuracy, information technology and systems, approaches to medium term forecasting, student number forecasts, etc. This allowed the narrative to be constructed by reference to those colour coded groups. It was considered that the interview data was of a sufficiently small size to permit a manual review by theme rather than employing data analysis software such as NVivo to code the data prior to undertaking searches of a particular grouping. However, the allocation of interview data to a specific topic is an iterative and subjective process and it is recognised that there is a risk of human error by manually coding (Welsh, 2002). Nevertheless, a manual approach was adopted, taking care to allocate interview findings appropriately.

Creswell (2014) explains that the challenge for researchers is how to converge or merge quantitative and qualitative data. He offers three approaches. The first is to report on the quantitative results and then discuss the qualitative themes or alternatively vice versa (a side-by-side comparison). The second is to merge the two databases, changing the qualitative themes or codes into quantitative variables by counting them (data transformation). The third is to merge the databases into a tabular or graphical output which results in a single vision (a joint display of data).

For this study, a side-by-side approach is adopted. The interview narrative included in Chapter 5 follows-on from the survey questionnaire findings in order to add depth to those findings. The interview data, which was sub-divided by theme, is mapped to and incorporated within the appropriate section of the questionnaire findings rather than providing completely separate sections for questionnaire findings and themes from the interviews. However, the interviews provide a data source in their own right and it would be too structured to link this directly to each of the key points from the findings. The interview data was repeatedly revisited in an attempt to ensure that no significant element was excluded from the resulting data analysis.

Whereas the findings from the quantitative survey data are analysed by looking at the average responses, the qualitative data from the interviews considers items specific to institutions. It is therefore possible to pick up problems in the qualitative data that are not apparent from the quantitative average.

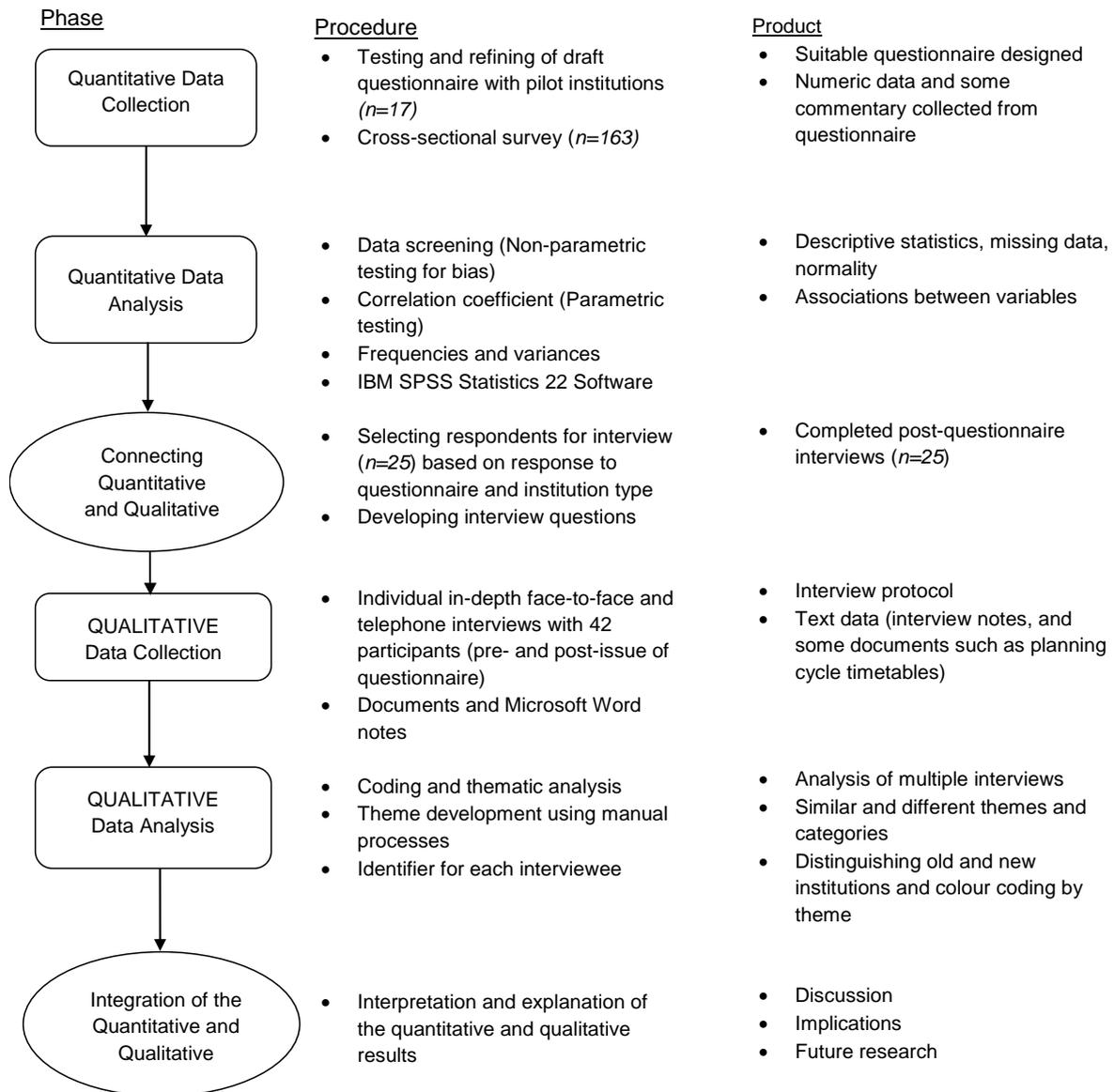
## **4.6 Sequential explanatory design**

In summary, the mixed methods approach adopted in this research involved a questionnaire survey which mostly yielded quantitative data supplemented by qualitative data from interviews. Two phases are employed within one study and the connected results are integrated in the subsequent analysis. The interview phase builds on the questionnaire phase by exploring the information acquired in greater depth. Priority is given to the questionnaire data as this comes first in the sequence and represents a major aspect of the data collected whereas the participant interviews are a smaller proportion of the institutions surveyed. However, the 42 interviews do provide a rich source of information. A benchmarking group, comprised of 20 institutions in the north of England and Northern Ireland, had also been established at the outset of the research and was used as a means to sense check the findings.

Where appropriate, the questionnaire and interview findings were augmented by citing relevant results from other studies and from related literature. In addition, the results were presented at conferences and discussed with other researchers and practitioners including the benchmarking group. This gave the opportunity to test the interpretation of the data.

A graphical representation of the procedure using a flow diagram (with a phase, procedure and product structure adapted from Ivankova, Creswell & Stick, 2006) is shown below in figure 4.1 and demonstrates the connecting points between the quantitative and qualitative phases.

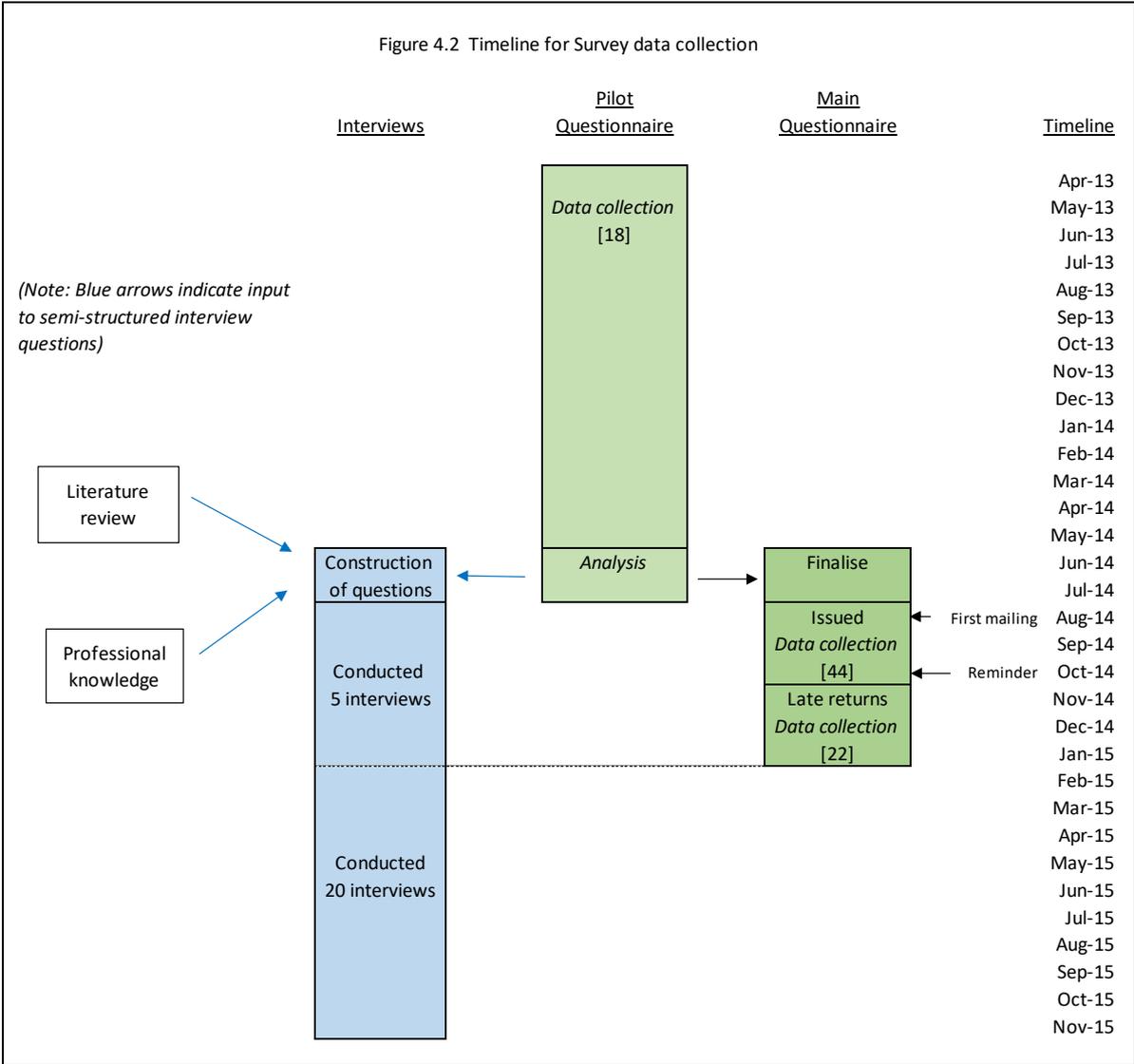
Figure 4.1  
 Visual Model for Mixed-Methods  
 Sequential Explanatory Design  
 Procedures



Whilst this particular approach permitted the investigation and analysis of budgeting, forecasting and scenario modelling practices in universities, it is recognised that this is only one of a number of possible mixed methods approaches (Creswell, 2014). Bryant and May (2011, p.636) suggest

that mixed methods research offers a means of “filling in the gaps” where the quantitative data is inadequate.

Ideally, the survey questionnaire data would have been collated and analysed prior to commencing the interview stage. Figure 4.2 sets out the actual timescale for collecting quantitative and qualitative data, commencing with the collection of data from pilot institutions in April 2013.



As illustrated by Figure 4.2, the interviews were commenced shortly after receipt of the initial completed questionnaires, and the interview questions were therefore based on a combination of information from the literature review, professional knowledge and data from the pilot exercise. These questions sought to develop an understanding of the reasons for the accuracy of budgeting

and forecasting achieved by institutions and also how scenario modelling was employed. The earlier commencement was due to some respondents requesting an early meeting, the opportunity to interview as a result of impending meetings with respondents and the limited resources available to the researcher to conduct a more compressed period of interviewing after all responses were received. Nevertheless, the qualitative data obtained was informative.

#### **4.7 Conclusion**

A number of approaches are possible to collect sector data on which a generalised view can be taken of university practices. The most appropriate appeared to be a mixed methods approach commencing with a questionnaire. Budgeting and forecasting questionnaires have been used successfully elsewhere. Therefore, in some instances questions were drawn for this research from the work of others, usually in a modified form, in order that comparisons could be made between the responses to this survey and other published results.

A considerable amount of time was spent assessing the validity of the draft questionnaire through the use of a pilot in order to refine and enhance its content. This exercise was helpful in identifying useful changes and increasing the likelihood of a good response rate.

Interviews with respondents permitted a deeper investigation of both the questionnaire responses and practices undertaken by universities. Data from the questionnaire and interviews is analysed in Chapter 5.

## Chapter 5

### Analysis of questionnaire responses and interviews

#### 5.1 Introduction

This chapter analyses the questionnaire and interview responses. It presents findings relating to the budgeting, forecasting and scenario modelling practices employed by universities, including the perspectives of finance officers.

The structure of the chapter follows that of the survey questionnaire. The first section focuses on the size and structure of each responding HEI (using income, surplus, assets, staff and student numbers as appropriate measures of size). The second and third sections review budgetary control processes and the perceived accuracy of budgeting. The fourth section assesses the resource allocation methods employed and potential changes under the new fee regime. The fifth section looks at forecasting in terms of its role, methods and systems employed, and assesses perceived accuracy. The sixth section reviews the use of scenario modelling, the key variables included in institutional models and the IT systems used. The final section identifies current processes employed by respondents and potential future direction in forecasting and financial planning. References to the word ‘accuracy’ throughout are in relation to respondents and interviewees ‘perceived accuracy’.

A contingency theory approach is utilised. Data is collected and analysed on variables which may have a relationship with budgeting and forecasting accuracy, as well as identifying the characteristics of scenario modelling. The data on potential contingent variables summarised in Chapter 5 enables the research questions to be answered on what budgeting, forecasting and scenario modelling practices are currently used by universities, whether perceived budgeting accuracy is associated with any particular university characteristics or contingent factors and if the financialisation of universities has had an effect on practices by first presenting the data and then testing it in Chapter 6.

Each section in Chapter 5 commences with a description of the questionnaire findings, including tables and charts to present the questionnaire data in order to address the research objective of

describing budgeting, forecasting and scenario modelling practices in universities. This is followed by the identification of the key points from these findings. Finally, an analysis from the interviews is provided to meet the objective of understanding the thoughts and perceptions of finance officers in relation to those techniques.

The themes identified when analysing the interviews are included within the most appropriate section of this chapter. Commentary from the interview process is therefore woven in to the results from the survey questionnaire using a side-by-side approach. Some themes generated a significant level of discussion with interviewees whilst others resulted in only brief comments. The varying length of the interviewee narrative on differing issues reflects where individuals placed emphasis. In particular, the interviews assist in explaining the practices employed or the perceptions of respondents, and therefore address the question of ‘why?’ compared with questionnaire responses which tend to identify ‘what?’ is happening at institutions.

Reference is made throughout to findings from other surveys including those from commercial sectors. The latter would seem appropriate if universities are facing increased commercialisation, as argued by Parker (2012a) and Matthews (2017). Reference is also made to academic and practice literature to clarify the issues identified.

The purpose of the chapter is therefore to set out the data characteristics of the responses and give insights into the shape of the distribution before testing the hypotheses and assessing the propositions. The chapter commences by considering the size and structure of institutions and whether this has a bearing on the budgeting and forecasting accuracy achieved.

## **5.2 Size and structure of institutions**

### *Questionnaire findings*

Table 5.1 considers the size of institutions.

Table 5.1 Institutional size

Institutional size for 2013-14	Population				Respondents			
	Mean	Stand dev	Max	Min	Mean	Stand dev	Max	Min
Income (£m)	186	204	1,504	8	188	171	1,022	14
Expenditure (£m)	179	199	1,511	7	180	166	1,010	13
Surplus/(Deficit) (£m)	7	10	61	(17)	8	9	39	(17)
Fixed assets (£m)	245	327	2,477	0 <sup>1</sup>	261	304	2,096	16
Student FTEs	9,274	6,697	31,023	70	9,741	6,169	25,629	70
Staff FTEs	2,439	2,198	10,435	130	2,613	2,144	10,435	180

1. The assets and liabilities of the Guildhall School of Music & Drama are consolidated into the City of London Corporation's balance sheet

(Source: HEIDI database for 2013-14)

Respondents appear to be representative of the overall HEI population and it is therefore valid to draw conclusions about the sector based on the data collected.

Section A of the questionnaire sought data on the structure of each institution and engagement of staff in the budgeting and forecasting process. The responses to Questions A1 to A4 are summarised in Table 5.2 below.

Table 5.2 Institutional structure

Number of:	Mean	Max	Min	Respondents
Academic Colleges	3	10	1	25
Academic Faculties	4	10	1	48
Academic Schools	11	38	1	47
Administrative or Professional Service departments	12	29	2	76
Staff engaged in budgeting and forecasting in the central management accounting function	8	36	1	82
Staff with a professional accounting qualification in this function	5	25	0	81

Responses to Question A1 indicated a range of structures. Higher education would seem to be characterised by decentralised practices (Broad et al., 2007; Deering & Sá, 2017) and are “somewhat arbitrary constructions of academic complexities” (Berry et al., 2004, p.28). Although the average number of colleges, faculties and schools within an institution did not exceed 11 (12 for administrative departments), many interviewees indicated that they devolved budget responsibility to an extensive range of academic departments and/or divisions. A possible explanation for adopting this approach is that budgetary responsibilities are better undertaken closer to where the activity to which they relate arises.

On average, eight accounting staff were employed on budgeting and forecasting centrally and five were qualified. This is more than found in the survey undertaken by Cropper and Drury (1996)

twenty years earlier and may be a reflection of increased institutional size due to greater student participation rates, greater financialisation/professionalisation or additional complexity.

Two thirds of institutions said that they employed finance staff within academic departments, but less than half (44%) were managed by the central finance function.

#### *Key points*

- Institutional structure does not assist in achieving budget accuracy and may increase the complexity of the process.
- There are increasing numbers of central finance staff with a budgeting and forecasting role.

#### *Interview findings*

A common theme was that structures were not necessarily stable. For example, finance teams had been centralised and others were considering this option. However, tensions existed around the issue of loyalties. An expression commonly used was that management accountants in faculties, schools and services had gone “native” and worked against the direction of the central finance department. One institution that had recently restructured commented that their processes had become too detailed without any improvement in accuracy, and “having more detail just raises more questions” (NU2). [Note: Section 4.4.1 explains the use of an identifier protocol, with OU representing ‘old university – Pre-1992’, NU being ‘new university – Post-1992’ and the numerical value signifying the individual institution.]

Those operating on a centralised basis spoke of the need for greater engagement and understanding of faculties and schools. Indeed, one finance department had started the process of seconding staff to faculties in order to improve the accuracy of its budgeting and forecasting (NU7). Others encouraged staff in their central finance department to spend more time in the areas with which they liaised. This ‘business partnering’ approach is addressed in this chapter under sections 5.6 and 5.8 prior to its inclusion in section 8.6 when considering recommendations.

The combination of changeable structures and devolved practices increases budgeting complexity, which potentially leads to more staff in the central finance function.

### 5.3 Budgetary control and reporting

*Questionnaire findings*

Question B1 assessed the budget approach taken using a Likert scale of 1 (bottom-up) to 10 (top-down).

Table 5.3 Budgeting approach

mean 5.55 (standard deviation 1.97)

	Bottom-up			Combination				Top-down			
Scale	1	2	3	4	5	6	7	8	9	10	Total
Respondents	1	4	7	10	24	13	12	7	2	4	84
Percentage	1%	5%	8%	12%	29%	15%	14%	8%	2%	5%	100%
Cumulative	1%	6%	14%	26%	55%	70%	85%	93%	95%	100%	

As explained by PricewaterhouseCoopers (2012b), the typical methodology adopted by most organisations is a combination of top-down setting out the financial constraints and bottom-up for developing the detailed plans and budgets. Most institutions (70%) were clustered around the 4-7 points on the scale, with a mean of 5.55, indicating a combination of both top-down and bottom-up. The results are consistent with studies of other organisations where a majority used a combination approach, thereby incorporating a collaborative capability in to their processes (Jutras & Hatch, 2009; Develin & Partners, 2009). Those using a top-down approach in the Develin study tended to be smaller organisations. Similarly, the 13 universities using a top-down approach (at scale points 8-10) were on average smaller than the total population, with an average income of £136m in 2013-14 compared with the population mean of £204m. Nine were post-1992 institutions and four pre-1992 (see chart 5.1).

Chart 5.1

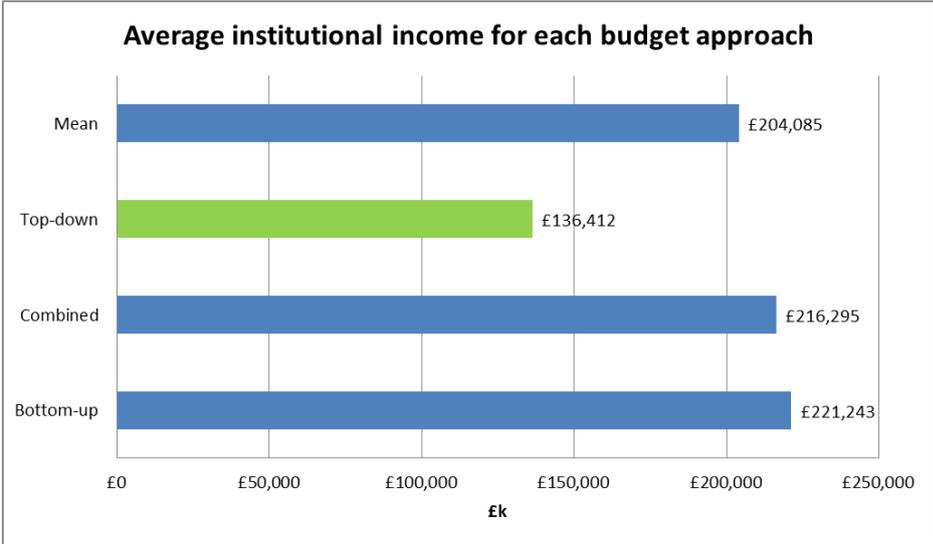


Chart 5.1 demonstrates that a top-down approach would seem more prevalent in institutions with a smaller than average income. It may be that either greater control is exerted over those institutions with lower income or their size simply makes it more efficient to use a top-down approach rather than involve subordinates.

Responses to Question B2 demonstrated that the majority sub-divided their budget into monthly control periods (77%). 16% of institutions chose not to break the budget down by period and instead concentrated on re-forecasting the budget to the year end and explained the change from the original budget. Thus, emphasis was placed on reporting against both future and past variances. The profiling of budgets is discussed further in the interview findings below.

The average time taken to prepare the annual budget was 15 weeks, with a further 5 weeks spent waiting for approval (Question B3). Develin and Partners (2009) found the average preparation time in many types of organisation was 3.7 months. Similarly, CFO Research Services (2011) found it took 2-4 months and PwC (2015) 95 days. Universities appear to take longer to complete the budget compared with other types of organisation and perhaps start the process too early. The reason for this may be due to an extended phase for challenging initial budgets submitted by academic and service areas followed by a long period waiting for the final budget to be approved through various committee structures.

Responses to Question B4 demonstrated a range of practices in terms of updating the budget once implemented. 34% (31 institutions) said that the budget was fixed and not updated, 31% (28 institutions) revised the budget on an ad-hoc basis and 33% (30 institutions) indicated that revisions occurred at the next formalised budgetary review. A clear association between the accuracy of budgeting (scale points 5 and 6) and the approach taken to updating the budget is not evident from the table below.

Table 5.4 Approaches to updating the budget

	Cautious				Accurate				Optimistic			Total	%	Mean
	1	2	3	4	5	6	7	8	9	10				
Once accepted, budgets are fixed	0	0	8	8	5	3	3	3	1	0	31	34%	4.9	
The budget is revised on an ad-hoc basis	0	1	7	10	2	1	2	5	0	0	28	31%	4.8	
Revisions occur at next formalised review	0	2	6	8	5	3	4	2	0	0	30	33%	4.7	
Rolling budgets are in place	0	0	0	0	0	0	1	0	0	0	1	1%	7.0	
Total	0	3	21	26	12	7	10	10	1	0	90	100%	4.8	
%	0%	3%	23%	29%	13%	8%	11%	11%	1%	0%	100%			

Institutions commonly appear at the more cautious end of the budgeting accuracy scale (points 3 and 4) irrespective of the approach, indicating that updating the budget as the year progresses does not result in an increased perception of accuracy compared with those who fix their budget.

The link between the budget and an institution’s strategy is important (Davies & Jackson, 2016). Question B5 sought to identify the strength of this relationship.

Table 5.5 Budgets and strategy

Responses to each statement	Scale mean	strongly agree 1	moderately agree 2	somewhat agree 3	somewhat disagree 4	moderately disagree 5	strongly disagree 6	Respondents
The budget process is explicitly linked to strategic objectives/targets within your institution	2.3	24	33	16	4	3	3	83
Setting the budget causes us to talk about and reflect upon our strategy	2.6	12	35	21	7	6	2	83
Feedback from the budgeting process can result in a change in our strategy/tactics	3.2	6	20	25	17	11	3	82
Managers are expected to identify tactical initiatives to improve performance	2.3	18	31	24	6	2	1	82

The annual budgeting process was connected with achieving strategic objectives in most institutions, with 73 respondents agreeing. Whilst this is consistent with a previous study by RSM Robson Rhodes (2003) which concluded that budget preparation in universities was directly linked to strategic plans, other studies found weaknesses in the link between strategy formulation,

budgetary control and performance evaluation due to a lack of accountability (Broad & Goddard, 2010). Means of 2.3 (indicating only moderate or somewhat agree) for the link between budget and strategy and the need for managers to identify initiatives to improve performance suggests that there are weaknesses in strategic processes. The comments of interviewees in the next section suggest that institutions concentrate too much on detailed operational issues at the expense of strategic matters.

64 respondents agreed that setting the budget caused the institution to talk about and reflect upon its strategy. However, the budget process did not necessarily result in a change in strategy, with only 51 respondents indicating that it did (just 6 strongly agreeing), even though 73 respondents stated that managers were expected to identify tactical initiatives to improve performance. The inability to achieve the budget in any one year does not necessarily invalidate the strategy being pursued, but longer-term failure and a lack of accountability can cause difficulties.

There was evidence that institutions suffered from budget gaming behaviours and reduced budgetary accuracy. Question B6 sought to understand the extent of common gaming behaviours, as detailed below.

Table 5.6 Budget gaming behaviours

Scale	Mean	Never 1	Occasionally 2	Frequently 3
Spending available resources at the end of the budget period so as not to lose it	1.2	6	58	20
Deferring necessary expenditures to assist in meeting budget targets	1.0	16	54	14
Incurring expenditures in the current period so as to make it easier to attain the budget in the next period	0.9	21	52	11
Negotiating easier targets than one actually thinks can be accomplished to make the budget easier to attain	1.0	16	49	19
Loading expenditure budgets on to certain headings/lines to hide contingencies	0.8	27	43	12

Although frequency tends not to be high there are at least occasional instances of gaming at the majority of institutions and perhaps gaming is inevitable. The results are consistent with evidence of gaming behaviours within companies (Libby & Murray Lindsey, 2010). However, most respondents claimed that gaming behaviours did not cause them undue concern (Question B7).

Table 5.7 Impairment of long-run performance by gaming behaviours

mean 4.58 (standard deviation 2.06)

	Not at all				To a very high extent						
Scale	1	2	3	4	5	6	7	8	9	10	Total
Respondents	1	8	21	16	9	13	8	3	2	2	83
Percentage	1%	10%	25%	19%	11%	16%	10%	4%	2%	2%	100%
Cumulative	1%	11%	36%	55%	66%	82%	92%	95%	98%	100%	

Over half indicated that on a Likert scale of 1 (no influence) to 10 (very high influence) they fell within the range of 1-4, suggesting that the behaviours had little effect on the long-run performance of the institution. Of course, accountants may simply have a different attitude towards dysfunctional behaviour compared with non-financial managers who tend to see the budget as more important (Lyne, 1990). Academic managers may perceive a benefit from budget gaming and their views may be quite different from central finance staff. Nevertheless respondents did not view gaming as being sufficiently disruptive to warrant concern.

Some of these budget gaming behaviours may be the result of not allowing unspent balances to be carried forward at the end of the financial year. The majority, 63% of institutions prevented it, with another 28% only permitting a limited element of carry forward (Question B8). Of the 32 who did allow the practice, most (21 institutions) indicated that it had little impact on their ability to forecast accurately (Question B9). Given this view, it might have been expected that many of these 21 institutions would perceive their budgeting to be accurate if carried forward budgets could be managed without adversely affecting accuracy. However, this was not confirmed by the perception of the budgeting accuracy achieved, with only eight of these institutions achieving budget accuracy at scale points 5 and 6. Therefore, allowing the practice appeared not to significantly improve perceived accuracy.

Finally, Question B10 asked institutions to indicate the methods of budgeting adopted.

Table 5.8 Budgeting methods

	Frequently	Sometimes	Never	Proposed	Total
Previous year plus inflation	51	27	4	2	84
Activity Based Budgeting	12	41	18	6	77
Zero-Based Budgeting	13	32	27	9	81
Priority Based Budgeting	11	33	29	4	77
Incremental Budgeting	28	32	15	3	78
Rolling Budgeting	5	16	42	12	75
Other	1	1	0	0	2

By far the most popular methods were ‘previous year plus inflation’ and ‘incremental budgeting’, which were used frequently or sometimes by 93% and 77% of respondents. This is consistent with previous findings by Cropper and Drury (1996) and Lyne and Alhatabat (2015) which showed that incremental budgeting remained dominant, and is considered further in sections 7.6.2 and 8.6.

Although there was a surprisingly high occasional usage of ABB, PBB and ZBB, this was probably to satisfy specific purposes such as one-off budget exercises in particular areas of activity if actually used at all. There was some evidence from the interview stage that respondents lack familiarity and understanding of more complex methods.

Institutions might have been expected to introduce more complex methods and to tighten budgetary controls in such a changeable environment but, the effectiveness of tight budgetary control is dependent upon the extent to which economic turbulence results in changes to an organisation’s financial position: “Tight budget control reduces budget deviation only for organisations experiencing significant budget turbulence” (Johansson & Siverbo, 2014, p.279). Those taking a more ‘sophisticated’ approach may not increase the accuracy of their budgeting if significant changes in the external environment do not affect the short-term budgets.

*Key points*

- A top-down and bottom-up budget approach was used by 44% of institutions, resulting in an extended period of preparation. Despite claims of increasing financialisation in a competitive market, there is little evidence of a tightening of budgetary control.
- The budget was usually updated in-year to reflect changed circumstances. The practice adopted can have a significant effect on how variances are reported to stakeholders.

- Budget gaming behaviours exist but appear to cause few problems and the carrying forward of unspent budget is rarely used to address this issue.
- Simple and incremental methods of budgeting are favoured despite changes in the environment.

### *Interview findings*

Those concentrating on a bottom-up approach to budgeting experienced difficulties, as explained by one interviewee: “Faculties and services take budgeting too seriously. There is not enough focus on strategy. The numbers can end up being ‘precisely wrong’. They are much too detailed. A lot of time is spent on the detail - it has become a sausage machine with numbers churned out that lack meaning” (OU19).

For many, the approach involved central management informing academic and administrative areas of the resources available. These areas then used the resources to set budget priorities. Iterative practices were common, with academic and administrative areas drafting an initial budget and the centre consolidating these prior to assessing them for affordability. However, this process requires the co-operation and trust of both central management and academic areas to work effectively (Berry et al., 2004).

At each stage interviewees indicated that a certain level of cautiousness was being built in to the final budgets. Furthermore, adopting a detailed approach caused difficulties. One interviewee explained that “the accuracy of the budget wasn’t improved by undertaking a detailed analysis. The budget quickly became out of date and was unrealistic by the time it came in to use” (NU3). Another commented that the institution’s current thinking was to move away from detailed operational plans, which do not necessarily assist in achieving accuracy, and to produce higher level strategic plans instead. The interviewee explained that: “In the past the process was too detailed. It wasn’t possible to see the wood from [sic] the trees” (OU20). The greater use of technology and a change to less detailed budget setting processes were considered to have improved the accuracy achieved (OU17).

Some interviewees claimed that there were areas of their university which were very stable and therefore easy to budget and forecast, and that it was rare for overspending to occur. In these instances accuracy was considered to be the norm.

Budget reporting practices were being reviewed by institutions. Some with quarterly reports were looking to move to monthly in order for faculties to become more self-sufficient and to highlight variances at an earlier stage (e.g. OU4, NU13). Conversely, other institutions indicated that reporting too frequently did not assist in determining if budgets and re-forecasts were accurate due to ‘timing differences’ (e.g. NU2, OU6, OU18).

Reported variances can signal either a change in expected performance or inaccuracy in the original prediction either overall or in terms of timing/profiling. Many found it challenging to determine which applied when undertaking variance analysis, and differing issues arise for income and expenditure. One explained: “It’s difficult to know when to flag up problems that we can see arising. There was a problem last year with a shortfall in tuition fee income which could have been flagged earlier. The previous FD’s advice was ‘never to make a budget call in January’ as things might change as the year progresses further” (OU10).

A number of interviewees commented that it was not sensible to look at variances from budget in isolation as, for example, an under-spend may signal that targets were not being achieved elsewhere. One explained that: “Faculties tend to be self-regulating. If an adverse variance is achieved in one area the faculty tries to compensate with favourable variances elsewhere”. The budget was not seen as the “be all and end all” and it was noted that other factors came in to play both in terms of the achieving the budget and other non-financial priorities. Variance from budget might indicate inaccuracy but only gave part of the story and was not important if the overall faculty contribution rate was achieved: “However, services are cost centres and therefore expected to remain within budget by setting and achieving priorities” (NU5).

The phasing of income for reporting purposes caused problems. Some took a simple approach and profiled most income over 12 or 10 months where fee income was excluded from July and August. One interviewee commented that: “Our bankers prompted us to re-look at our phasing of income as they couldn’t understand what our management accounts were telling them on how the

university was progressing during the year” (OU10). The time spent trying to achieve meaningful variance analysis prompted another interviewee to suggest that they needed to move away from apportioning the budget over the year and instead concentrate on regularly preparing a revised forecast (NU7).

Furthermore, an interviewee explained the difficulties that arise from only reporting against an original budget: “Finance and budget holders are held responsible against these original budgets, not against a re-forecast budget once student numbers are known. Sometimes variances have to be repeatedly explained and justified during the year which is quite de-motivating” (OU14). Another emphasised that: “The original budget becomes less important as the year progresses and revised forecasts take on greater importance” (NU5). Although the majority of institutions undertook re-forecasting the timing of the process varied and there were differences in terms of whether the budget was updated.

However, there were suggestions that preparing multiple iterations of the budget was not sensible: “It’s micro-managing and can mean that the institution misses the bigger picture. It’s hugely bureaucratic to keep adjusting the budget” (NU1). This interviewee referred to a previous role and explained that in industry variance analysis is key and the budget is fixed without being adjusted as the year progressed. “It’s important to know why the original budget didn’t work. If we keep adjusting then we lose the plot”. This comment was made in the context of not undertaking a regular update of all budgets but adjusting where a significant ‘error’ had occurred, such as student number projections.

Others preferred to avoid reporting against a potentially inaccurate start of year budget at all. One interviewee explained that the budget in place at the beginning of August was only considered to be a ‘draft’. During the first quarter (August to October) a ‘final’ budget was created and agreed. This incorporated high level adjustments to take account of any significant changes in areas such as tuition fee income and related expenditure. For the remainder of the year actuals were reported against this final budget: “It stops the practice of continually reporting on bad news throughout the year” (OU13). Where income dropped, budget holders were expected to make savings.

Budget gaming behaviours were common, particularly in respect of “over-egging the costs” and hiding contingencies (NU14). Whilst some interviewees said that it caused them problems in that they could not be certain if expenditure would come through as predicted resulting in a loss of confidence in the figures, others claimed to have an understanding of where and when favourable variances would arise even if they were less certain of the amounts involved.

However, as also indicated in questionnaire responses (Table 5.7 above), many were unconcerned about the consequences of gaming behaviours and appeared content to tolerate the possible effects on budgeting accuracy as other benefits were gained, such as a greater engagement in the process rather than disinterest (OU6, NU11, NU7). It was explained that: “It hasn’t been easy to get academic areas to take a more robust approach to managing their finances”. This person noted that the institution was “collegiate” so “academics have more power than perhaps at more teaching intensive institutions or those with a more conforming community where academics might be persuaded more easily of the need for changes in financial management” (OU11). Another interviewee alluded to the potentially biased views of finance staff in terms of their perception of the budgetary process: “We’re bound to say that units don’t take the budget process sufficiently seriously, we work in Finance!” (OU20).

The general response from interviewees was that carry forward was not allowed, with typical responses being “some areas were building up large reserves because they had been over-resourced” (OU21) and “people are used to this and it has caused few problems” (NU21). The central finance department appeared able to exert power over whether the practice was permitted and generally took the view that it created potential problems for an institution, thus arguing against the practice.

Where it was allowed, one interviewee explained that controls were placed over such expenditure and that schools were discouraged from creating large reserves. The interviewee commented that: “Reserve expenditure has created some difficulties in terms of adding ‘unbudgeted’ expenditure and therefore suppressing the current year’s surplus” (NU3). The controlled release of carried forward budget was emphasised by others to reduce adverse movements on institutional surpluses and cash flow management (OU8, OU9).

The consequences of not allowing unspent balances to be carried forward can be seen in the comments from interviewees: “One area purchased a stock of three years’ worth of photocopying paper rather than lose the money, but the paper was damaged in storage – it was a waste” (OU10), “There is some evidence of wasteful expenditure towards the end of the year such as buying laptops, but it is still relatively small in the overall scheme of things” (NU16), “The budget drove strange behaviours towards the year end with budget holders trying to spend up or they wouldn’t spend on important initiatives because they hadn’t been budgeted for” (NU3) and expenditure from reserves “would unexpectedly affect the bottom line” of the university (OU7).

When considering the differing budget methods used, although an incremental approach was common some adopted a less developed form of ZBB. One interviewee explained that: “Budgets are built up from scratch each year in detail. It’s not as sophisticated as ZBB. It’s an iterative process, with income and costs revisited until an acceptable level of surplus is achieved” (NU1). Another stated that there had been some use of ZBB, with “a comprehensive exercise undertaken” some years ago (but not completely deployed across the institution). There was a tendency to employ ZBB only in specific areas now as the need arose “for new areas and those that are changing”. It was introduced to “flush out inefficiencies” (NU19). However, there were also instances of a ZBB being undertaken but the result not implemented as it “resulted in a large unaffordable amount” (OU5).

#### **5.4 Accuracy of budgeting**

##### *Questionnaire findings*

Question C1 asked if budgeting was perceived as accurate (Question C1), meaning neither overly cautious nor optimistic. Using a Likert scale of 1 (cautious) to 10 (optimistic), many indicated they adopted a cautious approach. Given the uncertainties faced by the sector, a cautious approach might be a sensible strategy to setting the budget so that there is some leeway for unexpected outcomes. However, there may be a number of influences on the respondent’s perception including past budget variances (either favourable or adverse), consequences of inaccuracies, the individuals own worries and concerns, etc.

Table 5.9 Accuracy of budgeting

mean 4.75 (standard deviation 1.80)

	Cautious			Accurate				Optimistic			
Scale	1	2	3	4	5	6	7	8	9	10	Total
Respondents	0	3	22	22	12	7	8	9	1	0	84
Percentage	0%	4%	26%	26%	14%	8%	10%	11%	1%	0%	100%
Cumulative	0%	4%	30%	56%	70%	79%	88%	99%	100%	100%	

The above table indicates that this is indeed the approach taken, with 56% of respondents within the cautious range of 1-4. Of course, what may be viewed as a cautious budget at the outset may be considered to be optimistic as the year progresses. Furthermore, a cautious approach does not necessarily signal a cause for concern and may have benefits.

The following question sought to identify if a significant element of an institution’s income budget was also perceived to be accurate. Question C2 considered the accuracy of student number estimates and responses demonstrated a less cautious approach, but slightly more accurate. So, this initially indicated that respondents were more content with their student number estimates. However, comments from individual interviewees (detailed in the next section) indicated some frustrations.

Table 5.10 Accuracy of student number estimates

mean 5.77 (standard deviation 1.90)

	Cautious			Accurate				Optimistic			
Scale	1	2	3	4	5	6	7	8	9	10	Total
Respondents	0	2	5	11	18	11	19	13	2	1	82
Percentage	0%	2%	6%	13%	22%	13%	23%	16%	2%	1%	100%
Cumulative	0%	2%	9%	22%	44%	57%	80%	96%	99%	100%	

The difference between the accuracy of budgeting and student number estimating may be explained by the difficulty of deriving the income that student numbers would generate. [Note: the correlation between the accuracy of budgeting, student number estimates and forecasting is considered in Chapter 6.]

Question C3 asked respondents to indicate approaches taken to improve accuracy.

Table 5.11 Improvements to budgeting

	Respondents	Percentage
Discussion with budget holders	58	69%
More detailed analysis of budgets	57	68%
Review of past budget variances	35	42%
Greater devolvement of budgets	34	40%
Increased time spent on budgeting	33	39%
Targets set for budget accuracy	20	24%
Benchmarking accuracy levels	13	15%
Less devolvement of budgets	12	14%
Changing budget software	11	13%
Centralisation of finance staff	9	11%
Appointing external consultants	1	1%
Other	6	7%

The two most common were to increase discussion with budget holders and to analyse budgets in greater detail. This often involved spending more time on the process, but not always. Interviewees indicated that there was a degree of ‘working smarter’ in terms of targeting areas of the budget which required improvement whilst spending less time on other areas. A survey of companies by Dugdale and Lyne (2006, 2010) found similar themes including greater junior management involvement, more detailed analysis and an intensification in the use of budgets.

In terms of the budgeting approach, the results of this survey, and those by Dugdale and Lyne (2006, 2010) and Libby and Murray Lindsey (2010), failed to provide any clear evidence that traditional budgeting methods were in decline. Budgeting processes were being enhanced and traditional practices embedded.

It might be expected that the new fee regime, involving higher fees and changes to the student number controls after the Browne Review (2010), would contribute to budgeting inaccuracy as it represented a significant change to the sector. Uncertainty over student recruitment, increased competition between universities with the withdrawal of SNCs and the introduction of other providers meant that tuition fee income might be harder to predict. Question C4 therefore asked about its impact.

Table 5.12 Impact of the new fee regime on budgeting accuracy

mean 4.20 (standard deviation 2.23)

	Less accurate			None				More accurate			
Scale	1	2	3	4	5	6	7	8	9	10	Total
Respondents	1	3	7	14	27	12	4	3	0	1	72
Percentage	1%	4%	10%	19%	38%	17%	6%	4%	0%	1%	100%
Cumulative	1%	6%	15%	35%	72%	89%	94%	99%	99%	100%	

35% indicated there was less accuracy (14 were post-1992 institutions and 11 pre-1992). These post-1992 institutions were mostly at scale point 4, indicating marginally less accuracy, whereas the pre-1992 institutions were mostly at scale points 2-3 signifying a more significant difficulty. The expectation might have been that pre-1992 institutions would have greater certainty over student recruitment and have less difficulty in maintaining accuracy, but the responses indicated that some faced increased uncertainties. Those who said that they managed to maintain or increase accuracy may have exerted greater effort on planning due to the uncertainty.

Comparing respondents’ perceptions of the impact of the new fee regime with changes in student numbers between 2012-13 and 2013-14 might reveal differences between institutions who viewed the process as less or more accurate. Those who viewed the new regime as having no effect on accuracy or that budgeting was more accurate might be expected to have a stable student population or perhaps planned growth due to excess demand, whereas those indicating less accuracy might be experiencing increased uncertainty and a fall in student numbers which might be unplanned. The average change in student numbers for institutions at each point of the Likert scale for the impact of the new fee regime on accuracy was therefore calculated. For example, three institutions indicated that their budgeting was less accurate by signifying that they were at scale point 2. The student numbers for these three institutions were identified for years 2012-13 and 2013-14. The change between years was calculated and divided by 3 to give an average change. These averages at each scale point are shown in the table below for UK, Other EU and Non-EU students.

Table 5.13 Change in FTE student numbers between 2012-13 and 2013-14

Scale	Less accurate			None				More accurate				Mean
	1	2	3	4	5	6	7	8	9	10		
UK	-3	-543	-867	-296	-138	-92	-157	-268	0	-61	-189	
Other EU	25	-118	-5	-21	-9	-3	-50	-125	0	-16	-14	
Non-EU	89	-52	46	77	103	91	94	-70	0	-14	96	
No. of institutions	1	3	7	14	27	12	4	3	0	1		

(N = 72)

(Source: HEIDI database for HE students 2012-13 and 2013-14)

The figures show that there was more volatility in UK student numbers for those who perceived budgeting to be less accurate, suggesting these respondents were justified in considering it to be a more difficult exercise. The reductions for some of these institutions were well above the mean. However, it may be that the 25 institutions who considered budgeting to be less accurate (scale points 1-4) put mitigating measures in place to anticipate the fall. Of greater concern may be the eight institutions at scale points 7-10 who viewed the changes as increasing accuracy but suffered reductions in student numbers. In these cases the institution may not have planned for potential reductions in income. To compound their difficulties, some also suffered reductions in other EU and non-EU students.

Finally, Question C5 sought to discover the importance placed on budgeting accuracy in terms of institutional governance. Only 27 (36% of respondents to this question) confirmed that their risk register referred to poor budgeting and financial forecasting (16 were post-1992 institutions and 11 pre-1992). Just four perceived their budgeting to be accurate (i.e. scale points 5-6 when responding to Question C1), representing 14% of the 27, compared with 25% of all respondents to Question C1 who were within scale points 5-6. Whilst the return on income in 2013-14 for these 27 at 5.5% was little different to the average for all respondents of 5.1%, the average debt was higher at £55.6m (for 92% with loans) compared with £45.9m for all respondents (for 93% with loans).

*Key points*

- Budget setting is cautious, but student number planning is perceived to be more accurate.
- Current budgeting approaches are being further embedded rather than radically changed.
- The new fee regime is perceived as having little effect on budgeting accuracy by the majority. It may be that events which came after the questionnaire findings (such as Brexit) are more uncertain and challenging for universities.

- The majority do not explicitly recognise poor budgeting and financial forecasting on their risk register.

### *Interview findings*

Student number data was considered to be a major impediment to accurate forecasting of tuition fee income for many despite the perceived accuracy of that data in the responses to the questionnaire. One institution commented that the student number data created by finance was ‘triangulated’ to check its reasonableness by looking at what was currently on the ledgers, past data on refunds, etc. However, it was also noted that data coming from the planning department, which was used for external reporting of student numbers, could be quite different to that used for income projections (NU5).

For many there was a separation between those producing student number forecasts (usually based in a planning or registry office who worked with faculties and schools in agreeing student number targets) and those in a central finance department responsible for estimates of tuition fee income. This separation was based on the internal structure the institution chose to adopt. In most cases there was little direct link between the system used to provide the student numbers and the finance system.

The importance placed on student income forecasts was demonstrated by the comments of one interviewee following a year in which the institution had unexpectedly under-recruited: “Student number forecasting is now considered to be so important it is prepared by an Executive group before the forecasts are approved by Council” (OU7). However, the interviewee explained that student number datasets in academic areas and in the planning department did not reconcile and there was difficulty in getting the definitions right as to how students were counted and converted into income: “There is no clarity as to how many students there are. It depends on the individual’s definition of what students count towards the total and what don’t. The accuracy of student number data is not fit for purpose”. Furthermore, the student number spreadsheets used for identifying the fee income, the HEFCE teaching grant and the OFFA projections were complex and errors were regularly found. This interviewee concluded that: “Improvements are required in the quality of student data, both historic and future forecasting. This is our most significant

difficulty with budgeting and forecasting”. The comments from this respondent demonstrated that there were difficulties in identifying actuals even before attempting to identify forecasts.

Another interviewee described the process whereby the Registry department created the student number forecast for the coming year’s budget. They produced a large and detailed spreadsheet “which is massive, but no one understands the data” (OU13). The central finance department then created their own forecast to assess if they could get close to the Registry department’s figures as a sense check. The finance department had also encouraged the creation of a ‘partner’ role in Registry in an attempt to achieve greater interaction between the departments with the intention of improving the robustness and quality of the data produced. In the longer term there was an expectation that the Registry planning function would be transferred in to central finance: “They’re currently unable to see the wood for the trees. You ask them a question on their data and they’re often unable to answer it. There is a lack of logic to their forecasting data”. The interviewee explained that in the recent past the institution had had to do a prior year adjustment to its accounts because a HESES recreation of student data showed that they had been overpaid HEFCE grant: “The forecast which had just been submitted to HEFCE also had to be recalled and altered. This has left the institution with a culture of worry because incorrect figures had been rolled through for a number of years”.

Similar problems were experienced by others. One explained that they had difficulties “making the clear distinction between total student numbers and those that are fee payers” (NU9), with the interviewee referring to fee waivers offered on various postgraduate and undergraduate courses. Another claimed that: “Student number predictions are nonsense” (NU10). In this case the student forecasting model was considered too detailed and the finance director wanted a less complicated high level model. There were inconsistencies in the student number data produced by the student finance department (which sat outside of the central finance department) at a further institution. It was commented that it was “hard to get consistency between the student number forecasts and the number reported in HESES returns”, and that: “There is not a clear mapping between student numbers and the income projection” (NU15).

One institution which had moved the planning department in to the central finance department explained that the finance department “had been pushing for this change as the student number

data resulted in very inaccurate monetary values for income, which could be overstated by as much as two million” (NU15). Students would be counted as a whole value but the income would be a lot less than a full FTE because the students were only taking a limited number of fee paying modules. The current year’s planning process had now been changed so that target student numbers together with the related monetary values were included in the university’s planning templates. The interviewee commented: “This means that anomalies and inconsistencies can be identified very quickly” (NU16). Although there was increased confidence in the data, it was stated that further improvements were required as: “Student number information is key to the budgeting process. It needs to be more accurate in order to lay the foundations for building the rest of the budget”. (The challenges of student number forecasting are considered in section 7.6.1.)

Despite moves by some to incorporate the planning function within the central finance department the outcome was not always successful. One institution explained that there had previously been tensions between central finance and the planning department due to the unrealistic modelling of income. To address inaccuracies it was decided to bring the planning function in to central finance, but “nothing really changed. No one worked with them to re-look at their models” and after three years planning was moved out of central finance again having achieved no improvements. The interviewee offered a view that: “I’m not saying it is the wrong approach, it just didn’t work for us as the Finance Director didn’t change anything” (NU19).

As well as issues in respect of over-forecasting tuition fee income, one institution had experienced under-forecasting. The interviewee explained that ‘net’ FTE student numbers were produced by the planning department which took account of estimated withdrawals. When converting these FTEs into a monetary value it understated the income as a significant number of students withdrew beyond the deadline for which tuition fees were repayable. Furthermore, the analysis of income was not sufficiently disaggregated to allow the institution to easily identify where the favourable variance arose (OU18).

To address the difficulties discussed above a number of mechanisms were being employed primarily in relation to improvements in reconciling data and improving systems. In terms of the former, there was a general recognition that student number data prepared for the purposes of HESA/HEFCE returns was not necessarily useful for deriving income estimates e.g. because it

either overstated or understated the likely revenue. A reconciliation between the two was necessary, with explanations for how they linked to each other.

Integration of system data sets was viewed as essential. One institution described how they had created 'student reports' which included details of forecasted fee income and FTE student numbers based on algorithms. The starting point for creating such reports had been to take the monetary value of tuition fee income from previous years out of their SAP system and to compare this with the student numbers shown on the student record system. Associations were then derived between the two which could be used for modelling forecasts going forward. Student numbers and income modelling were thus contained within one system that could be effectively interrogated (OU17).

Other difficulties experienced by institutions included accurately identifying those paying the old tuition fee rate compared with the new rate, making best use of software, determining the most appropriate fee for postgraduate courses and the likely student recruitment, accurately modelling the mix of students, interpreting trend data and adjusting for changes going forward, predicting overseas student numbers, determining an appropriate retention rate and estimating the effect of demographic changes. One interviewee from a large institution explained that "We tend to over-forecast. We haven't yet got an accurate model for the right mix of students" (OU11)

Even once the year had commenced many were still in a position of not being clear as to whether the tuition fee income budget was an accurate reflection of what was achievable, as explained by one interviewee: "People think it should be an easy process to tell you what the tuition fee income is likely to be for the year once you're in to November, but it's difficult to do as further students can enrol later in the year [some institutions recruit students who start in January] and refunds are also a factor" (OU10). Another stated that "There is limited time to react to adjusting the forecast as a result of January start data" (OU20).

A point not raised during the interviews was that many think of student number planning and tuition fee income in terms of standard full-time home undergraduate students rather than the more volatile markets for overseas, part-time and postgraduate students. Academic areas are perhaps less sure of how many of these students will turn up and there is not the reaction time required to put things right if under-recruitment occurs. This is because many overseas students enrol for one

year top-up courses (particularly at post-1992 institutions) and postgraduate courses (particularly at pre-1992 institutions), whereas home students are generally recruited to three year courses.

There was a view that student data improvements were required. As an interviewee explained: “At the moment, data can be obtained, but it’s not in a form which is useful for trend analysis. Better student modelling would give more robust income estimates. We’re not able to critique the student numbers” (NU14). It was believed that more accurate income budgeting might also lead to some improvements in expenditure budgeting.

On the expenditure side, the issue of whether accuracy suffered because budgets holders failed to take sufficient ownership of their budgets or did not spend sufficient time on the process was also raised by a number of interviewees. Some studies have found a correlation between the degree of participation and the sense of ownership (Buxbaum, 2011). However, participation through devolved budgeting can lead to aggregation issues resulting from multiple variances as explained later.

The importance of developing trust through liaison in order to encourage ownership was emphasised by many. One interviewee explained that it helped “to show we’re not the enemy” (NU16). The benefits from a shared sense of trust might be that the central finance department gain a greater understanding of the devolved finances of an institution whilst budget holders acquire financial support and advice in undertaking their activities and a more inclusive approach.

When considering accuracy an interviewee explained that the important question was: “Is it inaccurate forecasting that is the problem or is it the inability to deliver?”. Inaccurate forecasting could be corrected by a change in practices, but the inability to deliver was a more serious problem. It was noted that budget holders “often say that the forecast was inaccurate, but they have a role to play. They agreed the targets at the outset so it isn’t good enough to say the income forecast was too high. They should have stated this at the time and also taken a sensible approach to their spending plans” (OU13).

Unexpected variances in fee income can lead to changes in the budget process. An interviewee explained that the new fee regime resulted in a significant and unexpected fall in student numbers

in 2012-13 with a significant loss of fee income of £17m (equivalent to £50-60 million over the lifetime of the student cohorts). For the first time, the budgets were updated in November for actual recruitment so as to reduce expenditure plans. For 2013-14, the budgets were again updated in November despite the institution exceeding its recruitment targets for this year. The expectation was that budgets would now be updated every November and the interviewee commented that: “I don’t consider this to be necessary, but the senior management team don’t want to be caught out again as they were previously” (OU7). Another explained that: “Budgeting and forecasting was included as a low risk on the risk register, but since falling short on student numbers in one year it has been moved up to a medium risk” (OU10).

In term of Governors’ views, one interviewee emphasised that: “Council are interested in forecasting accuracy. The members are switched on people. They expect an organisation of this size to be able to forecast accurately by providing robust figures”. It was commented that in the past the budget process had not been taken seriously enough: “Senior people tend to respond when there is a crisis, but beyond that they will let things drift along on the assumption that it will all come good in the end. However, the culture is changing” (OU13).

A new Finance Director detailed his experiences:

Variations over the past 10 years have been positive. In my first year as an FD we had an adverse variance on income of one million which upset people. A favourable variance occurred in the following year of a similar amount and the reaction then was ‘you’re getting the hang of it’. So a favourable variance is better received. We tend to be pessimistic in our financial budgeting, but optimistic in our student number estimates to keep the colleges focused on achieving as good a result as possible (OU10).

In this particular case there appeared to be less concern about ensuring the fee income budget matched with the student number forecast as they were used for differing purposes.

Another interviewee explained that members of the governing body took a strong interest in the accuracy of budgeting and forecasting. They had a commercial background and wanted to know why the bottom line had not been achieved:

They accept no excuses. They will go through the figures line by line. They see a favourable variance as a bad thing as it shows that the budget wasn’t sufficiently accurate. Coming from the commercial world they have an expectation of accuracy and don’t

necessarily understand how the institution operates and the uncertainties of the environment (OU14).

It was emphasised that they did not like favourable variances. However, when the budgets were tightened so they were not so cautious this resulted in an adverse variance on the bottom line and they were even less happy: “It was Armageddon”.

Many claimed to have reasonably accurate budget processes at the university level but, as might be expected, achieved less accuracy the more disaggregated the data became. “Prudent budgeting is the norm – A political thing” (NU1) and it was only human nature to negotiate easier budgets. This person also stated: “Are there contingencies? – You bet there are! Why would we give ourselves a massive rod for senior executive to hit us over the head with if adverse variances were to arise due to having no cushion for unanticipated events?”. However, the size of the variance was important, and high favourable variances could result in accusations of holding back resources which might have been deployed more appropriately.

A comment made by one interviewee was that: “There is no such thing as a perceived acceptable level of variance. Any significant variance would have an [adverse] effect on the ability to invest in further activities and on the bank covenants which are quite strict” (NU15). This institution’s finances in 2013-14 showed that external borrowing exceeded cash and short-term investment balances, demonstrating financial risk. Accurate Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA) and cash flow projections were required to re-assure external funders, including banks, of the sustainability of an institution and offer early warning signals of action required to remain within loan covenants. Another (OU6) explained that they met with their funding banks on a quarterly basis to consider EBITDA and student number trends. Funding covenants were taken seriously and the interviewee provided examples of the type of covenants imposed for revolving credit facilities and term loans. HEFCE suggest that loan covenants are becoming much tighter (HEFCE, 2013). HEIs, as charities, are obligated to ensure that they remain sustainable (HEFCE, 2016b).

A common reaction was: “It depends on the circumstances whether these variances are acceptable or not. Unpredictable and inconsistent variances are always a worry” (OU16). Similar comments were made by others (OU7, OU19, NU17, NU18, NU19). One interviewee emphasised that they

were “trying to drive out the kind of language which suggests that adverse variances are bad and favourable variances are good. There may be good reasons for undertaking expenditure above budget”. An example of increased expenditure on marketing was given where overspends had been incurred to meet future recruitment targets. Where variances could be sensibly explained and justified the institution was “generally comfortable with the variance that has arisen. Where there is a lack of a sensible explanation that is an issue”. Furthermore: “Getting the student number prediction right is key. They can swing significantly”. This interviewee also mentioned the requirement by HEFCE in the Financial Forecasts for variances of  $\pm 10\%$  to be explained (HEFCE, 2011) and described this as “somewhat artificial. Some of these variances can have a low monetary value” (OU20). Interestingly, there was little reference to the HEFCE reporting requirement from other interviewees, demonstrating its lack of relevance to most institutions when considering accuracy.

It may be too simplistic to specify an acceptable variance from budget as it implies an acceptable tolerance. In reality, implicit tolerances do exist even if they are not openly discussed as acceptable. For example, variations from expenditure forecasts may be acceptable if there is a compensating increase in income or if expenditure is up in one area but down in another, and budgets can be flexed. As one interviewee noted: “Budgets are our business plan - variations are not necessarily a bad thing, it depends on their context” (NU8). However, this interviewee also emphasised that variances from budget were highlighted at Senior Management Team meetings and “budget holders are reluctant to show an adverse or a favourable variance for fear of an adverse reaction from the VC”.

Variances towards the year end caused problems for many. An interviewee referred to the unexpected release of expenditure budgets in May-July as “tah-da” moments whereby budget holders suddenly recognised that the budget could not be spent despite having previously indicated otherwise. Although such moments were frustrating, the interviewee stated: “I don’t mind variances of any size provided they are explainable. I don’t like them of any size if they are not explainable” (NU14). Another expressed the opinion that: “The aim is to get the picture right for the Governors. It’s a confidence thing. Governors lose confidence if large unexpected variances arise” (NU15).

Some took positive action to address variances as the year end approached as explained by one interviewee who viewed favourable variances as being just as bad as adverse variances because details of the University's forecasts were sent to its bank as part of the conditions for borrowing and "any variances will result in questions. If a favourable variance is likely to arise the relevant area is asked to pull forward expenditure". For example, the: "Estates department maintain a list of 'quick win' projects [on maintenance and repairs, etc.] that could be quickly brought forward" (OU12). However, such practices can be disruptive for the receiving department and may result in a higher price for work undertaken at short notice.

Variances as the year progressed also caused concerns. In some cases staffing expenditure was forecast without sufficient provision for potential turnover and inclusive of vacancies, resulting in favourable variances. One institution referred to instances of cutbacks on other costs when the budget was being established which could have been avoided had the staffing budget been set at a realistic level at the beginning of the year. By the time it became apparent that less budget was required for staffing there was limited opportunity to transfer resources elsewhere (NU16). However, making assumptions about staff turnover can be difficult, particularly for smaller areas of a university.

Another explained that budgets were "rolled forward" (this year's used as a baseline for next year's) using agreed assumptions, inclusive of vacant posts, which usually resulted in overstated staffing budgets: "Faculties and services tend to overstate their expenditure requirements which results in investment opportunities being missed because the projected surplus had been set too low. It's starving the business of funds. If we used the budget projections our cash flows would look very weak and we would need to rely on credit facilities" (NU15). The potential link between inaccurate budgeting, missed opportunities and misleading cash forecasts was evidenced by these comments in respect of those with limited cash resources and a weak financial position.

One institution explained that: "Central adjustments are made when setting the budget to moderate any estimates that look unrealistic" (OU16). However, others appeared to be reluctant to introduce 'central provisions' as a counter-measure to reduce potentially overstated expenditure budgets for fear of negating budget holder responsibility: "Finance try not to include a central adjustment even

though it might make the budgets more realistic” (OU19), thus failing to deal with aggregation bias.

The issue of cautious budgeting leading to aggregation problems was common, as reflected in statements such as: “Layers of prudence are built in to forecasts” (OU19). There had been attempts to address it. An interviewee noted that: “The approach to budgeting is historically cautious. By nature people are conservative. We have cautious Deans. So at the University level there is cautiousness and also at a local level there is further cautiousness. The University has removed this local level of cautiousness in faculties by taking out the contingencies” (NU17). A similar comment was made at an institution with budget ‘pots’ which tended not to be spent. In explaining how to address this the interviewee stated “pots are little piggy banks ..... and now we get to the technical bit which involves a hammer” (NU1). The removal of contingency ‘pots’ was seen as a key factor in achieving greater accuracy in this case. Another stated that: “Budgeting has predominately been cautious as it is across the sector. More optimistic budgeting is now being encouraged” (OU20). However, there was some nervousness about the potential consequences of doing so which might remove a ‘buffer’ against unexpected shortfalls in income or higher than anticipated expenditure. In all these cases, it may only be possible to remove explicit contingencies or the more obvious ‘rainy day’ pots.

A typical statement made by one interviewee was that they were “always prudent, but realistic. We don’t deliberately under-forecast income or over-forecast expenditure” (NU20). This interviewee explained that there had been accusations of missed opportunities, but that there was a contradiction in that the accusation usually came from the area which caused the largest favourable variances (the Vice-Chancellor’s Office in this case) by incorporating budget contingencies such as strategic development funds which remained unallocated.

HEFCE recognise that financial prudence in the sector is the norm. When interviewed, the Funding Council commented that: “In a number of cases there is evidence of unexpected items coming through towards the end of the year which were not taken account of when the July forecasts were submitted for the budgeted outturn”. A need for accuracy arises in terms of meeting Funding Council requirements to assess risk, which in turn assists the Funding Council in its discussions with the government over future funding.

More unusual reasons for inaccuracies which come after the student cycle has finished included 'farm results' which can be variable because of technical accounting issues. If crops are harvested before 31 July they are accounted for on the basis of discounted market value. If they are still in the ground they are valued on a cost basis. As the interviewee explained "it can come down to the state of the weather patterns as to the valuation generated" (OU14).

An explanation for the lack of accuracy in the sector was offered by an interviewee with recent experience of the private sector: "In industry there is a greater emphasis on accuracy because the cash balances tend to be less than for a university" (NU1). It was also emphasised that accuracy was important for the minority of companies that have to meet stock exchange reporting requirements. Here budgets were 'tested' to ensure they were not "pie in the sky". There was a rigorous approval mechanism at the beginning of the budget setting process and the budget was taken very seriously with bonuses awarded for achieving it.

The consequences of inaccurate budgeting were set out by an interviewee from an institution with annual budgeted surpluses of £5-£10m, but actual outturn of around £40m. There was a perception that more could be achieved academically if the surplus had been recognised at the outset, even though the inaccuracy was caused in part by academic managers. It was explained that the Finance Director was currently striving for a surplus of 3-5% on income as a starting point as: "A £5m surplus is too close to the wire. In practice the academic community achieves a higher surplus than £5m which creates tensions. In emphasising the need to identify accurate surpluses, the interviewee stated: "We need to move away from setting a budgeted surplus which everyone knows will easily be exceeded and actually show the likely outturn" (OU8).

Whilst some suggested that missed opportunities had arisen due to inaccurate forecasting (OU10, OU15) others were less certain about the adverse effect: "Units tend to squirrel away slush funds in the system. Sometimes we know about these contingencies, but in other instances we don't and the money could have been used elsewhere. However, I don't know how we would have spent the money if there was more surplus" (OU20). Despite arguments against contingencies and favourable variances, they may be better for the institution in the end for ensuring financial health, and their presence may depend on the state of an institution's finances. There appears to be a

strange rhetoric concerning missed opportunities, with few suggesting that increased accuracy would lead to significantly different decisions, and it may be that institutional leadership are simply more concerned with maintaining the confidence of stakeholders such as governing bodies and the banks.

## **5.5 Resource allocation and contribution models**

### *Questionnaire findings*

Inaccurate resource allocation or contribution rates can potentially result in expenditure budgets which do not reflect the needs of the organisation or individual budget holders.

The majority of institutions employed either a resource allocation (55%) or contribution model (28%) to assist in determining how budgets are distributed (Question D1).

Funding was allocated to academic areas on the basis of income generated by 78% of respondents (Question D2). A clear link was therefore established between the income generated and the resources distributed. The overall principle seemed to be that 'if you earn it you keep [some of] it'. Holloway (2006) also found a high percentage (73%) used a student number income-distribution resource model. His desire that institutions should move away from mechanistic resourcing models based on student numbers to models which allocated funding based on expenditure needs appears not to have been realised. Holloway implemented a model at Brunel University which allocated resources based on prioritised plans for meeting strategic objectives.

Outside of the model only 29% of respondents said that it was easy to obtain new resources to support unforeseen opportunities (Question D3). These results are in contrast to survey findings by Libby and Murray Lindsey (2010) that over half of companies found it easy to obtain new resources outside of the normal budgeting process.

22 institutions (33%) used their models to set academic priorities (Question D4) and the new fee regime had not been a significant driver in altering current models (Question D5). Sixteen institutions (25%) stated that they had altered their approach due to a change in the fee regime. Ten were post-1992 institutions and six pre-1992, with six operating at low surpluses (less than

3%) or deficit for 2013-14. Another thirteen (20%) had still to decide if they would make alterations.

### *Key points*

- Resource or contribution models are commonly employed, with resources mostly distributed on the basis of income generated.
- A significant minority (25%) had changed their models as a result of the new fee regime.

### *Interview findings*

The new fee regime had resulted in few changes to models as institutions were unclear as to what new overhead or contribution rates might be sensibly applied. Some had reached their decision of no change by default, whilst others had created new models but had not implemented them as they were not considered to be an improvement on current practices. The implication of not changing models may be that variances against expenditure budgets result from inappropriate resourcing.

Many required those who wished to obtain additional resource to construct a business case explaining the requirement and the resulting benefit to the institution, demonstrating tensions between central control and the autonomy of faculties and schools. To address potential inaccuracies, one interviewee stated that: “Contingencies are maintained centrally where it is considered that some further expenditure will be required or if income will not be achieved” (NU8).

The avoidance of complexity was a common theme and it was recognised that there was a trade-off between simplicity and accuracy. The intention was that the model should be “roughly right rather than precise” (NU1). It was noted that “Following the new fee regime, the wealthy faculties now tend to be the teaching intensive ones rather than the research intensive ones” (OU7). One interviewee explained that “There is more buy-in from a simple model” (NU15). The importance of simplicity was also emphasised by another when describing how drivers were used to allocate central costs to faculties. These “drivers are only a proxy. The aim is to be transparent and simple rather than totally accurate. The model is fair, but without a spurious level of detail which would require the appointment of another accountant just to manage the model” (NU17). The downside of such a simple approach is to potentially undermine the trust of faculties, etc.

Overall, interviewees indicated that their estimates for income were sufficiently accurate to permit a fair distribution of resources and realistic expenditure planning. No evidence was available to support or reject these views. However, given that there is evidence from HEFCE to suggest that income is consistently under-budgeted (HEFCE, 2012b, 2013b, 2014c, 2015c, 2016b) resources may not be distributed appropriately (or sufficiently early) in a financial year.

Evidence of cross-subsidies have also been found in some studies of HEIs which would suggest that the degree of fairness is dependent upon where an individual is based within an institution (Angluin & Scapens, 2000; Lewis & Pendlebury, 2002; Bublitz & Martin, 2007; McChlery et al., 2007). Indeed, the issue of cross-subsidies and their transparency was mentioned by a number of interviewees (NU1, NU3, NU6, OU2, OU8, OU10, OU13) and may be a useful area for future research as it indicates incomplete financialisation (sections 2.7 and 8.5 consider the term financialisation).

**5.6 Forecasting**

*Questionnaire findings*

The importance of forecasting to various activities (Question E1) is shown in the table below, with respondents asked to rank activities using a 5-point Likert scale. Responses from institutions have been weighted and ranked in accordance with the importance attached to each activity. Where an activity is considered to be the most important the response is weighted by a factor of 5, where it is the least the weighting is 1.

Table 5.14 Reasons for undertaking forecasting

	Weighting	Most important					Least important	
		5	4	3	2	1	Weighted Score	Ranking
Annual budget process		280	60	15	4	4	363	1
Strategic planning at the University level		180	92	42	8	3	325	2
Formal planning of surpluses/(deficits)		175	100	30	8	4	317	3
Cash flow management		160	108	24	18	3	313	4
Strategic planning within colleges/faculties/schools		125	88	63	18	4	298	5
Communication with the Funding Council		110	104	48	20	5	287	6
On-going performance management		80	76	66	26	3	251	7
Preparation of the Margin for Sustainability and Investment		100	40	63	28	8	239	8
Debt financing		95	56	36	30	14	231	9
Other external reporting requirements		40	44	75	28	10	197	10
Tax planning		25	20	33	40	28	146	11
Other (including capital programmes)		5	0	3	2	3	13	12

Respondents identified that forecasting was most important for informing the budget, strategic planning, the planning of surpluses or deficits and cash flow management. However, despite its importance, forecasting as a process is only really effective if the results are acted upon (Berry et al., 2004). Some interviewees (see below) indicated a lack of confidence in their forecasting in the current uncertain environment which may affect how well they are used.

Most (67%) indicated that they updated medium-term forecasts quarterly or more frequently (Question E2). However, the validity of the responses seem doubtful. When interviewed, respondents who had indicated a frequent update were actually referring to a re-forecast of the annual budget rather than recasting the medium term forecasts. These latter forecasts were more commonly updated when re-running strategic models for internal planning purposes once student numbers for the current year had been established that could be rolled forward to future years, or were undertaken for external reporting purposes when updating figures reportable to the Funding Council. The survey questionnaire included a definition of terms at the start which stated that future forecasts were those falling beyond the period of the annual budget. With hindsight, it would have been beneficial to repeat the definition at the outset of section E of the questionnaire which dealt with forecasting questions.

Question E3 sought details of who provided information for forecasts. However, it is possible that some responses were in respect of both forecasts and revisions to budgets.

Table 5.15 Participation in forecasting

	Central finance	Academic areas	Support areas	Corporate management	Other
Funding Council grants	79	3	14	6	1
Academic fees and education contracts	65	44	28	11	1
Research grants and contracts	54	60	26	6	0
Other operating income	69	45	38	8	1
Endowment income and interest rec'd	82	1	4	3	1
Staff costs	74	49	52	14	0
Other operating expenses	72	60	56	11	2
Depreciation	84	0	3	2	0
Interest payable	83	0	0	2	0

The results indicated that forecasts were not prepared by central finance in isolation and included other departments in key aspects of the forecasts, but the degree of involvement of other areas is probably variable. The importance of central finance liaising with other areas is explained by Berry et al. (2004). They noted that senior finance managers tended to be distant from academic work, had an institutional focus and lacked an insight into the detailed nature of academic work. Interviewees were looking to address a lack of knowledge of academic areas by seeking to enhance business partnering practices (NU1, NU7, NU17, OU5, OU18, OU21).

Student number forecasting is becoming increasingly important. Question E4 therefore sought to discover who played a major role in preparing these forecasts.

Table 5.16 Role in preparing student number forecasts

	Major	Minor	None
Central finance function	23	33	5
Registry department	24	15	11
Planning department	52	9	5
Academic areas	39	19	3
Other	2	0	0

Table 5.17 Type of institution where the central finance function has a major role

Pre-1992	9
Post-1992	12
College of HE	2

The lead was usually taken by the planning or registry department with the assistance of academic areas. However, as explained earlier, interviewees expressed a view that these forecasts were generally inadequate. Increased input from academic areas might have improved the end result, particularly as greater responsibility for generating income now rests with those closest to the recruitment process.

When forecasts were recast very few institutions (13%) felt the need to reset the current year’s budget (Question E5). However, Question E6 indicated that most respondents used the current year’s budget as the base-line for deriving future forecasts, so there was a clear link between the two.

83% of responses to Question E7 indicated that the most common forecasting period was 3 to 5 years. Most tied the period to external reporting requirements or internal planning needs. Those who chose a much longer period appeared to do so in order to match their forecasts to the length of their strategic planning cycle, their estates and other capital plans or to inform their cash flow projections.

Over 67% of respondents had considered the effect on forecasting of the new reporting standard FRS102 and FEHE SORP 2015 (Question E8). At the time of the survey, the sector generally appeared to recognise that the new reporting requirements might have a significant effect on forecasting. Most interviewees seemed aware of the requirements and some had already modelled the potential effect in areas such as revenue recognition. Although university interviewees seemed generally unconcerned, an interviewee at HEFCE explained that FRS102 and the new SORP could have a significant impact on the Annual Accountability Return to HEFCE with reported surpluses becoming more volatile.

Question E9 sought to understand what areas caused institutions the most difficulty when trying to set accurate forecasts in terms of functions over which forecasters might be able to exert some control.

Table 5.18 Impediments to producing accurate forecasts

	Major	Minor	Not an impediment	Total Responses
Quality of financial data inputs	17	39	23	79
Quality of non-financial data inputs	20	40	19	79
Quality of student number data inputs	37	27	15	79
Pressure to match target rather than a realistic outlook	14	33	34	81
IT tools employed	17	34	29	80
Insufficient involvement of operational areas	7	34	38	79
Insufficient involvement of senior management	9	26	45	80
Time available to produce forecasts	15	37	29	81
Tendency to focus too much on detail	15	39	25	79
Difficulty accessing relevant data	14	47	18	79

The most common problem was obtaining meaningful student number data. This was consistent with earlier responses to Question E4 where central finance had difficulty in deriving accurate monetary forecasts from student number data. Most respondents recognised the importance of consulting widely and had good processes in place to do this even if the data obtained was not

always considered to be sufficiently robust. Furthermore, interviewees indicated that actions were usually taken to drive the institution towards its targets if the initial forecasts suggested that desired outcomes might not be achieved.

Question E10 sought views on the accuracy of forecasting.

Table 5.19 Accuracy of forecasts

mean 4.44 (standard deviation 1.77)

	Cautious			Accurate				Optimistic			
Scale	1	2	3	4	5	6	7	8	9	10	Total
Respondents	0	1	21	25	14	7	8	3	0	1	80
Percentage	0%	1%	26%	31%	18%	9%	10%	4%	0%	1%	100%
Cumulative	0%	1%	28%	59%	76%	85%	95%	99%	99%	100%	

59% of respondents produced cautious forecasts. CFO Research Services (2011) also found a preference for a cautious approach amongst large companies but to a lesser degree, with 44% setting conservative forecasts which would understate actual performance.

This tendency to set achievable forecasts was similar to findings for Question C1 and indicates that a similar attitude is adopted to annual budgeting and medium-term forecasting. Despite potentially more time and effort being employed on the budgeting process, the greater certainty of the outcome because of the shorter time period covered and the less granular approach taken to deriving forecasts, there appears to be little difference in the perception of accuracy between budgeting and forecasting.

When considering the IT used for budgets and forecasts, 50 institutions (62%) used one tool to integrate actuals, budgets, forecasts and reporting (Question E11). Thus preferring an integrated approach. However, only 28 respondents used specialist software for their student number planning (Question E12) despite the difficulties experienced in achieving accurate tuition fee income projections.

Reviewing the accuracy of forecasts against the actual outturn at a later date (Question E13) was undertaken by 68 institutions (84%) indicating the importance placed on achieving forecasting

accuracy. Furthermore, 55 respondents (68%) said they would be interested in comparing the accuracy of their forecasting against other institutions if benchmarking data were available (Question E14), but due to the lack of data available it was perhaps unsurprising that only 5% claimed to have made any attempt to benchmark the accuracy of forecasts against external data (Question E15).

Question E16 sought to discover if aspirational targets were maintained in addition to forecasts. Respondents appeared to understand the difference between the two. Over 30% said ‘yes’ and 34% ‘sometimes’. Respondents therefore sent forecasts to their Funding Councils which they considered to be a realistic reflection of the institution’s activities even if they might be somewhat cautious compared with the institution’s targets.

The penultimate question in Section E sought views on the forecasting process (Question E17).

Table 5.20 Perceptions of the forecasting process

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
Forecasting is more an art than a science	1	10	24	40	6	81
At this institution, forecasting is just part of the budgeting process, rather than a broader performance management tool	7	28	17	28	4	84
Reliability of the institution’s forecast is compromised because operational functions are not sufficiently involved	7	42	17	16	2	84
A greater understanding of how the various parts of the organisation operate would improve the forecasting undertaken	4	18	15	41	6	84
Forecasting accuracy has deteriorated in recent years	17	44	17	5	1	84
It is difficult to set accurate forecasts because of the unpredictability of factors influencing the institution’s activities	4	22	19	36	1	82
Forecasts quickly become obsolete or outdated	3	21	17	37	4	82
Inaccurate forecasting has adversely affected the institution	5	36	17	20	5	83
Governing body takes an interest in the accuracy of budgeting and financial forecasting	0	13	14	40	17	84

(Note: Shading is used to identify whether more respondents disagreed/strongly disagreed or agreed/strongly agreed)

The process was considered to be more of an art than a science (57%) that could be influenced by perceptions and the culture of the institution. 67% of senior executives in the private sector took a similar view (Economist Intelligence Unit, 2007). However, respondents were almost equally split in their view of whether forecasting was just part of the budgeting process (38%) or a broader performance management tool (42%). Similar percentages, at 44% and 40%, were found for

private sector organisations (Economist Intelligence Unit, 2007), suggesting similarities in thought processes despite differences in the type of organisation.

Many felt that their institution’s forecasts were reliable because operational functions were sufficiently involved in the process, but 56% agreed that improvements could still be made by acquiring a greater understanding of the various parts of the organisation. For the private sector, only 27% felt that the reliability of the organisation’s forecasts were compromised because operational functions were not sufficiently involved (Economist Intelligence Unit, 2007), indicating a more developed process.

Despite the recent significant changes affecting the sector, the majority believed that forecasting accuracy had not deteriorated in recent years. However, many agreed that forecasts quickly became obsolete or outdated and this could be a symptom of the pace of change in the sector. The majority also felt that any inaccuracy in their forecasting had not adversely affected the institution.

The final question in this section asked respondents to indicate which techniques were used for preparing income forecasts (Question E18).

Table 5.21 Techniques used to forecast income

	Respondents	Percentage of total returns
Estimates based on knowledge of staff	81	96%
Trend projections	57	68%
Market research	24	29%
Simulation analysis	12	14%
Regression analysis	5	6%
Other	5	6%

The majority prepared estimates based on the knowledge of staff and the use of trend projections, although the weaknesses of trend analysis were recognised by interviewees. Claims to the use of more complex statistical techniques such as simulation and regression analysis were rare. Various studies of the private sector have also found subjective estimates to be the most popular and statistical techniques the least (Drury, Braund, Osborne & Tayles, 1993; Guilding, Lamminmaki & Drury, 1998; Ahmad, Sulaiman & Alwi, 2003).

In a university context, Brinkman and McIntyre (1997) considered the alternative methods for enrolment forecasting in American universities and found that complex methods are rarely employed. Others explain that “mathematical trend extrapolation, time-series models, and probabilistic forecasts, are less familiar to higher education administrators” and are less likely to be employed (Morrison et al. 1984, p.14).

### *Key points*

- Participation in budgeting and forecasting is wide-ranging and may lead those outside of the central finance department to conclude that there is increasing financialisation of universities.
- Forecasting is as cautious as budgeting despite the interest of the central finance function in achieving accuracy.
- Simple forecasting techniques were preferred over more complex methods, similar to the approach taken to budgeting.
- Rhetoric on the consequences of inaccurate forecasting may not be supported by evidence of significant adverse effects.

### *Interview findings*

Despite future years forecasts being derived from the current year’s budget, in some cases the budget was considered to be of less value than forecasting. One interviewee commented that: “There is a desire to spend less time number crunching and more time on value added activities such as ensuring financial sustainability” beyond the period of the budget (OU6). Others explained that: “Lots of effort is put in to getting the budget right so this can be used as the baseline for forecasting in the following years. However, if faculties set unrealistic forecasts the figures are adjusted in the forecasts sent to HEFCE” (OU7). An interviewee of an institution where medium term forecasts were prepared as part of the overall budgeting cycle suggested that: “Future years’ forecasts are becoming increasingly important and there is a greater tendency to hold departments to what they say” (NU14).

A number of the interviewees stated that their institution maintained five year forecasts. One commented that: “This is undertaken for sustainability purposes to go beyond the ‘steady state’ period where tuition fee income has replaced HEFCE grant” (NU5). In a few instances the period

of the forecast was dictated by the bank from which funds had been borrowed. Others adopted the principle of '2+2' (i.e. two years' budgets, representing the current year's outturn and the following year's budget, and two years' forecasts), in-line with Funding Council reporting requirements at the time.

However, some were sceptical of the forecasting exercise given the current uncertain environment, with one stating that: The final two years of the HEFCE Annual Accountability Return forecasts is "just a box ticking exercise. It has no meaningful use" particularly given the regular changes in government policy (NU1). Uncertainty was a common theme in the discussions with interviewees (even prior to the UK's decision to leave the European Union following the referendum in June 2016) as well as the influence of banks.

In terms of reviewing the accuracy of forecasts, one interviewee explained that: "There have been exercises to track forecast evolution by faculty to see which areas have the largest variances" (OU19). Another commented that: "Forecasts can vary as a result of unexpected changes in the environment. This doesn't mean that the forecast was inaccurate based on the information available at the time" (NU20). Adverse or favourable variances were reviewed in context, i.e. additional income may have resulted in adverse variances on expenditure. An interviewee suggested that they might look at benchmarking their forecasting accuracy against others in 5 years' time, but the processes being put in place and the market changes were too new at the moment to draw any useful information from a benchmarking exercise (OU5).

Unlike other questionnaire responses where there was consistency with the interviewee comments, some indicated the use of sophisticated forecasting techniques when responding to the questionnaire, but this was not confirmed at the interview stage. For example, one respondent (NU14) used the TRAC return data to 'simulate' costs going forward by assuming that unit costs would be incurred on a similar basis in future years. A simulation model had not actually been developed despite the respondent indicating on the questionnaire that it was used. However, there appeared to be some movement away from reliance on past trends, with one interviewee explaining that as income was now more uncertain less emphasis was placed on trend analysis and more time was spent on assessing the future. Market research had also been undertaken in areas such as projecting international fee income (NU19). Another explained the uncertainties they

faced: “Overseas income has been growing fast, but the International Director is always nervous about how things will work out” (NU17). Forecasting overseas income tends to be based on a combination of current and past experience and target setting to ensure growth in income, but HEFCE has suggested that forecasting in this area may be overly optimistic (HEFCE, 2017a).

In explaining the process of creating forecasts, it was stated that: “Budgeting tends to be scientific, but forecasting depends on assumptions which are invariably wrong”. However, it was noted that the benefit was that it “gives you a feel for the risks and helps in getting the story right. It’s important to see where the assumptions are taking you” (OU6). Other interviewees commented that different investment decisions could have been made if a less cautious approach had been taken, but that “there is not much evidence that better decisions would have been the result” (OU16) and that “we know we’re being cautious and will plan capital projects with this in mind” (NU18).

Views gathered from HEFCE representatives when interviewed showed that the Funding Council appeared to have a good understanding of the forecasting accuracy of individual institutions, based on knowledge built up over many years. They know which are likely to submit prudent forecasts and those which are less likely to do so. The Funding Council also recognises that the culture of an institution and changes to it can affect the prudence of forecasts. Interestingly, they have commented that a change in Finance Director can sometimes result in changes to the cautiousness of forecasting. However, this may not be an intentional change in prudence as those interviewees new to the role of Finance Director did not indicate that they specifically sought to change forecasting practices. HEFCE’s view is that whilst forecasting in the sector will never be perfect, it does give an indication of an institution’s strategy and plans.

In commenting on the sector, one Finance Director explained that the “budgeting and forecasting processes tend to be tailored to the circumstances of the individual institution” (NU8). Other interviewees noted that they tended “to do better than forecast, certainly in the last 8 out of 10 years. This is typical of the pessimistic nature of the sector” (OU20) and: “There is an underlying cautiousness built in to the culture of the sector” (NU18).

## 5.7 Scenario analysis

### *Questionnaire findings*

The majority (88%) undertook scenario modelling (Question F1). Most did so for the purpose of internal contingency planning (46%) and/or internal resource planning (27%). Only 19% saw the primary purpose as meeting the requirements of their Funding Council (Question F2), which may provide some re-assurance to this body that the technique is embedded within university processes. In terms of the model created each year, 52% said that they developed a new model, whilst 48% indicated that they continued to use their current model (Question F3).

Many employed a ‘standard’ scenario model and altered the underlying assumptions annually, but even those who employed a new model generally started with the old model and updated it without making any significant alterations. The key variables used in scenario models (Question F4) are shown below.

Table 5.22 Key variables used in scenario models

	High	Medium	Low	Not important	Responses	% High
Student numbers (Home & EU under-graduates)	61	5	3	4	73	84%
Student numbers (Home & EU post-graduates)	34	18	12	6	70	49%
Student numbers (Overseas under-graduates)	46	17	3	5	71	65%
Student numbers (Overseas post-graduates)	42	16	7	4	69	61%
Student numbers (Part-time)	16	20	22	9	67	24%
Student numbers (Distance learning and franchise)	12	20	18	18	68	18%
Student tuition fee rate	31	23	8	5	67	46%
Student residences income	8	27	16	13	64	13%
Provisions for income not linked to student numbers	9	19	26	9	63	14%
Funding Council income	27	25	14	2	68	40%
Research grants	17	22	25	6	70	24%
Enterprise and innovation activity	10	28	25	6	69	14%
NHS funding	19	12	16	18	65	29%
Interest receivable	3	7	39	15	64	5%
Other income	4	25	33	3	65	6%
Staff costs	62	6	1	0	69	90%
Staff numbers (Head count or FTEs)	44	11	9	3	67	66%
Non-pay expenditure	34	25	9	1	69	49%
Depreciation/capital expenditure	22	28	14	3	67	33%
Interest payable	6	18	27	13	64	9%
Other	5	0	0	0	5	100%

(N = 73)

Those variables given the highest priority (Home and EU undergraduate student numbers, overseas undergraduate and postgraduate student numbers, and staffing in terms of costs and numbers) tend to be the largest amounts in many institutions' accounts and it is therefore unsurprising that they should be considered the most influential variables. However, the student tuition fee rate may take on increasing importance as the Government reviews the affordability of HE provision.

Many have developed models incorporating formulae which permit the 'logical' movement of expenditure with income. Question F5 sought to understand what the most common practices were.

Table 5.23 Formulae and sub-models used to link key variables

	Responses	% of those undertaking modelling
Separate sub-model for staff costs	45	61%
Separate sub-model for student fee income	43	58%
Depreciation and interest payable based on capital spend	43	58%
Differing inflation rates for income and expenditure	41	55%
Staffing costs as a proportion of income	40	54%
Staff student ratios	36	49%
Separate modelling of incremental drift for salaries	36	49%
Scholarships/Bursaries according to student numbers	33	45%
Interest receivable based on cash flow projections	29	39%
Research or other income per FTE staff	23	31%
Non-pay costs as a proportion of income	22	30%
Student number FTEs as a proportion of head count	19	26%
Estate running costs as a proportion of space occupied	10	14%
Residences income as a proportion of the student population	8	11%
Non-pay costs as a proportion of pay costs	8	11%
Other	3	4%

(N = 70)

Whilst many of these formulae had a sensible basis and were widely used, some were rarely applied, such as estate running costs as a proportion of space occupied. This might be because the relationship was not valid on a consistent basis or the required data was unavailable.

Some items were excluded from scenario models as they offered little of value in assisting institutions to judge annual movements in income and expenditure (Question F6). These included FRS17 pension costs, transfers to reserves, committed but not spent costs and non-recurrent expenditure.

Models varied in complexity, with the more sophisticated ones based on HEFCE's Annual Accountability Return so that the effect of changes to key numbers (usually identified in a table of critical assumptions) could be seen on income and expenditure accounts, balance sheets and cash flow statements. However, these models usually contained simple formulae to link the differing statements together. Indeed, most interviewees indicated that simplicity was key due to a lack of time to further develop models and the need to present understandable results. Deloitte (2015, p.11) explain that "too many metrics can dilute the message and prevent the finance function from communicating clearly with key stakeholders" (Deloitte, 2015, p.11).

By far the most commonly used modelling software was Excel, with 84% using either spreadsheets or other 'manual' methods. 6% used off-the-shelf forecasting/planning tools, 5% used a facility contained within their finance system, 4% employed bespoke forecasting/planning tools and just 1% used dedicated specialist software (Question F7). Despite the risk of introducing inaccuracies (Deloitte, 2015), spreadsheets remained the system of choice for the majority of institutions.

#### *Key points*

- Scenario modelling by universities is common and is employed for more than just satisfying Funding Council requirements, but a significant minority choose not to use it.
- A simple approach using spreadsheets is preferred to more complex methods despite the availability of suitable alternative software. This again follows the preference for 'simplicity over complexity' seen in the approach to budgeting and forecasting.

#### *Interview findings*

A number of interviewees demonstrated how they had constructed their financial scenario models using spreadsheets, the processes in developing the model and how key variables were selected. In some case this involved sitting in front of the interviewee's computer whilst they offered a

demonstration of how changes to key figures were fed through their model. This provided a better understanding of the level of sophistication of the models employed.

The key variables used in scenario models differed depending upon the strength and reputation of the institution. For those with high demand for student places or strong research performance the variables of ‘undergraduate home and EU students’ and ‘research income’ were given lower importance as there was little variability between years. Others explained that the income from postgraduate and overseas students was so small that there was little point in including these.

At the extreme, a small minority did little or no scenario modelling. One such interviewee commented that although the Vice-Chancellor was keen for it to be done there had been little progress despite explaining that it: “Would be easy enough to do. You just need to vary a few figures on a spreadsheet” (NU20). This interviewee in Wales explained that mergers between institutions in the country had “led to planning blight” at the university. Another explained that they were looking to address this in the future when time permitted and it was “on the wish list, but we need to get the basics right first” (OU4).

Excel was popular for modelling due to its functionality and the fact that users were familiar with the package. One interviewee explained that their finance system had the capability for scenario modelling but queried: “Why would you use it when spreadsheets have all the functionality you need?” (OU9).

Similar comments were offered by another interviewee who also said the scenarios would not be produced within the module capable of doing so in the finance system: “A complex mathematical model is not required. It would be too unwieldy. For it to work properly the student number modelling would have to be dynamic. It would be a horrible model” (OU16). It was explained that the current Excel based model gave an indication of the effect of altering key variables and showed the “ripple through effect of changes”. A balance is required between modelling that is too simplistic to give a realistic picture but too complex to be understandable (OU8).

It was unusual to find institutions with sophisticated software which permitted an integrated model for scenario building that had dynamic links to other systems. Just 24% said they either did or

sometimes operated such systems (Question F8). The uncertain environment appeared not to exert a significant influence on the adoption of such software by universities.

Scenario modelling tended to concentrate more on reacting to bad news rather than new opportunities. As explained by an interviewee, the process “looks more at the downside than the upside. No one wants to be caught out twice with an unexpected significant shortfall in student recruitment” and that the “key variables in the scenario model tend to be those that are volatile and difficult to forecast accurately” (OU7).

Interviewees explained that the scenario figures presented were based on a set of assumptions derived by the central finance department rather than from guidance originating from senior staff or governing committees, but did take account of their likely need for information. The output from scenario models was primarily used to inform and provide assurance to senior staff and governing bodies of the potential financial effect of the risks facing the institution. Few institutions prepared detailed documentation as to the thought processes behind the inclusion of certain variables or the reasoning for the size of the changes modelled. One interviewee stated that internal audit had criticised the fact that scenarios were not well documented and noted that: “It tends to be an iterative process with just the end result documented” (NU15).

Despite the requirement from HEFCE for institutions to undertake scenario modelling (HEFCE, 2011) and an expectation that institutions would clearly specify their key sensitivities (incorporating supporting figures) in their commentary to their financial forecasts as part of the Annual Accountability Return process, many institutions were reluctant to include specific figures or undertake the exercise at all. The requirement is not prescriptive and institutions are free to choose how they undertake scenario modelling. Most interviewees stated that they simply described the method used. The primary reason for this was a reluctance to demonstrate to a funding body how institutions might be able to manage with significant cuts in grant for fear of encouraging such a reduction. One institution that did share details of its scenario modelling figures with HEFCE explained that: “It’s sensible to do this so that HEFCE can have confidence that planning is being undertaken properly within the institution” (NU18). This institution generated low surpluses of 3% in 2013-14 and was perhaps keen to demonstrate effective financial management.

Scenario models were mostly updated annually, but one institution stated they may be considered 2 or 3 times a year by the university's finance committee when having an extended debate about the surplus or net debt position (OU16). In general, a light touch approach was taken. It appears to have been used more extensively in areas such as considering the fee to charge under the new fee regime and for assessing the affordability of new estate investments.

Overall, evidence from the interviews indicated that the sector was largely unconcerned about the need for sophisticated scenario models. As one interviewee explained "people say they need it, but they don't use it" (OU21). Some also cast doubt on the benefit of undertaking scenario modelling as the underlying forecasts were usually proven to be inaccurate anyway. This perhaps misunderstands the role of scenario modelling which is not about achieving accuracy, but more to do with considering alternative views of the world in which an institution operates and how it might react to those altered circumstances. Institutional reluctance to use the technique may be because they don't feel that it adds value to their processes and other activities take priority.

## **5.8 Current and future processes**

### *Questionnaire findings*

The majority of respondents (85%) had implemented their budgeting/management accounting system less than 15 years ago, with 18% implementing within the last 5 years (Question G1).

Question G2 found that Agresso/Coda was the most popular software (used by 36%), but many also used spreadsheets (26%). The significant use of spreadsheets is consistent with survey results elsewhere (Research Foundation, 2012; iGov, 2013).

Whilst some operate automatic budgetary controls, only 18% of respondents indicated that their system employed 'funds checking' to prevent further expenditure beyond the total budget which might give the impression of accuracy. Another 32% said the facility was available but not used (Question G3).

Access to reports and data can assist with effectively constructing and monitoring budgets and forecasts. 74% of respondents said that individuals were able to drill down to successive levels of

detail to investigate figures. However, only 26% of university respondents indicated that managers and budget holders regularly used the facility, with a further 57% stating that there was mixed usage of the facility (Question G4). This perhaps indicates a low priority given to financial analysis by managers and budget holders.

The sharing of budget and resource allocation figures across an institution was quite variable. Some institutions freely permitted users of the finance system to look at detailed budget figures throughout the organisation using ‘read-only’ functionality whilst others operated data control mechanisms to prevent institution-wide access.

Table 5.24 Sharing of budgets and resource allocation figures

	Resource allocation		Budgets	
	Respondents	Percentage	Respondents	Percentage
Yes	31	40%	30	38%
No	32	42%	33	41%
Informally	14	18%	17	21%
Total	77	100%	80	100%

There was almost an equal split between those who shared budget and resource figures and those who did not. Others indicated that there were informal mechanisms to share information. In some cases access may be limited due to competition between areas for resources and therefore a reluctance to share details of the budget may arise in case it results in arguments over whether one area is over-funded compared to another.

Questions G6 and G7 asked respondents to indicate the significant changes made in budgeting and forecasting practices in the last two years at their institutions and likely changes within the next two years. The results are summarised below.

Table 5.25 Significant changes made in budgeting and forecasting practices in the last two years

	Responses Percentage	
	Responses	Percentage
Changes to processes including re-timetabling	20	25%
New software implemented	10	13%
More liaising with senior staff and budget holders	10	13%
Changes to resource allocation or contribution models	9	11%
Revised targets and changed targeting setting process	7	9%
More attention to student number modelling	4	5%
Move to Zero-Based Budgeting	3	4%
Changes to reporting	3	4%
More transparency	2	3%
Rolling forecasts	2	3%
Greater linkage to strategic plan	2	3%
New staff	2	3%
Use of TRAC data for cost/budget allocation	1	1%
Greater focus on reforecasting the budget in-year	1	1%
More sensitivity analysis	1	1%
Greater use of external benchmarking	1	1%
Enhanced budget training	1	1%

(N = 57)

Table 5.26 Likely changes within the next two years

	Budget	Forecasting	Budget & forecasting	Total	% of respondents
Improve data quality	5	7	45	57	69%
More scenario planning	7	11	33	51	61%
Training of staff (finance & non-finance areas)	10	2	33	45	54%
Simplification and standardisation processes	6	3	35	44	53%
Reduce reliance on spreadsheet software	5	5	22	32	39%
Develop formal planning/budgeting workflow processes	7	0	23	30	36%
Better timetabling of processes	7	1	22	30	36%
Change budget reporting processes	13	1	15	29	35%
Reduce the time spent	13	0	16	29	35%
Incentives linked to budgets and forecasts	14	1	14	29	35%
Involve more decision-makers in the budgeting process	6	8	13	27	33%
Reduce in detail and greater focus on key business drivers	2	3	22	27	33%
Automate process flows associated with budgeting	5	3	18	26	31%
Use of benchmarking or external data	5	2	14	21	25%
Change or introduce new accounting software	4	2	14	20	24%
Frequency of budgeting and forecasting updates	3	4	9	16	19%
Introducing rolling budgets	4	5	6	15	18%
Involve less decision-makers in the budgeting process	2	1	5	8	10%
Centralisation of finance staff	0	1	4	5	6%
Other (KPIs, planning software, student number planning)	2	1	1	4	5%

(N = 83)

The responses demonstrate that despite some extensive changes to date more were planned in order to meet the institution’s needs. Changes that had already been incurred were commonly related to processes, software or interaction with budget holders. Movements toward the use of different budget methods were rarely mentioned. Those changes that were planned were predominately improvements to data quality, increased scenario modelling in an uncertain environment, increased training and further alterations to processes.

Furthermore, many indicated that the time spent on detailed budgeting, resource allocation, forecasting and scenario planning had increased over recent years (Question G8).

Table 5.27 Change in time spent on processes

Scale	Decreased significantly				No change		Increased significantly				Total	Mean	Std dev	
	1	2	3	4	5	6	7	8	9	10				
Detailed line-item budgeting	Respondents	0	0	2	3	14	17	24	16	4	1	81	6.57	1.40
	Percentage	0%	0%	2%	4%	17%	21%	30%	20%	5%	1%	100%		
Resource allocation and capacity planning	Respondents	0	0	0	2	14	23	22	13	5	1	80	6.61	1.27
	Percentage	0%	0%	0%	3%	18%	29%	28%	16%	6%	1%	100%		
Forecasting financial results	Respondents	0	0	0	0	13	14	23	21	7	2	80	7.01	1.30
	Percentage	0%	0%	0%	0%	16%	18%	29%	26%	9%	3%	100%		
Scenario planning and ‘what-if’ analysis	Respondents	0	0	0	1	13	14	27	18	6	2	81	6.91	1.30
	Percentage	0%	0%	0%	1%	16%	17%	33%	22%	7%	2%	100%		

This again appears to be a reflection of the changing environment, increased uncertainty, and possibly the size and complexity of the institution. More time was being spent on a range of activities, and financial forecasting in particular.

There were signs of an increasing use of Business Intelligence software designed to retrieve, analyse, transform and report data for decision support purposes, with 33% (27 respondents) stating that they had already implemented such software and another 22% (18 respondents) indicating that they proposed to do so (Question G9). Demonstrating the adoption of a more sophisticated and integrated approach. A sector survey indicated that the most commonly used software packages were: Business Objects, Qlikview and Tableau (HEIDI, 2015). An integrated approach could potentially improve budgeting and forecasting accuracy.

Finally, Questions G10 and G11 asked respondents to detail the most significant budget or forecasting problems which their institution needed to address and how they might solve them, as summarised below.

Table 5.28 Significant budgeting and forecasting problems

	Responses	Percentage of respondents
Student number and income forecasts	23	34%
Need to improve budget processes	11	16%
Managing costs	8	12%
IT system limitations	6	9%
Taking ownership for budgets	5	7%
Improved knowledge/practice of resource allocation and budgets	5	7%
Excessive prudence/optimism	5	7%
Linking the budget to the institution's strategy	4	6%
Dealing with cuts in funding	4	6%
Accuracy of budgets/forecasts and final period variances	4	6%
Sensitivity analysis and scenario planning	4	6%
Too much reliance on spreadsheets	3	4%
Need to move from top-down to bottom-up budgeting	2	3%
More involvement of staff outside of the Finance department	2	3%
Frequency of reforecasting	2	3%
Weak coding structure	2	3%
Pay cost planning model	2	3%
Adapting to change	2	3%
More responsive to change	1	1%
Reducing non-value added activities	1	1%
Too much focus on the detail	1	1%
Addressing financial targets	1	1%
Over-reliance on key individuals	1	1%

Table 5.29 Potential solutions

	Responses	Percentage of respondents
Improved processes - Including standardising and automating	17	33%
Improved IT / New software	13	25%
Improved Finance Business Partnering and more engagement	7	13%
Running training courses and development of staff	7	13%
Working to improve fee forecasting	7	13%
More challenging and review of the forecast numbers	6	12%
Greater market intelligence	5	10%
Staff recruitment and continuity of expertise	5	10%
Development of new resource/contribution models	3	6%
Development of new scenario/planning models	3	6%
Improved leadership	3	6%
Highlighting the impact of inaccurate forecasting	2	4%
Benchmarking	1	2%
Incentives	1	2%
Discussion on the importance of planning	1	2%
Updating the chart of accounts	1	2%

Two key problems appeared to be the accurate forecasting of student numbers, including the related fee income (to improve budgeting and forecasting of this major funding stream), and the need to improve and streamline processes (to reduce costs). Potential solutions to these difficulties ranged from actively attempting to improve processes (which sometimes meant automating and streamlining practices so as to reduce staff input), the implementation of new IT solutions, improved business partnering throughout the institution, and engaging in understanding and improving student number forecasts.

Of the 23 institutions that identified student number and income forecasts as a significant difficulty, 16 were post-1992 universities, five pre-1992 and two were Colleges of Higher Education. Finance officers at eight of these institutions were interviewed (six post-1992 and two pre-1992). All commented that they had recently experienced student recruitment difficulties and had in some cases changed their budgeting processes as a consequence in order to react to a shortfall in funding in a timelier manner.

The responses to this section of the questionnaire indicate that institutions have been modifying budgeting and forecasting practices during a period of change in their operating environment. Furthermore, these modifications were expected to continue. However, there appeared to be few instances of radical change.

### *Key points*

- Sophisticated ERP systems and spreadsheet software are both employed, but systems are not used to their full capability.
- Universities are going through a period of change to their budgeting/management accounting systems and processes, but not changing methods.
- A significant issue is accurately forecasting student numbers and tuition fee income, as identified in earlier discussion on the accuracy of budgeting.

### *Interview findings*

Most interviewees indicated that the finance system was used for budgeting and either the finance system or spreadsheets for medium term forecasting. However, there were some signs of institutions either implementing or making greater use of dedicated software to assist them with budgeting and forecasting. Others were looking to improve the presentation of data and user-friendliness of the finance system. One commented that they would like staff to use the finance system in the same way as they felt confident in using Excel and Word (NU20).

Those making extensive use of spreadsheets generally viewed the process as labour intensive and prone to error. However, the functionality of Excel was considered to have advantages over more complex database systems, but not in all circumstances. An interviewee explained that: “A lack of integrated systems is causing problems. There are a lot of bespoke standalone systems which don’t talk to each other and can generate conflicting data. We become reliant on one or two people to run each system” (OU19). Data inconsistencies, particularly in relation to student and staff numbers, caused difficulties for achieving accurate budgeting and forecasting.

In terms of the sophistication of finance systems, few employed ‘funds checking’ to prevent further expenditure once the budget had been exceeded despite the availability of this function. One interviewee explained that: “We don’t need the system to prevent over-spends. It causes more problems than it’s worth and there can be a number of legitimate reasons why we might want to allow an overspend” (OU11). This view might change if surpluses and cash flow come under greater pressure in the future.

The use of business partnering was increasingly seen as a means for establishing good working relationships. Many of the interviewees saw such arrangements as key in order to achieve accurate budgeting and forecasting. An example offered of the importance of the fit between finance and HR partners was the construction of robust data for staffing expenditure from which accurate forecasts could be derived (NU3). Another stated that “communication with faculties is key” (NU6).

The interaction between finance, planning and academic areas was generally viewed as very important, as explained in the Operating and Financial Review to the 2013-14 Financial Statements of the University of Portsmouth: “During 2013/14 we significantly enhanced our approach to Strategic and Financial Planning. By strengthening the integration between academic and financial planning” (p.20). The benefits claimed from doing so included a greater focus on delivering strategic ambitions, deploying resources more effectively, more effective capital investment and more explicit monitoring of planned and actual investment. This institution generated relatively low operating surpluses of 3% on income in 2012/13 and 2013/14, but increased this to nearly 8% in 2014/15. It was explained that: “Student numbers exceeded our budget targets for both home/EU full-time undergraduate and international students, contributing to the excellent reported surplus for 2014/15” (Operating and Financial Review to the 2014-15 Financial Statements of the University of Portsmouth, p.9).

The importance of developing a culture of effective working relationships was emphasised by another: “It’s a cliché, but Finance’s role should be that of a facilitator rather than a gate-keeper” (NU20). A similar point was made by Stella Atherstone (Head of Finance at the University of London): “It is now recognised that we are there to support departments, not to police them” (Gosling, 2016, p.68).

Those institutions that had established good working relationships between the central finance department and other areas appeared to have greater confidence in the accuracy of their budgets and forecasts, and felt more able to justify when and why inaccuracies might arise. These interviewees generally considered themselves as having an increased understanding of the institution’s activities and used the word ‘trust’ in some instances to describe their faith in a budget holder’s ability to establish realistic financial projections.

Interviewee comments overall follow the theme identified earlier of a preference for simplicity over complexity. Although sophisticated financial software had been adopted its capabilities were rarely used in full and spreadsheets were still widely used for various purposes. Changes in budgeting and forecasting practices are on-going, including the implementation of business partnering, but these changes tend not to be radical amendments to current methods. The issue of aligning student number planning and tuition fee income forecasting remains an unresolved problem for many.

## **5.9 Distribution of the results**

A 37 page report of the questionnaire results was distributed electronically to respondents in September 2015, together with an invitation to comment on the outcome. Whilst a number of institutions expressed an interest in being kept informed of any issues emerging from the subsequent assessing and testing of propositions and hypotheses, there were only a few comments on the findings. With hindsight it might have been beneficial to have distributed a shorter ‘executive summary’ that recipients could quickly scan.

Those who did respond were generally unsurprised by the results, particularly regarding the conservatism of the sector and the importance of achieving accuracy in projected student fee income. One respondent, who usually achieved accurate projections, wrote “student numbers and in particular student number trends are my number one concern – which other organisation do you know where you pretty much know your year-end outturn by Day 20 registration for example?, 23 October for us” (OU6). This institution also expressed a view that: “EBITDA [Earnings before interest, taxes, depreciation and amortization] is harder to manage” and there was likely to be “much greater emphasis on cash in future due to the arms race to borrow, build and impress future students”. This view was partly influenced by the banks from which the institution had borrowed funds who were concerned about the delivery of “sustainable student numbers compared with our peer group”.

## 5.10 Conclusion

This chapter presented an analysis of the responses to the survey questionnaire and interviews. The conclusion drawn from these findings is that a variety of practices exist, but with simplicity preferred over complexity by most.

Although there is some evidence of occasional interest in achieving accuracy (perhaps because of a recent history of difficulties or the holding of significant debt) there appears to be a lack of pressure coming from any particular individual or body to radically change practices in order to improve accuracy. The interviewee comments suggest there are a number of key actors who demonstrate a need for accuracy, such as the lending banks where an institution has significant loans and wishes to show that the university is financially well managed. Institutional leaders and Governors are also important, but they do not feature as regularly in the comments of interviewees as might have been expected if accuracy was a significant issue.

The data collected from the questionnaire and interviews indicates that there are range of factors which may affect the accuracy of budgeting and forecasting as well as the use of scenario modelling. These cover the influence of the external environment and the methods employed by institutions to ensure that their practices meet the institution's needs. The past experiences of interviewees, particularly in respect of coping with shortfalls in student numbers, demonstrate a form of path dependency with these historical events acting as contingent factors which set in motion changes to budgeting and forecasting processes.

The next chapter presents the results of testing hypotheses and assessing propositions, looking at the potential factors influencing accuracy and the use of scenario modelling. This chapter analyses the data in greater depth and assesses the relationship between the dependent variable of budgeting accuracy and other variables.



## **Chapter 6**

### **Assessing and testing the research propositions and hypotheses**

#### **6.1 Introduction**

Although the more descriptive analysis of the questionnaire findings and interview data were viewed as likely to yield the most interesting insights, it was felt that a more sophisticated analysis ought to be undertaken too, to see if there were any significant relationships. This chapter therefore tests the hypotheses and assesses the propositions set out in Chapter 3, using the questionnaire responses and comments drawn from interviewees to add further depth. Supplementary data is also extracted from HEIDI on the characteristics of universities. The hypotheses and propositions are grouped in the same order as in Chapter 3 to provide a consistent structure.

The chapter considers whether there is evidence of independent variables which influence the dependent variable of perceived budgeting accuracy and also comments on the characteristics of financial scenario models. Accurate budgeting leads to more informed planning and decision making, and its importance is explained in Chapter 1. The current chapter seeks to address the research questions set out in section 1.7 on which factors are believed to influence the perceived accuracy of budgeting and if the financialisation of universities has had an effect on practices. It commences with an outline of how the variables were analysed using SPSS in order to seek out relationships between variables, and subsequently considers each of the hypotheses and propositions using the output from the statistical analysis.

#### **6.2 Analysis of variables**

##### **6.2.1 Exploratory factor analysis (EFA)**

The large number of potential variables derived from the questionnaire and HEIDI (summarised in Appendix V) makes their analysis complicated and therefore EFA was employed to determine whether several items form a single latent variable.

Variables were grouped by theme to form constructs where good theoretical reasons existed to suspect that some variables represented a smaller set of latent variables based on questionnaire

items (e.g. measure of accuracy, gaming behaviours, budget methods, etc.) and an EFA was conducted in SPSS on each construct using principal axis factoring and varimax (orthogonal) rotation. Cronbach's alpha was used to test the internal reliability of each construct.

Whilst the constructs were selected based on the researcher's view of what variables might be sensibly brought together, the optimal number of factors under each construct was determined by the eigenvalue. A value greater than one means that the factor explains more variance than the single item. Whether the factor is considered to be appropriate is determined by the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, Bartlett's test of sphericity and the Anti-image correlation.

Factor loadings were identified together with the extraction sums of squared loadings. The loading measures the relationship of each variable to the factor, with high loadings making the variable representative of the factor. The squared factor loadings indicate the percentage of the variance in the original variable explained by the factor (Hair et al., 2010). Where collinearity between the variables in the construct was too high SPSS indicated that no extraction was possible for the factor. Also, in those cases where a single factor was identified from the construct the output was in the form of unrotated squared loadings only.

The results are presented in Appendix VI, with data for the appropriateness criteria shown in separate columns.

The criteria used for an acceptable factor are summarised in Table 6.1 below.

Table 6.1 Criteria for an acceptable factor

Test	Criteria	Definition
Kaiser-Meyer-Olkin (KMO)	$\geq 0.5$	Ratio of the squared correlation between variables to the partial correlation between variables
Bartlett test of sphericity	$< 0.05$	Whether the diagonal element of the variance-covariance are equal and whether the off-diagonal elements are approximately zero
Anti-image	$\geq 0.5$	Diagonals used to measure sampling adequacy
Eigenvalue	$> 1.0$	Amount of variation explained by a factor
Cronbach's alpha for EFA	$> 0.6$	Test for internal reliability

A rule of thumb to denote an acceptable level of internal reliability for Cronbach's alpha is usually 0.7 (Bryman & Bell, 2011), but 0.6 is deemed to be satisfactory for exploratory analysis (Hair et al., 2010).

The main SPSS output of the factor analysis in Appendix VI is to identify for individual constructs how much of each item within a construct forms a factor (i.e. the percentage of rotation sums of squared loadings), if any. These percentages are shown in the second to last column. The items which load highly on to a factor represent a theme within the construct. However, in order for a factor to be valid it must satisfy the criteria set out in Table 6.1. The data for assessing these criteria are shown in the columns headed KMO, Bartlett's test of sphericity, Anti-image correlation, Eigenvalue and Cronbach's alpha. Any data not meeting the criteria are signalled in red text.

A maximum number of three factors were found for each construct and the unrotated loadings for each of the factors is shown under columns headed 'Factor 1 loadings', 'Factor 2 loadings' and 'Factor 3 loadings'. By default, SPSS shows only loadings above the suppressed output of 0.3 or less and so there are blank spaces for many of the loadings. The factor loadings are the correlation of each item to the factor. High loadings make the item representative of the factor. The figures before rotation are not particularly important for interpretation (Field, 2013). Factor rotation leads to a simpler and more meaningful factor pattern and involves turning the reference axes of the factors until the variance from earlier factors is redistributed to later ones (Hair et al., 2010). Many

of the constructs resulted in a single factor only however. Thus, each column for the factor loadings shows which combination of items from the construct form a factor.

Factors meeting the appropriateness criteria are summarised in Appendix VII together with factor loadings. Cronbach's alpha revealed eight valid factors. For these valid factors, the source data for the variables was combined and divided by the number of variables to arrive at the 'combined' factor data, which is an approach used in other EFA studies such as Coetzee and Erasmus (2017). No weighting of individual variables was used as there were common scales for those variables combined (e.g. 10-point Likert scales, etc.). Factors were given a meaningful name and used for testing correlation including multiple regression analysis.

A valid factor for accuracy (COMA) comprised of a construct of the perceived accuracy of budgeting, forecasting and student number estimating would appear appropriate. All three variables should have a close relationship if an institution is to demonstrate that it has coherent financial planning. An inconsistent approach to any would likely result in variances which are difficult to sensibly explain.

Other valid constructs might also have been anticipated for the number and qualification of central finance staff engaged on budgeting and forecasting, the change in time spent on financial planning, and the number of variables and linkages in scenario models. It is therefore perhaps unsurprising that the EFA confirms the latent association between the variables in each construct. The remaining valid constructs which deal with strategy, participation and environmental issues affecting forecasting might not have been anticipated due to the variability of institutional processes and views in these areas. For strategy, this would indicate that respondents viewed the budgeting process as contributing to the achievement of the longer-term objectives of the organisation. Participation by a range of departments in constructing institutional forecasts for other income, staff costs and other operating expenses indicates consistency in the approach adopted which also appears to be applicable in terms of which areas of an institution played a major, minor or no role in setting student number forecasts. Many respondents also expressed similar views as to the effect of the uncertain environment on forecasting in terms of whether accuracy had deteriorated, forecasts quickly became obsolete, were more difficult to produce and were subject to more scrutiny by outsiders in terms of the governing body.

## 6.2.2 Correlation coefficient matrix

Two correlation matrices were constructed in SPSS containing variables and factors. Each matrix represents a group of items. The first (Table 6.2) contains the dependent variable of budgeting accuracy together with the independent variables and factors which represented respondents 'perceptions' of budgeting and forecasting (e.g. timing, gaming, difficulties, participation, strategy, forecasting, etc.). The second (Table 6.3) also contains the dependent variable of budgeting accuracy, but grouped with independent variables and factors associated with 'structure' such as size (based on financial data, staff numbers, student numbers and space), budget methods, etc. Significant correlations were identified.

As a robustness check, the Spearman correlation non-parametric test is included in the lower shaded diagonal of the tables to assess consistency with Pearson's test for parametric data in the unshaded upper diagonal. Spearman's correlation coefficient is considered to be a less powerful, but more conservative statistic and typically results in a lower coefficient (Hair, Celsi, Money, Samouel & Page, 2016). Spearman's correlation is robust to outliers (unlike Pearson's correlation). The size and direction of coefficients under both tests are generally similar in each table, which indicates the absence of serious non-normality problems.

To aid comparison the correlation results comparing the dependent variable of perceived budgeting accuracy with the independent variables are highlighted in yellow. Those correlations which are identified as significant under both the Pearson and Spearman tests are shown in green, those which are significant under only one of the tests are coloured in orange. The output from this analysis is used to inform the discussion of hypotheses and propositions in subsequent sections of this chapter.

Table 6.2 Variables for combined measure of accuracy and those relating to perceptions (e.g. timing, gaming, difficulties, participation, strategy, forecasting, etc.)

	BACC	SACC	FACC	COMA	PP92	TDBU	TIMP	TIMW	GAMA	CFWD	DFWD	NEWF	DIFF	FUNC	OTHT	OTHR	OTHN	OTHD	OTHP	COMT	COMN	COMP	COMR	COMS
BACC	1.000	.491**	.419**	.820**	.007	.193	-.249**	.021	-.084	.013	-.338**	-.105	.179	-.154	.008	-.060	.217**	-.078	-.109	-.049	-.069	-.067	-.133	-.167
SACC	.484**	1.000	.349**	.764**	-.118	.162	-.158	-.219	.080	.050	-.022	-.054	.281**	-.245**	-.056	-.181	.164	-.183	-.105	-.086	-.122	-.059	.006	-.159
FACC	.479**	.356**	1.000	.641**	-.116	.162	.004	-.143	-.009	.230**	-.188	.032	.239**	.035	-.086	-.372**	-.078	-.006	-.084	-.002	-.145	.119	.012	-.407**
COMA	.803**	.799**	.636**	1.000	-.046	.185	-.166	-.124	-.073	.070	-.237**	-.057	.252**	-.200	-.053	-.244**	.108	-.116	-.116	-.072	-.164	-.044	-.030	-.252
PP92	.013	-.097	-.029	-.034	1.000	-.128	.171	.007	.084	.012	.092	-.109	-.044	.111	.147	.087	-.019	-.039	-.154	-.223**	-.101	-.153	-.144	-.125
TDBU	.192	.159	.135	.176	-.115	1.000	-.308**	.063	-.032	-.147	.072	-.125	.122	.088	-.116	-.077	.089	.238**	.156	.077	-.114	.069	-.053	-.064
TIMP	-.277**	-.105	-.002	-.187	.115	-.265**	1.000	-.132	-.117	.141	-.013	.021	-.040	-.019	-.147	.016	-.201	-.066	-.157	-.138	.006	-.022	-.083	-.137
TIMW	.015	-.226**	-.067	-.114	.031	-.005	-.059	1.000	-.123	-.180	-.146	-.169	-.144	.108	.125	.113	-.048	-.046	-.098	-.102	-.143	.084	.093	-.085
GAMA	-.073	.112	-.076	-.033	.106	-.030	-.121	-.043	1.000	.041	.076	-.073	.228**	-.073	-.103	-.049	.030	-.170	-.121	.027	-.059	.091	-.006	.095
CFWD	.022	.070	.158	.099	.041	-.121	.077	-.157	-.046	1.000	.174	.123	.178	-.108	.097	-.007	.033	.178	-.039	-.113	.161	.009	-.014	-.186
DFWD	-.275**	-.029	-.221**	-.196	.114	.024	.009	-.113	.030	.331**	1.000	.004	-.019	-.250**	-.054	.085	-.137	-.094	-.100	.007	.148	-.009	.322**	-.009
NEWF	-.096	-.076	.029	-.077	-.061	-.046	.005	-.060	-.034	.076	.024	1.000	-.072	.047	.068	-.134	.003	-.250**	-.155	.325**	-.045	.074	.195	.077
DIFF	.102	.232**	.211	.173	-.051	.131	.016	-.181	.214	.156	-.074	-.119	1.000	.050	.017	-.089	.029	.186	.133	.138	-.061	.113	.061	-.151
FUNC	-.154	-.247**	.060	-.203	.136	.043	.010	.133	-.070	-.149	-.307**	.031	.029	1.000	.412**	.027	.103	.271**	.397**	-.078	.114	.135	-.055	.007
OTHT	.013	-.115	-.081	-.101	.169	-.087	-.187	.203	-.091	.093	-.044	.029	.021	.414**	1.000	.364**	.131	.000	.099	-.019	.252**	.158	.054	-.047
OTHR	-.040	-.199	-.331**	-.215*	-.098	-.044	.058	.112	-.031	.027	.106	-.160	-.086	.032	.381**	1.000	.007	.115	-.022	-.108	.332**	-.014	-.034	.051
OTHN	.194	.181	-.094	.141	-.062	.111	-.233**	-.036	.049	.035	-.116	-.039	.019	.092	.172	.011	1.000	.213	.403**	.134	.136	.008	-.034	.039
OTHD	-.113	-.200	-.052	-.162	-.039	.246**	-.044	-.109	-.179	.006	-.095	-.274**	.196	.210	.010	.113	.257**	1.000	.621**	-.029	.031	-.197	-.120	-.118
OTHP	-.112	-.132	-.106	-.139	.154	.182	-.183	-.124	-.141	-.052	-.118	-.158	.135	.297**	.111	-.029	.475**	.621**	1.000	-.057	-.055	-.143	.055	-.105
COMT	-.112	-.014	-.053	-.119	.146	.033	-.097	-.069	.003	-.040	.059	.130	-.086	.130	.033	.302**	-.143	-.088	-.145	1.000	-.234**	.117	.159	-.062
COMN	-.039	-.119	-.159	-.150	-.116	-.099	.063	.153	-.071	.198	.190	-.067	-.093	.103	.226**	.033	.156	.018	-.076	-.132	1.000	-.020	.133	-.137
COMP	-.087	-.086	.122	-.039	-.149	.040	-.039	.074	.069	-.002	-.066	.068	.088	.145	.119	-.023	-.028	-.204	-.143	-.030	-.028	1.000	.084	.062
COMR	-.198	-.027	-.017	-.091	-.096	-.118	-.023	.061	-.022	.023	.320**	.154	.047	-.059	.046	-.019	-.053	-.096	.054	.088	.133	.055	1.000	-.089
COMS	-.178	-.126	-.310**	-.215	-.167	-.061	-.094	-.018	.106	-.236**	-.046	.077	-.155	.036	-.022	-.021	.063	-.111	-.086	-.008	-.126	.119	-.057	1.000

Unshaded areas are Pearson's correlation coefficient / Shaded areas are Spearman's rank correlation

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

(Note: The software Statistical Package for the Social Sciences (SPSS) was employed to test the data)

A full correlation table of all variables and valid factors containing 83 columns and 83 rows is available from the author on request.

Table 6.3 Variables for combined measure of accuracy and structure (e.g. income, expenditure, staff, students, space, academic and admin., budget methods, scenario modelling, etc.)

	BACC	SACC	FACC	COMA	SURP	INCO	EXPO	FCOU	TPEC	RESG	OTHI	ENIC	STUS	SPAC	STAF	COLL	FACU	SCHO	SERV	TDBU	INFL	ABBB	ZBBB	PBBB	INCR	EXPC	EXPA	COMQ	COMV
BACC	1.000	.491**	.419**	.820**	-.334**	-.140	-.131	-.077	-.148	-.108	-.096	-.069	-.146	-.059	-.117	.058	-.080	.023	.019	.193	-.136	.014	-.059	-.043	-.152	-.019	-.091	-.043	.051
SACC	.484**	1.000	.349**	.764**	-.153	-.329**	-.324**	-.278**	-.275**	-.291**	-.310**	-.311**	-.327**	-.232**	-.242**	.037	-.211	.119	-.059	.162	-.093	-.011	-.046	-.040	-.008	.117	-.023	-.006	.053
FACC	.479**	.356**	1.000	.641**	-.229	-.172	-.160	-.194	-.156	-.093	-.144	-.112	-.146	-.199	-.150	-.131	-.121	-.143	.057	.162	-.145	-.111	-.061	.153	-.121	-.031	-.267**	.069	.023
COMA	.803**	.799**	.636**	1.000	-.264	-.253	-.245	-.221	-.246	-.200	-.202	-.212	-.261	-.184	-.237	.024	-.117	-.043	-.090	.185	-.102	-.051	-.022	-.033	-.135	-.079	-.095	-.058	.017
SURP	-.337**	-.138	-.253*	.247*	1.000	-.184	-.213	-.261	-.201	-.165	-.163	-.107	-.259	-.216	-.217	-.077	.002	-.108	-.036	-.017	-.059	-.088	-.078	.047	.175	.050	.068	-.214	-.193
INCO	-.025	-.145	-.112	-.139	-.212	1.000	.999**	.909**	.849**	.934**	.956**	.736**	.952**	.934**	.586**	.122	.255**	.251**	-.017	.127	.020	-.002	-.024	-.017	.123	.080	-.163	.150	-.030
EXPO	-.002	-.129	-.095	-.119	-.266*	.997**	1.000	.910**	.845**	.936**	.953**	.735**	.954**	.928**	.587**	.121	.256**	.244**	-.014	.121	.015	-.002	-.019	-.018	.112	.076	-.168	.156	-.021
FCOU	.038	-.175	-.107	-.139	-.296**	.903**	.908**	1.000	.722	.820**	.823**	.611**	.914**	.896**	.668**	.088	.237**	.344**	.018	-.077	.040	-.034	-.001	-.055	.065	.208	-.121	.236**	-.047
TPEC	-.102	-.173	-.160	-.198	-.149	.909**	.904**	.744**	1.000	.629**	.752**	.454**	.899**	.808**	.791**	.129	.388**	.242**	.031	-.078	.132	.086	-.113	-.033	.187	.078	-.101	.355**	.098
RESG	.031	-.094	-.049	-.047	-.330**	.867**	.874**	.838**	.669**	1.000	.928**	.797**	.811**	.828**	.305**	.069	.154	.159	-.063	.146	-.053	-.061	.053	.017	.051	.000	-.211	-.055	-.086
OTHI	.017	-.136	-.058	-.091	-.196	.895**	.889**	.753**	.760**	.862**	1.000	.746**	.870**	.906**	.421**	.180	.164	.222**	-.114	-.162	-.020	.000	.022	.029	.155	.049	-.178	.043	-.065
ENIC	-.001	-.196	-.072	-.135	-.186	.817**	.816**	.841**	.676**	.816**	.741**	1.000	.641**	.691**	.232**	.029	-.035	-.088	-.079	-.032	-.050	-.109	-.053	.020	-.034	-.066	-.195	-.022	-.198
STUS	-.047	-.165	-.073	-.150	-.229*	.979**	.976**	.888**	.909**	.829**	.858**	.814**	1.000	.900**	.775**	.147	.330**	.261**	.003	-.096	.079	.036	-.041	-.045	.107	.156	-.148	.309**	-.005
SPAC	.052	-.104	-.062	-.098	-.286**	.960**	.961**	.911**	.848**	.848**	.845**	.810**	.942**	1.000	.572**	.162	.217**	.394**	-.056	-.084	.070	.024	-.069	-.049	.148	-.149	-.098	.131	-.037
STAF	-.090	-.198	-.172	-.214	-.067	.873**	.859**	.813**	.918**	.609**	.680**	.693**	.884**	.858**	1.000	.058	.413**	.244**	.149	.048	.163	.044	-.130	-.046	.093	.266**	.011	.581**	.112
COLL	-.030	-.072	-.142	-.071	-.096	.112	.114	.105	.039	.179	.184	.108	.093	.084	-.063	1.000	-.307**	.008	-.212	-.132	-.120	.192	-.107	-.006	.009	.166	.166	-.045	-.014
FACU	-.055	-.175	-.109	-.097	-.109	.187	.184	.122	.266**	.034	.115	.075	.243**	.221**	.263**	-.444**	1.000	.039	-.179	.026	.082	-.038	-.170	.073	.058	.114	-.109	.175	.072
SCHO	.167	.263**	-.061	.208	-.161	.160	.169	.250**	.080	.205	.127	.184	.139	.192	.184	.022	-.231**	1.000	-.027	.068	.171	-.125	-.003	-.160	.049	.229**	.155	.159	.098
SERV	.068	-.028	-.069	-.021	-.060	.061	.067	-.080	.067	.036	-.031	.009	.035	.066	.096	-.290**	.144	.002	1.000	.186	-.036	.017	-.146	.024	-.033	-.042	-.285**	.291**	.144
TDBU	.192	.159	.135	.176	-.038	-.048	-.040	-.031	-.016	-.089	-.077	.015	-.017	-.005	.034	-.198	.072	.006	.205	1.000	.327**	-.116	-.322**	.010	.108	.128	.008	-.161	.130
INFL	-.201	-.132	-.193	-.152	.099	.024	.012	-.004	.100	-.003	.008	.049	.068	.026	.135	-.127	.058	.064	-.082	.356**	1.000	.109	-.017	.131	.040	.089	.121	.098	-.092
ABBB	.083	.018	-.027	.070	.102	.088	.083	.041	.107	.087	.057	.092	.081	.091	.060	.130	-.044	-.182	.058	-.131	.042	1.000	.176	.148	-.001	.040	-.117	.069	.321**
ZBBB	.110	-.048	-.034	-.004	-.135	-.162	-.160	-.120	-.161	-.101	-.083	-.113	-.162	-.170	-.219*	.188	-.200	.080	-.117	.348**	-.095	.135	1.000	.286**	-.279**	.070	-.321**	-.060	.019
PBBB	.031	.030	.221**	.058	.015	-.108	-.110	-.126	-.052	-.194	-.062	-.196	-.102	-.105	-.022	-.111	.093	-.088	.048	.003	.036	.048	.197	1.000	.109	.093	-.058	-.098	-.034
INCR	-.185	.005	-.161	-.122	.285**	.185	.173	.137	.189	.120	.215	.135	.182	.162	.258**	-.069	.060	-.018	-.085	.082	.149	-.047	-.350**	.070	1.000	.074	.146	-.096	.074
EXPC	.007	.084	.019	.067	.109	.085	.077	.111	.012	-.004	.047	.064	.095	.090	.124	-.163	.189	.055	-.140	.084	.133	.041	.093	.109	.131	1.000	.107	.028	.091
EXPA	-.064	.032	-.216	-.055	.074	-.044	-.048	-.027	-.063	-.105	-.069	-.114	-.071	-.054	.028	.118	-.071	.163	.266**	.003	.077	-.135	-.304**	.008	.230**	.140	1.000	-.049	.098
COMQ	-.022	.042	.063	-.025	-.143	.385**	.390**	.360**	.392**	.290**	.309**	.254*	.361**	.355**	.419**	-.093	.111	.238**	.331**	.181	.134	.052	-.145	-.133	-.028	-.087	-.054	1.000	.231*
COMV	.070	.037	.033	.004	-.189	.077	.085	.041	.126	.001	.003	-.018	.065	.100	.135	-.044	.040	.115	.181	.118	-.098	.262*	.063	.015	.070	.073	.108	.283**	1.000

Unshaded areas are Pearson's correlation coefficient / Shaded areas are Spearman's rank correlation

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

(Note: The software Statistical Package for the Social Sciences (SPSS) was employed to test the data)

The output in these tables indicate that there are few independent variables which have a significant correlation with the dependent variable of budgeting accuracy. These independent variables are the accuracy of student number estimates (SACC), forecasting accuracy (FACC), the difficulty caused by allowing carry forward of unspent budget (DFWD) and the participation of others outside of the central finance department in the forecasting of endowment and investment income (OTHN). However, the relationship for the latter variable was only significant under the Pearson test and not Spearman. The correlation for this variable may therefore be affected by outliers.

The results show that variables for ‘perception’ included in Table 6.2 were more likely to have a correlation with budgeting accuracy than those items relating to ‘structure’ in Table 6.3. However, within both tables there are indications of significant correlations between independent variables.

### 6.2.3 Multiple regression analysis

A stepwise regression analysis was carried out to determine which of the variables and factors were the strongest predictors of perceived budgeting accuracy. The stepwise method enters predictors with the highest t-statistic into a model until none with a significance of <0.05 are left. The requirements are that the residual data is normally distributed and that there is no significant correlation between the independent variables i.e. multicollinearity.

Table 6.4 Regression model output for the dependant variable of perceived budgeting accuracy

Model	Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		$\beta$	Std. Error	Beta			Tolerance	VIF
Step 1	(Constant)	1.884	.662		2.848	.006		
	SACC	.473	.107	.472	4.416	.000	1.000	1.000
Step 2	(Constant)	2.342	.626		3.739	.000		
	SACC	.465	.099	.464	4.690	.000	1.000	1.000
	DFWD	-.265	.076	-.347	-3.506	.001	1.000	1.000
Step 3	(Constant)	1.660	.691		2.401	.019		
	SACC	.375	.106	.374	3.542	.001	.835	1.197
	DFWD	-.230	.076	-.301	-3.042	.003	.951	1.052
	FACC	.265	.126	.228	2.108	.039	.799	1.252
Step 4	(Constant)	2.305	.733		3.142	.003		
	SACC	.372	.103	.371	3.614	.001	.835	1.197
	DFWD	-.225	.073	-.295	-3.068	.003	.950	1.052
	FACC	.283	.123	.243	2.311	.024	.795	1.258
	TIMP	-.048	.022	-.207	-2.196	.032	.995	1.005

Note:  $R^2 = .223$  &  $F = 19.5$  for model 1;  $R^2 = .343$  &  $F = 17.5$  for model 2;  $R^2 = .385$  &  $F = 13.8$  for model 3;  $R^2 = .429$  &  $F = 12.2$  for model 4.

(Note: The value for R is the Pearson correlation between the actual and predicted values.  $R^2$  shows how well the model generalises to the predictor values and is the proportion of the variance accounted for by those predicted values. The F value represents the ratio of the improvement in prediction that results from each iterative model together with the significance level. A good model should have a large F ratio, i.e. greater than at least 1.)

The model parameters in Table 6.4 show the unstandardised  $\beta$  indicating the individual contribution of each predictor to the model. The standardised  $\beta$  identifies the number of standard deviations that the outcome will change as a result of one standard deviation change in the predictor and gives an insight in to the importance of the predictor. As the predictors have different scales for the research data obtained, their relative strengths (the beta coefficients) are compared by standardising them.

For the dependent variable of perceived budgeting accuracy the specific model would be:

$$\text{Budgeting accuracy} = 0.372 \text{ SACC} - 0.225 \text{ DFWD} + 0.283 \text{ FACC} - 0.048 \text{ TIMP} + E \text{ (error)}$$

(The constant from the unstandardised scores of 2.305 is excluded as the mean of standardised scores is zero.)

VIF and tolerance statistics are used to assess whether there is collinearity (these statistics are within the required parameters of:  $\text{VIF} < 10$  and  $\text{tolerance} > 0.2$ , as suggested by Field, 2013). The F ratio is also  $> 1$ .

The predictor formula derived above demonstrates that a relatively small number of variables are related to perceived budgeting accuracy. Specifically, the results showed that the perceived accuracy of student number estimates and forecasting were positive predictors of perceived budgeting accuracy and represented the largest elements at +0.372 and +0.283. The difficulty caused by allowing unspent balances to be carried forward together with the time spent preparing the budget had a negative effect of -0.225 and -0.048, with the size of the latter indicating that it

had little significance. The former may have a negative effect because of the unpredictability caused by assessing how much and when such balances would be spent during the year.

Some responses to Question E2 indicated that there may have been instances of forecasting being confused with budgeting (see section 5.6). This was not picked up during the pilot testing as most respondents were led through the questionnaire by the researcher and none indicated a misinterpretation of the requirement of the question. Assuming that misinterpretation might have also arisen with responses to Question E10, which considered the key variable of the perception of forecasting accuracy, the model was rerun with this variable removed to assess how this influenced the multiple regression output. The result is shown below:

$$\text{Budgeting accuracy} = 0.414 \text{ SACC} - 0.264 \text{ DFWD} + E (\text{error})$$

The revised model now has two predictors only, with greater emphasis being placed on the accuracy of student number estimates and the difficulty caused by allowing unspent balances to be carried forward. The limited influence exerted by the variable of the time spent preparing the budget (TIMP) is no longer included as a predictor.

In cases where multicollinearity is too high, Hair et al. (2016) suggest removing one or more of the highly correlated variables from the regression model as they can affect the statistical significance of the individual regression coefficients. They offer a rule of thumb of +0.60 as evidence of potential problems. Removing the ten variables with correlations above +0.60 (INCO, EXPO, FCOU, TFEC, RESG, OTHI, ENIC, STUS, SPAC and STAF) did not alter the coefficients in Table 6.4.

As multiple regression analysis is based on an assumption of normal distribution, a Kolmogorov-Smirnov test was undertaken (appropriate for sample sizes over 50) which showed that most factors and variables had a significance of <0.05. Indicating that much of the data significantly deviated from a normal distribution. However, a visual inspection of the histograms shows that many appear to have a normal distribution curve, with evidence of skewness from Q-Q (quantile-quantile) plots [which are similar to P-P (probability-probability) plots but look at quantiles (where the data is split into equal portions) rather than every individual piece of data]. An analysis of the

concentration of data in the centre, the upper and the lower ends (tails) and the shoulders (between the centre and the tails) of the distribution of variables and valid factors indicates that 27% have a value of  $\pm 3.29$  when dividing the Kurtosis value by the standard error which results in a concern about normality of the distribution (Field, 2013). However, Field (2013, p.187) advises not to be over-reliant on tests such as Kolmogorov-Smirnov and Shapiro-Wilk because “small and unimportant deviations from normality might be deemed significant” and suggests a review of evidence provided by plotting the data, as does Hair et al. (2010). Indeed, Ghasemi and Zahediasl (2012) note that the Kolmogorov-Smirnov test has low power and should not be seriously considered for assessing normality.

Field (2013) explains that the central limit theorem “states that when samples are large (above about 30) the sampling distribution will take the shape of a normal distribution regardless of the shape of the population from which the sample was drawn” (p.871) and that where the “sample is fairly large, outliers are a more pressing concern than normality” (p.172). This view is also supported by Ghasemi and Zahediasl (2012) who refer to sample sizes greater than 30 or 40 as resulting in normal distribution. They also explain that boxplots which are symmetric with a median line which is approximately at the centre of the box and with symmetric whiskers slightly longer than the intersections of the centre box suggest normal distribution. Outliers can bias estimates of parameters and have a significant effect on the sum of squares on which most statistics are based.

Outliers were identified using boxplot diagrams in this study and the multiple regression output (excluding cases listwise) was re-tested by trimming these outliers from the key variables. Whilst this did not result in a significant change to the multiple regression model, the dangers of simply deleting the outliers from the population sampled are recognised as there is no reason to believe that they are not a valid element of the population. An alternative approach of winsorizing was therefore employed which replaces the outliers with a score of 3.29 standard deviations from the mean (Field, 2013). For the dependent variable of budgeting accuracy the model would then be:

$$\text{Budgeting accuracy} = 0.353 \text{ SACC} - 0.207 \text{ DFWD} + 0.258 \text{ FACC} - 0.051 \text{ TIMP} + E (\text{error})$$

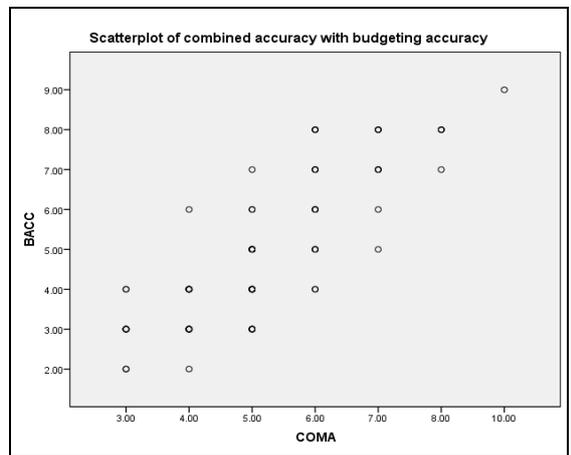
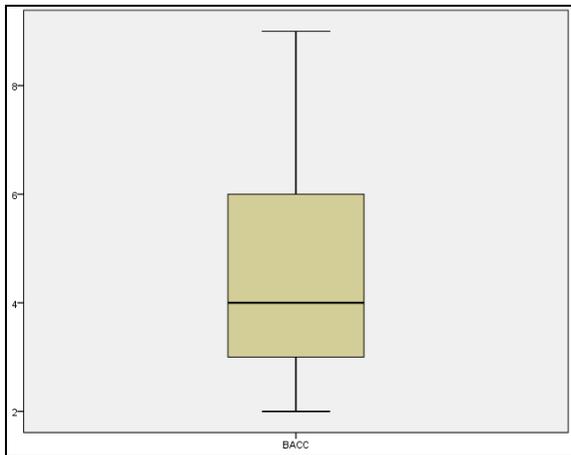
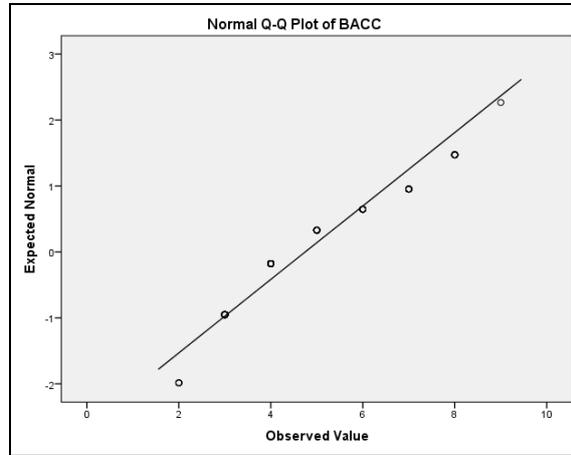
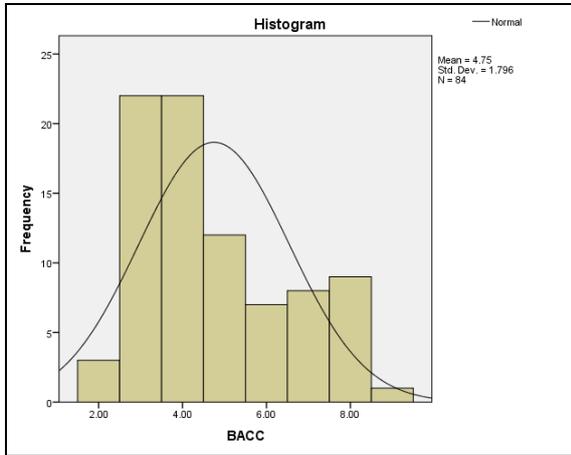
In addition to testing for normality and outliers, linearity and homogeneity were investigated using scatterplot graphs. These did not reveal serious violation of linear assumptions. For example, the histogram, Q-Q plot, boxplot and scatterplot for each of the key accuracy variables are reproduced below.

The histograms show that the data is approximately normally distributed with a peak towards the middle and fairly symmetrical. The histograms for the accuracy of budgeting (BACC) and the factor for accuracy (COMA) do however demonstrate some skewing of the data. The alternative graph method of a Q-Q plot shows that the scatter lies close to the line without an obvious pattern moving away from the line which indicates a normal distribution.

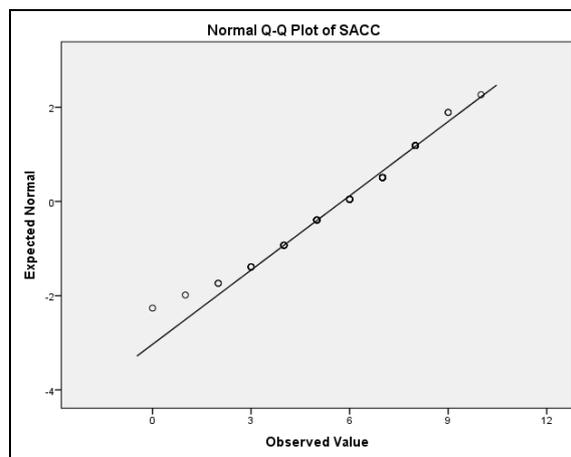
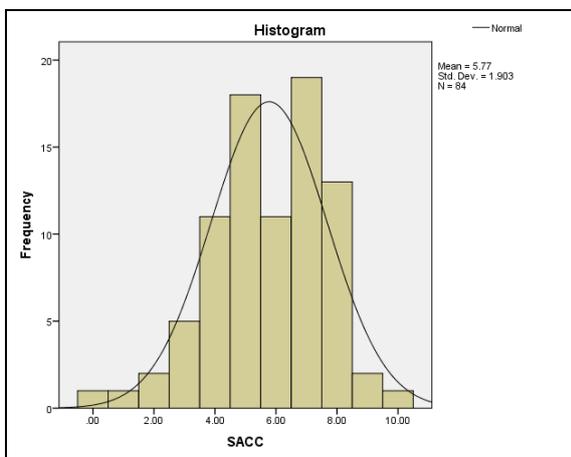
The boxplots show the median at the centre, with the top and bottom of the box representing the middle 50% of observations and the whiskers approximately the top and bottom 25%. Any score greater than the upper quartile plus 1.5 times the inter-quartile range is shown as an outlier. There are two such instances for the accuracy of student number estimates (SACC) and one for the accuracy of forecasting (FACC). In the case of student number estimates (SACC) and accuracy of forecasting (FACC) the whiskas are the same length indicating a symmetrical distribution. For the accuracy of budgeting (BACC) and the factor for accuracy (COMA) the upper whisker is longer than the lower, indicating signs of a skew.

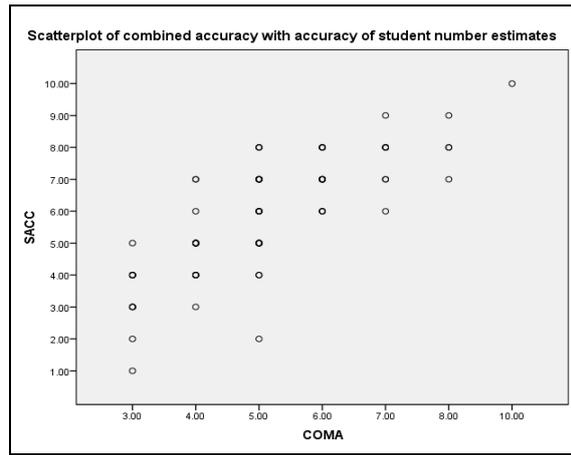
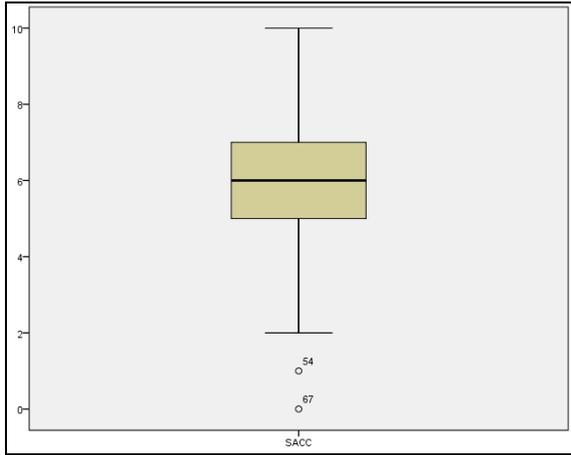
The scatterplots indicate the relationship between one variable (COMA) and another (BACC, FACC and SACC). The shape of the distribution in each case reveals a positive linear relationship.

## 1. Accuracy of budgeting (BACC)

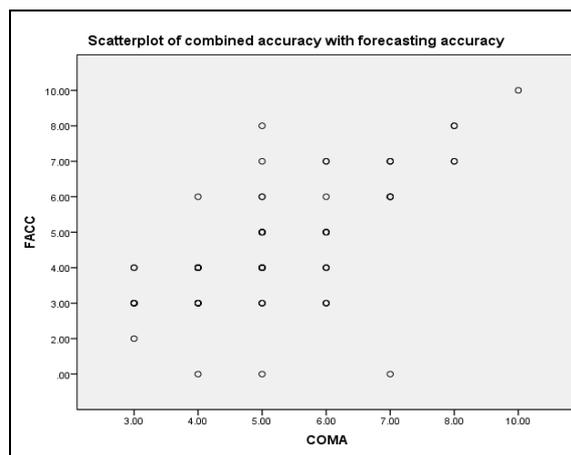
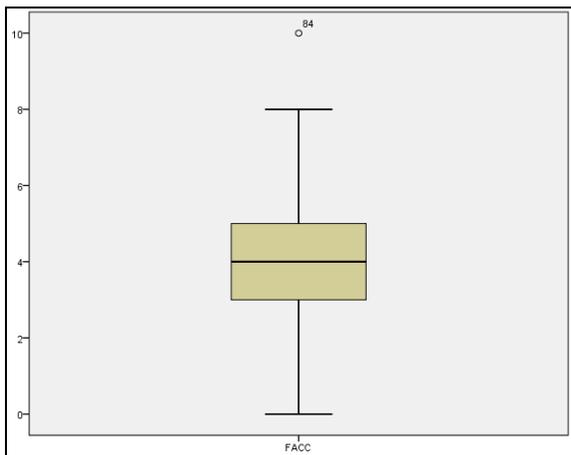
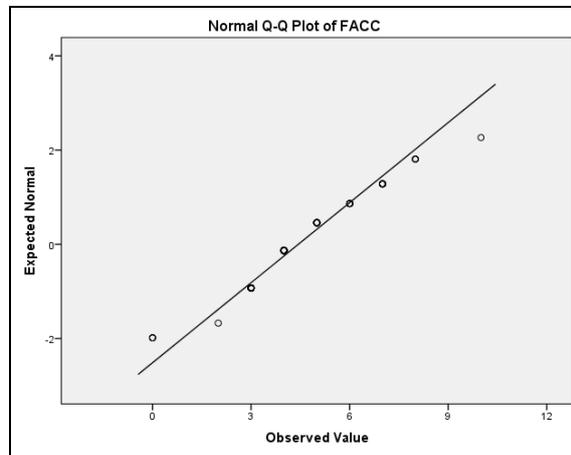
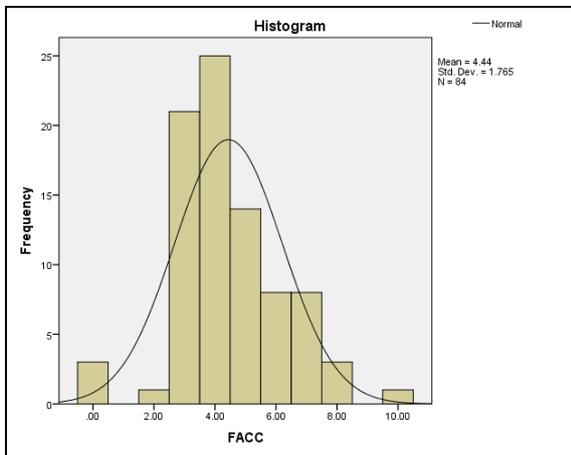


## 2. Accuracy of student number estimates (SACC)

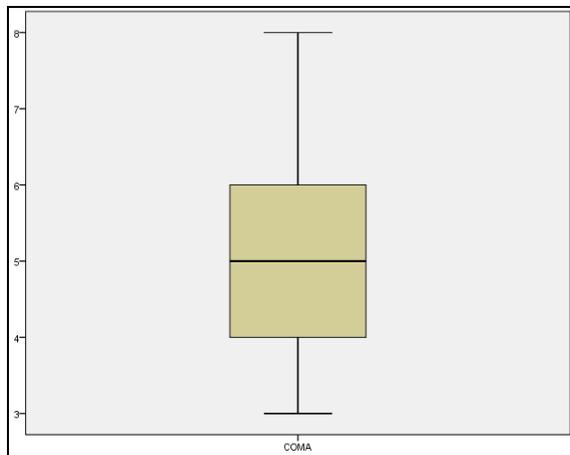
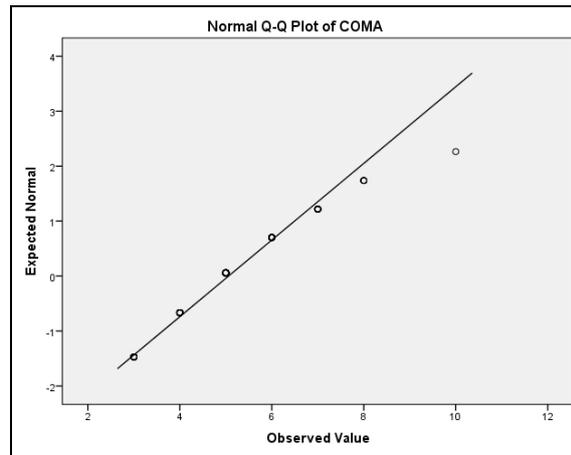
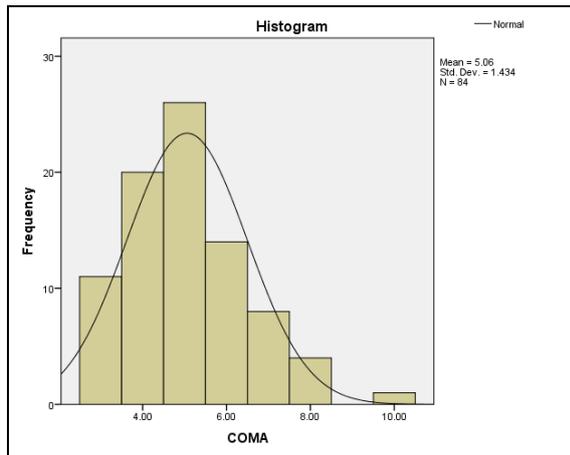




### 3. Accuracy of forecasting (FACC)



#### 4. Factor for accuracy (COMA)



As a final test, problems with normality and linearity can be addressed by transforming the data and various methods exist to do this (Field, 2013). Logarithm transformation ( $\log(X_i)$ ) was selected as it is useful for transforming data that is skewed. The key variables of BACC, FACC, SACC, DFWD and TIMP were converted into logs using functionality within SPSS and the regression analysis was re-run. The revised model (shown below) places greater emphasis on the accuracy of student numbers and the time spent preparing the budget, but less on the difficulty caused by allowing unspent balances to be carried forward. The variable for the accuracy of forecasting is removed. It also introduces a new variable of institutional surplus, but at a low negative predictor value, indicating little influence on budgeting accuracy despite being included in the model.

$$\text{Budgeting accuracy} = 0.406 \text{ SACC} - 0.117 \text{ DFWD} - 0.008 \text{ SURP} - 0.132 \text{ TIMP} + E (\text{error})$$

### **6.3 Findings**

The following discussion of each hypothesis and proposition makes reference to the statistical analysis, variables and factors above in considering the findings. References to r-values and p-values are in respect of Pearson's correlation coefficient (detailed in section 6.2.2) unless otherwise stated, and comments on multiple regression relate to the model output in section 6.2.3.

### **6.4 Perceived accuracy**

#### **6.4.1 Budgeting, student number estimates and forecasting**

*Hypothesis H1 - There is a significant positive relationship between the perceived accuracy of budgeting, forecasting and student number estimates [which contribute to the key income stream of most institutions].*

The survey questionnaire asked respondents to identify how accurate their institution's budgeting, student number estimates and forecasting were on a scale of 1 (cautious) to 10 (optimistic), with accurate being in the middle. Many recognised that their methods had consequences: "Adopting a prudent approach reduces accuracy" (NU8). A consistent approach to budgeting, student number estimates and forecasting would mean that an institution adopts the same cautious, accurate or optimistic approach for each.

An EFA was conducted on the sub-construct for perceived accuracy. The KMO test was 0.651, Bartlett's test of sphericity was significant ( $p < 0.05$ ) and the anti-image correlation result for each variable was above 0.5 indicating that factor analysis was appropriate. The analysis in Appendix VI identified one factor based on the eigenvalue (1.842) and the factor explained 43.161% of the variance (with the variance representing eigenvalues associated with each factor or the amount of the variables explained by the factor). A Cronbach's alpha of 0.684 was deemed satisfactory. It was therefore viewed as appropriate to combine the three variables for perceived accuracy in to a single accuracy factor.

The statistical analysis in Table 6.2 demonstrates moderately strong positive correlation between the variables for perceived accuracy and the perceived accuracy of budgeting with r-values measuring the strength of relationship and a p-value representing the probability of error at below 1% indicating a significant result. For Pearson's correlation coefficient the output shows; student number estimates ( $r = 0.491$ ;  $p = 0.000$ ) and forecasting ( $r = 0.419$ ;  $p = 0.000$ ). Spearman's correlation coefficient gives similar r-values, with the same p-values at 0.000. There is also a strong correlation between the accuracy factor and perceived budgeting accuracy ( $r = 0.820$ ;  $p = 0.000$ ). Furthermore, the variables for the accuracy of student number estimating and forecasting appear in the multiple regression analysis in Table 6.4, providing additional evidence of correlation. Therefore, H1 was accepted.

Consistency between these three elements of perceived accuracy would seem a sensible approach given that the budget often forms the basis for future forecasts, and student number estimates can have a significant effect on both. However, anomalies are apparent from the interviews. Despite a cautious approach to student number estimating, the conversion of these projections into tuition fee income can still lead to overly optimistic figures which need to be mitigated before finalising the budgets and forecasts (see section 5.4). The apparent contradiction between the quantitative survey data and the qualitative interview data is explained by the fact that average responses are produced from the quantitative data analysis whereas the qualitative data from the interviews considers items specific to institutions. Therefore, problems may be identified through the qualitative data that are not apparent from the quantitative average.

## **6.5 Financial strength**

### **6.5.1 Financial strength of an institution and accuracy**

*Hypothesis H2 - There is a significant negative association between the financial strength of an institution and perceived budgeting accuracy.*

Statistically testing the association between budgeting accuracy and the percentage surplus or deficit on income in 2013-14 as a proxy for financial strength may provide evidence to confirm the hypothesis. Although it is recognised that a more sophisticated set of key performance indicators

to measure financial strength could be used, annual surpluses are an important aspect (McConnell & Johnes, 2017). Pearson's correlation coefficient in Table 6.3 shows there is a negative correlation between budgeting accuracy ( $r = -0.334$ ;  $p = 0.002$ ) and the institution's percentage surplus or deficit. Spearman's correlation coefficient also indicates a negative correlation ( $r = -0.337$ ;  $p = 0.002$ ). However, as the correlation coefficient is low there is not a strong relationship. Bryman and Cramer (2011) suggest that as a rule of thumb a result of 0.20 to 0.39 would be considered low (Using the surplus or deficit generated in the previous year 2012-13 also showed a correlation at  $r = -0.308$ ;  $p = 0.005$ ).

Institutions with a cautious approach do appear on average to have higher surpluses than those which are more optimistic. The opportunity to build in contingencies, provisions and slack into the budget leads to unspent resources. Interviews with respondents provide further confirmation that surpluses are often higher than originally forecast for those taking a cautious approach, as would be expected. For those with a less caution approach, interviewees explained that intervention was necessary: "Senior managers are optimistic. The risks of this need to be managed so that the institution isn't too optimistic" (OU5) and "the VC will no longer tolerate a long-term structural deficit" (OU21).

The negative association between financial strength in terms of higher surpluses and the degree of accuracy seems to be valid in terms of testing Pearson's correlation coefficient. The variable of university surplus does not appear in the multiple regression model (Table 6.4), but is included as a minor negative predictor in a revised model if a logarithm transformation is performed on the data to address potential skewness as discussed at the end of section 6.2.3. H2 is tentatively accepted. Comments by interviewees and from financial health reports issued by HEFCE indicate that the cautious approach taken by universities tends to result in higher than forecast surpluses. However, the potential for declining surpluses in the future may change the association between budgeting accuracy and the surpluses achieved.

Taking a cautious approach is only partially explained by perceptions of the impact of the new fee regime, with 35% of respondents claiming that budget setting had become less accurate for this reason (scale points 1-4) on Question C4. However, Table 6.2 does not show a correlation between budgeting accuracy and the impact of new fee regime ( $r = -0.105$ ;  $p = 0.343$ ).

Respondents views on the budgeting and forecasting process (Question E17) might assist in explaining why those taking a cautious approach tend to have higher surpluses. Therefore, an analysis of the statements below was prepared to identify which were the common responses for institutions with higher than average surpluses. The mean surplus as a percentage of income for respondents was 3.9%, with an upper quartile of 6.0%. A value of 7.0% or above was therefore viewed as a reasonable approximation of those with higher than average surpluses.

Table 6.5 Views of high surplus institutions (7% or greater of income)

	Mode
Forecasting is more an art than a science	Neutral/Agree
At this institution, forecasting is just part of the budgeting process, rather than a broader performance management tool	Neutral/Agree
Reliability of the institution’s forecast is compromised because operational functions are not sufficiently involved	Neutral/Disagree
A greater understanding of how the various parts of the organisation operate would improve the forecasting undertaken	Agree
Forecasting accuracy has deteriorated in recent years	Disagree
It is difficult to set accurate forecasts because of the unpredictability of factors influencing the institution’s activities	Agree
Forecasts quickly become obsolete or outdated	Agree
Inaccurate forecasting has adversely affected the institution	Disagree
Governing body takes an interest in the accuracy of budgeting and financial forecasting	Agree

The combination of fears that forecasts quickly became obsolete, a greater understanding of the organisation was needed, the forecasting process was more difficult and the governing body showed an interest in accuracy may encourage institutions to take a cautious approach resulting in higher surpluses.

### 6.5.2 Low surpluses or deficits and the exertion of controls

*Hypothesis H3 - There is a significant positive association between institutions with low surpluses or even deficits, perceived budgeting accuracy and the exertion of greater budgetary controls [in order to avoid a far worse position than originally planned].*

Some interviewees explained that “the budget process starts as a bottom up approach which then becomes top-down as areas ask for more budget than is affordable and requests have to be reduced” (OU4). Statistically testing the association between budgeting accuracy and the approach taken to budgeting using a Likert scale of 1 (bottom-up) to 10 (top-down), with the middle indicating a combination, failed to find a correlation in Table 6.2 ( $r = 0.193$ ;  $p = 0.079$ ). Therefore, a top-down approach (i.e. where greater control is exerted over the budgeting process) does not seem to be more prevalent in institutions which are either cautious, accurate or optimistic in their budget setting. Furthermore, Table 6.3 shows there is no association between the budgeting approach and the percentage surpluses generated in 2013-14 ( $r = -0.017$ ;  $p = 0.881$ ). Further, 77% of institutions sub-divided their budget into monthly control periods (Question B2), thus demonstrating regular monitoring by the majority.

An analysis of the difficulty of obtaining new resources outside of the normal budget process to support unforeseen opportunities using a Likert scale of 1 (very difficult) to 10 (very easy) did not show an association with budgeting accuracy ( $r = 0.179$ ;  $p = 0.103$ ) in Table 6.2.

Therefore H3 is rejected as neither tighter controls through a top-down approach or restrictions on new resources appear to be associated with budgetary accuracy, and there is no significant relationship between a top-down approach and the surpluses generated

## **6.6 Institutional size, type and processes employed**

### **6.6.1 Institutional size, structure and accuracy**

*Hypothesis H4 - There is a significant positive relationship between (a) the size of the institution, (b) the staff employed in the central finance department and perceived budgeting accuracy.*

Interviewees often made reference to establishment size: “The size and complexity of the institution can have an impact on forecasting. The University has 600 research projects at any one time, all of which may incorporate some level of prudence” (OU19) and “The small size of the institution means that monitoring is easier” (NU14).

A statistical analysis of the size of an institution reveals no significant correlation with budgeting accuracy in terms of total income ( $r = -0.140$ ;  $p = 0.206$ ), expenditure ( $r = -0.131$ ;  $p = 0.238$ ), staff ( $r = -0.117$ ;  $p = 0.293$ ), students ( $r = -0.146$ ;  $p = 0.190$ ) and space occupied ( $r = -0.059$ ;  $p = 0.598$ ) in Table 6.3.

The data collected on institutional structure (number of colleges, faculties, schools and professional support departments), staff employed on budgeting and forecasting processes in the central management accounting function and the number who were qualified accountants varied significantly between institutions as might be expected with institutions of differing size and complexity. This data permits a contingency theory approach to be considered in testing whether these variables affect budgeting accuracy.

An EFA was conducted on the sub-construct for the number and qualification of staff. The analysis in Appendix VI identified one factor combining these two items for the purpose of assessing the relationship between budgeting accuracy and the number and qualification of staff.

Table 6.3 does not indicate a correlation between budgeting accuracy and the independent variables for institutional structure [number of; colleges ( $r = 0.058$ ;  $p = 0.599$ ), faculties ( $r = -0.080$ ;  $p = 0.471$ ), schools ( $r = 0.023$ ;  $p = 0.838$ ), service departments ( $r = 0.019$ ;  $p = 0.861$ )] or the

factor for the number and qualifications of staff employed in the finance department on budgeting and forecasting ( $r = -0.043$ ;  $p = 0.696$ ).

Data was not available to also test the correlation with accuracy of the number of staff employed outside of the central finance department on budgeting and forecasting and whether they were qualified accountants.

Overall, there is little evidence to support the hypothesis of correlation between institutional size and budgeting accuracy, or the correlation between staff employed in the central finance department on budgeting and forecasting and the level of budgeting accuracy. Therefore, H4 is rejected for both (a) and (b).

#### **6.6.2 Time taken to complete the budget and the degree of cautiousness**

*Hypothesis H5 - There is an association between the time taken to complete the start of year budget and the degree to which a cautious approach is taken.*

Logic would indicate that the longer it takes to produce the budget the more likely it would be that the projections become out of date and therefore inaccurate due to the changing nature of the environment in which universities operate. This was a view also shared by some interviewees. One explained that: “The budget quickly became out of date and was unrealistic by the time it came in to use. There was too much focus on variance analysis and the whole process was very backward looking” (NU3).

On average the process of completing the annual budget took 15 weeks (within a range of 4 to 40 weeks). With a further 5 weeks waiting for the budget to be formally approved by the institution’s governing body (within a 0 to 16 week range). However, some respondents indicated that the time spent awaiting approval was contained within the overall process time identified. Table 6.2 showed a weak negative correlation between process time and the degree of accuracy of budgeting ( $r = -0.249$ ;  $p = 0.023$ ) for Pearson’s correlation coefficient, which is also confirmed by Spearman’s correlation coefficient, but no significant correlation between accuracy and the time spent waiting for the budget to be approved ( $r = 0.021$ ;  $p = 0.848$ ). The multiple regression

analysis in Table 6.4 also shows a small negative relationship between the time taken to prepare the budget and budgeting accuracy.

There appears to be some evidence to support the view that budgeting becomes more optimistic as less time is spent on the process and therefore H5 is accepted. This negative correlation is perhaps counter to what might be expected given that those preparing the budget may wish to be especially cautious if there is little time to thoroughly prepare, review and check the budget.

**6.6.3 Budget gaming behaviours, unspent budgets and accuracy**

*Hypothesis H6 - There is a significant negative relationship between budget gaming behaviours, the permission to carry forward unspent budgets and perceived budgeting accuracy.*

The survey results indicate that budget gaming behaviours are more likely (either frequently or occasionally) where budgeting is cautious. Table 6.6 shows that more than half the incidents were at scale points 3-4.

Table 6.6 Budget gaming behaviours occurring frequently or occasionally

	Cautious				Accurate				Optimistic		Total
	1	2	3	4	5	6	7	8	9	10	
Spending available resources at the end of the budget period so as not to lose it	0	3	20	21	12	6	7	8	1	0	78
Deferring necessary expenditures to assist in meeting budget targets	0	2	20	16	9	7	7	6	1	0	68
Incurring expenditures in the current period so as to make it easier to attain the budget in the next period	0	2	19	15	9	5	7	5	1	0	63
Negotiating easier targets than one actually thinks can be accomplished to make the budget easier to attain	0	3	18	18	10	6	5	7	1	0	68
Loading expenditure budgets on to certain headings/lines to hide contingencies	0	3	15	13	6	5	6	6	1	0	55
Total	0	13	92	83	46	29	32	32	5	0	332

A cautious approach may encourage gaming behaviours. Whilst such gaming can have an effect on an institution’s ability to produce accurate budgets few indicated it affected them significantly using a Likert scale of 1 (not at all) to 10 (to a very high extent). This view may support Merchant’s (1985) argument that budget slack assists in addressing uncertainty and is therefore tolerated. An analysis of the data failed to find a significant correlation between the accuracy of budgeting and the hindrance of budget gaming behaviours ( $r = -0.084$ ;  $p = 0.448$ ) in Table 6.2.

One method for addressing budget gaming behaviours would be to allow the carrying forward of unspent budgets to be drawn upon when required by the area generating them, but this was rarely permitted. Whilst there appears to be no significant correlation between budgeting accuracy and the carrying forward of unspent balances ( $r = 0.013$ ;  $p = 0.904$ ), there is a weak negative correlation between accuracy and the resulting difficulty caused by allowing unspent balances to be carried forward which may result in unpredictable spending ( $r = -0.338$ ;  $p = 0.002$ ), as shown in Table 6.2. This negative relationship is also confirmed in the multiple regression analysis in Table 6.4. This would imply that budgeting becomes more cautious as the degree of difficulty of estimating expenditure from previous unspent balances increases, perhaps indicating that the uncertainty caused by spending from these reserves necessitates a cautious approach.

Overall, H6 is rejected.

#### **6.6.4 Diversity of an institution's activities and accuracy**

*Hypothesis H7 - There is a significant negative relationship between the diversity of an institution's activities and perceived budgeting accuracy.*

A test of the correlation between the budgeting accuracy and the size of the differing income streams of institutions for 2013-14 did not show a significant association.

There appears to be little significant correlation between budgeting accuracy and Funding Council grants ( $r = -0.077$ ;  $p = 0.491$ ), tuition fee income ( $r = -0.148$ ;  $p = 0.184$ ), research grants ( $r = -0.108$ ;  $p = 0.334$ ), other operating income ( $r = -0.096$ ;  $p = 0.389$ ), and endowment and investment income ( $r = -0.069$ ;  $p = 0.539$ ), as shown in Table 6.3. The lack of association is also confirmed by Spearman's correlation coefficient. Therefore H7 is rejected.

One interviewee commented that: "The University is good at forecasting income in total, but there are variances when this is broken down between fees, other income, etc." (OU19). Aggregation may therefore 'hide' inaccuracies because some variances cancel each other out. Also, it was felt that: "Forecasting was easier when there was a stable HEFCE grant" rather than less stable tuition fee income (OU10). Suggesting an increased need for caution.

### **6.6.5 Type of institution and the development of accurate processes**

*Hypothesis H8 - There is a significant positive association between the type of institution (i.e. pre- and post-1992) in terms of (a) strategy and (b) IT employed and perceived accuracy.*

Pre- and post-1992 institutions have differing characteristics relating to their finances (Moody's, 2014) and their management, resources and performance (McCormack, Propper & Smith, 2014). An analysis was therefore undertaken of respondents divided between these two groups (excluding colleges of higher education). The first part of this analysis was an attempt to understand if there were any significant differences between the two groups in terms of institutional strategy and links to the accuracy of budgeting, student number estimates and forecasting.

The survey questionnaire asked if respondents agreed or disagreed with four statements on strategy using a scale of 1 for strongly agree to 6 for strongly disagree.

An EFA was conducted on the sub-construct for strategy which considered respondents views on the linking of the budget to strategic objectives, reflecting on strategic objectives, the use of feedback from the budget process and the expectation of closing the gap between desired and actual performance. The analysis in Appendix VI identified one factor and it was therefore viewed as appropriate to combine these four items for strategy for the purpose of assessing the relationship between accuracy and strategy.

In order to test H8 the factors for accuracy and strategy were sub-divided between pre- and post-1992 institutions, with the results shown in the Table 6.7 below:

Table 6.7 EFA of perceived accuracy and strategy factors for pre- and post-1992 institutions

Pre-1992			KMO	Bartlett's test of sphericity	Anti-image correlation	Eigenvalue	Factor loadings	Extraction sums of squared	Rotation sums of squared	Cronbach's alpha
Construct	Code	Items	≥0.5	<0.05	≥0.5	>1.0				
Accuracy	BACC	Budgeting Accuracy	0.610	0.002	0.581	1.728	0.820	57.607%	One factor	0.625
	SACC	Accuracy of student number estimates			0.591		0.797			
	FACC	Forecasting accuracy			0.723		0.649			
Strategy	OBJE	The budget process is explicitly linked to strategic objectives/targets within your	0.697	0.000	0.648	2.301	0.841	57.513%	One factor	0.739
	TALK	Setting the budget causes us to talk about and reflect upon our strategy			0.650		0.822			
	CHAN	Feedback from the budgeting process can result in a change in our strategy/tactics			0.811		0.682			
	CGAP	Managers are expected to identify initiatives to close the gap between current and desired			0.794		0.672			
Post-1992			KMO	Bartlett's test of sphericity	Anti-image correlation	Eigenvalue	Factor loadings	Extraction sums of squared loadings	Rotation sums of squared loadings	Cronbach's alpha
Construct	Code	Items	≥0.5	<0.05	≥0.5	>1.0				
Accuracy	BACC	Budgeting Accuracy	0.702	0.000	0.722	2.100	0.708	55.176%	One factor	0.783
	SACC	Accuracy of student number estimates			0.710		0.726			
	FACC	Forecasting accuracy			0.678		0.792			
Strategy	OBJE	The budget process is explicitly linked to strategic objectives/targets within your	0.741	0.000	0.740	2.596	0.749	55.471%	One factor	0.817
	TALK	Setting the budget causes us to talk about and reflect upon our strategy			0.701		0.888			
	CHAN	Feedback from the budgeting process can result in a change in our strategy/tactics			0.768		0.881			
	CGAP	Managers are expected to identify initiatives to close the gap between current and desired			0.794		0.461			

The statistical analysis in Table 6.2 shows a correlation between the accuracy factor and the strategy factor ( $r = -0.252$ ;  $p = 0.021$ ). Analysing pre- and post-1992 institutions separately shows that there was no significant correlation for pre-1992 institutions ( $r = 0.015$ ;  $p = 0.928$ ), but post-1992 institutions demonstrate a negative correlation ( $r = -0.448$ ;  $p = 0.003$ ) indicating that as post-1992 institutions became more cautious they were less likely to agree that attaining accuracy assisted in achieving strategy. Comparing the budgeting accuracy variable only with the strategy factor produces a similar negative correlation for post-1992 institutions ( $r = -0.366$ ;  $p = 0.017$ ), and ( $r = 0.121$ ;  $p = 0.462$ ) for pre-1992 institutions. However, this association was not revealed by a multiple regression analysis of post-1992 institutions.

An earlier study by Newton (1997) concluded that post-1992 universities had more sophisticated computer systems because of their enhanced reporting practices. However, the current study shows little significant difference between the software used by pre- and post-1992 institutions.

Pre-1992 universities were more likely to employ sophisticated software for student number planning, such as Cognos Planning tools (seven pre-1992 and two post-1992) or Corporate Planner

(seven pre-1992 and five post-1992), particularly at the more cautious end of the budgeting accuracy spectrum, but the numbers were relatively small.

The leading financial software in the sector, Agresso/Coda supplied by Unit4, was used by both pre- and post-1992 universities for budgeting, although slightly more common in pre-1992 institutions (20 pre-1992 and 16 post-1992).

The use of a 'funds checking' mechanism within the financial software to automatically ensure that expenditure budgets were not exceeded (thus preventing adverse variances) was rarely used, irrespective of the degree of budgeting accuracy achieved, despite its widespread availability. Post-1992 universities (ten) were slightly more predisposed to using funds checking than pre-1992 institutions (four).

Institutions regularly employed other mechanisms to monitor and warn of impending overspends which can be addressed at an early stage. These included providing a mechanism for managers and budget holders to drill down to successive levels of detail from summary reports and investigate budget profile variances. A total of 30 respondents from post-1992 institutions said that managers and budget holders could drill down, compared with 25 from the pre-1992 universities (three colleges of higher education also used the facility). These institutions were not grouped within any particular area along the budgeting accuracy scale.

Those respondents who indicated that the ability to drill down was available commonly responded that budget holders and managers made mixed use of the facility. 30 of the 47 respondents said that this was the case (16 post-1992 and 14 pre-1992). Only 15 claimed that it was used regularly (8 post-1992 and 7 pre-1992) and just 2 (both pre-1992) said it was not used. It might therefore be concluded that although monitoring facilities are in place to allow managers and budget holders to identify the early warning signs of potential under or over-spending, they are not necessarily effectively used and that this is the case for both pre- and post-1992 institutions across the range of cautious, accurate and optimistic budgeting.

In terms of how the new fee regime had affected budgeting accuracy, most responded that there had either been no effect or that the process was now less accurate. It might have been anticipated

that the new £9,000 tuition fee regime would not make it any more difficult for old and traditional universities to recruit students as they were already popular destinations for undergraduates. Indeed, the removal of the student number control, allowing unrestricted recruitment, might permit such institutions to increase their number of students. However, attracting and retaining students at newer institutions would be more problematic, particularly if greater reliance is placed on the Clearing process for recruitment of students who may be less likely to complete their studies, and therefore increase the difficulty of setting accurate budgets. However, differences between pre- and post-1992 universities in terms of their views on the impact of the new fee regime on budgetary accuracy (with a Likert scale of 1 for less accurate and 10 for more accurate) failed to reveal a pattern of significant differences between the two types of institution. Statistical testing of the correlation between the measure of accuracy and impact of the new fee regime shows little correlation for either pre-1992 institutions ( $r = -0.117$ ;  $p = 0.461$ ) and post-1992 ( $r = -0.103$ ;  $p = 0.516$ ).

Overall, there does appear to be some evidence of differences between pre- and post-1992 universities in terms of the correlation between strategy and accuracy. However, H8 is rejected for part (a) on strategy as although there is an association when using Pearson's correlation coefficient this association does not also arise under multiple regression analysis. Part (b) on IT employed is also rejected as newer universities do not make greater use of the latest technology compared with older institutions, in contrast to the earlier study by Newton (1997).

#### **6.6.6 Participation and accuracy**

*Hypothesis H9 - There is a significant positive relationship between participation and perceived forecasting accuracy.*

The participation of departments outside of central finance in the forecasting process was mostly undertaken in areas where the departments concerned had a significant understanding of activities which might inform the forecasts. However, achieving an effective interaction was seen as challenging by interviewees, with one commenting that: "It doesn't work properly all the time" (NU20).

Only in a few ‘specialist’ areas, or in cases where an overview of the institution was necessary, did central finance play the primary role in forecasting. These areas included Funding Council grants, endowment and investment income, depreciation and interest payable.

An EFA was conducted on the sub-construct for participation in two areas, with the results in Appendix VI. Firstly, the involvement of departments other than central finance in forecasting the main streams of income and expenditure and secondly, the departments that had responsibility for preparing student number forecasts. For the former, the analysis in Appendix VI identified three factors. These three factors were categorised as (1) participation in specialist streams, (2) participation in general streams and (3) participation in major streams. Cronbach’s alpha showed that the specialist and major streams had results of  $<0.6$  indicating that internal reliability was inadequate. Therefore, only the participation in general streams was retained as a factor with a Cronbach’s alpha result of 0.748. The other two factors were not retained.

For the second sub-construct, which analysed participation in student number forecasts, the analysis in Appendix VI identified one factor. It was therefore viewed as appropriate to combine the four items of student number forecasting in to a single combined participation factor for the purpose of assessing the relationship between accuracy and student number forecasting participation.

When tested statistically, Table 6.2 shows there was little evidence of significant correlation between budgeting accuracy and the participation by departments in forecasting funding council grants ( $r = -0.154$ ;  $p = 0.163$ ), tuition fee income ( $r = 0.008$ ;  $p = 0.939$ ), research grants and contracts ( $r = -0.060$ ;  $p = 0.587$ ), depreciation ( $r = -0.078$ ;  $p = 0.483$ ), interest payable ( $r = -0.109$ ;  $p = 0.332$ ), or for the general streams factor i.e. other income, staffing and other operating expenses ( $r = -0.069$ ;  $p = 0.531$ ). Although, there was some evidence of a correlation in the forecasting of endowment and investment income ( $r = 0.217$ ;  $p = 0.047$ ), this was not confirmed by Spearman’s correlation coefficient or by the multiple regression analysis.

Furthermore, there was no evidence of significant correlation between budgeting accuracy and the factor for participation in student number forecasting ( $r = -0.067$ ;  $p = 0.543$ ) in Table 6.2. Thus

suggesting that the dimension of budgeting addressing participation is not a significant contingent variable for achieving budgeting accuracy.

Only 11% of institutions viewed the insufficient involvement of operational areas as a major issue when preparing accurate forecasts. There also appears to be little association between the adoption of either a top-down or bottom-up approach to budgeting and the accuracy achieved, as explained under H3.

Therefore, H9 is rejected.

### **6.6.7 Changes in the HE environment and the achievement of accuracy**

*Hypothesis H10 - There is an association between recent changes in the environment for HE institutions and perceived budgeting accuracy.*

Statistical testing of budgeting accuracy and the impact of the new fee regime shows little correlation ( $r = -0.105$ ;  $p = 0.343$ ) in Table 6.2.

An EFA was conducted on the sub-construct for respondents' views on the forecasting process (Question E17). The analysis in Appendix VI identified three factors (which might also be viewed as contingent factors) and were categorised as (1) environmental issues affecting forecasting, (2) internal issues affecting forecasting and (3) process issues affecting forecasting. However, two of the factors (internal issues affecting forecasting and process issues affecting forecasting) had Cronbach's alpha results of 0.529 and 0.277 indicating that internal reliability was lacking and these were discarded. Only the factor addressing environmental issues which combined the four items that considered respondents views on whether forecasting had deteriorated in recent years, the unpredictability of factors influencing an institution's activities, the speed at which forecasts become obsolete and the interest of the governing body in accuracy was used. This had a Cronbach's alpha result of 0.708. Statistical testing of this factor against budgeting accuracy failed to find a significant correlation ( $r = -0.133$ ;  $p = 0.229$ ) as shown in Table 6.2.

Many institutions indicated that they were likely to make changes to their budgeting and forecasting processes in the next two years. The key changes being considered are analysed below showing the number of institutions considering a change at each level of the accuracy factor:

Table 6.8 Proposed changes to processes at each level of accuracy

	Cautious			Accurate				Optimistic			Total
	1	2	3	4	5	6	7	8	9	10	
Improve data quality	0	0	7	17	18	8	3	3	0	1	57
Change budget reporting processes	0	0	6	14	15	5	6	4	0	1	51
Automate process flows associated with budgeting	0	0	8	10	13	6	5	2	0	1	45
Involve more decision-makers in the budgeting process	0	0	7	9	16	6	4	2	0	0	44
Introducing rolling budgets	0	0	5	9	9	5	3	1	0	0	32
More scenario planning	0	0	5	10	7	3	3	2	0	0	30
Change or introduce new accounting software	0	0	6	7	7	6	3	0	0	1	30
Reduce reliance on spreadsheet software	0	0	3	7	10	5	2	2	0	0	29
Develop formal planning/budgeting workflow processes	0	0	3	4	9	6	5	1	0	1	29
Reduce in detail and greater focus on key business drivers	0	0	4	5	9	4	3	3	0	1	29
Training of staff (finance & non-finance areas)	0	0	2	9	7	4	4	0	0	1	27
Incentives linked to budgets and forecasts	0	0	3	5	8	6	4	1	0	0	27
Better timetabling of processes	0	0	4	8	5	5	3	1	0	0	26
Centralisaion of finance staff	0	0	4	4	7	2	2	2	0	0	21
Involve less decision-makers in the budgeting process	0	0	3	2	8	2	4	0	0	1	20
Frequency of budgeting and forecasting updates	0	0	4	5	3	1	0	2	0	1	16
Reduce the time spent	0	0	2	4	4	1	2	2	0	0	15
Simplification and standardisation processes	0	0	1	2	1	1	1	2	0	0	8
Use of benchmarking or external data	0	0	1	1	0	2	1	0	0	0	5
Other	0	0	0	1	2	0	0	1	0	0	4
Total	0	0	78	133	158	78	58	31	0	9	545

The greatest number of institutions looking to bring about changes to their budgeting and forecasting processes were those whose accuracy lay within scale points 4 – 5, representing the slightly cautious to accurate range of the Likert scale. Despite appearing to be relatively content with the accuracy achieved, institutions in this group were striving for further improvements in a changing environment, particularly in the areas of improving data quality, reporting and automation. Typical comments from interviewees were: “Given the change to the £9k fee the need for greater accuracy has increased as the sums involved are much higher than previously” (OU16), but “Changes tend to come about slowly at this institution” (NU18).

Many indicated that the time spent on planning, budgeting and forecasting had increased as a result of the uncertainties over funding (with 1 on the Likert scale indicating that the time had decreased significantly and 10 that time had increased significantly). An EFA was conducted on the sub-construct for time spent on financial planning which considered respondents views on the

change in time spent on budgeting, resource allocation and capacity planning, forecasting and scenario modelling. The analysis in Appendix VI identified one factor. It was therefore viewed as appropriate to combine the four items for time spent on financial planning into a single combined factor for the purpose of assessing the relationship between accuracy and the change in time spent on this activity. Pearson's correlation coefficient in Table 6.2 showed no significant correlation between budgeting accuracy and the factor for the time spent on financial planning ( $r = -0.049$ ;  $p = 0.659$ ).

Overall, H10 is rejected. The implication for contingency theory is that changes in the external environment have not had an effect on budgeting accuracy when it might have been expected that they would. An explanation may be that the changes have not been sufficiently severe yet or perhaps universities have been able to react to the changes in such a way that they maintained the desired level of accuracy currently.

## **6.7 Scenario models**

### **6.7.1 Use of scenario models and accuracy**

*Proposition P1 - There is a significant positive relationship between the use of scenario models and the perception of accuracy for budgeting, forecasting and student number planning.*

Although the accuracy of budgeting, forecasting and student number planning may not be directly influenced by scenario modelling the technique may indirectly assist by ensuring that institutions consider key drivers when undertaking financial planning.

The majority of respondents (74) undertook scenario modelling and it seems reasonable to conclude they derive some benefit irrespective of the point at which they appear on the Likert scale for the accuracy factor.

For those who did not undertake scenario modelling, six fell within the scale points 5 and 6 of the accuracy factor. It therefore appears that such institutions have practices and processes in place that give sufficient accuracy for budgeting, forecasting and scenario modelling without also

benefiting from scenario modelling. However, these six represented just 15% of the 40 institutions within these scale points. The remainder were at scale points 3 and 4, the more cautious end of the spectrum.

The number of key variables given a high level of importance tended to be smallest at scale point 5 for accuracy, indicating that those with the most accuracy concentrated on the fewest number of key drivers. The complexity of the model also appeared to be minimised at this scale point as there were fewer linkages of key variables. The reason for this is perhaps explained in the comments of one interviewee that “there shouldn’t be a need for detailed scenarios where good financial management is in place” (NU11).

Chart 6.1

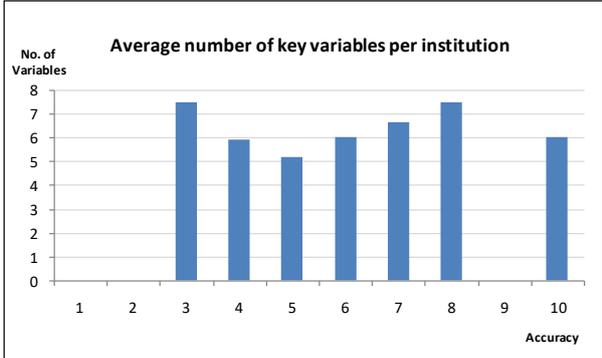
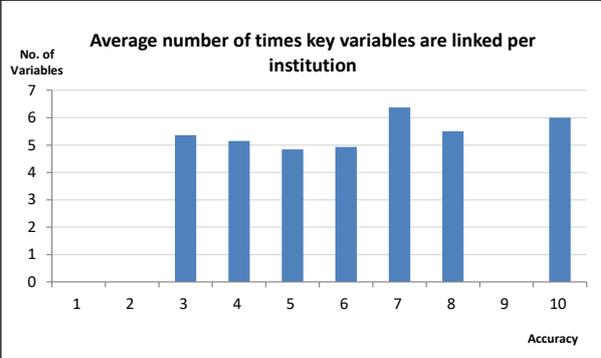


Chart 6.2



An EFA was conducted on the sub-construct for scenario modelling which considered the number of high importance variables included in scenario models and the number of linkages between key variables. The analysis in Appendix VI identified one factor. It was therefore viewed as appropriate to combine these two items into a single combined factor for the purpose of assessing the relationship with accuracy. However, statistical testing of the accuracy factor and the factor for scenario modelling variables and links failed to show a correlation ( $r = 0.017$ ;  $p = 0.876$ ) in Table 6.3. Furthermore, testing the variable for budgeting accuracy and the factor for scenario modelling variables and links also failed to show a correlation ( $r = 0.051$ ;  $p = 0.642$ ).

Overall, the use of scenario models was common irrespective of the degree of accuracy achieved and therefore P1 is rejected. However, models appeared most efficient at accuracy scale point 5 (where the drivers and links were minimised).

**6.7.2 Type of institution and the use of scenario analysis**

*Proposition P2 - There is an association between the type of institution (i.e. pre- and post-1992) and the use of scenario modelling.*

The primary purpose of undertaking scenario analysis was very similar between pre- and post-1992 institutions, with the main reason being internal contingency planning for both types of institution:

Table 6.9 Purpose of scenario analysis

	Pre-1992	Post-1992	Total	Pre-1992	Post-1992	Total
To meet Funding Council requirements	10	13	23	18%	21%	19%
Internal resource planning	16	16	32	29%	25%	27%
Internal contingency planning	28	27	55	50%	43%	46%
Other	2	7	9	4%	11%	8%
Total	56	63	119	100%	100%	100%
Not undertaking scenario planning	4	5	9			
Total responses	60	68	128			

Post-1992 institutions use scenario analysis more than pre-1992 institutions for meeting Funding Council requirements and other purposes (these included providing information to the board of directors or Governors, understanding the areas and scale of potential financial risk, Audit Committee overview, to assess confidence levels, to help with accuracy, to challenge the assumptions made in the forecasts, and to assess opportunities and risk). Perhaps indicating that post-1992 institutions believe they apply the technique in more innovative ways. Of the nine respondents who did not undertake scenario modelling there was no indication that these represented a particular type of institution.

In terms of whether a new scenario model was constructed each year (i.e. a model with significant alterations to parameters compared with the previous year), the data shows that post-1992 universities were 14% more likely to prepare a new model than pre-1992 institutions, with 20 post-1992 institutions doing so compared with 15 from the pre-1992 group (see charts below).

Chart 6.3

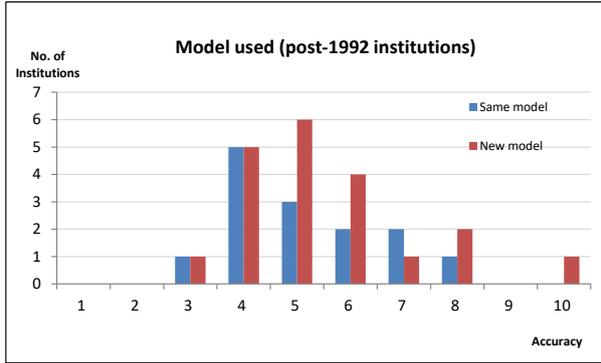
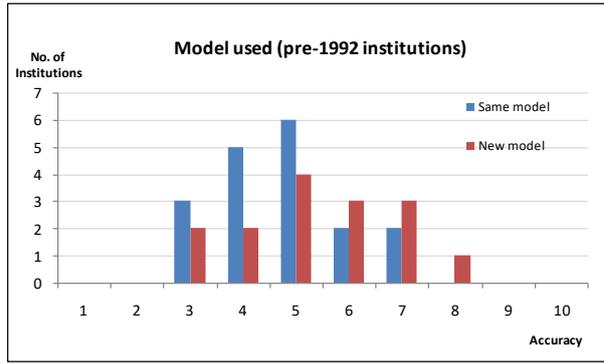


Chart 6.4



At the scale points where most accuracy is achieved (5-6) post-1992 institutions showed a preference for new models whereas pre-1992 institutions commonly preferred the same model. The reasons for this are unclear from the questionnaire data. One explanation could be that the operating environment is more volatile for post-1992 institutions and therefore the use of the same scenario model from one year to the next would not be suitable.

The average number of key variables used by post-1992 institutions was slightly higher at 6.2 per institution compared with 5.1 for pre-1992 institutions. However, for both types of institution the number of variables used were close to their lowest point where accuracy was achieved (scale point 5) as shown below.

Chart 6.5

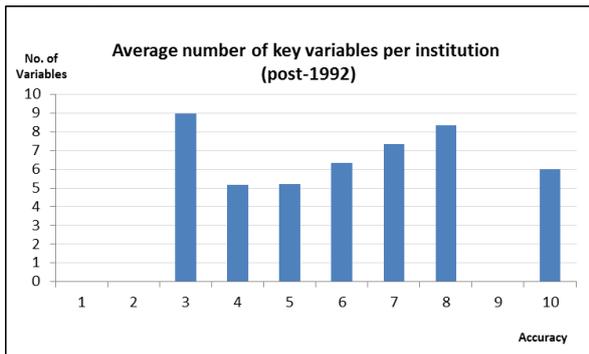
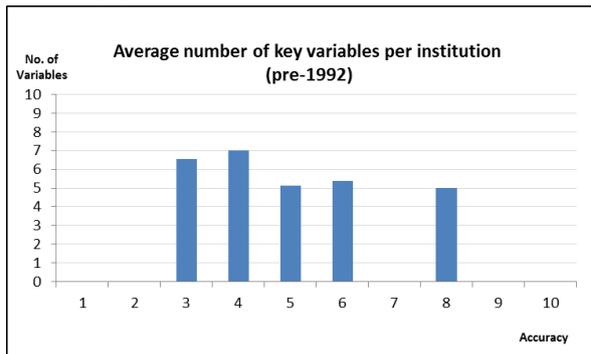


Chart 6.6



Despite the use of a greater number of key variables by post-1992 institutions they made less use of the facility to link them together in some logical way. The average number of linkages was 4.9 for post-1992 institutions compared with 5.5 for pre-1992.

Slightly more respondents from pre-1992 institutions (ten) said that they operated an integrated model for scenario building compared with post-1992 (seven).

Overall, there appear to be only limited differences between pre- and post-1992 institutions when comparing their usage of scenario models. This may be because in many instances both types of institution face similar uncertainties. Therefore P2 is rejected.

### **6.7.3 Consistency of scenario models**

*Proposition P3 - There is sufficient consistency in the key issues identified within institutional scenario models to build a 'standard' model applicable to the sector as a whole.*

There was an almost equal split between those who use the same model each year (48%) and those who construct a new model (52%).

The survey questionnaire asked respondents to identify the key variables included in their models and to specify their level of importance. In order to rank the most important a weighting was applied. Variables with high importance were given a weighting of three, medium importance two, low importance one, and those that were not important were excluded. The weighted mean scores varied from 66 to 21 (ignoring 'other' as this category attracted few responses, but included inflation, Scottish referendum, pension deficits, specific items of income, and loan financing for capital expenditure) and are ranked in the table below.

Table 6.10 Key variables used in scenario models

	High (3)	Medium (2)	Low (1)	Mean	Ranking
Staff costs	186	12	1	66	1
Student numbers (Home & EU under-graduates)	183	10	3	65	2
Student numbers (Overseas under-graduates)	138	34	3	58	3
Student numbers (Overseas post-graduates)	126	32	7	55	4
Staff numbers (Head count or FTEs)	132	22	9	54	5
Non-pay expenditure	102	50	9	54	6
Student numbers (Home & EU post-graduates)	102	36	12	50	7
Student tuition fee rate	93	46	8	49	8
Funding Council income	81	50	14	48	9
Depreciation/capital expenditure	66	56	14	45	10
Research grants	51	44	25	40	11
Enterprise and innovation activity	30	56	25	37	12
Student numbers (Part-time)	48	40	22	37	13
NHS funding	57	24	16	32	14
Other income	12	50	33	32	15
Student numbers (Distance learning and franchise)	36	40	18	31	16
Student residences income	24	54	16	31	17
Provisions for income not linked to student numbers	27	38	26	30	18
Interest payable	18	36	27	27	19
Interest receivable	9	14	39	21	20
Other	15	0	0	5	21

Three of the top five variables related to income and this perhaps reflects the risk and funding uncertainty facing the sector at the time the questionnaire was completed. Expenditure variables relating to staffing were ranked one and five, and non-pay at six. The risks associated with managing costs were recognised as evidenced by the importance placed on assessing staff costs. The rate of inflation at the time was falling towards zero and pressure was being exerted by the government to maintain low public sector pay awards, institutions may therefore have felt more able to exert control over pay costs. Furthermore, changes in institutional income could be addressed by controlled changes in costs.

Scenario models included provision for linkages in data. Typically this included sub-models for tuition fee income and staff costs, but also formulaic links such as the use of staff student ratios, differing inflation rates depending upon the type of income and expenditure, and bursaries/scholarships as a proportion of student numbers. On average the number of linkages was five, indicating that models had some degree of sophistication in terms of making associations between movements in income and expenditure, but without making excessive use of the facility.

In the majority of cases scenario models were produced on spreadsheets and were not integrated with other systems. Again, this suggested that simplicity was preferred over complexity.

The commonality of approach to preparing scenario models and the similarities between institutions in the identification of key variables would seem to support the proposition that the construction of a standard model applicable to the whole sector should be possible. However, the degree of emphasis placed on those variables by differing types of institution would mean that the model might not be operated in a similar way. For instance, research intensive institutions might wish to model the gain or loss in research income by sponsor type whereas those with few streams of research activity might be content to undertake sensitivity analysis at the level of total research income only. One interviewee who had doubts about the usefulness of a standard model commented that: “There are too many variations between institutions. Russell group institutions can be very different to new universities” (NU18).

Whilst P3 is accepted as the research findings show sufficient consistency in the variables used by institutions to build a scenario model applicable to all, discussion with interviewees indicated a common view that a standard model imposed on institutions would not be welcomed and even a voluntary model would be unlikely to be used. It may simply be easier for an institution to design their own model which would be less intrusive and offer less visibility than a standard model implemented by a regulator.

## **6.8 Level of importance, the use of IT and methods of resource allocation**

### **6.8.1 Importance of budgeting and forecasting accuracy**

*Proposition P4 - Accurate budgeting and forecasting is important to institutions and efforts are made to ensure an effective approach.*

The importance given to accurate budgeting and forecasting by HE institutions can be assessed by considering the degree to which budgets are linked to strategy, the level of accuracy claimed, current and future changes to budget setting and monitoring, the recognition of risks associated

with budgeting, the participation of others outside of the finance department in the process, the frequency of updates to budgets and forecasts, and the use made of the latest technology.

Evidence from the responses to the survey questionnaire suggests that institutions generally take a cautious approach to budgeting (52% at scale points 3-4 for the accuracy of budgeting) and forecasting (58% at scale points 3-4 for the accuracy of forecasting) rather than achieve accuracy. Comments from interviewees suggest that prudence is intentional given the uncertain environment, indicating the existence of the asymmetrical loss function.

Furthermore, 88% of institutions agreed that the budget process was explicitly linked to strategic objectives/targets, 82% that the process of setting the budget caused the institution to talk about and reflect upon strategy, and 89% that managers were expected to identify tactical initiatives to improve performance if the budget was not achieved. However, fewer institutions (62%) agreed that feedback from the budgeting process resulted in a change in strategy or tactics and this may be a reflection of the fact that the budget relates to an annual cycle whereas strategy tends to be associated with a longer timeframe. Therefore, under- or over-achieving the budget does not necessarily invalidate the institution's strategy.

When assessing the changes made by institutions within the last two years to budget setting and monitoring processes, on average there were relatively few changes at approximately three per institution. The two most common changes involved greater discussion with budget holders (69%) and more detailed analysis of budgets (68%). However, there was little attempt to set targets for budgeting accuracy (24%), to benchmark accuracy levels (15%) or to change budget software (13%). This might indicate that institutions were not unduly concerned about the accuracy of their budgeting process as long as it met their needs and they did not see any great benefit from introducing state-of-the-art software to improve accuracy. It was noticeable that interviewees indicated that it was inappropriate to define an acceptable level of variance from budget as it depended upon the circumstances of each situation.

The fact that the introduction of the new fee regime in England appeared to have limited impact on budget setting accuracy might partly explain why relatively few changes had been made at a time when the environment was changing for HEIs. Over 50% of respondents indicated that the impact

of the new fee regime on accuracy levels fell within scale points 5-6 on a Likert scale of 1 (less accurate) to 10 (more accurate), implying that budgeting and forecasting remained relatively accurate despite changes in the funding regime. As one interviewee explained: “There’s a fixed tuition fee and we’re fairly certain of student numbers. Therefore, the new fee regime has had little impact on the accuracy of budgeting here” (NU1). This was despite the increased competition and withdrawal of student number controls. Another stated that: “A greater understanding of the institution’s income is being developed as more knowledge is gained of the tuition fees and student numbers under the new fee regime” (NU16). However, this interviewee also explained that it was sometimes necessary to adjust the initial income projection down by as much as £2m with the approval of the finance director to arrive at a more accurate fee income budget and that getting an even greater understanding of the new fee regime would help.

Furthermore, nearly 57% said that their institution’s risk register did not refer to poor budgeting and financial forecasting. Thus suggesting that this area was not seen as a significant risk and did not need to be changed as it met current requirements. Despite this, 31% of institutions agreed that inaccurate budgeting and forecasting had adversely affected their institution and it was an area reviewed by the institution’s governing body with 68% agreeing that this body took an interest in the accuracy of budgeting and forecasting. As noted under section 5.4 some interviewees explained that their governors had a business background and expected accuracy to be achieved.

The most important aspects of forecasting concern the setting of the annual budget, assisting with strategic planning, the formal planning of surpluses/(deficits) and cash flow management. All of these might be considered to be key aspects of operating an institution and demonstrate that respondents recognised the importance of effective forecasting.

In order to achieve accurate forecasting it might be argued that appropriate participation by departments outside of central finance is necessary. Respondents indicated that there were high participation rates in the key headings of income and expenditure. Low rates were only shown for the forecasting of Funding Council grants (the value of which had fallen significantly at most institutions since 2011-12, particularly in England), endowment income and interest received, depreciation and interest payable.

The close link between budgeting and forecasting is confirmed by respondents' affirmation that the current year's budget is used as the starting point to derive future forecasts in 74% of institutions. Therefore, achieving budgeting accuracy has a direct impact on the resulting forecasting accuracy. However, the difficulty of achieving forecasting accuracy in the long-term was recognised, with 88% of institutions only preparing forecasts up to a period of 5 years (including the budget year).

The importance of budgeting and forecasting is also demonstrated by the fact that the majority of institutions (67%) had made an early start in considering the effect of new reporting requirements under FRS102 and the FEHE SORP 2015.

Whilst institutions felt that there were a number of areas which had an impact on achieving accurate forecasting, ranging from the quality of financial data inputs to difficulties in obtaining relevant data, the one which appeared to cause significant problems was the quality of student number data inputs. Despite this, only 38% had decided to introduce software specifically to address student number planning.

In terms of checking accuracy, most (84%) claimed that they reviewed the accuracy of their forecasting at a later date. Explanation of the reasons why were offered by a number of interviewees, with one stating: "Forecasts are reviewed once student fee income is known. It's considered important to do so in respect of identifying whether the required cash generation will be achieved. Future estate developments will be from the institution's own cash resources" (NU20).

Although many (55%) expressed an interest in being able to benchmark the accuracy of their forecasts against other institutions only 5% claimed to have made any attempt to do so.

Reassuringly, respondents appeared to understand the difference between forecasts and targets. As one interview stated: "Targets set for research are different from those used for forecasting purposes" (OU1). Over 64% indicated that they maintained aspirational targets in addition to the forecasts submitted to their Funding Council. Thus indicating that realistic projections were submitted in statutory returns.

The majority of institutions forecast their income based on the knowledge of staff (96%) and the use of trend projections (68%). Far less used market research (29%) or claimed to undertake statistical methods such as simulation analysis (14%) or regression analysis (6%). This perhaps reflects the more conservative nature of staff employed on forecasting using traditional methods.

Overall, it would appear that institutions do take the process of budgeting and forecasting sufficiently seriously, but it is considered to be an area of lower risk as current systems largely meet the institution's requirements without the need for any radical changes. Although P4 is accepted, it was noticeable that interviewees mentioned specific key actors as driving the need for accuracy, including lending banks. This is discussed further in section 7.5.

### **6.8.2 Use of sophisticated tools, techniques and processes**

*Proposition P5 - Institutions use sophisticated tools, techniques and processes in deriving and maintaining budgets and forecasts, and increasing use is expected.*

A study of colleges and universities in the United States by Borgia and Coyner (1996, p.490) found that “a vast majority of the budgeting systems at institutions of higher education use characteristics drawn from more than one budget approach”. As expected, the results of the survey of UK institutions also demonstrate a varied approach to budgeting.

Despite accounting theory generally considering the incremental (or traditional) approach to be inappropriate (Haka & Krishmann, 2005; Atkinson, 2011; Good, 2011), particularly in a changing environment, it was still found to be popular in the results from this survey. Previous year plus inflation and incremental budgeting accounted for a total of 64% of the methods employed ‘frequently’.

Even when ABB and ZBB were deployed they appeared not to be used to arrive at what might be perceived as an accurate budget. An analysis of budgeting accuracy for those using the techniques frequently demonstrated a widespread of accuracy, ranging from a cautious 2 to an optimistic 9 on the Likert scale for those using ZBB and 3 to 8 for those using ABB.

Table 6.3 shows no significant correlation between budgeting accuracy and the differing budget methods employed.

Institutions had attempted to make improvements to budgeting processes covering a range of activities from increased discussion with budget holders to the centralisation of finance staff. One of the most common improvements was to undertake a more detailed analysis of the budgets. However, there was limited evidence of significant changes in budgetary techniques being employed across an institution. Whilst a range of practices are used for updating the budget during the year, rolling budgets are rare. Survey responses also appeared to suggest that forecasts were updated regularly with (67%) indicating a quarterly or more frequent update.

The lack of frequent use of more sophisticated techniques might be explained by the limited resources available at some institutions to prepare budgets and forecasts, including tight deadlines for completion. However, it might also be an institutional perception that there is little to be gained from employing more sophisticated techniques, particularly as over half of the respondents (57%) viewed forecasting as more of an art than a science and only a minority (31%) felt that inaccurate forecasting had adversely affected their institution in the past.

Contingency theory suggests that technology can play an important role in the design of accounting control systems (Chenhall, 2003). Despite a perception that new technology moves forward quickly, most institutions (71%) had implemented their budget/management accounting software between 5 and 15 years ago. Some of these systems would have been upgraded, but few appeared to take a more radical approach of implementing completely new software, with only 19% indicating that their software had been implemented less than 5 years ago.

37% used Agresso and 26% spreadsheets, followed by a variety of other software which had been supplied either externally or internally. Few used the power of the software to automatically prevent budget holders from exceeding the set expenditure budget (18%), but the facility to drill down to successive levels of detail was commonly available (74%) even if it was not well used.

Despite making infrequent changes to budget/management accounting software, 72% of respondents said that they had made significant changes to their budgeting/forecasting practices within the last 3 years, including changed processes, increased liaison with senior staff and budget holders, and altered resource allocation models. Increased time was also being spent on budgeting, forecasting, resource allocation and scenario modelling.

Although only 33% of respondents had implemented a Business Intelligence (BI) system another 22% indicated that they proposed to do so. The perceived need for these systems appeared to be gaining momentum and might be partly explained by the fact that institutions identified student number and income forecasting as a problem. Indeed, improvements to processes and IT were viewed as the two most common solutions to budgeting and forecasting problems. Those interviewees from institutions either with a BI system or intending to introduce one identified the primary benefit as the linking of systems for improved reporting, in order to “achieve consistency and control” (OU15).

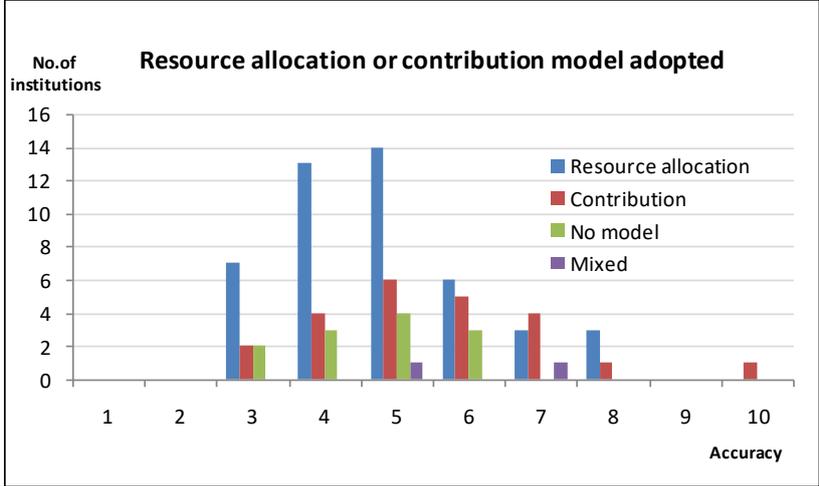
Overall, there was evidence from the survey responses to suggest that institutions were making greater use of sophisticated tools and software and using more complex processes in their budgeting and forecasting practices. Some significant changes had been achieved over the previous 3 years, but this did not necessarily arise from a change in an institution’s main budgeting and management accounting software or from the adoption of new and more complex budgeting techniques. Whilst this process of change appeared to be on-going there was only limited evidence of significant changes taking place in the budgeting methods employed, with many retaining a more traditional incremental approach as it appeared to meet their requirements. Good (2011) suggests that only during periods of severe fiscal or economic crisis is a non-incremental budgetary approach adopted. It may be that although universities are facing severe pressures, such as redundancies and pension difficulties, they are not yet in crisis. Therefore, P5 is rejected.

### **6.8.3 Accuracy and resource allocation**

*Proposition P6 - There is a significant positive relationship between the method of internal resourcing employed and perceived accuracy.*

The common model used by institutions was resource allocation (55%) which was almost twice as popular as contribution models (28%). The chart below identifies which model was used at each point of the Likert scale for the accuracy factor.

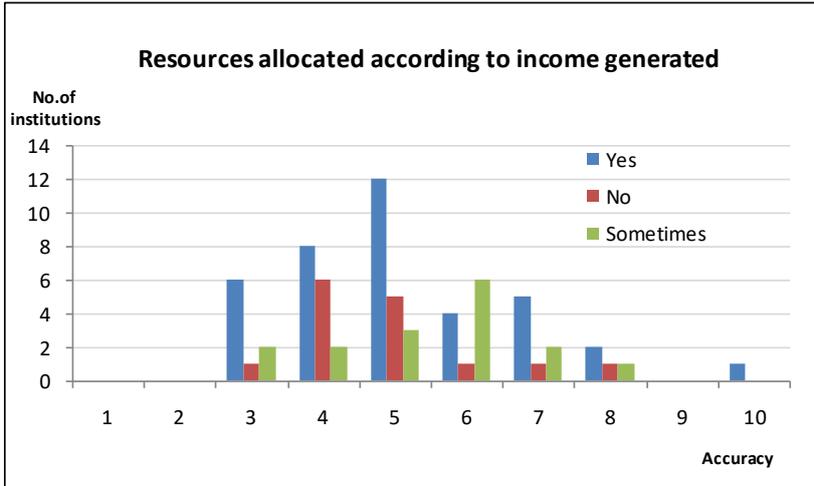
Chart 6.7



Those employing a resource allocation model were more likely to appear at points 4-5 of the combined accuracy measure, indicating a marginally ‘cautious to accurate’ approach to budgeting and forecasting. Those employing contribution models were generally at scale points 5-6 which indicated ‘accuracy’. Those who stated that they did not employ any model all fell within scale points 3-6. Not adopting a recognised model did not therefore seem to significantly impede the achievement of accuracy.

The majority of institutions (55%) allocated resources according to how the income was generated, thereby adopting the general principle that: “You get what you earn” (OU19). However, this interviewee also explained that “it’s necessary to balance the detail of the model with the level of bureaucracy created”. The chart below indicates how many institutions used this practice at each scale point for accuracy.

Chart 6.8

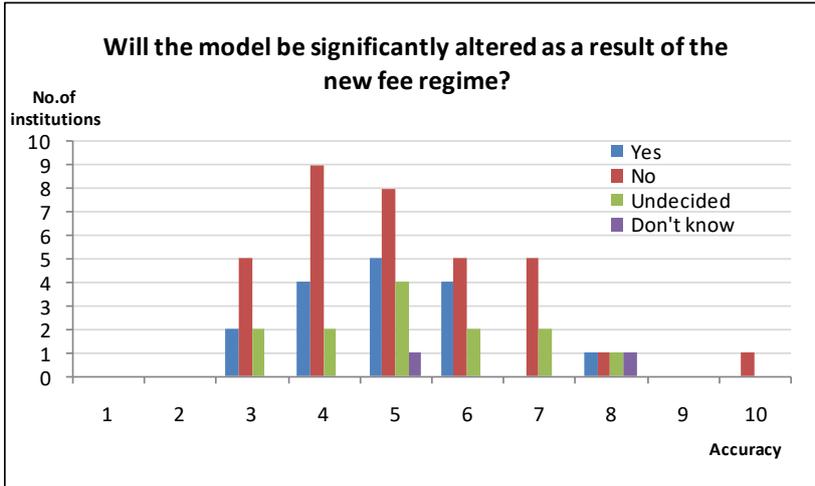


Most institutions who allocated funding in this way fell within scale points 3-7, with the common level of accuracy at scale point 5. This initially indicated that deploying resources on the basis of how they were generated resulted in a reasonable degree of accuracy. However, even those who did not employ this method achieved a fair amount of accuracy, with many institutions falling within scale points 4-5. It would therefore appear that a marginally ‘cautious to accurate’ approach to budgeting and forecasting is achieved irrespective of whether resources are allocated on the basis of income generated or not. This perhaps confirms again that prudence is intentional.

Respondents who identified the difficulty of obtaining new resources to support unforeseen strategic opportunities generally demonstrated that as the degree of difficulty increased (with 1 indicating that it was very difficult and 10 suggesting that it was very easy) the level of accuracy moved towards the more optimistic end of the spectrum. However, Pearson’s correlation coefficient did not indicate a significant correlation between budgeting accuracy and the difficulty of obtaining new resources ( $r = 0.179$ ;  $p = 0.103$ ) as shown in Table 6.2.

There appeared to be some reluctance to use models to drive behaviours or to alter them according to changes in the environment. Only 33% of institutions used their resource allocation or contribution model to set academic priorities. Furthermore, the majority (52%) had decided not to change their model as a result of the new fee regime. These latter institutions covered a wider spectrum on the combined accuracy scale, falling within points 3-7, as shown below.

Chart 6.9



Those who had decided to change their models mostly fell within a narrower range of scale points 4-6. This suggests that institutions who took a pro-active approach to adapting their models to changed circumstances achieved marginally greater accuracy.

Overall, accuracy appeared to be achieved irrespective of the type of resourcing or contribution model employed and the approach taken to its development. Therefore, P6 is rejected.

**6.9 People involved in the process**

**6.9.1 Experience of staff and the accuracy achieved**

*Hypothesis H11 - There is a significant positive relationship between the respondent's experience and perceived budgeting accuracy.*

On average, respondents to the survey questionnaire had 5 years' experience in their current role (within a range of 0.25 to 23 years) and 22 years' experience in an accounting role overall (within a range of 4 to 40 years).

A statistical analysis of the data showed no significant correlation between budgeting accuracy and the respondent's experience in their current role ( $r = 0.019$ ;  $p = 0.865$ ) or the number of years

spent overall in accounting ( $r = -0.091$ ;  $p = 0.428$ ), as shown in Table 6.3. Therefore, H11 is rejected.

Although the hypothesis was not proven the test may not be valid as it fails to take account of other variables for which limited data was available. These include:

- Whether the respondent actually led the budgeting process and therefore had a significant influence over it.
- The experience of all staff employed on the budgeting process, both within the central finance department and throughout the institution.
- Constraints which prevented the institution from achieving accuracy, such as a requirement to adopt a cautious approach imposed by top management, etc.

### **6.9.2 Qualifications of staff and accuracy achieved**

*Proposition P7 - There is a positive relationship between the respondent's qualifications and perceived budgeting accuracy.*

A survey by Tayib & Hussin (2003) of Malaysian universities found that the adoption of 'good budgeting characteristics' may be hindered by a lack of skilled and trained staff.

The majority of UK institutions appear to achieve a reasonable level of accuracy. Almost all respondents were fully qualified accountants with one of the professional accounting bodies (just one was CIMA part-qualified). It might be argued that holding a professional qualification and the knowledge that brings to the budgeting and forecasting process has an influence over the accuracy achieved.

However, similar caveats to those explained in the previous section also apply to the proposition here. The survey results indicate that others, apart from just the respondent, also held professional accounting qualifications. On average there were 5 individuals holding a professional accounting qualification working on budgeting and forecasting within the central finance department. Furthermore, two thirds of institutions also employed staff with a finance role within academic departments. In 71% of these cases either all or some of the staff were professionally qualified

accountants. Therefore, P7 is rejected because of insufficient data to prove the proposition that the survey respondent was the cause of the accuracy achieved.

**6.9.3 Number of staff and the accuracy achieved**

*Hypothesis H12 - There is a significant positive relationship between the number of individuals employed centrally on budgeting and forecasting processes and perceived budgeting accuracy.*

Logic might indicate that the greater the staffing resource available in the central finance department to prepare, co-ordinate and review budgets and forecasts the greater the degree of accuracy that can be achieved. The majority of institutions employed ten or less staff centrally on budgeting and forecasting but many of these employees were qualified, as shown in Table 6.11

Table 6.11 Staff employed on budgeting and forecasting in the central finance department

Number of staff	1-5	6-10	11-15	16-20	21-25	26 or more	Total
Central finance staff - No. of institutions	38	21	13	7	1	1	81
Qualified staff - No. of institutions	49	27	3	1	1	0	81

Small central finance teams appeared to be common. A statistical analysis of the factor for the number of professional qualified staff employed in the central finance department on budgeting and forecasting showed no significant correlation with budgeting accuracy ( $r = -0.043$ ;  $p = 0.696$ ). Overall, there appears to be insufficient evidence to accept H12. The result may be influenced by the number of institutions employing finance staff within academic and service areas (67%), with the majority holding a professional qualification.

## 6.10 Summary

Table 6.12 Summary of hypothesis and proposition results

Type	Hypotheses and propositions	Outcome
H1	Accuracy of budgeting, forecasting and student number estimates are all correlated	Accepted
H2	A cautious approach leads to higher surpluses	Accepted
H3	Low surpluses or deficits are associated with weak accuracy and tighter budgeting controls	Rejected
H4	A positive relationship exists between (a) the size of the institution, (b) the staff employed in the central finance department and the accuracy achieved	(a) Rejected (b) Rejected
H5	The greater the time taken to prepare the budget the more cautious it becomes	Accepted
H6	Budget gaming behaviours and permission to carry forward unspent budgets affect budgeting accuracy	Rejected
H7	The diversity of an institution's activities affects the accuracy of its budgeting and forecasting	Rejected
H8	Certain types of institution (i.e. pre- and post-1992), in terms of (a) strategy and (b) IT employed, have developed more accurate processes	(a) Rejected (b) Rejected
H9	Participation of other departments affects the accuracy achieved	Rejected
H10	Recent changes in the environment have increased the difficulty of achieving accurate budgets and forecasts	Rejected
P1	There is a positive association between the use of scenario models and accuracy	Rejected
P2	There is a positive association between the type of institution (i.e. pre- and post-1992) and the use of scenario modelling	Rejected
P3	A consistent approach is adopted to the key drivers used within institutional scenario models allowing a 'standard' model to be constructed	Accepted
P4	Accurate budgeting and forecasting is important to institutions and there is evidence of attempts to ensure an effective approach	Accepted
P5	Universities use sophisticated tools, techniques and processes in deriving and maintaining budgets and forecasts, and increasing use is expected.	Rejected
P6	The method of resource allocation employed affects the accuracy achieved	Rejected
H11	There is a positive relationship between the respondent's experience and the accuracy achieved	Rejected
P7	There is a positive relationship between the respondent's qualifications and the accuracy achieved	Rejected
H12	The number of staff employed centrally on budgeting and forecasting processes affects the accuracy achieved	Rejected

## 6.11 Conclusion

This chapter commenced by applying factor analysis to reduce the number of variables for testing correlation against the perceived accuracy of budgeting. The testing revealed that only a few variables had an association with budgeting accuracy. In particular, the perceived accuracy of forecasting and student number estimates had a positive impact whereas the difficulty caused by

carrying forward unspent budgets and the time taken to prepare the budget had a negative effect. Other variables, including contingent factors such as the external environment, did not have a strong influence despite evidence that institutions viewed budgeting accuracy as important and were expending effort on achieving greater accuracy.

A number of circumstances influence a person's perception of accuracy including past experiences, the views of colleagues, the financial health of the institution, the operating environment, etc. Thus a perception of accuracy can be valid if the budgeting and forecasting meets an institution's needs even though large variances arise. It may well be that where a budget or forecast is cautious the resulting variance is not unexpected and is therefore accurate at the outset even if the size of the variance might suggest otherwise.

Having tested and assessed a number of hypotheses and propositions, Chapter 7 discusses the findings, and the patterns in them, in relation to relevant literature.



## **Chapter 7**

### **Discussion**

#### **7.1 Introduction**

Earlier chapters looked at the literature on budgeting, forecasting and financial modelling. The results from the survey questionnaire and interviews were also considered and a number of propositions assessed and hypotheses tested. This chapter now seeks to draw this analysis together.

The research aims to identify and understand the factors influencing budgeting and forecasting accuracy and the use of financial scenario models in order to contribute to the management accounting literature. It attempts to bridge theory and practice (Starkey & Madan, 2001) on the influence of contingent factors (such as changes in the environment, use of technology, organisational structure, etc.) on budgeting and forecasting in universities by considering the application of practice in relation to contingency theory. By understanding the budgeting, forecasting and financial scenario modelling practices employed, the influences exerted on them can be considered in the context of achieving budgeting and forecasting accuracy. Whilst there is a significant amount of literature on budgeting, there is little which deals specifically with budgeting accuracy within universities. It may be that this subject is not of sufficient importance to universities currently when the inaccuracy generally results in favourable rather than adverse variances.

This chapter sets out to discuss some of the key findings and themes in relation to relevant literature. It is framed through a series of questions which primarily look at the influences on budget accuracy and the challenges faced by universities. These questions emerge from considering changes to the external environment, findings from the data, the differing interpretations of the meaning of accuracy, whether anyone is really concerned about achieving accuracy, key issues faced by universities and whether current methods are satisfactory, and the requirements and possible development of scenario modelling. They are summarised below with the section number in brackets:

- Is uncertainty influencing the financial management of universities? (7.2)
- What does accuracy mean? (7.3)
- What do the survey results tell us about the sector? (7.4)
- Who are the key actors? (7.5)
- What are the significant challenges facing the sector on accuracy? (7.6)
- Are universities satisfied with their methods? (7.7)
- What are the requirements for undertaking scenario modelling? (7.8)
- Can a standard model be built for the sector? (7.9)

## **7.2 Is uncertainty influencing the financial management of universities?**

It is recognised that good financial management, including effective budgeting and forecasting, results in intervention and a pro-active response where an institution is alerted to adverse indicators such as a failure to meet financial targets (Shattock, 2010).

A number of universities have in the past operated without the necessary management information systems expected of a large and complex organisation, as discussed in Chapter 1. How many are continuing to do so is difficult to ascertain, since such institutions are unlikely to admit to the existence of inadequate or ineffective management accounting practices.

The higher education sector as a whole has continued to undergo dramatic change (McGettigan, 2014; Marginson, 2014a; Wolf, 2015a), potentially making budgeting and forecasting more difficult yet also more important. Recent years have seen a high level of turbulence arising from the introduction of a variable fee regime in 2006. This turbulence has been accentuated as a result of the Browne Review (2010) and there is much continued uncertainty surrounding the impact of increased tuition fee income levels and “demanding market conditions” (Palfreyman & Tapper, 2016, p.53). The operating environment has changed rapidly as a consequence of a reduction in public funding and an increase in tuition fees. Greater flexibility in fee levels during a period of economic downturn has reinforced the reputational pull of various institutions as well as the vocational value placed on certain disciplines.

Some institutions have not performed well in the recent past and have been placed on HEFCE's "At Higher Risk" list because of threats to the institution's financial sustainability (Grimston & Newman, 2010; NAO, 2011). HEFCE generally do not make their risk assessments public until three years have elapsed (HEFCE, 2010). It is therefore difficult to assess how many institutions are currently facing difficulties.

The results in Chapter 5 show that many institutions claim to take a cautious approach (56%) or have achieved accuracy (22%) in their budgeting and forecasting. It is perhaps understandable in an uncertain environment that caution is followed by the majority. The claims to accuracy may be either because the institution has not been affected by the uncertainty, has put effective processes in place or the accuracy is more perceived than real.

### **7.3 What does accuracy mean?**

Part of the challenge of undertaking the research was understanding what 'accuracy' meant to institutions.

Most definitions of accuracy refer to the quality of being true, precise, exact or being free from error whether systematic or random. Applying such a strict definition to the financial planning of universities would mean that accuracy is rarely achieved (Shattock, 2010).

External auditors consider the materiality of misstatements in published accounts on the basis of whether they "could reasonably be expected to influence the economic decisions of users" (ISA320 Materiality in Planning and Performing an Audit, p.314). However, what is material to one user may not be for another. External auditors refer to "tolerable error" and define materiality as "the degree to which a reasonable person might be influenced by an omission" (Grant Thornton, 2015, p.7). Materiality is a matter of professional judgement, although ISA320 uses standard benchmarks as a starting point. Traditional benchmarks include: 0.5–1.0% of turnover, 5-10% of profit before tax and 1-2% of gross assets.

Castellina (2014, p.1) makes the point that: "While 100% accuracy may be an unobtainable dream, the goal should still be to get as close as possible, in order to give decision-makers some idea of

what they can expect as they attempt to guide the business. This is easier said than done". However, the goal should perhaps be to achieve a level of accuracy that meets an organisation's needs.

The sector generally adopts a cautious approach to both budgeting and forecasting, and this is reflected in the results of this research study. However, there are exceptions. Sometimes institutions fail to adequately account for the competitive environment and under-recruit students. Furthermore, HEFCE have commented over a number of years that the overseas student recruitment targets of institutions look optimistic given the immigration restrictions imposed by the government even though forecasts have usually been exceeded in the past. This view is supported by Universities UK (2015b, p.2) who note that "the growing number of international students going to competitor countries is fuelling concern about the UK's ability to attract international students", but their comments are perhaps expressed in the context of lobbying the government.

Defining exactly what institutions consider to be accurate or inaccurate is difficult. Large and unexpected variances from budget or forecast potentially provide evidence of inaccuracy and are a cause for concern, particularly if adverse, but how large does the variance need to be before it implies that there is a level of unacceptable inaccuracy? A large monetary variance may represent a small percentage of the total budget and vice-versa. Furthermore, a large adverse variance that is off-set by a related favourable variance may be acceptable despite the clear inaccuracy. Variances must therefore be viewed in the context of how and why they arise, rather than adopting a budget-constrained (Hopwood, 1976) interpretation.

At the outset this research sought to consider whether university budgeting and forecasting was sufficiently accurate to meet institutional needs. What is apparent from the comments of interviewees and from the benchmarking data is that large variances can exist which fail to cause undue concern for some institutions or their governing bodies as although the prediction turned out not to be exact it did not result in any operational difficulties. Furthermore, a cautious approach does not necessarily signal inaccuracy if favourable variances arise as expected.

However, institutions vary in their need for precision. Those heavily reliant on teaching activity placed significant importance on the accurate budgeting of tuition fee income. Unexpected deviations from budget can cause concern, whether in terms of having sufficient physical capacity to accommodate additional students or being able to swiftly reduce costs due to under-recruitment. Finance officers at a number of institutions explained that they were under pressure to show that the agreed tuition fee budget was achieved each year as expenditure plans were reliant on this income. The consequences of positive variances were potentially very different from adverse variances which might lead to spending cuts.

HEFCE adopt a strict interpretation of accuracy which requires institutions to explain variations from the annual budget or forecast exceeding  $\pm 10\%$  on the main headings from the financial statements, implying that inaccuracy lies outside of this narrow band. Few institutions adopt such a rigid approach in their own reporting practices, preferring instead to report on any area of potential concern or over/under-achievement. Evidence from the literature review demonstrated that those organisations in the private sector that set rigid parameters often appeared not to achieve them (Economist Intelligence Unit, 2007). The difficulty for HEFCE over recent years has been that universities have generally exceeded their budgeted surplus and thus arguments by HEFCE to the government that the sector faces financial difficulties have perhaps been undermined.

For individual institutions, inaccuracy also potentially means that activities which could have been undertaken earlier have not been because financial planning resulted in miss-directed resources. Whilst there was some evidence of this argument from interviewees, there were also counter-arguments that an institution's leadership took account of potential inaccuracies in their planning processes as favourable variances tended to arise consistently from one year to the next.

#### **7.4 What do the survey results tell us about the sector?**

The survey results confirm HEFCE's view that the sector adopts a cautious approach to its budgeting and forecasting (HEFCE, 2015b), with the majority of institutions producing better outturns than forecast. This caution may be a symptom of the uncertain environment although institutions generally claim not to have suffered any adverse effect on accuracy from the introduction of the new fee regime. This may be because an adverse effect can be absorbed within

current surpluses generated by most institutions whilst plans are implemented to make appropriate adjustments.

Despite contingency theory suggesting that significant changes in the external environment will affect the management accounting practices employed (section 2.5) it does not appear to be having a major influence on the budgeting techniques adopted by institutions. Perhaps suggesting that the changes are not yet sufficiently significant. An incremental approach is still the most popular method employed by universities in providing financial estimates, consistent with previous findings by Cropper and Drury (1996) and Lyne and Alhatabat (2015). Given the increasingly volatile nature of teaching funding, mostly earned from tuition fees since the introduction of the new fee regime, greater use of methods such as ABB or ZBB might have been anticipated. Those changes that have been implemented or are being considered tend to concentrate on further embedding current practices, such as greater interaction with budget holders, more detailed analysis and reporting, further devolvement of budgets, simplification and standardisation, increased budget training and improving data quality, etc. Thereby enhancing and developing processes that have been in place over many years. Institutions appear largely content with simple methods, but are applying them in increasingly sophisticated ways.

Universities are complex organisations (Berry et al., 2004), employing a range of structures and methods, none of which appear to have a significant influence on the accuracy of budgeting and forecasting. Furthermore, the number of management accounting staff employed centrally by the finance department and whether they are professionally qualified has a limited influence on the degree of satisfaction with the accuracy achieved. This result was surprising given that it might have been expected that additional resources in this area would have led to improved accuracy (hypothesis H12 and proposition P7 in Table 6.12). Additional staffing may simply increase the complexity of the exercise rather than lead to an improved outcome.

A wide range of budget cycles and processes was found in the discussion with interviewees and from responses to the questionnaire. Two key aspects to this were that the process itself often led to less accuracy as a degree of cautiousness was built in to the budget at various points in the budget cycle of most institutions. Indeed, the greater the time available to prepare the budget the more likely that multiple levels of caution would be included. This is because additional time

meant that more participants could be involved who would include their own level of cautiousness too (hypothesis H5). Secondly, budget gaming was alive and well, but few admitted that it caused them difficulties such as spending unnecessarily (Jones, 1994b) or distortion to management information (Dunk & Perera, 1997). This was because institutions preferred budget holders to be engaged and interested in the process even if it meant addressing some adverse behavioural traits. However, allowing unspent budgets to be carried forward was not viewed as an acceptable practice in the sector (Angluin & Scapens, 2000; Dugdale & Dai, 2013). Even where allowed, it tended to be heavily controlled with unspent budgets only released again under certain circumstances. The primary reasons for not allowing the practice (i.e. loss of budgeting accuracy and the danger of an uncontrolled run on large accumulated reserves) took precedence over implementing a practice which might have assisted in addressing gaming behaviours. There appeared to be an association between budgeting accuracy and the difficulty caused by allowing the practice (Table 6.4).

The general approach taken to budgeting incorporates both a top-down (involving a central resourcing function) and bottom-up (involving academic and administrative service areas) culminating in a negotiation process and ultimately approval by the institution's governing body. Each stage has the potential to introduce or remove bias. Biases introduced when establishing the budget proposal may be retained during the negotiation stage and at the final approval, either intentionally or unintentionally. These may be explicitly identified, so that they can be monitored, or hidden and revealed later in the budget year.

Institutions generally followed a consistent approach so that those who were cautious in their budgeting were also cautious in forecasting (the budget was often used as the baseline for forecasting according to responses to Question E6) and when undertaking student number estimating. However, student number predictions caused concerns for many central finance departments, primarily because of the limited control exerted over the production of estimates that were viewed as not sufficiently robust to create tuition fee income projections or lacked detail when attempting to analyse why variances had occurred from budget. The latter resulting in an inability to explain the variance. This was particularly frustrating in cases of inconsistent variances, such as higher than anticipated student numbers but lower tuition fee income than predicted. Although participation in budgetary processes was mentioned by a number of interviewees as a key driver for improving accuracy there was little statistical evidence to suggest

that it improved forecasting (hypothesis H9), and in the area of tuition fee income prediction it appeared to cause difficulties.

Various studies (Newton, 1997; McCormack, Propper & Smith, 2014; Grant Thornton, 2016b) suggest that there is a distinction between pre- and post-1992 institutions in terms of size, activities, management, organisation, etc. It was therefore logical to test whether there were differences in the approach taken by these two types of institution. Although there appeared to be some differences in terms of the association between strategy and accuracy (hypothesis H8), the results failed to indicate a clear distinction between budgeting and forecasting processes, systems or methods adopted. Previous suggestions that post-1992 institutions had more advanced IT reporting systems (Newton, 1997) appear not to be valid in the current environment as both types of institution employ sophisticated financial software. Thus pre-1992 institutions have caught up with post-1992 universities. So there has been a change but not further development as might be suggested by contingency theory.

Both types of institution made use of financial scenario models. However, for those achieving accurate budgeting and forecasting the overall preference was for simple scenario methods with a minimal number of key drivers and as few linkages between them as possible. Again, this would seem to reflect the sector's preference for a less complex approach to financial planning methods despite the uncertain environment.

The perception of the respondents is key to many of the survey findings on accuracy. As explained in the previous section, there are differing views and definitions on what might be considered accuracy. The size, either as a percentage or a monetary value, of a variance is not necessarily a good indication of what might be logically viewed as inaccuracy. Whilst respondents were reluctant to indicate what an acceptable variance might be, there is perhaps a link with contingency theory as the variance may be considered acceptable or unacceptable depending upon the circumstances under which it arises and whether it has the potential to cause adverse consequences for the institution. Evidence from the survey would suggest that the tolerance for variances depends upon the user of the information. Some university governing bodies appeared to have little tolerance for variances whether they were favourable or adverse, whilst others showed a high degree of tolerance provided the reason for them was logical and not unexpected. However, it was

surprising that relatively few institutions included the potential for adverse variances on their risk register given the strong views on the avoidance of variances held by some governing bodies and institutional leadership.

### **7.5 Who are the key actors?**

Comments from interviewees provide insights into who viewed accuracy as important and who could either affect or were affected by the achievement of accuracy. The actors included external stakeholders (such as lending banks and Funding Councils), the institutional leadership (Vice-Chancellors and others), staff (academic and administrative staff with an interest in budget outcomes), and the central finance function who should have sufficient expertise (Tayib & Hussin, 2003). Some exerted a significant influence on the finance function. For example, lending banks sought explanations for variances and influenced the management accounting information presented, with one interviewee explaining that they had changed the profiling of budgeted income to improve the clarity of information. Interviewees referred to Vice-Chancellors, university executive groups (including the Finance Director) and Governors expressing concerns as to the cause and size of variances in particular circumstances. These individuals were generally looking for financial stability.

However, the consequences of inaccuracy seem to be somewhat limited. Reputational risk was mentioned in respect of possible loss of confidence in the central finance department together with delayed expenditure. Inaccuracy could potentially lead to incorrect decisions on cutting expenditure or re-allocating resources, but there were few specific examples offered. Furthermore, some interviewees expressed the need for accuracy in order to ensure early warning of any possible breach in bank lending covenants. Overall, there appears to be a lack of pressure coming from any particular individual or body to radically change practices in order to improve accuracy.

Whilst accuracy was generally viewed as good, it cannot necessarily be aimed for because of a need to be cautious in an uncertain market. Lending banks were mentioned by interviewees as key players in the provision of accurate budgetary information, and interviewees cautioned that their relationships with banks needed to be managed in terms of explaining the reasons for variances from budget. However, the central finance function appeared to have a conflicting role in pursuing

accuracy whilst also ensuring that a cautious approach was adopted which could absorb unexpected adverse financial situations.

## **7.6 What are the significant challenges facing the sector on accuracy?**

The key challenge faced by institutions is the adoption of a strategy to ensure the university's prosperity in an ever more competitive market place. Some themes emerge from the research to suggest that inadequacies exist in important areas of the budgeting process:

### **7.6.1 Student number forecasting**

Few universities appeared to be content with their forecasting of student numbers. Difficulties were encountered in accurately determining the likely student recruitment and retention each year. Even those institutions popular with prospective home and EU students experienced difficulties in other areas such as the forecasting of overseas and post-graduate numbers.

Furthermore, many found it challenging to convert their budgeted student numbers in to accurate tuition fee income projections. A series of variables appeared to cause problems ranging from student mix, projected tuition fee waivers, applicable fee rates, retention rates, sandwich year placements, non-traditional enrolment patterns, etc.

The IT systems employed to record and forecast student numbers also demonstrated inadequacies and in many cases complex spreadsheets were used. The operation of such spreadsheets tended not to be widely understood and the outputs in terms of forecast income were usually criticised for their inaccuracies. The failure to integrate systems led to inconsistencies between data sets and this was mentioned by a number of respondents to the survey questionnaire and by interviewees as an impediment to constructing budgets and forecasts accurately and efficiently. They also caused difficulties when trying to sensibly explain variances from budget or forecast. For example, at the University of Manchester, Davies and Jackson (2016) identified the need to understand relationships between student numbers and tuition fee income, in order to answer questions such as: Why is tuition fee income down when student numbers are up? Thus emphasising the importance of performance reporting (Berry, 2014).

Universities appeared to be trying to address this in one of two ways. The first was to bring the differing functions together within one system only that was fully integrated. The second was to use some form of business intelligence software that provided a means to connect the systems together and form an over-arching platform from which multiple datasets could be interrogated. Both approaches had problems. The single system approach tended not to provide an optimal solution for at least one of the functions. For example, it may provide a good finance function but be inadequate in terms of maintaining and forecasting student numbers. The business intelligence systems tended to be expensive to purchase and required significant internal resources to implement and maintain.

Furthermore, there was a disconnect between those preparing the student number forecasts and those creating tuition fee income projections. There appeared to be limited understanding of the requirements of these differing departments and functions, and attempts were actively being made to increase the interaction between the two areas at many institutions to improve the quality of information.

The concern was that this stream of income was growing rapidly as it replaced Funding Council income and yet the budgeting process contained significant weaknesses that were frequently raised by interviewees (section 5.4). Whilst the difficulties were recognised the solutions had either proven to be inadequate or were being developed over an extended period of time, such as developing knowledge through a greater interaction between central finance and the department responsible for preparing student numbers by employing a business partnering approach. The two main challenges from the new fee regime are to identify the number of students and the fee mix that these produce, with the latter appearing to be the more complex.

### **7.6.2 Incremental budgeting**

Incremental budgeting has long been criticised as an ineffective method for ensuring accurate projections (Fielden & Lockwood, 1973; Carr, 1994). However, it remains popular in the HE sector and is widely used. Despite significant changes in the operating environment and pressures placed on university funding there has been little movement towards ‘beyond budgeting’ or the use

of alternative techniques such as ABB or ZBB. Where the latter have been used it has tended to be for specific purposes such as budgeting for functions like university library services (Foskett & Brindley, 1991) or for assessing areas at financial risk.

In recent years there has been much debate on beyond budgeting techniques in order to address perceived inadequacies in the budgeting process ranging from the amount of time spent on the process to the inadequacies of the end result. Despite this, there is a lack of evidence that traditional budgeting methods are in decline or that beyond budgeting is gaining popularity (Dugdale & Lyne, 2006, 2010; Libby & Murray Lindsey, 2010).

In the HE sector only one institution has published details of progress in implementing beyond budgeting (University of Plymouth). No institution responding to the survey questionnaire indicated an intention to implement this technique. Indeed, traditional budgeting approaches remain popular with the sector. The beyond budgeting principles put forward by Hope and Fraser (2003) appear not to be of immediate interest to HEIs and are perhaps viewed as too radical a change. HEIs generally use a broad range of management controls, such as assessing league table performance, NSS scores, etc. Budgets form only one aspect of such performance measures and therefore little may be gained from their abandonment. Indeed, evidence from this research demonstrates that incremental budgeting contributes effectively to management control given the increasing desire to embed and develop current processes, and minimises the level of effort to construct budgets for a large organisation. It also assists in avoiding conflicts over the allocation of resources (Shattock, 1981). Although there are instances of institutions acknowledging that their approach is too cautious or too optimistic, many institutions believe that this is the optimal method as their budgeting and forecasting meets their needs.

The widespread use of an incremental approach possibly contributes to the reason why budgeted surpluses are commonly exceeding. This consistency may also assist institutions and the Funding Councils to predict the likely outturn long before it is actually known. The incremental approach seems unlikely to change until institutions experience a significant financial crisis (Good, 2011). The reluctance to use alternative techniques may be due to the resources required to implement them and the current lack of perceived benefit.

### **7.6.3 Budget processes and bias**

Budget processes generally appeared to cause universities challenges. These covered a range of issues including the timeliness of the budget cycle, meeting deadlines, setting clear guidelines (including establishing budget procedures manuals), getting budget holders to take sufficient ownership and responsibility for the resources they controlled, removing slack and bias, the use of manual systems that consumed an inordinate amount of time, non-standard practices and general inconsistencies which delayed completion of the budget, a lack of responsiveness to change, insufficient integration of budgeting with planning, and what one respondent referred to as “detail stiflement” (NU21) in terms of the failure to consider materiality in some of the projections.

Many have investigated the propensity of individuals to engage in budget gaming behaviours and to introduce budget slack. The motives for doing so are usually related to some form of personal gain. Merchant (1985, p.203) sets out the rationale clearly in terms of the effect on the budgeting system i.e. managers who are placed under pressure to achieve a budget will introduce slack. This is because “slack can be used to absorb uncertainty”. However, it is also claimed that the active participation of managers in the budget setting process can help to reduce slack.

Hofstede (1968) found that budgeting had the capacity to result in all kinds of harmful behavioural effects when used for performance evaluation. HEIs appear to be no different from any other type of organisation whereby adverse reactions can result from the imposition of budgets which create a conflict between the control exerted and the motivation/aspiration of the individual.

Budget holders may intentionally introduce bias which adversely affects accuracy (Kaye, 2012). However, the consequences of such actions may not be significant. For example, the degree of bias may be insignificant when considered in the context of the overall budget of a HEI. Furthermore, this bias may be consistent across an institution and between years, meaning that it can be anticipated and allowed for when undertaking financial planning.

Although Hofstede suggests that managers should treat budgetary control as a 'game' which should not be taken too seriously, and Hopwood (1976) and Emmanuel and Otley (1985) also propose that it is the way in which senior managers use budget systems which determines effectiveness, it

is still possible to implement a strict process but allow for inaccuracies based on past experience. In a HEI this might best be done by creating compensating budget entries to address the potential bias where it can be recognised and predicted. However, some element of budget slack may actually be good as it allows an organisation to cope with periods of uncertainty and also exploit opportunities (Sharfman & Dean, 1997; Van der Stede, 2000; Bradley, Shepherd & Wiklund, 2011; Wiersma, 2017). There is a danger of taking research findings from the business sector and using them in the context of universities as they may be sector specific. However, behavioural aspects of budgeting and their consequences may apply to any organisation where there is human intervention in the budgeting process.

The natural tendency of budget holders in HEIs is to take a cautious approach and introduce slack, resulting in favourable variances, seemingly irrespective of the degree of pressure to achieve the budget. This appears to be at odds with the work of Merchant (1985) where more emphasis was placed on slack being introduced by those under pressure. The majority of HEIs do not use the finance system to automatically prevent overspends. There also appears to be no willingness to exert greater financial control (i.e. a top-down approach) where it might be expected, such as for institutions generating low surpluses.

Moreover, this tendency for caution existed even where the environment was more certain than it is currently under the new fee regime. The sector as a whole has over-achieved budgets for many years. This culture of caution appears to be embedded within the sector and as Merchant (1985, p.209) explains “there is much more to learn about what causes managers to create budgetary slack”.

Merchant appears to be correct in claiming that slack is less likely to be introduced where it can be detected. Many HEIs employ a budget cycle which allows an opportunity for proposed budgets to be challenged and adjusted. However, budget holders may be becoming increasingly sophisticated at hiding contingency budgets or senior staff may be more willing to tolerate suspected slack during periods of uncertainty as the institution may benefit from over-achieving the budget and creating higher surpluses than originally envisaged. It was noticeable amongst some of the interviewees that greater efforts were being made to drive out these contingencies at the level of

individual academic and service departments in favour of including an overall corporate contingency that was transparent.

Many budget process issues caused frustrations at various levels within an institution. Attempts to address them had in some cases simply resulted in further problems but in a different area, such as the increased devolving of budgets leading to greater contingencies being introduced and difficulties in achieving budget deadlines. However, some had implemented large scale projects to automate and standardise as many elements of the budget process as possible and were making increased use of IT systems. Others were looking to improve training and working relationships between departments in the hope that current processes could be made more efficient and effective.

Eliminating bias in the budgeting process may not be easy to achieve unless the bias falls in an obvious area. It would be necessary to incentivise accuracy for those involved in the budgeting process and reduce the potential adverse reaction from under-achieving a budget which was set as honestly as possible.

Hopwood's (1976) view that organisations adopt a profit-conscious, budget-constrained or non-accounting style of evaluation supports the contingency theory view that the budget approach taken will depend upon how the organisation adapts to its external environment. Uncertainty, environmental hostility and intense competition tend to be associated with an emphasis being placed on achieving the budget (Otley, 1978; Ezzamel, 1990) even though Hopwood concludes that a profit-conscious style results in greater efficiency.

The sector faces an uncertain environment with significantly increased competition, but there is no clear association between the use of a top-down budgetary approach (i.e. where there is greater control being exerted over the budgeting process) and institutions which perhaps face an uncertain future (i.e. those generating low surpluses), as shown by hypothesis H3. It may, of course, be that HEIs do not currently feel such extreme environmental pressure that they tighten budgetary controls in order to survive because they are not yet in crisis. Indeed, their efforts may be more externally focused, concentrating on non-financial information and generating income. Perhaps HEIs feel better served by the type of flexible, broad and future orientated systems that Gordon

and Narayanan (1984) suggest as an optimal solution for organisations wishing to prosper. Whilst this is an area of the research that could be investigated further a difficulty is to define a valid and reliable measure of the contingency variable of environmental uncertainty in the HE sector. Variables in the environment that are perceived by one HEI as a threat may be seen by another as an opportunity.

#### **7.6.4 Creation of reserves**

Some institutions look to incentivise schools, faculties and service departments for over-achieving their budget by allowing reserves to be created. However, the majority choose to take a simple approach and not allow the practice, partly because of concerns about unanticipated expenditure from those reserves which would reduce the accuracy of expenditure budgets. Angluin and Scapens (2000) and Dugdale and Dai (2013) found a similar reluctance to allow the carry forward of unspent allocations. There have also been concerns about the size of the reserves created and potential issues over ownership. Of much less concern seems to be the risk of annuality leading to unnecessary spending towards the end of a year (Jones, 1994b; Hyndman, Jones, Pendlebury & Martin, 2005; Hyndman, Jones & Pendlebury 2007).

It would appear that unanticipated spending could be addressed by employing more sophisticated approaches such as only permitting controlled releases from reserves where the relevant area had included such a release in their annual budget. As an additional safeguard, permission for release might also be sought from an appropriate member of the senior management team, or during the 'budget planning round', and the budget held within a separate ring-fenced cost centre together with the related expenditure for monitoring purposes.

However, testing hypothesis H6 (section 6.6.3) indicates that there is a negative effect on budgeting accuracy for those who allow the creation of reserves. This would imply that budgeting becomes more cautious as the degree of difficulty of estimating expenditure from previous unspent balances increases, perhaps indicating that the uncertainty caused by spending from these reserves necessitates a cautious approach.

## **7.7 Are universities satisfied with their methods?**

Hopwood (2009) and Endenich (2014) suggest that during periods of economic crisis organisations might increase the importance of management accounting in ensuring sustainable corporate success. Despite significant changes to the external environment in which universities operate and a move towards greater competition between institutions the research discovered a lack of ‘sophisticated’ methods used for budgeting, forecasting and financial scenario modelling.

Institutions are largely satisfied with the methods currently in place (corroborated by Lyne & Alhatabat, 2015), and prefer to develop and enhance those methods and processes instead of introducing significant changes. Furthermore, maintaining structural stability and inertia may mitigate the impact of turbulence in the external environment (Boyne & Meier, 2009), or there might be an inability to sufficiently articulate the need for change. Ozdil and Hoque (2017) argue that changes do not necessarily occur as a result of external pressures, but can be provoked by an institutional change champion.

There is a risk associated with making radical changes and institutions largely appeared to be unwilling to undertake this risk and deploy additional resources to introduce new and unfamiliar methods which may be perceived as only offering limited benefits. Such risk-aversion in a competitive environment is also seen in companies (Khandwalla, 1972). The new tuition fee regime seems to have had only a limited impact on the accuracy of budgeting, with most institutions putting processes in place to cope with changes in estimating fee income. Therefore, the change in regime has not driven institutions to adopt more sophisticated methods.

Overall, the results call in to question the reasons why there seem to be so few radical changes in methods employed when the external environment has been undergoing significant change with claims within the sector that the current environment is now much more competitive, uncertain and harsh. Accurate budgeting and forecasting and effective financial planning appears to be maintained to a sufficient degree to meet institutional requirements without the need for radical change in management accounting methods. The changes in the environment are not currently having such a significant effect on institutions as to cause financial difficulties.

The primary reason why institutions prefer to further embed and develop current processes rather than make any radical changes would seem to be that HEIs are financially secure and therefore do not feel under any great pressure to move away from the incremental and simple approaches that have served them well to date.

During the data collection period for this research the HE sector generated a healthy total surplus before exceptional items in 2013-14 of £1.2 billion (3.9% of income) with the number of institutions recording a deficit decreasing from seventeen to fourteen. For 2014-15 the total surplus was £1.6 billion (5.8% of income) with nine institutions in deficit. Furthermore, the majority of institutions produced better financial outturns when compared with their forecasts and the sector appears to be stable. Therefore, the external drive to make radical changes in budgeting, forecasting and financial scenario modelling methods may currently be lacking, but this might change in the future due to the “growing variability in the financial performance of institutions” (HEFCE, 2016c, p.11). Universities could also be experiencing a form of ‘accounting lag’ in terms of their continued preference for less sophisticated systems (Kaplan, 1986).

## **7.8 What are the requirements for undertaking scenario modelling?**

HEFCE require English universities to produce Annual Accountability Returns which include forecasts of income and expenditure together with balance sheet and cash flow projections, using “the institution’s best estimates for the forecast period” and to comment on “what scenario planning or sensitivity analysis has been undertaken” (HEFCE, 2011, p.7 and p.17). A similar forecasting requirement is made of institutions in Wales (HEFCW, 2011, Annex D) and Scotland (SFC, 2012, HEIs strategic plan forecasts) by their Funding Councils. In Northern Ireland, the Department for Employment and Learning advised Queen’s University Belfast and the University of Ulster “to undertake scenario planning in anticipation of reductions of up to 15 per cent in allocations from the department in 2015-16” (Havergal, 2014b, p.1).

However, there are few references to scenario modelling and sensitivity analysis undertaken within UK universities (Gee, 1988; McKenzie, 2016) despite calls for the use of financial modelling (Sizer, 1981; Prowle & Morgan, 2005; Grant Thornton, 2016a). Some of the current modelling may be inappropriate. HEFCE indicated that the scale of grant cuts being considered by

institutions during 2009 at 20% of income were unlikely to arise (Newman, 2009), but this misses the point of undertaking such exercises. One unnamed vice-chancellor admitted to modelling cuts on this scale as it helped the institution to work out how to react to cuts in terms of the replacement income required and the possible reduction in staffing.

Many institutions felt that their scenario modelling or sensitivity analysis satisfied their own requirements and this was seen as the primary reason for undertaking it rather than merely reporting to their Funding Council (as identified in section 5.7), but they were uncertain as to whether they were in fact adopting the right approach, particularly as there was little sector guidance in this area. A range of practices exist in the sector but there is no sharing of models used.

Despite the fact that HEFCE requires English institutions to inform them of the scenario modelling undertaken through the Annual Accountability Return, the NAO (2011, p.26) found that only “64 per cent of institutions complied with this basic requirement in 2009”. Not unsurprisingly, the NAO conclude that HEFCE’s “ability to model the impact of changes on the sector would be enhanced by more complete data on scenario planning”. However, institutional reluctance to offer too much detail of their scenario modelling might be explained by a fear of revealing financial information to the funding body on how they would cope with a fall in teaching or research income in case this encouraged such a reduction. Indeed, 12% of respondents admitted that they were not undertaking scenario modelling and there was no indication that the Funding Council were pressuring these institutions to conform with their reporting requirements, perhaps indicating a lack of concern provided an institution’s forecasts demonstrated that it was financially sound.

Evidence collected from the survey questionnaire and from subsequent interviews suggests that institutions do not make significant use of sophisticated financial scenario models to support ‘what if’ or sensitivity analysis. The primary reason for this appears to be because institutions are interested in a limited number of key variables. The outputs tend to measure impact on total income, total expenditure, surplus or deficit and the cash position. The 12% who did not use scenario modelling either had not yet managed to build a model or questioned the benefit of doing so and raised arguments that if the ‘base forecasts’ to be used in the model were likely to be inaccurate then any modelling of these figures would also be inaccurate. This perhaps misses the

point of why scenario modelling is useful in determining the key financial drivers of the institution.

There is no prescribed method for scenario modelling by universities, unlike Further Education institutions which use a rigid approach for scenario modelling set by the Education and Skills Funding Agency. Universities devise their own models. A number of those interviewed said that they used the HEFCE Annual Accountability Return template as a basis for determining the level of detail to be used when conducting their own ‘what if’ modelling exercises. The sub-tables within this return for income streams (e.g. detailing tuition fee income, Funding Council grants, etc.) and staffing costs were used as the key variables which could be modelled at differing values to test the sensitivity of the institution’s annual surplus/(deficit). However, differing decision-making groups are likely to require differing levels of detail depending upon their responsibilities within the organisation. An income stream which is insignificant at the institutional level may be of far more significance for an academic unit manager or service head. Other institutions used very simple models, concentrating on a few key income and expenditure streams.

Four specific examples of the models used at British universities are shown in Appendix VIII. Three of these models were considered during discussions with interviewees and the fourth is from the researcher’s own institution. For ease of analysis, these have been categorised as: (a) Basic, (b) Intermediate, (c) Advanced and (d) Best case - worst case. Due to the potentially sensitive nature of the data, specific figures are not included in the examples shown other than for the University of Huddersfield. The University of Edinburgh utilises four scenarios; baseline/current (do nothing), expected, optimistic and pessimistic (McKenzie, 2016).

Most of those interviewed had not had any formal training on financial modelling and were building scenario models based on their Excel knowledge and understanding of the institution in which they worked as well as the HE environment generally. It was usually left to the central finance department to construct an appropriate model and identify the key variables.

## **7.9 Can a standard model be built for the sector?**

Technically there appears to be no reason why a standard financial scenario model could not be constructed for use by the sector. There are a number of key variables which seem to be applicable to all universities and most are familiar with the application of the technique. However, the degree to which institutions demonstrate vulnerabilities or opportunities in relation to those variables will differ depending upon the type of university and its activities (Lenzen, Benrimoj & Kotic, 2010; Grant Thornton, 2016a). The benefit of a standard model would be that time and effort is saved within the central finance department in constructing a model and there is some re-assurance of its legitimacy if adopted by the sector.

As shown from the survey results (proposition P3), key variables such as home and EU and overseas students and staff costs are considered to be of significant importance by the majority. There is also evidence of basic linking of key variables so that as income moves so does expenditure in a logical way, and the use of sub-models where a more detailed ‘what-if’ analysis is required. Few areas of income and expenditure are intentionally excluded from the models, the most common being pension adjustments and transfers between reserves. Neither has a cash flow implication.

As most institutions use stand-alone spreadsheets to prepare their scenario models, this would seem to be the appropriate software to use in constructing a model that might be used across the sector. A model which can inter-act with the financial forecasts returns submitted to the relevant Funding Council would also be logical as most institutions draw data from these forecasts in order to assess the effect of changes in key variables.

The model would need to be simple enough to allow those institutions wishing to take a light touch approach to easily identify the effect of changes on income, expenditure and the overall surplus/(deficit). However, it would also need to be sufficiently complex to allow a more granular analysis to be prepared for those wishing to undertake a complex investigation and report on the resulting revisions to revenue items, balance sheets and cash flows.

A starting point would be to design a worksheet containing the key variables used to construct the initial set of budgets and forecasts. Each of these variables would need to be converted in to a monetary value so that as they are flexed the appropriate adjustment is made to the financial forecasts. It may also be necessary to identify a 'base year' so that the adjustments can be applied on a cumulative basis from this point onwards. Where appropriate the variables could be linked.

## **7.10 Conclusion**

The circumstances of each university will dictate their view as to whether the budgeting and forecasting accuracy achieved meets their needs. There is no 'standard' definition for a university as to what is or is not considered to be accurate. Whilst some may interpret any variance from budget or forecast as an indication of inaccuracy others will judge this on the basis of whether it has affected their decision making processes. If knowledge had existed at the outset of what the likely variance would be and this would not have changed the financial decisions made then the required level of accuracy has probably been achieved.

Of the main challenges facing universities in producing accurate budgets and forecasts, the most important seems to be the prediction of tuition fee income. This is perhaps unsurprising as the responsibility for paying for higher education moves from the UK government to students. Universities have therefore seen one of their primary income streams move away from relatively stable Funding Council grants to more volatile tuition fee income.

The issues considered in this chapter are not a comprehensive list, but reflect the more common areas of concern from the questionnaire findings and interviews. As the sector environment faces increasing uncertainties the budgeting processes adopted are also being changed in order to ensure they remain useful, but the budgeting methods used have largely remained unchallenged. The current lack of pressure to move away from traditional incremental methods is due to the good financial health of the sector and perhaps a lack of knowledge and willingness to implement other methods. However, as individual institutions become more susceptible to adverse changes in their finances the desire to adopt more radical approaches may increase. This could result in a more widespread and comprehensive use of techniques such as ABB and ZBB, together with a greater

emphasis on the production of scenario models which assist institutions in anticipating and planning for both adverse and favourable changes in their circumstances.

It was noticeable that although there is no standard approach to scenario modelling, many institutions favour the use of simple rather than complex models. Such models are currently used infrequently and for specific purposes, therefore limited resources are devoted to their construction and maintenance. The imposition of a standard approach on the sector is unlikely as there seems to be little appetite to conform to a standardised model and this might explain HEFCE's reluctance to impose more than outline guidance on how institutions should undertake scenario modelling. What institutions lack is a reference point where they can view the approach taken by others in order to determine if their own methods are sufficiently robust. This research partly addresses that gap in the current understanding of practice.



## **Chapter 8**

### **Conclusions**

#### **8.1 Introduction**

This chapter commences by considering whether the aim, objectives and research questions set out at the start of this investigation have been successfully addressed. It outlines the contribution made to the limited literature on management accounting in universities and the more general literature on budgeting, forecasting and scenario modelling through the lens of contingency theory. It updates and provides deeper insight into certain practices employed by universities and makes three key further contributions: discovery of the contingent factors which influence perceived budgeting accuracy, explanation of the reasons why HEIs experience difficulties in moving from student number estimates to tuition fee income forecasts, and identification of the scenario modelling undertaken by universities (sections 8.3.1 to 8.3.4). Furthermore, it considers whether the budgeting practices of UK universities reflect the financialisation of the sector worldwide that Parker (2012a, 2012b, 2013) has pointed to, as well as making contributions to the limited general literature addressing budgeting accuracy and financial scenario modelling.

Thus, the initial section (8.2) identifies how the aim, objectives and research questions have been met which brings together the differing elements of the research structure. This is followed by section 8.3 which sets out the contribution to the management accounting literature on universities, including key findings in specific areas of practice (8.3.1 to 8.3.4) and the contribution to the general management accounting literature (8.4). These contributions suggest a form of financialisation of the sector which may be unique to the UK (8.5). The research also makes a contribution to policy and practice by suggesting some recommendations for universities to consider (8.6). The limitations of the study are identified (8.7) and from these possible suggestions for future research are offered (8.8). Finally, concluding remarks are made on the research findings (8.9).

## **8.2 Addressing the aim, objectives and research questions**

The aim of this research was to identify and understand the contingent factors which influence the accuracy of budgeting and forecasting in UK universities and the characteristics of financial scenario modelling in the sector, including important variables during a period of turbulence and uncertainty.

This was achieved by discovering the university budgeting and forecasting practices employed and their perceived accuracy, together with the scenario modelling undertaken, through the use of a mixed methods approach of a questionnaire and interviews (summarised in section 4.6). The findings detailed in Chapters 5 and 6 explain that there are a range of factors which influence perceived budgeting accuracy, but there is a general lack of pressure to improve accuracy, and that a simple approach is taken to budgeting, forecasting and financial scenario modelling. These findings address a gap in knowledge that currently exists, as well as providing an updated perspective on previous findings where relevant.

The objectives of the research, and their relationship with research questions (RQs), were to:

1. Investigate and describe the budgeting, forecasting and scenario modelling practices in the university sector (RQ1)

The first objective was achieved by initially reviewing the limited literature available on the methods employed by universities in Chapter 2 before investigating current practices. This review found several gaps in the literature on the accuracy of budgeting, the contingent factors influencing this accuracy and the use of scenario modelling in the current turbulent environment. Chapters 5 and 6 describe and analyse these practices based on the results from a comprehensive survey questionnaire issued to the entire UK HE sector, comprised of 163 institutions (with a 52% response rate).

2. Understand the thoughts and perceptions of finance officers in relation to budgeting, forecasting and scenario modelling processes (RQ2)

The second objective was addressed by undertaking a series of 42 interviews, which goes further than previous UK HE questionnaire surveys [detailed in this research study]. The findings are also shown in Chapters 5 and 6, and reveal hidden issues such as the difficulty of converting student number estimates into tuition fee income forecasts and the limited use made of scenario modelling. These issues are not addressed in the current literature. Whilst the results of the survey reveal a level of institutional diversity which necessitates the careful interpretation of the data obtained, it is nevertheless possible to draw conclusions about the sector and offer recommendations on areas where improvements might be made to current practice (see 8.6).

3. Reflect upon the findings of the research in order to contribute to the management accounting literature on the influence of contingent factors on budgeting and forecasting in universities in a period of financialisation and the use of financial scenario modelling (RQ3, RQ4, RQ5)

The third objective of reflecting upon the research findings was addressed through the discussion in Chapter 7, which bridges the theory and practice of budgeting and forecasting within universities, and in the following sections which set out the contributions made to both the university-specific and the general management accounting literature with a particular emphasis on contingency theory. Budgeting accuracy and scenario modelling have not been addressed previously in a university context. Moreover, the published management accounting literature concentrates on budgeting processes rather than the resulting accuracy. Furthermore, scenario modelling has mostly been considered in a general strategic context (Wack, 1985a, 1985b) instead of financial sensitivity analysis (Gee, 1988) and the practices adopted by universities appear sometimes to be less than those required by their Funding Council. The published literature here lacks depth. Claims about the usefulness of scenario modelling (Wright & Goodwin 1999; Wright, 2001; Hodgkinson & Wright, 2002; Grant Thornton & APQC, 2015) are only supplemented with broad outlines as to how it should be undertaken (Pierone, 2013), without considering financial sensitivity analysis. This is a subject which would benefit from further research. A potential fourth objective emerging as a result of undertaking the research might have been to consider splitting objective three between sector specific contributions and the wider contribution to management accounting in general.

The research questions that this study sought to answer are restated below (from section 1.7), together with a brief commentary.

RQ1. What budgeting, forecasting and financial scenario modelling practices are currently used by universities?

This question addresses Objective 1 and is answered by the detailed results of the survey, contained within Chapter 5. The findings reveal a preference for traditional and simple methods, such as incremental budgeting, but viewed by survey respondents and interviewees as being implemented in a sophisticated way with increased use of technology, greater staffing resources and a more intrusive approach to liaising with budget holders. Changes to current processes were therefore more likely than implementing unfamiliar and complex methods. The research did not discover a sector rapidly changing its approach to budgeting and forecasting by adopting alternative (so called ‘sophisticated’) methods, such as ABB or ZBB, which might suggest that a changeable external environment is not a significant contingent factor in influencing the practices used by universities. This may be because the environment is not sufficiently hostile to result in constrained resources and universities remain financially healthy. Indeed, there were cases of techniques such as scenario modelling not being applied at all despite HEFCE requirements to do so. However, some areas do cause significant concern, such as student number planning, and attempts were being made to implement improved practices. This issue has not been picked up in previous research, perhaps because of previous student number quotas and funding stability.

RQ2. What is the perception of central finance officers of budget and forecasting accuracy?

During the course of this research it became apparent that accuracy means different things to different individuals and organisations. RQ2 therefore addresses Objective 2 in seeking to understand the thoughts and perceptions of finance officers, as outlined in Chapter 5. Furthermore, Chapter 7 includes a section which attempts to elaborate on what accuracy might mean (section 7.3). Assuming that accuracy would imply that budget variances were minimised then the sector as a whole fails to achieve accuracy because a cautious approach is generally employed, as confirmed by the survey findings. An alternative question might have been whether this inaccuracy causes significant difficulties. Missed opportunities seem to be the most significant consequence raised by

a few interviewees, but it appears possible to have large variances - especially favourable ones - which cause few concerns or difficulties. This is because universities are currently financially secure, not tightly constrained and, because of the nature of student recruitment, have plenty of time to respond to any adverse disturbances.

RQ3. Which contingent factors influence the perceived accuracy of budgeting?

The statistical analysis undertaken in Chapter 6 discovered a relationship between perceived budgeting accuracy and the accuracy of student number estimates, accuracy of forecasting, difficulty associated with allowing unspent budgets to be carried forward and the time spent preparing the budget. Some of these might be considered as key sector-specific contingent factors in pursuing budgeting accuracy, while others relate to aspects of a process that arise in many other organisations.

RQ4. Has the 'financialisation' of universities had a significant effect on budgeting, forecasting and financial scenario modelling practices?

Whilst contingency theory would suggest that changes in the external environment should have a significant influence, the new fee regime and the removal of student number controls in England appears to have had little effect on the approach taken to budgeting, forecasting and financial scenario modelling. The reasons for this are reflected upon (Objective 3) and discussed further in section 8.5 below.

RQ5. What conclusions can be drawn about the state of budgeting, forecasting and financial scenario modelling within universities?

Section 8.3 offers contributions on the current use of budgeting, forecasting and financial scenario models within universities and draws out key conclusions from the research. The argument of an emerging financialisation of universities is also considered in section 8.5 and whether increased importance is being attached to budgeting (Parker, 2012). There has been only a limited drive towards the increased use of 'sophisticated' techniques despite significant changes taking place in the sector. However, current methods are being used more rigorously and embedded further, as

evidenced by institutions moving towards greater automation and standardisation, increased business partnering/participation, and more devolved practices.

### **8.3 Contribution to the literature on management accounting in universities**

This section considers the contribution the research makes to the limited literature on management accounting in UK universities derived from survey questionnaires, summarised in Table 2.1 (Chapter 2). Only the work by Berry et al. (2004) has appeared in a refereed publication and is therefore a key study for comparison purposes. Cropper and Drury (1996) was published in a trade journal, Newton (1997) was a master's thesis and Holloway (2006) a doctoral thesis. Lyne and Alhatabat (2015) was a paper presented at a CIMA HEI practitioner conference, based on an unpublished doctoral study by Alhatabat. The remaining UK surveys (Lewis & Pendlebury, 2002; Angluin & Scapens, 2000) addressed the very specific area of resource allocation in UK universities. Only brief reference is made to overseas university surveys addressing budgeting processes (Simmons, 2012; Nasser et al., 2011; Tayib & Hussin, 2003; Otley & Pollanen, 2000; Goodwin & de Gouw, 1997) as there are insufficient papers to give a systematic review. Despite the findings from previous UK questionnaire surveys generally not being published in refereed journals, and therefore lacking quality control, they nevertheless do offer information against which to contrast the current research and the findings from these studies are treated for present purposes as a reliable source. The current research contributes to a better understanding of how institutions undertake budgeting and forecasting with a particular emphasis on accuracy and the use of scenario modelling. It also considers why the methods used are not more sophisticated in a sector undergoing significant change.

The mixed methods approach used is more comprehensive than in previous studies. Some of those surveys had few questions and lacked depth. For example, Holloway (2006) asked a single question on resource allocation requiring a simple yes or no answer, with no follow-up interviews. Similarly, the studies by Newton (1997) and Lyne and Alhatabat (2015) chose not to use interviews to clarify and explain the data obtained from their questionnaire. Cropper and Drury (1996) undertook 15 post-questionnaire interviews. A recent study by Dai (2016) used three case studies of universities rather than a survey questionnaire, with few findings presented. Berry et al. (2004) followed-up their survey responses with "case studies of 11 UK institutions" (p.10) which

involved interviews with university finance directors and their colleagues. The results of only three of these ‘cases’ were presented. A broader range of universities were interviewed in the current study and the findings therefore have the potential for greater generalizability.

These previous studies did not undertake a detailed investigation of budgeting and forecasting practices within universities and did not ask specific questions on accuracy. More importantly, apart from the studies by Lyne and Alhatabat (2015) and Dai (2016), they are not current and therefore do not indicate how practices are being employed at the moment in a turbulent and challenging environment during an era of financialisation.

Table 8.1 below summarises the themes within questionnaire surveys of management accounting practices in UK universities. The significance of each theme is identified as either minor, moderate or major. It is apparent that investigations of resource allocation and budgeting processes are much more common than those relating to budgeting accuracy and scenario modelling which are rarely mentioned, if at all.

Table 8.1 Themes within questionnaire surveys of UK university management accounting practice

University Survey	Authors	Publication	Investment appraisal	Costing	Resource allocation	Performance analysis	Budgeting process	Developed budgeting	Budgeting accuracy	Forecasting	Scenario modelling	Good practice
Budgeting and financial planning in UK universities	This study				x	x	xxx	x	xxx	xxx	xxx	xx
Management accounting practices in British universities	Lyne and Alhatabat, 2015	CIMA HEI Conference paper	x	xx	xx	xx	xxx			x		
Financial management and planning in higher education institutions	Holloway, 2006	Doctoral thesis			xxx	x	xx					x
Financial management practices in UK universities	Berry, Clements and Sweeting, 2004	ICAEW refereed research report			xx	xx	xx	xx				x
Cross-subsidy in colleges of higher education	Lewis and Pendlebury, 2002	Financial Accountability & Management			xxx	xx						
Transparency and perceived fairness in UK universities' resource allocation	Angluin and Scapens, 2000	British Accounting Review		x	xxx	x	x	x				x
Financial decision-making in British universities	Newton, 1997	MPhil thesis		xx	xx	xx	xxx	xx				x
Management accounting practices in universities	Cropper and Drury, 1996	Management Accounting (British)	xx	xx		xx	xx	xx				x

(Significance of themes identified: x = minor, xx = moderate, xxx = major)

Conclusions from this study in relation to each of these themes are briefly detailed below.

### 1. Costing and investment appraisal

Whilst these subjects are a theme in other sector surveys of management accounting practice which also address budgeting they are outside the scope of the research undertaken.

### 2. Resource allocation

Studies of resource allocation have concentrated on the appropriateness of the allocation method (Holloway, 2006) or cross-subsidisation (Angluin & Scapens, 2000; Lewis & Pendlebury, 2002). The current research takes a different view by considering whether the output of allocation models is sufficiently accurate (i.e. avoiding over- or under-allocation of resources under the new fee regime). Interviewees indicated a fair distribution despite the late or non-release of resources as a result of cautious income budgeting. Nevertheless, increases in the tuition fee for home and EU undergraduates has resulted in a significant number of institutions changing their models, thereby conforming to contingency theory with the environment having a significant influence on the practices adopted. However, further research would be beneficial to understand the changes being made.

### 3. Performance analysis

Some studies have found major differences between pre- and post-1992 universities in terms of resourcing and performance, with the former securing a much higher research income. However, financial processes have not been found to be transparent at either type of institution (Berry et al., 2004). Whilst the disparity in funding is still apparent, the transparency of financial processes shows some increase, with the majority of institutions – whether pre- or post-1992 - sharing budget and resource allocation figures across the institution.

Furthermore, Newton (1997) found that post-1992 universities had better systems than pre-1992 in respect of monitoring and reporting committed expenditure against budget. Whilst some differences between pre- and post-1992 institutions still remain in terms of the association between strategy and accuracy, the research showed no significant difference in the technology

employed. It would therefore appear that the sector as a whole has converged as no systematic differences are discernible.

#### 4. Budgeting process

Previous studies have failed to find an association between budgeting practices and the characteristics of universities, such as type (pre- and post-1992), size, activity and strategy or an association between management accounting practices and competition intensity or environmental uncertainty (Lyne & Alhatabat, 2015). This appears to provide evidence that although there are significant changes taking place in the sector these are not a contingency factor in the adoption of management accounting practices. Furthermore, despite changes in the external environment over the past two decades, studies undertaken by Cropper and Drury (1996), Holloway (2006) and Lyne and Alhatabat (2015) found little change in the popularity of traditional incremental budgeting methods. This may perpetuate the cautious approach taken by the sector generally which leads to inaccuracy.

Whilst the data collected by Lyne and Alhatabat (2015) demonstrated that incremental budgeting was common, they also reported a relatively high adoption rate for ABB and ZBB in setting the annual budget which was not explored further. Some literature does suggest that universities use more than one approach (Borgia & Coyner, 1996) and that practices differ between institutions (Otley & Pollanen, 2000), but it may be the case that the respondents in this study and previous surveys only perceived they were using ABB and ZBB without actually employing them in a comprehensive manner. Grant Thornton (2016a) explain that although some institutions say they are using ZBB in reality it would take too much time and effort to effectively assess every programme annually. The current research shows that these methods tend to be used on an occasional basis, to satisfy specific purposes such as one-off budget exercises in specific areas of an institution or for particular activities (Foskett & Brindley, 1991). Moreover, it may be the case that the person completing the questionnaire did not understand the definition of these budgeting methods as demonstrated by comments made at the interview stage of the current research, and were not actually employing the technique. The lack of sufficiently skilled and trained university staff has been found in other studies (Tayib & Hussin, 2003). Therefore, the Lyne and Alhatabat (2015) findings need to be treated with caution.

## 5. Devolved budgeting

Newton (1997) claimed that the benefits of budgetary devolution had persuaded many universities to devolve budgets to departments. Current budgeting practice demonstrates that many institutions use both a top-down and bottom-up approach, with a significant input from departments outside of central finance in preparing the annual budget and forecasts. Suggestions by Berry et al. (2004) of a clear divide between pre-1992 universities operating on a devolved basis and post-1992 universities being centralised are no longer apparent in current practices, with the sector generally adopting a devolved approach.

The issue of trust between central finance staff and academic areas was a significant theme in the current research and was regularly addressed in the interviews. There seemed to be a recognition amongst finance staff that if budgeting and forecasting processes were to be improved it required greater liaison with others from outside the finance department, particularly in an uncertain environment where past trends can no longer be relied on for future predictions. Previous studies found a lack of trust, understanding and co-operation between academic and central administrative staff (Deering & Sá, 2017; Simmons, 2012; Berry et al., 2004; Newton, 1997; Goodwin & de Gouw, 1997). The term ‘business partnering’ was commonly raised by interviewees as an area for development, perhaps demonstrating that a sufficient level of trust still needed to be achieved, and the sector seems keen to drive this forward (BUFDG, 2016).

Participation in the budgeting process was not proven to be a significant contingent factor in achieving accuracy however, despite its perceived importance (hypothesis H9). The difficulties concerning the establishment of trust and effective communication between academic departments, central finance and other professional services may partly be the cause of problems in identifying accurate tuition fee income projections, as detailed in section 8.3.2.

## 6. Budgeting accuracy

The current study found four instances of correlation between the accuracy of budgeting and contingent factors of university organisation or processes (section 8.3.1). However, there was little indication of an association between budgeting accuracy and institutional size or structure (hypothesis H4), diversity of activity (H7), allocation of resources (proposition P6) or number of central finance staff involved in the process (H12).

The achievement of accuracy is only rarely identified elsewhere and demonstrates that the topic is under-researched. It arises in the context of whether factors such as a manager's position, qualification and experience has a bearing on the adequacy of the budget derived (Nasser et al., 2011) and in respect of staff trust issues with a belief of an inevitability of inaccuracy (Simmons, 2012). The lack of publications suggests that accuracy is viewed as implicit despite evidence of a lack of accuracy in university budgets and forecasts (HEFCE, 2016a, 2016b).

#### 7. Forecasting (beyond the annual budget)

Forecasting is not addressed in previous sector surveys other than a brief reference in the study by Lyne and Alhatabat (2015), despite being a significant contingent factor in respect of perceived budgeting accuracy. The current research suggests that forecasting is as cautious as budgeting but that inaccurate forecasting, based on simple techniques, has not had significant adverse effects. This may change as the sector comes under increased financial pressure and institutions may feel the need to tighten their financial planning in order that decision making processes and reporting are based on more accurate analysis. Alternatively, the sector may become even more cautious.

#### 8. Scenario modelling

Financial scenario modelling is not addressed in previous sector surveys despite being an important management accounting technique (CIMA, 2014). The contribution of this research in respect of scenario modelling is shown in section 8.3.3.

#### 9. Good practice

Berry et al. (2004) explained that they hoped: "findings from the study may indicate what 'good', 'appropriate' and 'effective' financial management may be in different types of university settings" (p.11), thus implying a contingency theory approach to their work. However, although the study provided an indication of current practice in the sector and commentary on its effectiveness it did not actually identify what might be good, appropriate or effective! Their conclusion was that the sector had a "somewhat varied and perhaps muddled approach to strategy, organisational and financial management" (p.68). Evidence from the current research perhaps confirms the varied approach to financial management in the context of budgeting, forecasting and scenario modelling, but most institutions appear to be focussed on developing effective processes even if they lack

sophistication rather than necessarily signifying a muddled approach to financial management. Clear lines of responsibility, knowledgeable and skilled finance staff, and effective IT systems are all indicators of good budgeting processes (Tayib & Hussin, 2003). The current research shows that over half of the significant recent changes made to budgeting practices are in-line with such indicators and involved changing processes (including the timetabling of the budget cycle), introducing new software and the greater interaction by finance staff with other areas of the university.

The survey by Newton (1997) recognised that there was no consistent approach to management accounting practices in universities and this probably explains why his study did not provide a clear indication of best practice but instead highlighted areas where he thought effective processes existed. Newton also noted that recommendations from the Jarratt Report appeared not to have had much influence in improving management accounting in universities perhaps due to a lack of a prescriptive approach to those recommendations and the greater interest shown in traditional financial accounting by universities at that time. Interviewees in the current research claimed that they adopted practices that best met their own perceived needs and that management accounting has been given a higher priority. However, although Simmons (2012) emphasises the basic need for all financial information to be accurate, the causes and consequences of inaccuracy are not discussed. Suggestions for practice arising from the research findings are shown in section 8.6.

As well as updating and extending the current literature, this research makes a contribution to possible new literature by identifying some key practice ‘themes’ that are not addressed in other studies of the sector (see Table 8.1). These are:

1. A model which identifies contingent factors with a relationship to perceived budgeting accuracy
2. An investigation of the largely hidden issue of the difficulty of deriving estimated tuition fee income from student number predictions
3. Identification of the scenario modelling used by the sector.

Each of these is considered below.

### 8.3.1 Perceived budgeting accuracy model

Budgeting is seen to be cautious in universities, but there is no literature that considers the contingent factors which influence accuracy in either the HE sector or other industries. The multiple regression model in Chapter 6 identifies four variables which are statistically significant for perceived budgeting accuracy:

$$\text{Budgeting accuracy} = 0.372 \text{ SACC} - 0.225 \text{ DFWD} + 0.283 \text{ FACC} - 0.048 \text{ TIMP} + E (\text{error})$$

*SACC – Perceived accuracy of student number estimates*

*FACC – Perceived accuracy of forecasting*

*DFWD – Difficulty caused by allowing unspent budget to be carried forward*

*TIMP – Time spent preparing the budget*

Student number estimates have a significant effect on predicting budgeting accuracy and the difficulty of accurately arriving at the student numbers together with tuition fee income projections was a common theme in the research (as detailed in the following section). A key element of contingency theory is the influence of the external environment turbulence (Chapman, 1997), which is significant for universities as a result of increased uncertainty under the new fee regime. Furthermore, forecasting accuracy is perceived to be as important as budgeting accuracy and the two are inter-related (section 2.2.1). Therefore, the inclusion of perceived forecasting accuracy also appears to be valid in the model as the environmental turbulence affects both short and long-term financial planning. This shows the particular ways in which general environmental turbulence and uncertainty track through and reflects the complexity of the fee mix, retention rates and non-traditional enrolment patterns, etc.

The carrying forward of unspent balances was not common in the sector, but prevalent enough to be statistically significant, and interviewees mentioned the difficulties created by allowing these

resources to be spent in later periods when unbudgeted. This reluctance may be justified on the basis of the negative effect of the variable on accuracy, but there is a potential conflict here with the adverse effect on the motivation of a budget holder to reduce expenditure in-year where it is sensible to do so. Accuracy may therefore come at the cost of de-motivating budget holders. A recommendation on practice in respect of releasing unspent budgets is included in section 8.6. Finally, although the time period for preparing the budget was not generally mentioned as a difficulty in terms of achieving budgeting accuracy, universities do take an extended period to complete the process which perhaps leads to multiple levels of caution and inaccuracy being introduced. Devolved practices allow a greater number of staff to be involved in the process throughout an institution, all of whom may introduce some degree of bias within their estimates. The greater the devolution and the longer the budget cycle the more important becomes the process of challenging and questioning if a realistic budget is to be set (Neeley et al., 2001; Berry et al., 2004).

Improved budgeting accuracy might be achieved by greater controls being placed over these four contingent factors, a key element of which is student number estimating as this has a vital role in deriving forecast tuition fee income. In an uncertain environment estimating this income becomes increasingly problematic.

### **8.3.2 Student number planning and tuition fee income**

The difficulties experienced by universities in modelling tuition fee income is largely a hidden issue that is not addressed in the management accounting literature and is now highlighted in this research. Although the need for effective forecasting is recognised in the work of Brinkman and McIntyre (1997), the difficulties are not discussed. Even recent texts with contributions from university planning practitioners (Strike, 2017) fail to address this key issue. Demand for products or services in the majority of cases tends to be the driver or constraining factor for what an organisation can spend (Agostini, 1991; Drury, 2015). Research income accounted for only 16% of

the total sector income in 2016-17 (HEFCE, 2018) and much of the expenditure was matched to projects. The tuition fee income budget is therefore the foundation of other budgets since expenditure may ultimately be dependent upon students recruited and retained. If this income budget is not accurate other budget estimates will also be unreliable.

Sections 2.2.3 to 2.2.5 in Chapter 2 explain the difficulties of accurately identifying projected revenues and the tendency to under-estimate income (Voorhees, 2006). Tuition fee income forecasting is not discussed in the current higher education literature despite being of significant importance to institutions following the Browne Review (2010) with the move away from stable Funding Council grants to much greater reliance on tuition fee income which is subject to competitive pressures.

Logically, multiplying a projected number of students by a known tuition fee rate should create few problems. However, questionnaire responses and discussion with interviewees reveals a multitude of difficulties which may partly be explained by the weak linkage between staff in central finance, academic areas and professional service departments. The importance of this linkage has been recognised by those employed within planning departments (Hodson, 2017), but generally in the context of involving academic units in agreeing student number targets rather than also addressing the difficulties of setting tuition fee income forecasts in conjunction with finance departments. The challenges identified by planning departments tend to be outward looking (e.g. government policy, Brexit, TEF affecting fee rates, competition, etc.), or address issues of working with learning and teaching teams on analytics data to predict student behaviour, rather than also addressing the difficulties arising from ineffective liaison between internal departments. Despite this research identifying tuition fee income forecasting as the most significant issue facing university finance officers and that efforts were being made to address it, the issue is not yet reflected in the published literature. It may be that university strategic planners are simply more concerned with the delivery of the strategic plan than the income forecast underpinning it (Virdee & Keeble, 2017).

Significant shortfalls in budgeted tuition fee income have consequences for long-term sustainability and research in this area is therefore of interest to practitioners, but the reasons for the failure to devise effective models should also be of interest to a wider audience. There seems to be an inertia in developing better working practices that is not reflective of the literature on the emerging financialisation of universities. HE strategy and planning texts place greater emphasis on strategy development and analytical capacity (Strike, 2017) rather than also considering inter-departmental relations or the need for effective modelling software for tuition fee income forecasts. The use of complex and detailed spreadsheets for the latter remains common despite their inadequacies. Although this complexity might suggest a certain level of accuracy, this was not reflected in the comments of interviewees and may lead to decreased accuracy due to a lack of understanding of the figures and calculations contained within them. Furthermore, the separation of spreadsheets used for a key aspect of income forecasting from the main finance system is an indication of weak budgeting practices along the lines of that which hid the impending financial difficulties at UCC (Shattock, 1988). A key difference is that under the current climate universities are not yet facing significant cuts in overall funding of the type that arose in the 1980s, but this may change.

### **8.3.3 Scenario modelling in UK HEIs**

As explained in Chapter 2, very little literature exists on the use of financial scenario modelling in universities in order to undertake ‘what if?’ analysis. Much of the academic literature (Wack, 1985a, 1985b; Richards et al., 2004; Sayers, 2010) is directed towards a form of modelling that is of a more general strategic nature than the type of financial modelling that HEIs currently undertake. The scenario modelling described by Wack (1985a, 1985b) would seem unlikely to be widely adopted by universities because it goes well beyond what survey respondents and interviewees considered to be the Funding Council requirements and the needs of their own institutions. Most of the current literature therefore lacks relevance to practice. Examples of financial scenario models in UK universities are rare (Gee, 1988; McKenzie, 2016) and there is no guidance on how to construct or maintain a model. HEFCE have only offered brief advice on what

variables they would expect to see modelled (HEFCE, 2012a). Current examples of approaches are considered in the research findings and in Appendix VIII. These models have not been published previously.

The research suggests that models are generally under-developed, use a simple approach, are spreadsheet-based and tend to be employed infrequently despite the changing environment. A number of interviewees stated that the outcome of their modelling was not shared with HEFCE and a significant minority undertook no modelling at all. Yet, Madeleine Atkins, HEFCE Chief Executive, claimed that:

While there may be significant uncertainty and financial challenge for the sector in the medium term, we are reassured by the way institutions appear to be responding through their scenario planning and the development of contingency plans. (HEFCE, 2017b)

A simple approach may satisfy sector requirements whilst universities remain financially healthy and may possibly be the reason why HEFCE seemed unconcerned by current scenario modelling practices.

There was some evidence from this study of a lack of understanding by finance officers of the purpose of scenario modelling, with comments that the technique was flawed because precision could not be attained. This is wrong because the purpose of such modelling is to consider multiple variations on the future and how contingency plans might be put in place to react to these changes, not to try to predict a single outcome. Despite this, those using it adopted a consistent approach to the variables included in models even if attempts to link those variables in some logical way were unsophisticated. This consistency demonstrates the commonality of universities' underlying activities.

Although the construction of a standard scenario model for the sector should not present any significant technical problems, its acceptance by institutions may be less successful. As explained earlier, institutions all have their own cultures, views and practices. Therefore, attempting to apply a standard voluntary approach may be difficult. Templates for the preparation of financial forecasts are imposed on the sector by the Funding Councils. Institutions therefore have little choice other than to complete these returns if they wish to continue to be funded and to recruit students.

However, none of the Funding Councils has indicated an intention to impose a standard scenario model.

What the sector may find more useful is guidance and examples of good practice in the construction and use of scenario models rather than the imposition of a standard template. The lack of shared practice results in individual universities taking a somewhat inefficient approach to the design of models by either relying on what has been prepared in the past and replicating this or designing a model in isolation that may take some time to prepare but still not be optimal and contain errors.

University financial planning models, such as that prepared by Gee (1988) for the University of Salford, have not set a precedent for how universities should design and operate sensitivity analysis. Although his model took a relatively simple approach in identifying key income and expenditure streams, it appears not to have been adopted by others in the sector and is no longer in operation at Salford. Given the changes in HE funding over recent years, the model would need to be significantly updated.

#### **8.3.4 Summary of key contributions to the sector literature**

The contributions identify the significant contingent factors influencing budgeting accuracy, shed light on the issue of the difficulty of accurately forecasting tuition fee income (which has a significant importance because expenditure budgets are based on the income predicted) and highlight the current financial scenario modelling practices of universities which are not addressed in the sector literature. The research also updates and extends the current literature on management accounting in universities.

#### **8.4 Contribution to the general management accounting literature**

Having considered the contribution to the sector-specific literature it is possible to also identify the following contributions to the general management accounting literature.

### *Contingency theory*

Whilst contingency theory has not been proven as such (Otley, 2016), the basic insight is accepted. Previous studies have considered contingent factors which primarily fall within three major categories; the environment, organisation and technology. However, as Otley (2016) explains, some previous studies have only investigated a limited number of variables and management control systems have not been adequately assessed in the context of other elements surrounding them.

Contingency theory is complex and there have been previous suggestions that more studies on the influence of contingent factors are necessary (Merchant, 1981). In this respect, there is little which deals specifically with budgeting accuracy perceptions and what contingent factors influence perception in the general management accounting literature, particularly under challenging market conditions. This research found that for complex organisations, such as HEIs which are financially healthy but operate in an uncertain environment, four key contingent factors have a relationship to perceived accuracy. These are two elements of ‘organisation’ (i.e. perceived accuracy of student number estimates which relate to the main stream of income and the carrying forward of unspent budget resources) and two elements of ‘process’ (being the perceived accuracy of forecasting and the time spent preparing the budget). These findings offer the opportunity to replicate this study in other sectors where organisations are financially healthy but face uncertain environmental conditions. This might reveal whether similar contingent factors of organisation and process (substituting estimates of significant product or service sales for student number estimates) have a relationship with perceived budgeting accuracy.

### *Accuracy and decision-making*

It is argued that a lack of budgeting accuracy adversely affects decision-making processes (Dunk & Perera, 1997; Jain, 2007; Shattock, 2010; CGMA, 2013) and that attempts need to be made to either improve accuracy and reliability or adapt the way in which budgets are used in order to maintain their usefulness (Schiff & Lewin, 1970; Hopwood, 1976; Vonasek, 2011; CFO Research Services, 2011; Ghosh & Willinger, 2015; Drury, 2015). However, the research findings show that only a few key actors express concern about lack of accuracy and that missed opportunities as a result of inaccuracy are rare. Thus, tolerance for inaccuracy in public-sector type organisations may vary depending upon the actors concerned, the financial health of the organisation, the stage

in the operating cycle and the potential predictability of the inaccuracy. This tolerance may also differ from commercial entities who need to manage investor relationships.

#### *Environmental changes*

It is claimed that in periods of economic crisis management accounting practices increase in importance (Hopwood, 2009; Enderich, 2014) and there is a greater need for more ‘sophisticated’ methods as organisations try to cope with an uncertain and volatile environment (Gordon & Narayanan, 1984; Chenhall & Morris, 1986; Gul & Chia 1994; Haka & Krishmann, 2005; PricewaterhouseCoopers, 2012b). However, it may be that – at least initially - the further embedding of current practice is more likely than movement towards more radical and ‘sophisticated’ management accounting techniques where organisations have not yet been exposed to severe financial constraint, as is the case with universities.

#### *Asymmetrical loss function*

Voorhees (2006) suggests that forecasters have a natural bias towards underestimating revenues and therefore avoiding adverse variances. The basis of this argument is that the individual suffers less of an adverse reaction if favourable variances arise. However, for those employed in a central finance department (who are not especially responsible for the income), the argument is too simplistic. The research demonstrates that it is possible to be seen as a ‘villain’ if large variances are either adverse or favourable. What causes the most difficulty are unpredictable and inconsistent variances. These variances can potentially cause a loss of confidence in the central finance office and may lead to sub-optimal decision making. If resources are unexpectedly released late in a financial year it may be too late to re-deploy them effectively. The Voorhees study does not differentiate between expected and unexpected bias, with the latter potentially causing concern amongst the organisation’s leadership and governing body.

#### *Dysfunctional budgeting*

There have been suggestions that budgeting is not a useful technique, is dysfunctional and should be abandoned (Ekholm & Wallin, 2000; Hope & Frasier, 2003; Dugdale & Lyne, 2006). However, other than the new management model being developed at the University of Plymouth (Bogsnes, 2012), no UK university has indicated that budgeting is to be replaced by another technique. Indeed, the research indicates that budgeting processes are being embedded further through the use

of greater devolution, standardisation and enhanced software, etc. It appears that complex organisations derive a benefit from budgeting despite inadequacies in the process.

### *Scenario modelling*

The literature on scenario modelling exercises tends not to discuss the adoption of a minimalistic approach concentrating on key variables within financial models. The use of such models has the advantage of ease of preparation and understanding. The research is therefore useful in adding depth to guidance on global management accounting principles (CIMA, 2014) which consider the objectives of the technique, but without sufficiently detailing how it might be applied. Indeed, much of the published literature on scenario modelling considers the benefits to be derived from the technique (Wack, 1985a, 1985b; Wright & Goodwin 1999; Wright, 2001; Hodgkinson & Wright, 2002; Grant Thornton & APQC, 2015) but without discussing how it should be undertaken in the context of financial sensitivity analysis.

By analysing the characteristics of financial scenario models the current literature is extended beyond that which merely explains the objectives and advantages of this technique, bringing greater understanding.

### *Model of the influences on budgeting accuracy and financial scenarios*

Covaleski et al., 2003 explain that budgeting is the most researched aspect of management accounting. However, some argue this literature is not sufficiently grounded in practice and lacks depth (Hopwood, 1980). This research makes a contribution to the general management accounting literature by providing a framework of the influences on budgeting accuracy and the use of financial scenario modelling (Figure 2.1). The empirical part of the study, involving a detailed analysis of practice, discovered contingent factors in the complex organisations found in the HE sector which might explain the perceived accuracy of budgeting. Accuracy tends to be implicit in the academic literature on budgeting, but its importance means that it should be studied as a distinct subject because of the potential consequences of inaccurate financial planning for some key actors. Details that emerged from the empirical part of the research deepened and helped to clarify the picture of budgeting accuracy and the use of financial scenario modelling that was created in the theoretical part of the study.

## 8.5 Financialisation and budgeting in universities

In a changing and turbulent external environment contingency theory would suggest that it should be possible to observe changes in the budgeting, forecasting and scenario modelling employed, which might lead to more emphasis on the accuracy of budgeting and forecasting as a result of 'financialisation'. McGettigan (2013, p.155) defines this as "the process by which knowledge becomes enclosed by a system of accounting", but it goes beyond the narrow focus concerning funding and loans offered by McGettigan (2014). In assessing its wider implication Parker (2012a, 2012b, 2103) suggests that the term reflects the rise in financial self-sufficiency expected of universities.

Globally, Parker (2012b) explains that new public management principles of:

- A shift in the balance between public and private funding
- Allowing market competition
- Eroding budget allocations and targeting funding to selected areas
- Commercialising organisations and holding them accountable
- Proliferating and tightening accounting and financial controls

have stimulated governments' view that universities have an important role to play in contributing to national economies and generating export earnings.

This is characterised by universities:

- Increasing student recruitment, particularly in areas with higher tuition fee rates and where there are few recruitment restrictions
- Diversifying and expanding research and enterprise activity as a means of generating additional income
- Seeking new and alternative funding mechanisms
- Seeking cost reductions and efficiencies
- Placing increased emphasis on financial control and sustainability
- Introducing greater managerialism

The fall in the unit of resource experienced by many universities results in a greater visibility to financial management. As Parker (2013, p.3) states “efficiency of resource utilisation remains the central concern, expressed through university strategic planning, budgeting, financial control and reporting systems” (p.3), allowing “administrative control and reporting systems to proliferate” (p.5) and leading universities to “focus on budgetary control and compete on price” (p.8).

It is against this background that Parker (2012a, p.1157) explains that “budgetary discourse has become the dominant internal currency” within universities as a result of the rise in the influence of financial strategy which undermines the quality of the core business. Parker’s (2013, p.3) view is that there is a “focus on managing resource constraints and pursuing bottom line profitability”, with teaching, research and business engagement viewed as products to be sold. Budgeting is seen as taking on a much more important role within an institution as “a driving force that focuses upon resource efficiencies” (Parker, 2012b, p.249) which can “increase levels of competition and decrease collaboration between [academic] units” (Deering and Sá, 2017, p.9).

Whilst there is a suggestion that budgeting plays an increasing role in UK universities, its dominance is not proven by this research study. Despite the attention paid to budgeting, forecasting and scenario modelling in the published financial statements of universities and in sector reports from the Funding Councils (e.g. HEFCE 2016a, 2016b), there have only been limited changes to budgeting practices. Therefore, Parker’s (2013, p.3) claim that budgeting reflects the central concern of universities for “efficiency of resource utilisation” seems to overstate the role played by this management accounting technique.

Whilst Parker makes no reference to universities increasing the ‘sophistication’ of their budgeting methods or the need for accuracy, it might be expected that they would move away from an incremental approach in a changing environment (Gordon & Narayanan, 1984; Chenhall & Morris, 1986; Gul & Chia 1994; Haka & Krishmann, 2005; PricewaterhouseCoopers, 2012b). However, UK universities are not adapting and evolving their budgeting methods in the face of uncertainty in order to achieve increased levels of accuracy or implementing the latest developments so as to keep pace with changes in their operations as contingency theory and inference from Parker might suggest.

Financial management as a HE issue has certainly increased its profile over recent years due to a change in fee regime and greater pressures placed on universities to operate more efficiently, but it remains as an important enabler within university strategic plans and statements rather than the dominant part of the strategy. It is perhaps more visible than it has ever been as universities become increasingly reliant on tuition fees as their main source of income (HEFCE, 2018). It is also easy to find examples of where financial management is challenging, such as reconciling planned student numbers with the related income. Greater analysis and discussion with budget holders and a more devolved approach have been implemented to 'improve' budgeting, which increases the visibility and intrusiveness of such practices. This might be explained by the peculiarities of UK changes.

Parker talks about a two pronged approach to financialisation of cost cutting and revenue increases, but they are not being employed together in UK universities at present. Indeed, some of the predicted doom for the sector seems not to have occurred yet (McGettigan, 2014; Wolf, 2015; Morgan, 2016b; Bebbington, 2017). Costs have been allowed to rise because home and EU tuition fee income is higher and overseas student numbers have increased. Other countries have experienced a reduction in government funding to universities which has not been replaced by tuition fee income as in the UK. Whilst the universities in such countries have needed to cut their costs to compensate for lower income this has not generally happened in the UK where resources have not been constrained.

However, UK universities face uncertainty surrounding competitive pressures (Taylor, 2013). Whilst there has been an expansion in overseas student recruitment, which is part of Parker's view of financialisation, there has been little price competition for full-time home and EU undergraduate students with most charging the maximum fee allowed by the government which is contrary to expectations. Therefore, they are not competing on a cost leadership strategy (Porter, 1980) and are not increasing the sophistication of budgetary systems in order to manage costs.

Financialisation of universities appears to be incomplete, as evidenced by the use of cross-subsidisation (recognised by Parker, 2013) within resource allocation models (Angluin & Scapens, 2000; Lewis & Pendlebury, 2002; Liefner, 2003) and the need to be 'roughly right' when distributing resources, the failure to deploy ZBB other than for ad-hoc exercises (Foskett &

Brindley, 1991), the continued use of traditional incremental budgeting practices (Grant Thornton, 2016a), and the failure by some to undertake scenario modelling as required by HEFCE.

Central finance staff appear to have set out to increase engagement with others throughout their university with the aim of ever greater participation in the budgeting process. This perhaps contributes to Parker's (2013, p.11) view that there is an "emerging internal accountability for financial performance upwards through the university hierarchy". There is also evidence of a move towards greater use of IT to address budgeting and forecasting issues. Budget holders may perceive these changes as threatening due to the increased exertion of financial control, responsibility and accountability. The views of budget holders outside of the central finance department, and academic budget holders in particular, would have enriched the findings of this research and is a topic that warrants further research.

UK universities are not currently experiencing the type of financial pressures that would necessitate an organisation to move away from traditional incremental budgeting. Therefore, Parker's (2012b, p.263) view that "we see financial management move from the margins of its traditional decision support role in higher education institutions, to centre stage" is not seemingly supported by evidence of a move towards more complex and developed budgeting techniques, but is reflected in the increased emphasis placed on finances.

Furthermore, the favourable variances that the sector generates means that budgets are of less concern to the managers at the university centre [but they perhaps create increased pressures lower down the organisation as individual budget holders strive to achieve financial success in the generation and control of resources for which they are responsible]. As Parker (2013) suggests, senior university management's understanding and use of accounting systems and performance data is an area which is also worthy of further research. In many ways, effective accounting and accountability within universities acts as a means of protecting an institution's strategic aims (Deering & Sá, 2017). Whilst an institution is financially healthy it is able to pursue academic objectives, sometimes through cross-subsidisation, that might be less appealing if finances were constrained thereby preventing mission drift.

Financialisation may increase if the cap is removed on full-time undergraduate home and EU tuition fees (which currently seems unlikely), but this only occurs if some universities drop their prices whilst others increase theirs. The government could also reduce the fee cap. This would address the mistake that the government made in assuming that a competitive market would be introduced based on price when it implemented the changes in fees following the Browne Review (2010). Alternatively, the government could freeze the fee at £9,250 and wait for inflation to take its toll. Eventually the need for cost cuts would lead to an increased importance being placed on budgeting as universities reduce surpluses and deplete their reserves. As explained by Holloway (2006, p.57) “Budgetary famine, at least for a time, decreases the likelihood of incremental budgeting”. This fits with Parker’s argument that reduced government support and funding increases the financialisation of institutions, but the size of the reduction in funding needs to be sufficiently significant for budgeting to take on an enhanced role.

The financialisation of UK universities might well be happening, but not perhaps yet fully in the way that Parker portrays. This is because universities have taken revenue generating opportunities. Overseas student numbers increased, despite government rhetoric on controlling immigration while keeping students in immigration numbers. The change in the fee regime is viewed as moving the responsibility for funding HE to the student and has actually made universities wealthier.

In the short-term universities have been cushioned from any shortfall in student numbers and reduced government funding by an increase in tuition fee income (Bebbington, 2017). However, it might be expected that the environmental disturbance would work through more fully at some point and become a significant contingent factor on the management accounting techniques employed. The ‘jolt’ of marketisation has been delayed by the way in which the new fee regime changes have been brought in. This jolt may depend on the extent to which student numbers and fees move in the future and may possibly come later than anticipated. Therefore, also delaying the introduction of more complex methods for budgeting and forecasting to manage expenditure and increase accuracy.

## **8.6 Recommendations on policy and practice in HEIs**

There are implications for policy and practice that flow from the research contributions, and recommendations are offered. A Mode 2 approach of seeking knowledge in the context of application (Starkey & Madan, 2001) is adopted. A review of the questionnaire and interview findings in Chapter 5 indicates a number of common areas where improvements might be made. Taylor (2013, p.146) noted that “in the current and foreseeable harsh UK HE environment, aspiring to best-practice financial management will be key to ensuring prosperity and indeed survival – of any university”. Whilst it might be argued that the environment is uncertain rather than harsh, it nevertheless remains desirable to adopt good practices, perhaps in advance of bad times to come, at least for some.

During the study it became apparent that budgeting and forecasting processes are generally well embedded within institutions and whilst the research might inform the methods and processes used it would be unlikely to effect change by itself. Suggestions are therefore offered for individual institutions to consider rather than specific advice for the sector to follow.

Incremental budgeting is common, but if meaningful change is to be implemented representing a departure from the status quo then alternative methods might be used, particularly by those institutions facing financial difficulties or looking to change strategy. It is possible to implement ZBB in phases where an institution seeks justification for a budget, looking at specific functions or course programmes. There was some lack of understanding of advanced techniques, such as ZBB, demonstrated by interviewees. Undertaking training on the technique would be beneficial before attempting to implement. However, complex processes can become a distraction from what the institution is attempting to achieve.

The length of the budget cycle appears to be important for achieving accuracy. An extended cycle appears to have a negative effect on budgeting accuracy. Whilst sufficient time is required to properly engage with academic and professional service areas in arriving at a sensible budget, too long a period can increase inaccuracy to varying degrees. Therefore, the engagement and consultation stage should be minimised. A timetable could be established at the outset detailing

the key deadlines and this could be published widely with clear direction as to responsibilities. Critical path analysis might be used to eliminate unnecessary delays and inefficiencies.

Those taking a cautious approach tend to incorporate contingencies in to their budgets and forecasts. Although such institutions were generally clear that they expected to over-achieve the budget it was not necessarily transparent where favourable variances might arise. It should be possible to analyse what contingencies exist, how they might affect the outturn if not required and when they might be effectively released. A positive decision can then be taken as to whether to dispense with contingencies and perhaps improve the accuracy of budgeting and forecasting. Clarity at the outset would also allow the distinction to be made between inaccuracies intentionally incorporated (if relevant) and those that were unexpected.

The central finance department rarely plays a major role in forecasting student numbers but is primarily responsible for identifying tuition fee forecasts. Such functional disconnections between departments can hinder the production of accurate monetary forecasts (section 8.3.2) as departments will be biased towards the production of data that meets their own specific requirements. The development and maintenance of good working relationships with academic and service areas was considered to be key to achieving accurate budgets and forecasts by many central finance departments, particularly in the area of student number planning and estimating tuition fee income. Some achieved this by embedding finance staff within these areas, whilst others used a system of liaison. Interviewees made the point that working in isolation had an adverse effect on accuracy and should be avoided. There is a benefit to understanding the challenges and concerns that financialisation brings to those at the receiving end of such practices if engagement is to be effective and central finance staff should be encouraged to actively seek out opportunities to engage with colleagues throughout their institutions.

Furthermore, student numbers and tuition fee income are generally reported separately to an institution's academic managers, leadership and governing body as the data for each tends to be held in separate systems (UCISA, 2017). Adopting a practice of reporting the data sets together would assist preparers and users to develop a greater understanding. It would also help when undertaking an analytical review of the reasonableness of the data (Davies & Jackson, 2016). This

increased transparency of reporting, highlighting any anomalies contained within the data, may assist in achieving budgeting accuracy.

In respect of expenditure budgets, many institutions adopt the practice of ‘wiping the slate clean’ each year. However, allowing unspent budgets to be carried forward has potential advantages such as motivating budget holders to over-achieve their budget, reducing gaming behaviours and discouraging wasteful expenditure towards the end of a year (Dugdale & Dai, 2013). There is evidence that carrying forward unspent balances can lead to budget inaccuracies (section 8.3.1). However, the risk of over-spending could perhaps be addressed by adopting adequate controls such as clear approval processes for spending from reserves, restrictions on the type of expenditure incurred and sufficient forward planning so that expenditure is incorporated in the annual budget at the outset, all of which were mentioned by those interviewees whose institutions permitted the practice. Those who do not do it seem not to appreciate how it can be done well.

The research demonstrates four key contingent factors which have a relationship with perceived budgeting accuracy (section 8.3.1). By directing efforts towards controlling these factors it should be possible to improve accuracy.

Whilst the majority said that they reviewed the accuracy of their forecasts (84%) and were interested in comparing accuracy with others in the sector (68%), only a very small number had done so (5%). Little data exists on which to undertake a benchmarking exercise given the commercial sensitivity of the data, but there are suggestions that systematically reviewing accuracy can lead to improvements (Mentzer et al., 1999; Cassar & Gibbon, 2008). The sharing of data between institutions not in direct competition should be possible and university finance officers could seek opportunities to do this either through BUFDG, regional finance groups or by contacting other institutions directly.

Finally, a range of methods exist throughout the sector on how financial scenario models are constructed and presented. However, there was commonality on the key drivers and recognition that the number of drivers should be minimised if the model is to be understandable (section 8.3.3). The sharing of models (but not necessarily the underlying figures) would perhaps assist institutions looking to improve their approach. Alternatively, a guide could be issued addressing

areas of common practice. Furthermore, training on scenario modelling could usefully be undertaken as some interviewees misunderstood what was to be achieved by the technique.

The above suggestions/recommendations are not exhaustive. However, they represent some of the main themes where the sector has the potential to make improvements based on survey responses and interviews.

## **8.7 Limitations**

Laughlin (1995, p.65) explains that when undertaking research “theoretical and methodological choices are inevitably made whether appreciated or not” and that “all empirical research will be partial, despite any truth claims to the contrary, and thus it would be better to be clear about the biases and exclusions”. Despite using a comprehensive postal questionnaire and undertaking interviews the reality is that budgeting and forecasting processes are multi-layered and complex. Institutions achieve the level of accuracy they do for a variety of reasons. With this in mind, the limitations of the research are detailed below.

### *Timing and environment*

The cross-sectional survey using a questionnaire took place at one point in time and different results may have arisen if a longitudinal study had been undertaken. It is possible that certain events or preoccupations of the respondent or interviewee particularly influenced the results but were not apparent from the information obtained (Mace, 1995).

### *Cross-national*

Parker (2012a, 2012b, 2013) takes a worldwide perspective when considering the financialisation of HEIs. This study was only of UK universities and institutions in other countries may have more developed budgeting, forecasting and modelling processes as a result of resource constraints. Thus, differing results might be obtained from a study of overseas universities. Humphrey and Miller (2011) argue the case for more cross-national studies. However, this study of UK universities does provide an interesting insight into current practices within complex organisations

and perhaps offers a benchmark against which to compare practices of universities in other countries.

### *Breadth and depth*

Although the questionnaire contained numerous lines of enquiry (many of which were unique to this survey) even more could have been included to gain further useful information (e.g. the meaning of accuracy, the perception of key players, the training and experience of central finance staff and academic budget holders, etc.). The disadvantage of doing so is that fewer people might have been willing to respond.

More depth to the interviews, covering a greater number institutions, might have provided even greater insight in to the accuracy achieved. On reviewing the interviewee comments it is apparent that it would have been useful to have spent more time with finance officers, not only discussing their responses to the questionnaire but also considering the wider implication of budgeting and forecasting accuracy and the use of scenario models within their respective institutions. Unfortunately, time constraints on the interviewee prevented this.

The nature of this research means that it was only possible to obtain a broad overview of the practices of universities. As Otley and Pollanen (2000, p.494) argue, “a greater emphasis on case-based and longitudinal work would seem appropriate” in order to develop a detailed understanding of the operation of organisational control processes that might not be achieved through the use of a questionnaire, limited observations and interviews.

### *Liaison and key actors*

The survey sought the views only of those working in the central finance department. A different assessment of accuracy and budgeting generally might have been acquired from those working in academic areas or service departments. Although central finance departments were making increasing efforts to adopt a business partnering role there was evidence of tensions in the working relationships between the central finance department and other areas of the institution. It might have been worth analysing these relationships in order to assess whether they had a significant effect on the accuracy of budgeting and forecasting, particularly in relation to academic structures and also the student number planning function. Furthermore, it has not been possible to include a

study of budgeting, forecasting and scenario modelling from the perspective of the Board of Governors or lending banks (where relevant). Hence the important area of the relationship between practice and the views of the Governors and banks in a changing environment was only briefly considered.

#### *Data and trends*

Institutions and Funding Councils regard forecasting data as confidential and are therefore reluctant to share it. An appreciation of the size of budget and forecast variances, and trends over time, compared with the respondents' views on accuracy would have been useful in order to give context to those views.

#### *Independence*

The researcher is a practitioner working closely with the subject matter. This has benefits, but can also lead to claims of bias and a lack of independence, with a danger of imposing one's own views when interpreting the research results. In order to mitigate such risks a variety of sources of information are drawn upon for the study as well as regularly seeking advice from the supervisory team. Nevertheless, being a practitioner facilitated access to and discussion with a range of institutions (including funding bodies) as well as easier access to various reports and documents which might not have been possible otherwise.

Despite these limitations, no previous survey information is available on the subjects of budgeting and forecasting accuracy and financial scenario modelling in the HE sector. Hence, the data collected provides a unique insight and highlights areas that might benefit from more in-depth research. It also provides some insights for management accounting generally.

## **8.8 Future research**

Suggestions for future research tend to follow from the limitations.

#### *Timing and environment*

Assessing forecasting trends over time may reveal a connection between the accuracy achieved and changes in areas such as the external environment, key university personnel (e.g. change in

Finance Director or Vice-Chancellor) or change in the culture of the institution, etc. This may be particularly important as the sector experiences “continued volatility and growing variability in the financial performance of institutions” (HEFCE, 2016c, p.11). A qualitative research design such as using multiple case studies or surveys, combined with quantitative data, could provide interesting insights in to how an institution maintains accuracy during periods of significant change. However, as explained by Van der Stede, Young and Chen (2005, p.665): “Longitudinal designs are not frequently observed because repeated surveys are difficult and costly to conduct, are subject to increasing non-response over time, and result in incomplete longitudinal data”. It might also need the co-operation of the Office for Students to achieve.

The sector’s state of flux when undertaking this study may have contributed to a natural tendency towards cautious budgeting and forecasting. It may be that certain types of organisation, in certain circumstances, react differently depending upon the nature of the change in the external environment which influences the budgeting and forecasting methods used. This could be investigated further.

#### *Cross-national*

A wide-ranging study looking at management accounting practices employed at universities in other countries, and what affects that practice, might reveal whether accuracy is a significant issue elsewhere. This could also provide useful information on whether scenario modelling is sufficiently well developed given the changes taking place in the UK HE sector and whether lessons can be learnt from countries that have undergone change.

#### *Breadth and depth*

Greater breadth and depth of enquiry could be introduced. For example, the very nature of accuracy could be investigated in more depth. Some people adopt very specific tolerances for budget and forecast variances which provide a clear indication of what might be considered to be inaccuracy. Many others, however, adopt a far less rigid approach and consider the context in which the variances arise. A greater understanding of the perceptions held by individuals would provide a useful insight in to what accuracy means and whether these perceptions are shared across organisations and industries.

The training and experience of staff might also be explored further by delving into the reasons for the lack of familiarity of some finance staff with differing budgeting and forecasting methods and whether it has an effect on the accuracy achieved, etc. Could it be that the lack of familiarity is due to inadequate training or over-dependence on practices that have been in place for many years? The recruitment, training, promotion and experience of management accountants within universities could be contrasted with other types of organisation.

Specific elements of the budgeting process may also benefit from further investigation. The difficulty of estimating student numbers and converting them to a projection of tuition fee income is worthy of further investigation. The linkage between how the two forecasts are prepared and the difficulties in getting departments to effectively work together in a challenging environment may lead to solutions to a problem that causes significant frustration.

It was also noticeable that many university finance officers viewed the creation of reserves by budget holders retaining unspent resources to be problematic. Therefore, it was largely rejected by the finance function. However, the motivational consequences, which encourage budget holders to spend resources before the year end or lose them, were not adequately considered. The practices of universities might be usefully contrasted with those of other non-publicly funded organisations.

#### *Liaison and key actors*

Shattock (1988) noted that information provided to Governors can be very aggregated and summarised, which may hide issues relating to accuracy and the usefulness of scenario models. Research findings in this area could be compared with new developments in the transparency literature addressing the nature of internal transparency in public service organisations (Lapsley & Rios, 2015) and perhaps add to the study of corporate governance practices in UK HEIs by Soobaroyen, Broad and Ntim (2014). Indeed, Ntim, Soobaroyen and Broad (2017, p.104) suggest “further research to examine more closely the determinants of HEI financial and non-financial performance, with an emphasis on the influence of governance arrangements and executive team characteristics”.

An analysis of the key actors may reveal the influence they exert on the management accounting function. For HEIs the research suggests that lending banks (where relevant) have an influence

over how internal financial information is presented to external entities and the requirement for accuracy. Comparing and contrasting the views of university management accountants with those of lending banks might demonstrate differences in their tolerance for inaccuracy, particularly as borrowing takes on greater importance.

Also, academic and other staff across an institution tend to have budget responsibilities thrust upon them even where they have little previous experience or training in managing finances. Whilst the current study did not consider this issue in any detail, research could be undertaken to investigate whether such practices occur at other types of organisation and if such individuals sufficiently develop budgetary skills or if this contributes to a cautious approach. Furthermore, senior management's understanding and use of accounting systems and performance data is an area worthy of further study.

An investigation of the quality of budgeting and forecasting processes across a university using case studies might assist in defining what characteristics lead to accuracy and address a possible limitation of the current study's depth. Further study of the behavioural aspects of budgeting and forecasting at various management and budget holder levels within universities would be beneficial. For instance, closer interaction between the central finance function and other areas of the university to improve budgeting accuracy was advocated by questionnaire respondents and interviewees, but a different view of its usefulness might be obtained from academic budget holders. It may be beneficial to explore the conflicts and oppositions between central administrative functions and leadership within faculties and schools, and how they might be overcome (Ozdil & Hoque, 2017). Business partnering may be seen as increasing financialisation and little attention appears to be given to the views of those expected to engage in the process.

#### *Data and trends*

There are opportunities for future research in a number of areas, both within universities and other organisations based on the limitations identified in the previous section. This research could be repeated again in five or ten years to assess if the results are consistent or if some change in circumstances has altered the outcome, especially if general financial conditions become less benign.

Overall, the survey findings and their limitations point to possible future lines of enquiry in developing the current findings. The changing environment for UK universities would suggest that further research could enhance the rich source of data already obtained.

## **8.9 Conclusion**

In recent years the UK HE sector has been transformed by a change in the funding mechanism and a move towards marketisation and greater competitive pressures. The management of higher education institutions is receiving increasing attention and faces some significant challenges ahead. This research study sets out where we are now in terms of the budgeting, forecasting and scenario modelling practices employed by universities.

Although financialisation of the sector is apparent, universities demonstrate a preference for simple budgeting and forecasting processes, but implemented in a more complex way, with the introduction of greater automation and standardisation, increased business partnering/participation, and more devolved practices. This preference and an aversion to more radical approaches in what is claimed to be a competitive and harsh environment initially appeared to be puzzling, but is explained by the good financial health of the sector which perhaps encourages inertia with no significant pressure to change. Inertia, stability and incrementalism in a turbulent environment has also been found in other studies (Khandwalla, 1972; Boyne & Meier, 2009; Good, 2011), but not in a university context.

The key contributions are in three areas. Firstly, to define the contingent factors which have a relationship with budgeting accuracy. These have not been identified in previous studies. Secondly, to shed light on the hidden difficulties of establishing accurate tuition fee income projections based on estimated student numbers. Thirdly, to identify and offer examples of the financial scenario modelling undertaken by universities which are absent from the academic literature. The research adds to and updates the limited literature on management accounting in

universities, which does not address the issues of the accuracy of budgeting and forecasting and the characteristics of scenario models in a changing external environment. It provides additional insights to Parker's (2012a, 2012b, 2013) "financialisation thesis". Contributions are also made to the general management accounting literature on the factors which influence budgeting accuracy and the use of financial scenario modelling. Furthermore, recommendations are offered on policy and practice in HE institutions. In focusing on budgeting accuracy, it highlights an issue that, though implicit, is rarely discussed.

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**Appendix I**  
**Recent surveys addressing budgeting and forecasting practice**

Themes	Authors
Need for accurate budgeting and forecasting to improve control and planning processes and to execute strategy	Neeley, Sutcliffe and Heyns, 2001; Cap Gemini Ernst and Young, 2002; PricewaterhouseCoopers, 2007; PricewaterhouseCoopers, 2012a; Castellina, 2013b, 2014, 2015; Walker, 2015; PricewaterhouseCoopers, 2015
Understanding business drivers to achieve accurate forecasts	Jutras and Hatch, 2009
Provision of accurate data to support effective decision making	Deloitte, 2015
Criticism of traditional budgeting as being too time-consuming, too costly, iterative, inaccurate and encouraging dysfunctional behaviour	Barrett and Hope, 2006; Libby and Murray Lindsay, 2010; CFO Research Services, 2011; Ard, 2012; CEB Financial Planning and Analysis Leadership Council, 2013; Grant Thornton and APQC, 2015
Business environment and uncertainty as causes of variations between plans and actual	Leahy, 2005
Extended planning cycles leading to dated outputs and the lack of correlation between the detail underlying forecasts and accuracy	CFO Research Services, 2011
Lack of evidence of a decline in traditional budgeting methods	Coveney and Cokins, 2014; Dugdale and Lyne, 2010; Libby and Murray Lindsay, 2010
Forecasting as a more valuable activity than budgeting	CEB Financial Planning and Analysis Leadership Council, 2013
Few companies planning to abandon the traditional annual budgeting process	Ekholm and Wallin, 2000
Effect of budgets on entrepreneurial activity and innovation	Marginson, Ogden and Frow, 2006; CIMA and ICAEW, 2004; Wiersma, 2017
Lower error rates in forecasts in less volatile sectors and improvements in accuracy as sales forecasts are aggregated	Institute of Business Forecasting, 2006
Failure to budget within $\pm 5\%$ of actual revenues and costs	Pan, Nicholas and Joy, 1977; Economist PricewaterhouseCoopers, 2007; Intelligence Unit, 2007; Develin and Partners, 2009
Inaccurate or incomplete data for forecasts	Economist Intelligence Unit, 2007
Measuring and reporting on forecasting accuracy	CFO Research Services, 2011; Castellina, 2013a
Measuring tight budgetary control	Van der Stede, 2001
The use of tolerance levels for variances from actual to budget of $\pm 5\%$ to 10% in respect of revenues, expenses, EBIT and cash flow, and the consequences of failing to achieve target	Centage and the Institute of Management and Administration, 2007

Accuracy of short-term budgets and forecasts as the time period extends in to the future	McCarthy, Davies, Golicic and Mentzer, 2006; Barrett and Hope, 2006; Ryan 2008; Sweeney, 2009; Develin and Partners, 2009; CFO Research Services, 2010; Jain and Malehorn, 2006
Effect on forecast accuracy as the lead time before an event reduces	Lawrence and O'Connor, 2000
Business partnering to achieve accurate budgets and forecasts	CGMA, 2015a; PwC, 2015; Cap Gemini Ernst & Young, 2002; Economist Intelligence Unit, 2007; CFO Research Services, 2009; PricewaterhouseCoopers, 2012a; Castellina, 2013a.
IT inadequacies and the use of spreadsheets for budgeting and forecasting	Neeley, Sutcliffe and Heyns, 2001; Cap Gemini Ernst & Young, 2002; PricewaterhouseCoopers, 2007; CFO Research Services, 2010; Axiom EPM 2013, CGMA, 2014; Deloitte, 2015
Use of spreadsheets as a budgeting tool	Sanders and Mandrot, 2003; Centage and the Institute of Management and Administration, 2007; Dickinson, 2011; Quantrix, 2011, 2012; Advanced Business Solutions, 2012; Financial Executives Research Foundation, 2012; iGov Survey, 2013; Coveney and Cokins, 2014; Deloitte, 2015
Frequency of re-forecasting	Barrett and Hope, 2006
Use of forecasting models deliberately separated from an organisation's financial management system	Neeley, Sutcliffe and Heyns, 2001; Neeley, Bourne and Adams, 2003
A single database to achieve a comprehensive 'what if?' analysis	Dickinson, 2011
Prevalence of scenario planning as organisations attempt to anticipate changes to their economic environment and develop contingency plans	Quantrix, 2011, 2012; PricewaterhouseCoopers, 2012a; Bergstrom, Batchelor and Marcotte, 2012; Castellina, 2013a, 2015; Grant Thornton and APQC, 2015
Concentrating on key drivers. Exploiting data analytics and avoiding information overload	Neeley, Sutcliffe and Heyns, 2001; Ard, 2012; Leahy, 2005; Pricewaterhouse Coopers, 2007; CGMA, 2016
Improved timeliness and accuracy of budgeting and forecasting by adopting more advanced processes	CEB Financial Planning and Analysis Leadership Council, 2013
Relationship between strategy, budgetary slack and short-termism	Van der Stede, 2000; Bradley, Shepherd and Wiklund, 2011
Integrating budgeting and planning cycles	Rieley, 1997a
Planning, budgeting and forecasting for performance management	O'Mahony and Lyon, 2015; Goddard and Simm, 2017

Common themes appear to cut across sectors, with issues such as the criticism of the budget process, the accuracy of forecasting, the use of business partnering and inadequacies of IT systems affecting a diverse range of organisations.

The survey results provide conflicting evidence in some areas: Traditional budgeting methods have been criticised, but are still commonly employed. The difficulties of using spreadsheets have been highlighted, but they remain a popular tool. There appears to be a need for accurate budgeting and forecasting, but complex techniques are shunned in favour of simpler methods. However, caution has to be exercised in interpreting the results of those surveys which appear to have been undertaken with the intention of generating additional business through consultancy services rather than to enhance knowledge.



## **Appendix II**

### **Outcome of piloting the draft questionnaire**

#### *Section A: General information on the HEI's structure*

There was little consistency to the number of colleges/faculties/schools and the number of administrative or professional service departments.

The number of accountants employed in the central finance function and in academic areas also showed significant variation. However, there may be some correlation between the numbers employed, their qualifications and the accuracy of budgets and forecasts, which could be assessed from a greater number of responses.

The responses offered only a limited insight in to the structures employed at each institution, but this section did appear to provide a good opening to the questionnaire by offering questions that were sufficiently easy to answer to encourage the respondent to engage with it.

#### *Section B: Budgetary control and reporting*

Most questions in this section produced variations in responses from institutions. The most consistent responses were for the control periods used for budgeting (always either monthly or quarterly) and the budgeting methods employed (usually 'previous year plus inflation' or 'incremental').

Respondents were knowledgeable about their budgeting processes and comfortable with the questions asked. In particular, respondents seemed keen to address the questions on budget gaming behaviours and talk about their experiences. Some even viewed such behaviours as a positive thing as it showed that budget holders were engaging with the budgeting process within the institution rather than viewing it as another administrative burden.

No questions caused concerns nor difficulties. However, it was considered that some of the questions in this section could be removed without adversely affecting the outcome of the research. These included questions on the number and type of budget holders, the influence exerted by key individuals on the institution's budget, the time and effort spent on the budget,

factors affecting financial strategy, performance assessment in terms of achieving the budget and the budgetary control philosophy. Some aspects of these would be explored during the interview stage.

### *Section C: Accuracy of budgeting*

One question in this section which caused problems for many respondents was: “What is considered to be an acceptable variance from budget?” at various levels within the organisation. Some felt that it was not possible to specify the acceptable level, whilst others gave a personal view which they said may not reflect the views of others in the institution. The question needed to be explained in greater detail during the discussion and the respondent generally had to be encouraged to provide an answer. This question was removed as it was considered that it may discourage completion of the questionnaire at an early stage. However, the question was retained outside of the postal questionnaire for interview purposes.

Another question resulted in the same answer from most respondents, when asking: “Are any penalties/rewards applied for weak/strong budgeting?”. In almost all cases the answer was a simple “no”. This question was removed as it did not seem likely that it would result in any useful data from across the sector.

The use of the word ‘pessimistic’ in describing budgeting which resulted in favourable variances led to comments that this was not the correct term to use and should be replaced with ‘cautious’ as it better reflected the outlook of the institution.

A respondent also felt that one area of enquiry needed to be enhanced by asking the same question, but for different years. Respondents were asked to indicate if their estimates were cautious, accurate or optimistic when answering the question: “Student number data is a critical aspect of forecasting tuition fee income. Do you feel that student number data can be predicted in sufficient detail within your institution to allow accurate budgeting?”. This particular institution indicated that their projections in 2012-13 were very optimistic, but had been quite pessimistic in 2013-14 following difficulties in recruitment in the previous year. Rather than covering multiple years, which would increase the size of the questionnaire and may not result in any more useful data, it

was decided to shorten the question whilst also inserting the words “on average”, and to address the responses in more detail at the interview stage.

#### *Section D: Resource allocation*

One question in this section tended to result in the same answer when asking: “Is the resource allocation process considered to be sufficiently accurate and equitable?”. The majority simply answered “yes” to each funding stream of their model (i.e. teaching, research, commercial activity and other). This was consistent with the responses to an earlier question which asked: “Has or will the model be significantly altered as a result of the new fee regime?”, where most provided a “no” answer. Whilst the majority viewed their resource allocation model as both accurate and fair, some did have difficulties with the complexity of their models, which may affect accuracy going forward. It was therefore decided that this question might be better addressed at the interview stage with respondents and the question was therefore retained outside of the postal questionnaire.

This section had few questions and respondents had no difficulty answering them. It did, however, result in some detailed discussion on how resource allocation models worked at each institution and the processes involved in the use of a contribution model in particular. In order to avoid too much emphasis being placed on this subject area some of the questions were simplified and reduced.

#### *Section E: Forecasting*

Forecasting was primarily seen as useful in the following areas; setting the annual budget, for strategic planning, for cash flow projections, and for communication with the Funding Council. A range of departments are involved in the forecasting process at institutions, but with much of the work led by the finance department. Few appeared to use sophisticated software packages and most simply relied on spreadsheets. The questions raised here appeared appropriate.

Furthermore, few institutions answered “yes” to the question: “Do you review the accuracy of your forecasts against the actual outturn?”. Here a sub-question was also asked as to what percentage variance arose on each of the major headings of income and expenditure where accuracy was reviewed. Those who did review the accuracy of their forecasts weren’t able to identify the percentage variations on the main headings of income and expenditure. It was therefore decided to

remove the second part of the question as respondents seemed not to have the information readily available to provide an answer and it was felt that this may have an adverse effect on response rates.

The discussion with respondents revealed a number of areas that might usefully be explored with institutions throughout the sector. Therefore, additional questions were included. These addressed the purpose of forecasting, the frequency of re-forecasting, the areas of the institution that participate in the forecasting process, the use of the budget as a baseline to set later forecasts, the period covered by forecasts, changes due to FRS102 and the new FEHE SORP 2015, the accuracy of forecasting as distinct from budgeting, the technology used in student number planning, benchmarking the accuracy of forecasting, the use of aspirational targets in addition to forecasting and the forecasting techniques employed.

#### *Section F: Scenario modelling*

The majority undertook scenario modelling, usually in the form of ‘what if’ analysis using spreadsheets, and provided useful information on what they considered to be the key drivers in their model. Unsurprisingly, student numbers and the related fee income tended to dominate the key variables that were considered. There was some lack of clarity over what was meant by the words ‘Student fees’ when asking respondents to identify those key variables. To clarify this the words ‘Student fees’ were changed to ‘Student fee rate’.

Some differences between respondents arose over the purpose of scenario modelling and an additional question was included in this area together with a question on the software employed to undertake modelling.

#### *Section G: Current and future process*

Questions in this section did not cause respondents any difficulties. The majority had finance systems which had been in place for 10 years or more, although many had been upgraded, and clear views on the strengths and weaknesses of their processes which they were happy to share. They also knew the changes they would like to make to their budgeting and forecasting processes, and therefore had little difficulty in responding to the forward-looking question: “Is your

institution likely to make any changes to budgeting and forecasting systems within the next two years?”

*Other aspects of the questionnaire:*

At the outset, the length of the questionnaire was considered to be a potential obstacle to obtaining a sufficiently high response rate. Consideration was therefore given to significantly reducing the number of questions in order to decrease the overall questionnaire size from 14 pages to below 10, which might be considered less of a burden to complete. Key questions were retained and those that were considered to be peripheral were removed, as were those for which the relevant information might be obtained in other ways. For example, by gathering information on an institution’s structure from its website. The intention was that these areas of the original questionnaire might be explored further with the institution should they agree to be interviewed after submitting their responses. However, only one pilot institution expressed a view that the full questionnaire contained too many questions (Although there were two instances of meetings being cut short due to the time being taken to complete the document, this primarily arose because of unanticipated in-depth discussions that resulted from the responses received to some questions). On being shown the smaller questionnaire, no institution expressed a view that it would be more likely to result in a response. The general view was that if the recipient was interested enough to engage in the process they would be just as likely to complete the more comprehensive questionnaire as the shorter version. Indeed, one respondent suggested increasing the size of the questionnaire by including more open ended questions with larger text boxes for a written response. It was therefore decided to issue the full questionnaire.

In terms of timing, there was no consistency amongst pilot respondents when asked about the best time to issue the questionnaire. This was due to differing workload patterns. Some indicated that the start of the budget process might be appropriate (e.g. January), others thought the end of the process would be better (e.g. July). However, individuals had differing views depending up their own personal workload patterns. For example, some rejected January on the basis of the work that needed to be undertaken on finalising the institution’s TRAC returns. On the whole, the most appropriate time, based on the response of the pilots, would seem to be July or August, with one or two reminders sent to non-respondents.



**Appendix III**  
**Survey questionnaire**

**SURVEY OF BUDGETING AND FORECASTING IN HIGHER EDUCATION  
INSTITUTIONS**

The information provided by you will be treated as confidential. No reference will be made to the respondent or the particular institution in the findings of the survey. Completed questionnaires will be stored in a secure environment and will not be accessible to anyone other than the researcher. All respondents will receive a copy of the final report.

Please return the completed questionnaire to me at the address below in the envelope provided.

**My contact details are:** Paul Cropper  
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**Terms used within this questionnaire**

**Budget:** The annual approved financial plan of expenses and revenues.

**Forecast:** Future forecasts of expenses and revenues which fall beyond the period of the annual budget.

**GUIDANCE NOTES**

This questionnaire has been designed so that many of the questions require you to tick only one of the responses or to provide a rating. However, please note that some questions require you to tick more than one box if appropriate or to circle your response on a scale. The questionnaire contains the following sections:

- (a) **General information on HE institution's structure**
- (b) **Budgetary control**
- (c) **Accuracy of budgeting**
- (d) **Resource allocation**
- (e) **Forecasting**
- (f) **Scenario planning**
- (g) **Current and future processes**

**Thank you for your co-operation.**

*Paul*



B5. Please indicate the degree to which you agree or disagree with the following statements as they apply to your institution. (*please score using the guidelines below*)

1 = strongly agree                      3 = somewhat agree                      5 = moderately disagree  
 2 = moderately agree                      4 = somewhat disagree                      6 = strongly disagree

- a) The budget process is explicitly linked to the institution's strategic objectives/targets [ ]
- b) Setting the budget causes the institution to talk about and reflect upon its strategy [ ]
- c) Feedback from the budgeting process can result in a change in strategy/tactics [ ]
- d) Within the budget process, academic managers are expected to identify tactical initiatives to close the gap between current performance and desired performance [ ]

B6. Using the previous two financial years as a point of reference, how often do you think the following practices occur in your institution? (*please score using the scale below*):

0 = never occurs    1 = occurs occasionally    2 = occurs frequently

- a) Spending available resources at the end of the budget period so as not to lose them [ ]
- b) Deferring necessary expenditures (e.g. maintenance, computer equipment, advertising, R&D, staff development, etc.) to assist in meeting budget targets [ ]
- c) Incurring expenditures in the current period so as to make it easier to attain the budget in the next period [ ]
- d) Negotiating easier targets than one actually thinks can be accomplished to make the budget easier to attain and increase the odds of receiving a favourable evaluation [ ]
- e) Loading expenditure budgets on to certain headings/lines to hide contingencies [ ]

B7. To what extent have the above affected the institution's ability to produce accurate financial forecasts? (*please circle on the scale line below*)

Not at all To a very high extent

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

B8. Are unspent balances for colleges/faculties/schools/services carried forward into the following year?

Yes [ ]                      No [ ]                      Partially [ ]

If yes or partially, is any restriction placed on how/when these funds can be spent?  
 (*please specify*) \_\_\_\_\_

If partially, which type of balances are allowed to be carried forward?  
 (*please specify*) \_\_\_\_\_

B9. If unspent balances are carried forward, does this cause any difficulties in establishing an accurate forecast of future spending plans? (*please circle on the scale below*)

Has little impact Makes forecasting difficult

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

B10. Which methods of budgeting are used by your institution for preparing the annual budget?  
*(please tick one box per row)*

	Frequently	Sometimes	Proposed	Never
Previous year plus inflation	[ ]	[ ]	[ ]	[ ]
Activity Based Budgeting	[ ]	[ ]	[ ]	[ ]
Zero-Based Budgeting	[ ]	[ ]	[ ]	[ ]
Priority Based Budgeting	[ ]	[ ]	[ ]	[ ]
Incremental budgeting	[ ]	[ ]	[ ]	[ ]
Rolling budgets	[ ]	[ ]	[ ]	[ ]
Other <i>(please specify)</i>				

**SECTION C : ACCURACY OF BUDGETING**

C1. How accurate are the institution’s budgets? *(please circle on the scale below)*

Cautious	Accurate						Optimistic		
1	2	3	4	5	6	7	8	9	10

C2. On average, how accurate are your student number estimates? *(please circle on the scale below)*

Cautious	Accurate						Optimistic		
1	2	3	4	5	6	7	8	9	10

C3. What changes have been made to budget setting and monitoring in the last 2 years? *(please tick as many boxes as appropriate)*

More detailed analysis of budgets	[ ]	Greater devolvement of budgets	[ ]
Review of past budget variances	[ ]	Less devolvement of budgets	[ ]
Targets set for budget accuracy	[ ]	Increased time spent on budgeting	[ ]
Benchmarking accuracy levels	[ ]	Changing budget software	[ ]
Discussion with budget holders	[ ]	Appointing external consultants	[ ]
Centralisation of finance staff	[ ]		
Other <i>(please specify)</i> _____			

C4. What impact has the new fee regime had on budget setting accuracy? *(please circle on the scale below)*

Less accurate	None						More accurate		
1	2	3	4	5	6	7	8	9	10

C5. Does the institution’s risk register refer to poor budgeting and financial forecasting?

Yes	[ ]	No	[ ]	Don’t know	[ ]
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## SECTION D : RESOURCE ALLOCATION

D1. What type of resource model do you employ?

Resource allocation [ ] Contribution [ ] No model [ ] (*If no model, please go to section E*)

D2. Are resources/budgets allocated to the college/faculty/school in accordance with how much income they generate?

Yes [ ] No [ ] Sometimes [ ]

D3. Outside of the normal budget process, how difficult is it to obtain new resources to support unforeseen opportunities designed to accomplish strategic initiatives? (*please circle on the scale line*):

Very difficult

Very easy

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

D4. Is the resource allocation or contribution model used to set academic priorities?

Yes [ ] No [ ]

D5. Has or will the model be significantly altered as a result of the new fee regime?

Yes [ ] No [ ] Yet to be decided [ ] Don't know [ ]

If yes, please specify \_\_\_\_\_

## SECTION E : FORECASTING

E1. In which of the following do your institution's forecasts of income and expenditure play an important role? (*please circle on the scale, with 1 being the most important and 5 the least*)

Annual budget process	1	2	3	4	5
Strategic planning at the institutional level	1	2	3	4	5
Strategic planning within colleges/faculties/schools	1	2	3	4	5
On-going performance management	1	2	3	4	5
Cash flow management	1	2	3	4	5
Formal planning of surpluses/(deficits)	1	2	3	4	5
Preparation of the Margin for Sustainability and Investment	1	2	3	4	5
Communication with the Funding Council	1	2	3	4	5
Other external reporting requirements	1	2	3	4	5
Tax planning	1	2	3	4	5
Debt financing	1	2	3	4	5
Other ( <i>please specify</i> )	1	2	3	4	5

E2. How frequently are your institution's forecasts updated?

Daily, weekly or monthly  Annually   
 Quarterly  Event/Exception driven

E3. Which of the following best describes who is involved in preparing forecasts for the following headings of income and expenditure? (*please tick all that apply*)

	Central Finance	Academic Areas	Support Areas	Corporate Management	Other
Funding Council grants	<input type="checkbox"/>				
Academic fees and education contracts	<input type="checkbox"/>				
Research grants and contracts	<input type="checkbox"/>				
Other operating income	<input type="checkbox"/>				
Endowment income and interest rec'd	<input type="checkbox"/>				
Staff costs	<input type="checkbox"/>				
Other operating expenses	<input type="checkbox"/>				
Depreciation	<input type="checkbox"/>				
Interest payable	<input type="checkbox"/>				

E4. Who is responsible for preparing the student number forecasts? (*please tick one box per row*)

	Major Role	Minor Role	No Role
Central finance function	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Registry department	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Planning department	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Academic areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Other (*please specify*) \_\_\_\_\_

E5. Do you reset the current year's budget if short-term forecasts are updated?

Yes  No  Sometimes

E6. Do you use the current year's budget to assist you in deriving forecasts for future years?

Yes  No  Sometimes

E7. How many years in to the future do you prepare forecasts of income and expenditure including the budget year?

E8. Has any consideration been given to the effect on forecasting of the new FRS102 and HE SORP year-end reporting requirements?

Yes  No

E9. Do any of the following have an impact on the production of accurate forecasts at your institution?

	Major Impediment	Minor Impediment	Not an Impediment
Quality of financial data inputs	[ ]	[ ]	[ ]
Quality of non-financial data inputs	[ ]	[ ]	[ ]
Quality of student number data inputs	[ ]	[ ]	[ ]
Pressure to match target rather than a realistic outlook	[ ]	[ ]	[ ]
IT tools employed	[ ]	[ ]	[ ]
Insufficient involvement of operational areas	[ ]	[ ]	[ ]
Insufficient involvement of senior staff	[ ]	[ ]	[ ]
Insufficient time available to produce forecasts	[ ]	[ ]	[ ]
Tendency to focus too much on detail	[ ]	[ ]	[ ]
Difficulty accessing relevant data	[ ]	[ ]	[ ]

E10. How accurate are your forecasting processes? (*please circle on the scale below*)

Cautious	Accurate	Optimistic							
1	2	3	4	5	6	7	8	9	10

E11. Which of the following best describes your institution?

We prepare forecast data on a different software package to the one used for budgeting [ ]  
 We use one tool to integrate actual, budgets, forecasts and reporting [ ]

E12. Do you use or are you in the process of purchasing any of the following software for student number planning purposes? (*please tick all that apply*)

Cognos Planning [ ]      Tribal EBS Curriculum Planner [ ]  
 Corporate Planner [ ]      Other (*please specify*) [ ]

E13. Do you review the accuracy of your yearly forecasts against the actual outturn at a later date?

Yes [ ]      No [ ]

E14. Would you be interested in comparing the accuracy of your forecasting against other institutions if benchmarking data were available?

Yes [ ]      No [ ]

E15. Has any attempt been made in the past to benchmark the accuracy of your forecasts against any external data, such as reports published by the Funding Council or by commercial enterprises?

Yes [ ]      No [ ]

If yes, please specify: \_\_\_\_\_

E16. Are aspirational targets (in areas such as research and enterprise income, etc.) maintained in addition to the forecasts submitted to the Funding Council?

Yes [ ] No [ ] Sometimes [ ]

E17. To what extent do you agree with the following statements? (*please circle on the scale*)

Financial forecasting is more an art than a science, and even with the best processes good instincts are key:				
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

Financial forecasting is part of the budgeting process, rather than a broader performance management tool:				
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

Reliability of the institution's financial forecast is compromised because operational functions are not sufficiently involved:				
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

A greater understanding of how the various parts of the organisation operate would improve the financial forecasting undertaken:				
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

Forecasting accuracy has deteriorated in recent years:				
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

It is difficult to set accurate forecasts because of the unpredictability of factors influencing the institution's activities:				
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

Financial forecasts quickly become obsolete or outdated:				
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

There have been occasions where inaccurate financial forecasting has adversely affected the institution:				
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

The institution's Governing body takes an interest in the accuracy of budgeting and financial forecasting:				
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

E18. Which of the following are used to forecast income? (*please tick all that apply*)

Estimates based on knowledge of staff	[ ]	Market research	[ ]
Regression analysis	[ ]	Simulation analysis	[ ]
Trend projections	[ ]	Other ( <i>please specify</i> )	[ ]

## SECTION F : SCENARIO PLANNING

F1. Do you undertake scenario planning (sensitivity analysis) when forecasting your income and expenditure?

Yes  No  (If no, please proceed to section G)

F2. What is the primary purpose for undertaking scenario planning? (please tick all that apply)

To meet Funding Council requirements  Internal contingency planning   
 Internal resource planning  Other (please specify)

F3. Do you employ the same scenario model which is updated annually or do you create a new model each year?

Same model  New model

F4. What key variables do you use in your scenario models? (please tick one box per row in terms of importance)

	High	Medium	Low	Not important
Student numbers (Home & EU under-graduates)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Student numbers (Home & EU post-graduates)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Student numbers (Overseas under-graduates)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Student numbers (Overseas post-graduates)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Student numbers (Part-time)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Student numbers (Distance learning and franchise)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Student tuition fee rate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Student residences income	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Provisions for income not linked to student numbers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Funding Council income	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Research grants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Enterprise and innovation activity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
NHS funding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interest receivable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other income	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Staff costs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Staff numbers (Head count or FTEs)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Non-pay expenditure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Depreciation/capital expenditure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interest payable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other items (please specify)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

F5. Do you use a formulaic basis to link any of the key variables? (*please tick all that apply*)

Staff/student ratios	[ ]
Student number FTEs as a proportion of head count	[ ]
Staffing costs as a proportion of income	[ ]
Non-pay costs as a proportion of income	[ ]
Non-pay costs as a proportion of staffing costs	[ ]
Research or other income per FTE staff	[ ]
Separate modelling of incremental drift for salaries	[ ]
Separate sub-model for staff costs	[ ]
Separate sub-model for student fee income	[ ]
Differing inflation rates for income and expenditure	[ ]
Scholarships/bursaries according to student numbers	[ ]
Depreciation and interest payable based on capital spend	[ ]
Interest receivable based on cash flow projections	[ ]
Residences income as a proportion of the student population	[ ]
Estate running costs as a proportion of space occupied	[ ]
Other ( <i>please specify</i> )	[ ]

---

F6. Do you exclude any items of income or expenditure from the model? (*please tick any that apply*)

FRS 17 pension costs	[ ]
Committed but not yet expended costs	[ ]
Non-recurrent expenditure on self financing activities	[ ]
Interest on short term loans	[ ]
Restructuring costs	[ ]
Transfers to reserves	[ ]
Other ( <i>please specify</i> )	[ ]

---

F7. What system do you use for scenario planning?

Finance system (e.g. a module within your finance system)	[ ]
Spreadsheets / manual processes	[ ]
Off-the-shelf forecasting/planning tools	[ ]
Bespoke forecasting/planning tools	[ ]
Dedicated specialist software ( <i>please specify</i> )	[ ]

---

F8. Do you operate an integrated model for scenario planning? (i.e. data is drawn from direct links to other systems to gather details of staff, students, space, etc.)

Yes [ ] No [ ] Sometimes [ ]

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**SECTION G : CURRENT AND FUTURE PROCESSES**

G1. When was your current financial software first implemented?

Less than 5 years ago  5-10 years  11-15 years  16-20 years  Over 20 years  Don't know

G2. Which financial software do you use for your budgetary system?

Agresso / Coda  Oracle   
 ABS (eFinancials)  SAP   
 Microsoft Great Plains  In-house solution   
 Spreadsheets   
 Other (please specify)  \_\_\_\_\_

G3. Does your finance system employ 'funds checking' to automatically stop expenditure once the budget has been exceeded?

Yes  No  Available, but not in operation

If no, what are the consequences for the budget holder from over-spending?

\_\_\_\_\_

G4. Are managers and budget holders able to drill down to successive levels of detail from summary reports?

Yes  No  If yes, do they use the facility? Yes  No  Mixed

G5. Are colleges, faculties, schools or service departments able to view each other's resource allocation or budget figures?

Resource allocation		Budget	
Yes	<input type="checkbox"/>	Yes	<input type="checkbox"/>
No	<input type="checkbox"/>	No	<input type="checkbox"/>
Informally	<input type="checkbox"/>	Informally	<input type="checkbox"/>

G6. Please indicate when the last significant changes were made in your budgeting/forecasting practices:

Within the last year  2 years  3 years  Over 3 years ago

Please briefly describe any significant changes that have been made within the last 2 years:

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

G7. Is your institution likely to make any of the following changes to the **budget and forecasting** processes within the next two financial years?

	Budget	Forecasting
Improve data quality	[ ]	[ ]
Develop formal planning/budgeting workflow processes	[ ]	[ ]
Involve more decision-makers in the process	[ ]	[ ]
Involve fewer decision-makers in the process	[ ]	[ ]
Change budget reporting processes	[ ]	[ ]
Reduce the time spent	[ ]	[ ]
Automate process flows	[ ]	[ ]
More scenario planning (sensitivity analysis)	[ ]	[ ]
Introduce rolling budgets/forecasts	[ ]	[ ]
Reduce in detail and greater focus on key business drivers	[ ]	[ ]
Simplification and standardisation of processes	[ ]	[ ]
Incentives linked to budgets and forecasts	[ ]	[ ]
Training of staff (in finance and non-finance areas)	[ ]	[ ]
Centralise finance staff	[ ]	[ ]
Better timetabling of processes	[ ]	[ ]
Change frequency of budgeting and forecasting updates	[ ]	[ ]
Reduce reliance on spreadsheet software	[ ]	[ ]
Change or introduce new accounting software	[ ]	[ ]
Use of benchmarking or external data	[ ]	[ ]
Other ( <i>please specify</i> )	[ ]	[ ]

G8. Given the uncertainties over funding faced by the sector, has the amount of time spent on planning, budgeting and forecasting changed in recent years? (*please circle on the scale line*)

Detailed line-item budgeting:

Decreased significantly			No change				Increased significantly		
1	2	3	4	5	6	7	8	9	10

Resource allocation and capacity planning:

Decreased significantly			No change				Increased significantly		
1	2	3	4	5	6	7	8	9	10

Forecasting financial results:

Decreased significantly			No change				Increased significantly		
1	2	3	4	5	6	7	8	9	10

Scenario planning (sensitivity analysis):

Decreased significantly			No change				Increased significantly		
1	2	3	4	5	6	7	8	9	10

G9. Does your institution employ any Business Intelligence software (e.g. QlikView, etc..) to bring together data from different parts of the organisation? (such as Finance, HR, Student records, etc.)

Yes [ ] No [ ] Propose to implement [ ]

G10. What are the most significant budgeting or forecasting problems that you feel your institution needs to address?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

G11. How might you solve the problems identified in question G10?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

*(please continue on a separate page if necessary)*

**Thank you very much for completing this questionnaire**

---

Please provide the following information about yourself. The contact details will only be used in the event of a query about your responses and to send you a summary report of my findings. **They will not be revealed to third parties.**

**PERSON COMPLETING THE QUESTIONNAIRE:**

Name \_\_\_\_\_

Job title \_\_\_\_\_

Institution \_\_\_\_\_

Telephone \_\_\_\_\_ E-mail address \_\_\_\_\_

Period spent in current role \_\_\_\_\_ Period spent in an accounting role \_\_\_\_\_

Accounting qualifications \_\_\_\_\_

**Would you be willing to meet to discuss some of the issues raised by this questionnaire?** Yes [ ] No [ ]

**Acknowledgement**

I would like to express my gratitude to those institutions that piloted this survey questionnaire and provided support and guidance in its development. Their contributions provided valuable insights into the budgeting and forecasting processes at a range of institutions and offered useful and constructive comment on the survey questionnaire prior to its distribution across the sector.

## **Appendix IV**

### **Standard interview questions**

Can you tell me a little about your background?

What are the key stages in your budget cycle?

#### **Budgeting**

How do you go about setting the University's annual budget?

Role of the Vice-Chancellor in setting the budget? Do they set the tone for a cautious/optimistic approach?

Level of devolving of budgets? Deans/Directors, Heads/Deputies, Course leaders/administrators?

Do budget holders take the process sufficiently serious? Spend enough time on it?

*\*G3 - Budget produced in 16 weeks. Does this length cause any difficulties?*

Is a budget holder's performance judged by his/her superiors on the basis of attaining budget goals?

Do you employ 'indicators' on your financial reports to guide budget holders as to what variances might need reviewing such as conditional formatting to highlight certain figures?

Is a favourable variance better than an adverse variance?

*\*B8 - Partial carry forward of unspent balances. Carry forward allowed if there is an agreed reason – Any particular type of expenditure allowed?*

What percentage deviation from budget is considered acceptable?

#### **Resource allocation**

*\*D5 - Resource model has been significantly altered – Reason for changes? How has it been altered?*

Complex or simple model?

Is the model considered both accurate and fair?

Could your model be improved by better forecasting of income?

## **Medium Term Forecasting**

\*E2 – Why are medium term forecasts updated quarterly?

Are the forecasts revisited during the year for any particular purposes?

\*E7 - Why forecast 3 years in to the future?

Does the University tend to do better than forecast? Any consequences?

What percentage deviation from forecast is considered acceptable?

Are you satisfied with your current system of budgeting and forecasting?

FRS102 – Any concerns about the effect on budgeting and forecasting?

\*E17 - The Governing body take an interest in the accuracy of budgeting and forecasting. What form does this take?

## **Scenario models**

How are they created? (Someone in the Finance department or a wider group?)

How are they used?

Who uses them?

How often are they updated?

## **Current and Future**

\*G6 – There is a greater link to strategic academic planning and target setting. Reasons for the change?

(Note: The example set of standard questions shown above is from one of the interview sessions. This standard instrument was tailored for items relating to the questionnaire responses in order to explore these in greater depth. These tailored items are prefixed with a '\*' shown in blue text and include the relevant question number.)

## Appendix V Variables and data source

Theme	Code	Variable	Source
Accuracy	BACC	Budgeting accuracy	C1
	SACC	Accuracy of student number estimates	C2
	FACC	Forecasting accuracy	E10
Financials for 2013-14	INCO	Total income	HEIDI
	EXPO	Total expenditure	HEIDI
	FCOU	Funding body grants	HEIDI
	TFEC	Tuition fees & education contracts	HEIDI
	RESG	Research grants & contracts	HEIDI
	OTHI	Other income	HEIDI
	ENIC	Endowment & investment income	HEIDI
	SURP	Surplus	HEIDI
Measures of size	STUS	Students	HEIDI
	SPAC	Space	HEIDI
	STAF	Staff	HEIDI
Structure	PP92	Pre-1992 or Post-1992	Wikipedia
	COLL	Number of colleges	A1
	FACU	Number of faculties	A1
	SCHO	Number of schools	A1
	SERV	Number of professional service departments	A1
	FSEC	Number of staff engaged in budgeting and forecasting in your central management accounting function	A3
	QUAL	Number of qualified accountants	A3
Processes	TDBU	Budget approach (top-down and bottom-up)	B1
	TIMP	Time spent preparing the budget	B3
	TIMW	Time spent waiting for budget to be approved	B3
	GAM1	Spending available resources at the end of the budget period so as not to lose them	B6a
	GAM2	Deferring necessary expenditures	B6b
	GAM3	Incurring expenditures in the current period so as to make it easier to attain the budget in the next period	B6c
	GAM4	Negotiating easier targets than one actually thinks can be accomplished	B6d
	GAM5	Loading expenditure budgets on to certain headings/lines to hide contingencies	B6e
	GAMA	Extent to which budget gaming behaviours affect an institution's ability to produce accurate forecasts	B7
	CFWD	Carrying forward of unspent balances	B8
	DFWD	Difficulty caused by allowing unspent balances to be carried forward	B9
	NEWF	Impact of new fee regime had on budget setting accuracy	C4
	DIFF	Difficulty of obtaining new resources outside of the normal budget process	D3
	TBUD	Change in time spent on detailed line-item budgeting	G8
TRES	Change in time spent on resource allocation and capacity planning	G8	
TFOR	Change in time spent on forecasting financial results	G8	
TSEN	Change in time spent on scenario planning (sensitivity analysis)	G8	
Budget method	INFL	Previous year plus inflation	B10
	ABBB	Activity Based Budgeting	B10
	ZBBB	Zero-Based Budgeting	B10
	PBBB	Priority Based Budgeting	B10
	INCR	Incremental budgeting	B10
Strategy	OBJE	The budget process is explicitly linked to strategic objectives/targets within your institution	B5a
	TALK	Setting the budget causes us to talk about and reflect upon our strategy	B5b
	CHAN	Feedback from the budgeting process can result in a change in our strategy/tactics	B5c
	CGAP	Managers are expected to identify initiatives to close the gap between current and desired performance	B5d
Number of other depts involved in budgeting/forecasting (excluding Finance)	FUNC	Participation in funding Council grants	E3
	OTHT	Participation in tuition fees & education contracts	E3
	OTHR	Participation in research grants & contracts	E3
	OTHO	Participation in other income	E3
	OTHN	Participation in endowment & investment income	E3
	OTHS	Participation in staff costs	E3
	OTHE	Participation in other operating expenses	E3
	OTHD	Participation in depreciation	E3
OTHP	Participation in interest payable	E3	
Participation in student number forecasting	SFIN	Central finance	E4
	REGI	Registry	E4
	PLAN	Planning	E4
	ACAD	Academic areas	E4
Respondents	EXPC	Experience of respondent in current role	Contact details
	EXPA	Experience of respondent in an accounting role	Contact details
Scenario modelling	KEYV	Number of high importance key variables	F4
	KEYL	Number of linkages between key variables	F5
Views on the forecasting process	STA1	Forecasting is more an art than a science	E17
	STA2	Forecasting is just part of the budgeting process, rather than a broader performance management tool	E17
	STA3	Operational functions are not sufficiently involved	E17
	STA4	A greater understanding of how the various parts of the organisation operate would improve the forecasting	E17
	STA5	Forecasting accuracy has deteriorated in recent years	E17
	STA6	Difficult to set accurate forecasts because of the unpredictability of factors influencing the institution's activities	E17
	STA7	Forecasts quickly become obsolete or outdated	E17
	STA8	Inaccurate forecasting has adversely affected the institution	E17
	STA9	Governing body takes an interest in the accuracy of budgeting and financial forecasting	E17



## Appendix VI Factors from the EFA

Construct	Code	Items	KMO	Bartlett's test of sphericity	Anti-image correlation	Eigenvalue	Factor 1 loadings	Factor 2 loadings	Factor 3 loadings	Extraction sums of squared loadings	Rotation sums of squared loadings	Cronbach's alpha (for constructs)
Accuracy	BACC	Budgeting accuracy	≥0.5	<0.05	≥0.5	>1.0						>0.6
	SACC	Accuracy of student number estimates	0.651	0.000	0.619	1.842	0.765			43.161%	One factor only	0.684
	FACC	Forecasting accuracy			0.648		0.641					
Financials for 2013-14	INCO	Total income	--	--	--	--	--					--
	EXPO	Total expenditure										
	FCOU	Funding body grants										
	TFEC	Tuition fees & education contracts										
	REG	Research grants & contracts										
Measures of size	OTHI	Other income										
	ENIC	Endowment & investment income										
	SURP	Surplus										
Structure	STUS	Students	0.535	0.000	0.519	2.505	--					--
	SPAC	Space			0.536							
	STAF	Staff			0.557							
Number and qualification of staff	COLL	Number of colleges	0.581	0.040	0.566	1.470	-0.574			18.932%	18.881%	-0.042
	FACU	Number of faculties			0.571		0.547			2.411%	2.462%	
	SCHO	Number of schools			0.401		0.359					
Approach and time	SERV	Number of professional service departments			0.637							
	FSEC	Number of staff engaged in budgeting and forecasting in the central management accounting function	0.500	0.000	0.500	1.863	0.929			86.253%	One factor only	0.887
	OUAL	Number of qualified accountants			0.500		0.929					
Time	TDBU	Budget approach (top-down and bottom-up)	0.522	0.024	0.517	1.361	0.693			23.516%	One factor only	-0.385
	TIMP	Time spent preparing the budget			0.515		-0.440					
	TIMW	Time spent waiting for budget to be approved			0.593							
Gaming and effect	TIMW	Time spent preparing the budget	0.500	0.232	0.500	1.132	0.363			13.160%	One factor only	-0.210
	TIMW	Time spent waiting for budget to be approved			0.500		-0.363					
	GAM1	Spending available resources at the end of the budget period so as not to lose them	0.654	0.000	0.587	2.210		0.809		26.662%	19.161%	0.552
	GAM2	Deferring necessary expenditures			0.721	1.093				10.621%	17.822%	
	GAM3	Incurring expenditures in the current period so as to make it easier to attain the budget in the next period			0.625			0.313				
GAMA	GAM4	Negotiating easier targets than one actually thinks can be accomplished			0.635		0.735					
	GAM5	Loading expenditure budgets on to certain headings/lines to hide contingencies			0.715		0.493					
	GAMA	Extent to which budget gaming behaviours affect an institution's ability to produce accurate forecasts			0.673		0.470	0.321				

(Note: Figures shown in red do not meet the minimum criteria to proceed with the factor)

Construct	Code	Items	KMO	Bartlett's test of sphericity	Anti-image correlation	Eigenvalue	Factor 1 loadings	Factor 2 loadings	Factor 3 loadings	Extraction sums of squared loadings	Rotation sums of squared loadings	Cronbach's alpha (for constructs)
Gaming	GAM1	Items Spending available resources at the end of the budget period so as not to lose them	≥0.5	<0.05	≥0.5	>1.0						>0.6
	GAM2	Spending available resources at the end of the budget period so as not to lose them	0.611	0.000	0.586	1.885		0.629		25.981%	19.698%	0.584
	GAM3	Deferring necessary expenditures			0.701	1.077		0.623		12.372%	18.656%	
	GAM4	Incurring expenditures in the current period so as to make it easier to attain the budget in the next period			0.632							
	GAM5	Negotiating easier targets than one actually thinks can be accomplished Loading expenditure budgets on to certain headings/lines to hide contingencies			0.564		0.851					
Carry forward and its effect	CFWD	Carrying forward of unspent balances	0.500	0.113	0.500	1.174	0.417			17.370%	One factor only	0.167
	DFWD	Difficulty caused by allowing unspent balances to be carried forward			0.500		0.417					
Effect of gaming and the use of carry forward	GAM6A	Extent to which budget gaming behaviours affect an institution's ability to produce accurate forecasts	0.518	0.386	0.514	1.207	0.510			13.157%	One factor only	0.178
	DFWD	Carrying forward of unspent balances Difficulty caused by allowing unspent balances to be carried forward			0.512		0.510					
Time spent on financial planning	TBUD	Change in time spent on detailed line-item budgeting	0.779	0.000	0.877	2.875	0.908			63.207%	One factor only	0.869
	TRES	Change in time spent on resource allocation and capacity planning			0.741		0.829					
	TFOR	Change in time spent on forecasting financial results			0.719		0.728					
	TSEN	Change in time spent on scenario planning (sensitivity analysis)			0.838		0.697					
Budget method	INFL	Previous year plus inflation	0.454	0.012	0.500	1.468				19.467%	14.953%	0.262
	ABBB	Activity Based Budgeting			0.619	1.212				10.210%	14.724%	
	ZBBB	Zero-Based Budgeting			0.450		0.711	0.423				
	PBBB	Priority Based Budgeting			0.448		0.711	0.423				
Strategy	INCR	Incremental budgeting			0.384		-0.476					
	OBIE	The budget process is explicitly linked to strategic objectives/targets within your institution	0.725	0.000	0.693	2.410	0.853			49.036%	One factor only	0.777
	TALK	Setting the budget causes us to talk about and reflect upon our strategy			0.676		0.757					
	CHAN	Feedback from the budgeting process can result in a change in our strategy/tactics			0.793		0.679					
	CGAP	Managers are expected to identify initiatives to close the gap between current and desired performance			0.818		0.446					

(Note: Figures shown in red do not meet the minimum criteria to proceed with the factor)

Construct	Code	Items	KMO	Bartlett's test of sphericity	Anti-image correlation	Eigenvalue	Factor 1 loadings	Factor 2 loadings	Factor 3 loadings	Extraction sums of squared loadings	Rotation sums of squared loadings	Cronbach's alpha (for constructs)
Number of other depts. involved in budgeting/forecasting (excluding Finance)	FUNC OTHT OTHR OTHO OTHN OTHS OTHE OTHD OTHP	Participation in funding Council grants Participation in tuition fees & education contracts Participation in research grants & contracts Participation in other income Participation in endowment & investment income Participation in staff costs Participation in other operating expenses Participation in depreciation Participation in interest payable	≥0.5 0.554	<0.05 0.000	≥0.5 0.575 0.527 0.552 0.535 <b>0.436</b> 0.692 0.603 0.534 0.527	>1.0 2.583 1.964 1.270	0.377   0.420  0.376 0.854 0.609 0.985	0.416 0.833 0.371  0.803  0.479	0.416 0.833 0.371  0.803  0.479	23.925% 18.313% 9.223%	18.732% 18.163% 14.566%	0.683
Participation in student number forecasting	SFIN REGI PLAN ACAD	Central finance Registry Planning Academic areas	0.637	0.000	0.649 0.586 0.561 0.741	2.322	0.838 0.684 0.681 0.448			45.882%	One factor only	0.752
Respondents experience	EXPA	Experience of respondent in current role	0.500	<b>0.353</b>	0.500	1.107	0.325			10.594%	One factor only	0.170
Scenario modelling	KEYV KEYL	Number of high importance key variables Number of linkages between key variables	0.500	0.000	0.500 0.500	1.495	0.703 0.703			49.368%	One factor only	0.661
Views on the forecasting process	STA1 STA2 STA3 STA4 STA5 STA6 STA7 STA8 STA9	Forecasting is more an art than a science Forecasting is just part of the budgeting process, rather than a broader performance management tool Operational functions are not sufficiently involved A greater understanding of how the various parts of the organisation operate would improve the forecasting Forecasting accuracy has deteriorated in recent years Difficult to set accurate forecasts because of the unpredictability of factors influencing the institution's activities Forecasts quickly become obsolete or outdated Inaccurate forecasting has adversely affected the institution Governing body takes an interest in the accuracy of budgeting and financial forecasting	0.670	0.000	0.575 <b>0.412</b> 0.694  0.656 0.738  0.642 0.661 0.663 0.801	2.471 1.582 1.214	0.414  0.591  0.631  0.900 0.814  0.357	0.340  0.591  0.631  0.452	0.340  0.591  0.631  0.452	22.974% 11.045% 4.979%	21.485% 12.331% 5.182%	0.558

(Note: Figures shown in red do not meet the minimum criteria to proceed with the factor)



## Appendix VII Factors defined

Factors (Latent variables)	Factor code	Code	Items	Factor loadings	Cronbach's alpha (for factors)
Accuracy	COMA	BACC	Budgeting accuracy	0.765	0.684
		SACC	Accuracy of student number estimates	0.641	
		FACC	Forecasting accuracy	0.546	
Number and qualification of staff	COMQ	FSEC	Number of staff engaged in budgeting and forecasting	0.929	0.887
		QUAL	Number of qualified accountants	0.929	
Gaming (Spending resources in year)	COMG	GAM1	Spending available resources at the end of the budget period so as not to lose them	0.809	0.325
		GAM3	Incurring expenditures in the current period so as to make it easier to attain the budget in the next period	0.456	
		GAMA	Extent to which budget gaming behaviours affect an institution's ability to produce accurate forecasts	0.321	
Gaming (Attaining easier targets)	COME	GAM3	Incurring expenditures in the current period so as to make it easier to attain the budget in the next period	0.313	0.447
		GAM4	Negotiating easier targets than one actually thinks can be accomplished	0.735	
		GAM5	Loading expenditure budgets on to certain headings/lines to hide contingencies	0.493	
		GAMA	Extent to which budget gaming behaviours affect an institution's ability to produce accurate forecasts	0.470	
Time spent on financial planning	COMT	TBUD	Change in time spent on detailed line-item budgeting	0.908	0.869
		TRES	Change in time spent on resource allocation and capacity planning	0.829	
		TFOR	Change in time spent on forecasting financial results	0.728	
		TSEN	Change in time spent on scenario planning (sensitivity analysis)	0.697	
Strategy	COMS	OBJE	The budget process is explicitly linked to strategic objectives/targets within your institution	0.853	0.777
		TALK	Setting the budget causes us to talk about and reflect upon our strategy	0.757	
		CHAN	Feedback from the budgeting process can result in a change in our strategy/tactics	0.679	
		CGAP	Managers are expected to identify initiatives to close the gap between current and desired performance	0.446	
Participation in specialist streams	COMO	FUNC	Participation in funding Council grants	0.377	0.523
		OTHN	Participation in endowment & investment income	0.420	
		OTHD	Participation in depreciation	0.609	
		OTHP	Participation in interest payable	0.985	
Participation in general streams	COMN	OTHO	Participation in other income	0.803	0.748
		OTHS	Participation in staff costs	0.376	
		OTHE	Participation in other operating expenses	0.854	
Participation in major streams	COMM	FUNC	Participation in funding Council grants	0.416	0.598
		OTHT	Participation in tuition fees & education contracts	0.833	
		OTHR	Participation in research grants & contracts	0.371	
		OTHS	Participation in staff costs	0.479	
Participation in student number forecasting	COMP	SFIN	Central finance	0.838	0.752
		REGI	Registry	0.684	
		PLAN	Planning	0.681	
		ACAD	Academic areas	0.448	
Scenario modelling variables and links	COMV	KEYV	Number of high importance key variables	0.703	0.661
		KEYL	Number of linkages between key variables	0.703	
Environmental issues affecting forecasting	COMR	STA5	Forecasting accuracy has deteriorated in recent years	0.414	0.708
		STA6	Difficult to set accurate forecasts because of the unpredictability of factors influencing the institution's activities	0.900	
		STA7	Forecasts quickly become obsolete or outdated	0.814	
		STA9	Governing body takes an interest in the accuracy of budgeting and financial forecasting	0.357	
Internal issues affecting forecasting	COMI	STA3	Operational functions are not sufficiently involved	0.591	0.529
		STA4	A greater understanding of how the various parts of the organisation operate would improve the forecasting	0.631	
		STA8	Inaccurate forecasting has adversely affected the institution	0.446	
Process issues affecting forecasting	COMF	STA2	Forecasting is just part of the budgeting process, rather than a broader performance management tool	0.340	0.277
		STA5	Forecasting accuracy has deteriorated in recent years	0.452	

(Note: Figures shown in red do not meet the minimum criteria to proceed with the factor)



## **Appendix VIII**

### **Examples of financial scenario models**

The examples given in this appendix are of scenario models used in British universities

#### **Basic**

A simple approach would be to concentrate on certain headings of income and expenditure and assess the increase/decrease in income/expenditure as a result of varying the assumptions for these headings only.

An example offered by one institution is reproduced in Table VIII.1 below. Two key areas for this institution were home and EU undergraduate and overseas postgraduate recruitment, both of which were modelled to assess sensitivities and eventually reported at a potential 10% drop. However, the analysis broadly assumed an equal division in each year for the 10% shortfall which therefore implied that the reduction in income quickly reached a steady state position. However, given the nature of course delivery over a three or four year period many institutions assumed that a shortfall in one year was followed by further shortfalls or compensating growth whilst action was taken to address the issue over the short to medium term.

Like many universities, this institution included provision in its forecasts for savings on staff costs and for growth in income. The favourable financial effect of both of these assumptions was reduced by 25% in the scenario model. Again, it was largely assumed that a change to one year would not have an effect on the following year. Therefore, if savings on pay or growth in activity were achieved at a lower rate in one year this trend would continue at the same rate in following years and not have a cumulative effect.

Some attempt was made to show the effect of an escalating cut in HEFCE grants from 5% to 10% later in the period of the forecast. However, the intention overall was to provide an understandable model at the expense of incorporating more sophisticated linkages. The figures reported showed the change in the relevant income or expenditure rather than restating the new overall forecast.

Table VIII.1 Example of basic scenario modelling

Scenario Analysis	Forecast	Forecast	Forecast	Forecast
	2014/15 £000	2015/16 £000	2016/17 £000	2017/18 £000
<u>Risks:</u>				
a. 10% reduction in H/EU UG intake 2015/16	-	X,XXX	X,XXX	X,XXX
b. 10% reduction in overseas PGT	X,XXX	X,XXX	X,XXX	X,XXX
c. Failure to deliver 25% of pay savings	XXX	XXX	XXX	X,XXX
d. Failure to deliver 25% of growth	XXX	X,XXX	X,XXX	X,XXX
e. 5% cut in HEFCE T & R Grant in 2016/17 and 10% cut in 2017/18	-	-	X,XXX	X,XXX
<u>Contingencies in place:</u>				
General fee income	X,XXX	X,XXX	X,XXX	X,XXX
General fund	XXX	XXX	XXX	XXX

This institution did, however, make reference to contingencies that had been included within their forecasts which could be released and to mitigating actions in order to address any shortfall in income within the narrative to the model. These included:

- Active management of admissions in August and September to ensure any shortfalls are addressed by exceeding targets in other areas, but still maintaining quality
- Slowing down of the capital expenditure programme funded by surpluses
- A cost reduction programme and extension of the scope of a compulsory redundancy programme
- Development of higher income generation from other sources such as new course innovation, enterprise and distance learning (but recognising the development time required)

No attempt was made to place a value on such mitigating actions.

**Intermediate**

Intermediate models identified a limited number of key variables and linked these to an income and expenditure account on a single worksheet. The example below is taken from the University of Huddersfield. The model in this case contains a table of key variables linked to an income and expenditure account so that changes to the variables feed through to monetary values in the

relevant heading of income and expenditure. The key variables were identified as a mixture of percentages and monetary values. Where appropriate these variables had a cumulative effect. For example, a change in the percentage pay award in 2015/16 would affect staffing costs in that year and following years. However, some variables related to a single year only, such as one-off staff severance payments. The key assumptions could therefore be altered to produce either one-off changes where it was sensible to do so or recurrent alterations where the changes were likely to affect multiple years.

Table VIII.2 Example of intermediate scenario modelling

<b>Key Annual Changes (from the forecast):</b>	2015/16	2016/17	2017/18	Cumulative
Staff pay award and growth contingency (%)	1.5%	3.0%	3.0%	7.5%
Staff cost adjustment - Recurrent (£'000)	£0	£0	£0	£0
Staff cost adjustment - One-off severance (£'000)	£0	£0	£0	£0
Operating expenses - Inflation (%)	2.0%	2.0%	2.0%	6.0%
Operating expenses adjustment - Recurrent (£'000)	£0	£0	£0	£0
HEFCE T grant (including WP & TESS)	-43.8%	-25.7%	-14.6%	-84.1%
HEFCE QR grant (%)	147.3%	-6.8%	0.0%	140.5%
Research grants and contracts (%)	40.0%	24.2%	0.0%	64.2%
Tuition fee income - H&EU (full-time) - Fee rate for new students from 2015-16	£9,000	£9,000	£9,000	£9,000
Tuition fee income - H&EU (full-time) - Reduction in new fee students (FTE)	-50	-34	-17	-235
Tuition fee income - H&EU (part-time - excluding CPCET t/fee transfers in) (%)	-23.3%	-20.2%	-20.2%	-63.7%
Tuition fee income - Overseas (%)	0.8%	10.0%	10.0%	20.7%
NHS income (%)	1.4%	5.5%	4.2%	11.1%

	2013/14 Actual £k	2014/15 Budget £k	2015/16 Budget £k	2016/17 Forecast £k	2017/18 Forecast £k
<b>Total University</b>					
<b>Income</b>					
Funding Council Grants	27,653	18,729	15,648	11,717	9,862
Tuition Fees and Education Contracts	97,997	112,711	123,312	128,421	131,208
Research Grants and Contracts	4,978	6,969	8,655	8,655	8,655
Other Income	9,925	10,142	9,586	9,172	8,758
Interest Receivable	562	901	751	751	751
<b>Income Total</b>	<b>141,115</b>	<b>149,452</b>	<b>157,953</b>	<b>158,716</b>	<b>159,235</b>
<b>Expenditure</b>					
Staff costs (excluding FRS17)	-75,200	-80,814	-89,346	-93,684	-96,960
Target savings	75%	0	0	1,451	4,465
Other operating expenses	-38,516	-46,104	-48,540	-48,493	-48,891
Target savings	25%	0	0	484	1,488
Depreciation	-4,840	-5,105	-6,188	-6,621	-6,941
Interest Payable	-18	-18	-18	0	0
<b>Expenditure Total</b>	<b>-118,574</b>	<b>-132,041</b>	<b>-142,158</b>	<b>-142,845</b>	<b>-143,311</b>
<b>Surplus before FRS 17</b>	<b>22,541</b>	<b>17,411</b>	<b>15,795</b>	<b>15,872</b>	<b>15,923</b>
<b>% Surplus</b>	<b>16.0%</b>	<b>11.6%</b>	<b>10.0%</b>	<b>10.0%</b>	<b>10.0%</b>
<b>% Staff costs to income</b>	<b>53.3%</b>	<b>54.1%</b>	<b>55.6%</b>	<b>56.2%</b>	<b>56.4%</b>
FRS 17	-1,041	-2,500	-2,500	-2,500	-2,500
<b>Surplus after FRS 17</b>	<b>21,500</b>	<b>14,911</b>	<b>13,295</b>	<b>13,372</b>	<b>13,423</b>
Surplus (%)	4.0%	7.0%	7.0%	7.0%	7.0%
Surplus (£)	5,645	10,462	11,057	11,110	11,146
Economic contingency reserve (%)	12.0%	4.6%	3.0%	3.0%	3.0%
Economic contingency reserve (£)	16,896	6,949	4,739	4,761	4,777

The structure of the income and expenditure account was similar to that required to be submitted to HEFCE as part of the Annual Accountability Return, but with some alterations. The pension costs related to FRS17 were shown as a separate line so that the surplus could be reported before

and after this cost. Furthermore, the key ratio of staff costs to income was also reported. Items such as the ‘difference between historical cost depreciation and the actual charge’ and transfers between reserves in respect of the ‘realisation of property revaluation gains of previous years’ were ignored however on the basis they merely represented an accounting adjustment without any cash effect.

In this particular model, the University of Huddersfield had a target surplus based on 10% of income (7% to fund a capital programme and 3% as an economic contingency reserve during a period of significant uncertainty). Varying the assumptions related to income resulted in a monetary change of surplus, but the model was constructed so that this always remained at 10% of the revised income. To maintain this 10% surplus (before FRS17 costs), where an adverse change in assumptions was implemented, savings were introduced on headings of pay and non-pay expenditure (the yellow rows in the table above) based on a ratio set by the user. In the above example the ratio was 75% staffing to 25% non-pay. In effect, these were the savings required in order to maintain the targeted surplus of 10%. The savings needed, particularly in later years, could build to a significant value depending upon the adverse impact of changing some of the variables.

The identification of savings was considered to be of key importance as it set out the required action at a high level of what was needed if the university wished to achieve its strategic target of a minimum 10% margin for sustainability and investment.

Overall, whilst the model was capable of handling the effect of multiple changes to key variables there was only an indirect linkage between losses of income and required changes to expenditure. A more direct link could have been built in to the model by using Staff Student Ratios and assumed average non-pay expenditure to income.

### **Advanced**

An approach used by some institutions was to take the template forecast income and expenditure accounts supplied by the relevant Funding Council as part of the annual accountability return (see example of the HEFCE AAR Income and Expenditure template below) and to modify this to meet

the individual institution's scenario requirements. This was linked to a 'key variables' sheet (recreated below from observing the template used at one institution). Depending upon how the spreadsheet cells were linked, the institution could then update its assumptions and assess how these fed through to the surplus/(deficit) or cash balances in each year. An example of the approach is shown below.

The intention was not to achieve precision within the model, but to provide an analysis that was 'roughly right' in order to encourage a discussion on the significant areas of risk. In some instances the output from the models was also linked to charts which offered a more visual impact of how the surplus or deficit moved as a result of changes.

The key variables included FTE numbers for home and EU and overseas students which were broken-down by cohort for each financial year. The total student FTEs were adjusted for potential withdrawals and multiplied by an average fee, thereby allowing the figures to be modelling at a more granular level. Pay expenditure could also be varied by staff numbers and percentage for pay inflation, pension and NI costs. These figures were linked to a separate staffing sub-model to arrive at a monetary value. Aspects of non-pay could be varied as required including monetary values for changes in annual expenditure, inflation percentages, and alterations to capital expenditure and the related depreciation.

Table VIII.3 Example of advanced scenario modelling

Income and expenditure account	Actual	Actual	Forecast	Forecast	Forecast	Forecast
	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
	£000	£000	£000	£000	£000	£000
<b>Income</b>						
1. Funding body grants	0	0	0	0	0	0
2. Tuition fees and education contracts	0	0	0	0	0	0
3. Research grants and contracts	0	0	0	0	0	0
4. Other income	0	0	0	0	0	0
5. Endowment and investment income	0	0	0	0	0	0
6. Total income	0	0	0	0	0	0
7. Less: share of income from joint venture(s)	0	0	0	0	0	0
8. Net income	0	0	0	0	0	0
<b>Expenditure</b>						
9. Staff costs	0	0	0	0	0	0
10. Other operating expenses	0	0	0	0	0	0
11. Depreciation	0	0	0	0	0	0
12. Interest and other finance costs	0	0	0	0	0	0
13. Total expenditure	0	0	0	0	0	0
14. Surplus/(Deficit)	0	0	0	0	0	0
15. Share of surplus/(deficit) in joint venture(s) and associates	0	0	0	0	0	0
16. Taxation	0	0	0	0	0	0
17. Minority interest	0	0	0	0	0	0
18. Exceptional items	0	0	0	0	0	0
19. Surplus/(deficit) for the year transferred to accumulated income in endowment funds	0	0	0	0	0	0
20. Surplus/(deficit) for the year retained within general reserves	0	0	0	0	0	0
Projected cash balances	0	0	0	0	0	0
changes to cash items	0	0	0	0	0	0
Revised cash balances	0	0	0	0	0	0

## Key variables

Actual	Actual	Forecast	Forecast	Forecast	Forecast
2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
£000	£000	£000	£000	£000	£000

### Tuition fees and education contracts

Full-time UG home and EU student FTEs						
Year 1	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX
Year 2	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX
Year 3	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX
Year 4	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX
Fee per FTE	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX
Withdrawal (%)	X.X	X.X	X.X	X.X	X.X	X.X
Inflation (%)	X.X	X.X	X.X	X.X	X.X	X.X

Non-EU domicile students						
Year 1	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX
Year 2	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX
Year 3	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX
Year 4	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX
Fee per FTE	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX
Withdrawal (%)	X.X	X.X	X.X	X.X	X.X	X.X
Inflation (%)	X.X	X.X	X.X	X.X	X.X	X.X

Full-time postgraduate home and EU	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX
Part-time fees - home and EU	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX

### Pay Expenditure

Staff numbers	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX
Pay award (%)	X.X	X.X	X.X	X.X	X.X	X.X
Pension costs (%)	X.X	X.X	X.X	X.X	X.X	X.X
NI costs (%)	X.X	X.X	X.X	X.X	X.X	X.X
SSR	XX	XX	XX	XX	XX	XX

### Non-pay expenditure

Supplies and services change	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX
Inflation						
Capital expenditure	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX
Depreciation rate (yrs)	XX	XX	XX	XX	XX	XX

## Best case worst case

An interviewee from a new university (former polytechnic) explained that the institution used an approach which involved constructing income and expenditure accounts under three conditions. A 'base' model was produced which reflected the expected outcome. This was restated under two different sets of assumptions to show a 'worst' and 'best' case scenario. Typically, these models

reflected changes to the likely recruitment for both home and EU and overseas students, alterations to research income and changes to significant aspects of expenditure, such as pay inflation, on-costs and numbers employed. Differing elements of non-pay costs were also varied. Of particular importance was the resulting surplus or deficit figure as the institution was about to undertake a significant redevelopment of its campus which would necessitate funding from a combination of new loans and internal resources.

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