Director Shareownership and Corporate Performance in South Africa

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Abstract

This paper investigates the relationship between director shareownership and corporate performance in South Africa using a sample of 169 listed firms from 2002 to 2007. Our results suggest a statistically significant and positive association between director shareownership and corporate performance. By contrast, we find no evidence of a non-linear effect of director shareownership on corporate performance. Our findings are robust across a raft of econometric models that control for different types of endogeneity problems and corporate performance proxies. Overall, our results provide support for agency theory, which suggests that director shareownership can reduce agency problems by aligning more closely the interests of shareholders and corporate executives, and thereby improving corporate performance.

Keywords: corporate governance, corporate performance, director shareownership, South Africa, endogeneity

Introduction

This paper examines the crucial policy question of whether director shareownership (*DOWN*) affects corporate performance in South Africa (SA). Agency theory has suggested a number of different mechanisms for resolving agency problems in modern corporations, whereby ownership is separate from control (Fama, 1980; Fama and Jensen, 1983a). In the main, these mechanisms consist of incentive alignment (i.e., director pay, options and shareownership) and monitoring (i.e., corporate governance, disclosure, and auditing) (Jensen and Meckling, 1976; Fama and Jensen, 1983b).

With specific respect to SA, close to two decades of incentive alignment and monitoring reforms have been pursued, mainly in the form of the 1994 and 2002 King Reports on corporate governance (CG) (Ntim *et al*., 2011, 2012). Consequently, the King Reports have generally focused on improving corporate performance by raising CG standards in SA firms (Ntim, 2011, 2012). More specifically, however, the central objective of the reforms has been to reduce agency costs by aligning the interests of shareholders with those of managers through: (i) enhancing the independence and monitoring capacity of SA boards; and (ii) providing them with appropriate incentives (King Committee, 2002).

An important proxy for measuring the degree of managerial interests' alignment with those of shareholders is *DOWN* (Morck *et al*., 1988; McConnell and Servaes, 1990). In fact, the ongoing extensive public policy (Lipton and Lorsch, 1992; Jensen, 1993) and academic (Agrawal and Knoeber, 1996; Vafeas and Theodorou, 1998; Himmelberg *et al.*, 1999; Andre, 2008) debate on the role and effectiveness of *DOWN* in reducing agency conflicts by aligning the interests of shareholders and managers indicates that *DOWN* may affect corporate performance. However, and whilst there is a theoretical consensus that *DOWN* can reduce agency costs and improve performance (Jensen and Meckling, 1976; Fama,

1980; Fama and Jensen, 1983a, b; Jensen, 1993), the empirical evidence on the impact of *DOWN* on performance is conflicting (Demsetz, 1985; Davies *et al*., 2005).

A number of reasons, however, have been offered that may explain the mixed results of prior studies. First, previous studies have been criticised for potential methodological weaknesses (Agrawal and Knoeber, 1996; Yermack, 1996; Beiner *et al.*, 2006), with a considerable number of them employing OLS, as well as not adequately addressing endogeneity problems (Demsetz and Lehn, 1985; Himmelberg *et al.*, 1999), and thereby resulting in misleading findings. Second, it has been suggested that the link between *DOWN* and corporate performance may not just vary by firm-specific characteristics (Cheung and Wei, 2006; Krivogorsky, 2006), but also by variations in country-specific CG and institutional heterogeneities (Short and Keasey, 1999; Kapopoulos and Lazaretou, 2007). Despite this issue, previous studies investigating the impact of *DOWN* on performance are primarily concentrated in a limited number of developed countries, which depicts comparatively similar institutional contexts (Hermalin and Weisbach, 1991; Laing and Weir, 1999; Weir and Laing, 2000; Demsetz and Villalonga, 2001).

However, and arguably, in emerging countries with different CG practices and institutional contexts, the effectiveness of *DOWN* may differ, and as such, the link between *DOWN* and performance can be expected to be different from what has been reported in developed countries. Therefore, an examination of the impact of *DOWN* on performance in a major developing African country, where there is acute dearth of empirical evidence will be critical in providing a more complete understanding of the effect of *DOWN* on performance (Cheung and Wei, 2006; Krivogorsky, 2006; Ntim and Osei, 2011).

Consequently, we investigate the link between *DOWN* and performance for a sample of SA listed firms. SA provides an interesting context to examine the impact of

DOWN on performance. Similar to other Anglo-American countries, SA has carried out CG reforms, mainly in the form of the King Reports with the main objective of reducing shareholder and managerial interests' divergence by enhancing the level of director monitoring and incentives (Ntim, 2009; Ntim *et al*., 2011). With particular respect to director incentives and shareownership, the 2002 King Reports encourage directors to hold shares of companies that they run in order to improve interests alignment, including specifying that the performance-related elements of director pay, such as vested shares and options should form a substantial part of the total director compensation.

However, the SA corporate context has unique characteristics (Ntim, 2009). These include: (i) greater institutional ownership; (ii) high block ownership, including government ones; (iii) weaker shareholder activism; and (iv) poor record of implementing and enforcing corporate laws (Ntim and Osei, 2011; Ntim, 2011, 2012). For instance, greater block ownership can limit the effectiveness of the market for corporate control (Ntim *et al*., 2011, 2012). Arguably, this can have severe implications on whether companies will engage in voluntary compliance with and disclosure of CG rules, including those relating to *DOWN*, which can potentially impair the capacity of a voluntary code to improve CG standards in SA. Thus, we contend that the rich research context in terms of the: (i) differences with developed countries; (ii) recent CG reforms carried out; and (iii) the severe dearth of past evidence, offer a compelling basis to examine the link between *DOWN* and corporate performance in SA listed firms.

Our study seeks to make a number of new contributions to the extant CG literature. First, using a sample of 169 SA listed firms from 2002 to 2007, we provide evidence on the link between *DOWN* and corporate performance. To the best of our knowledge, this represents one of the first attempts at modelling the impact of *DOWN* on corporate

performance within an African context, with particular reference to SA, and thus crucially extends the literature to that continent. It also contributes to the predominantly developed countries-based literature on the link between *DOWN* and corporate performance. Second, we examine whether *DOWN* is non-linearly related to the corporate performance. Finally, and unique from most past studies, we employ econometric techniques that sufficiently address different types of endogeneity problems and alternative corporate performance measures.

The rest of the paper is structured as follows. The next section reviews the extant literature on *DOWN* and corporate performance. The following sections present the data and research methodology, report empirical analyses and concluding remarks.

Literature Review: Theory, Evidence and Hypothesis Development

DOWN is an important CG mechanism that the theoretical literature suggests can reduce agency problems by aligning the interests of shareholders and managers (Jensen and Meckling, 1976; Fama and Jensen, 1983a, b), and thereby enhancing corporate performance. However, there are two contrasting theoretical propositions: convergence-of-interests and entrenchment.

Agency theory suggests that *DOWN* helps in reducing the conflicts of interest that exists between shareholders and managers (Jensen and Meckling, 1976; Fama, 1980; Jensen, 1993). Specifically, it is suggested that as the proportion of equity owned by directors increases, their interests and those of shareholders become more aligned and thus, the incentive to indulge in opportunistic behaviour diminishes (Agrawal and Knoeber, 1996; Vafeas and Theodorou, 1998). This is because the greater their financial stake in the form of *DOWN*, the greater the costs they will incur for not maximising shareholders wealth.

Consequently, directors who own large blocks of shares have additional incentive to actively monitor managerial actions that can help reduce agency costs and increase corporate performance.

However, another strand of the theoretical literature suggests director entrenchment as an alternative hypothesis to convergence-of-interests (Morck *et al*., 1988; McConnell and Servaes, 1990; Short and Keasey, 1999). The entrenchment hypothesis proposes that at low levels of *DOWN*, the competitive internal and external market forces (discipline) can help align the interests of directors with those of shareholders. However, it contends that at high *DOWN* levels, directors may hold sufficient voting power to protect themselves against such disciplinary forces, and therefore directors will prefer to pursue non-wealth maximising goals. This is because the private benefits in the form of perquisites consumption, such as guaranteed employment with attractive salaries that will accrue to directors are greater than the utility that they will obtain from pursuing optimal projects that will increase the wealth of all shareholders. This leads to director entrenchment in which other shareholders are unable to remove or influence the actions of the managing directors, even in the face of serious under performance or misbehaviour. In this case, the *DOWN*-performance link is expected to be negative.

Further, the theoretical literature suggests that combining the convergence-of-interests hypothesis with the entrenchment hypothesis gives rise to a non-linear director *DOWN*-performance link (Morck *et al*., 1988; McConnell and Servaes, 1990). This means that at low levels of *DOWN*, interests' alignment may help increase corporate performance. However, at high levels of *DOWN*, director entrenchment impedes beneficial takeovers, and thus decreases corporate performance.

Consistent with the conflicting nature of the theoretical literature, the empirical evidence on the *DOWN*-corporate performance association is mixed (Morck *et al*., 1988; Vafeas and Theodorou, 1998; Himmelberg *et al*., 1999; Davies *et al*., 2005). Specifically, a group of researchers reports positive relationship (Krivogorsky, 2006; Kapopoulos and Lazaretou, 2007), another documents negative association (Laing and Weir, 1999; Demsetz and Villalonga, 2001; Andre, 2008), while a third group finds a non-linear link between *DOWN* and corporate performance (Morck *et al*., 1988; Davies *et al*., 2005).

Morck *et al*. (1988) investigate the association between *DOWN* and corporate performance using a cross-sectional sample of 371 *Fortune* 500 US firms in 1980. They report a non-monotonic link between *DOWN* and corporate performance. This suggests that corporate performance first increases, then declines, and finally increases slightly, as *DOWN* increases. Specifically, Morck *et al*. (1988) document a statistically significant and positive *DOWN*-performance link at lower levels (0% to 5% - *interests convergence*), a statistically significant and negative relationship at moderate levels (5% to 25% - *entrenchment*), and additionally a statistically significant and positive association at higher levels (above 25% - *interests convergence*) of *DOWN*.

Their evidence suggests that at low levels of *DOWN*, interests alignment helps to increase corporate performance, while at high levels, director entrenchment negatively affects performance. Recent US and UK studies by McConnell and Servaes (1990), Hermalin and Weisbach (1991), Short and Keasey (1999), Weir and Laing (2000), and Davies *et al*. (2005) have supported the non-monotonic *DOWN*-performance link.

By contrast, using a sample of 87 Greek listed firms, Krivogorsky (2006) report that *DOWN* impacts positively on corporate performance. Consistent with the evidence of Krivogorsky (2006), Kapopoulos and Lazaretou (2007) document a positive association

between *DOWN* and performance in a sample of 175 Greek listed firms. This suggests that the market perceives *DOWN* to be providing extra incentive to enhance performance.

A third stream of empirical papers documents no relationship between *DOWN* and corporate performance. For example, Demsetz and Lehn (1985) report no cross-sectional link between *DOWN* and corporate performance for 511 US listed firms from 1984 to 1989. Re-examining previous US evidence using a sample of 600 listed firms from 1984 to 1992, Himmelberg *et al*. (1999) report a spurious correlation between *DOWN* and corporate performance. They find that a large fraction of the cross-sectional variation in *DOWN* is explained by firm-level characteristics like size, cash flow, capital, and advertising intensity, amongst others. They suggest that *DOWN* is rather endogenous in corporate performance regressions, casting serious doubts on prior US evidence that indicates that managerial ownership is exogenously related to corporate performance.

Despite the conflicting empirical evidence, and as has previously been discussed, the King Reports encourage directors to hold shares of companies that they manage, including specifying that the performance-related elements of directors' remuneration, such as stock options should constitute a substantial portion of their total remuneration package in order to align their interests with those of shareholders. It should also be designed to provide incentives to directors to perform at the highest operational levels. This indicates that the King Reports expect *DOWN* to have a positive impact on corporate performance, and thus our main hypothesis is that.

H_1: There is a statistically significant and positive relationship between *DOWN* and corporate performance.

Data and Research Methodology

Sample and Data

Our initial samples consisted of a total of 402 firms from ten industries that were listed on the JSE as at 31 December 2007. The industries included basic materials, consumer goods, consumer services, financials, health care, industrials, oil & gas, technology, telecoms, and utilities. We excluded 111 financials and utilities due to regulatory and capital structure reasons. This limited our sample to 291 firms from eight non-financial industries. Financial and CG data were needed to investigate the link between *DOWN* and corporate performance. The CG variables were extracted from the sampled firms' annual reports. The annual reports were downloaded from the *Perfect Information Database*. The financial data was obtained from *DataStream*. We set two main criteria for the firms that were included in our final sample to meet: the accessibility to a company's complete five-year annual reports from 2002 to 2006; and the availability of a company's corresponding financial data from 2003 to 2007.[1]

Our sample inclusion criteria were set for a number of reasons. First, and in line with past studies (Henry, 2008; Beiner *et al*., 2006), the criteria ensured that the requirements for a balanced panel data analysis were met. A number of advantages that can be obtained for using panel data include having: (i) both time-series and cross-sectional observations; (ii) more degrees of freedom; and (iii) less multi-collinearity among the variables (Gujarati, 2003; Wooldridge, 2010). Second, an investigation of five-year data with both cross-sectional and time-series properties may help in ascertaining whether the observed cross-sectional link between *DOWN* and corporate performance holds over-time

[1]Corporate board decisions take time to reflect in corporate performance (Laing and Weir, 1999; Ntim and Osei, 2011). Thus, to circumvent potential endogenous link between *DOWN* and corporate performance, we introduce a one year lag between *DOWN* and corporate performance such that this year's corporate performance depends on last year's CG structure, as specified in equation (1). The sample also begins from 2002 for two reasons. First, second King Report became operational in 2002, and secondly, data coverage in *Perfect Information/DataStream* on SA listed firms was low until 2002. The sample ends in 2007 because it is the year for which data was available.

(Agrawal and Knoeber, 1996; Ntim *et al*., 2012). This can also permit direct comparisons to be drawn with the findings of previous studies (Davies *et al*., 2005; Cheung and Wei, 2006). Applying our sample selection criteria, the complete data needed for our empirical analysis was obtained for a total of 169 firms over five-firm years and 8 industries.

Variables: Dependent, Independents and Controls

This subsection presents all the three main types of variables that we use in our empirical examination. First, our main independent variable is *DOWN*. Second, Tobin's Q (*Q*) is our main dependent variable, but as a robustness check, we employ return on assets (*ROA*) and total share return (*TSR*) to ascertain how robust are results are to alternative accounting and market-based corporate performance measures, respectively. Finally, and following past studies (Morck *et al*., 1988; McConnell and Servaes, 1990), we include below a number of control variables.

First, companies with greater investment opportunities tend to grow faster (Henry 2008; Ntim and Osei, 2011), and are more likely to generate higher corporate performance. Thus, our prediction is that sales growth (*GROWTH*) will relate positively to corporate performance. Second, companies with higher investment in research and development can gain competitive advantages (Yermack, 1996; Short and Keasey, 1999), and thus may be able to generate higher corporate performance. By contrast, research and development is capital intensive activity (Weir and Laing, 2000; Demsetz and Villalonga, 2001), and therefore may impact negatively on corporate performance.

Also, greater debt usage can improve corporate performance by effectively minimising managerial ability to expropriate 'free cash flows' (Jensen 1986; Ntim, 2012). In contrast, greater use of debt can increase bankruptcy risks, and impact negatively on corporate performance by minimising the ability of companies to utilise growth

opportunities (Jensen, 1986; Ntim *et al*., 2011). Similarly, and due to higher agency problems, larger companies can be expected to have good CG mechanisms (Agrawal and Knoeber, 1996; Beiner *et al*., 2006), and therefore may impact positively on corporate performance. By contrast, smaller companies tend to have greater investment and growth opportunities (Beiner *et al*., 2006; Guest, 2009), and therefore may be able to generate higher corporate performance. As a result of the mixed theoretical expectations, we predict that gearing (*GEAR*), capital expenditure (*CAPEX*) and firm size (*LNTA*) will either have a negative or positive impact on corporate performance.

Third, companies that are cross-listed on international stock markets are more likely to have greater access to funds and investment opportunities (Ntim, 2009; Ntim *et al*., 2012), and therefore may have a positive effect on corporate performance. Therefore, we expect that cross-listing (*CROSLIST*) will be positively associated with corporate performance. Fourth, it has been suggested that audit firm size is positively related to auditor independence and audit quality (DeAngelo, 1981; Ntim and Osei, 2011), and thus companies audited by large audit firms may have a positive impact on corporate performance. Thus, we hypothesise that audit firm size (*BIG4*) will be positively associated with corporate performance.

Fifth, as government ownership provides access to critical resources, such as finance and profitable government contracts (Ntim *et al*., 2011; Ntim, 2012), we hypothesise that government ownership (*GOVOWN*) will correlate positively with corporate performance. Sixth, companies that voluntarily set-up CG committee to specifically monitor CG standards may have higher ability to reduce managerial ability to expropriate corporate resources (Ntim *et al*., 2011; Ntim and Osei, 2011), and thus may generate higher corporate performance. Hence, we predict that the presence of a CG

committee (*CGCOM*) will be positively associated with corporate performance. Finally, and in line with past studies (Beiner *et al*., 2006; Henry, 2008; Guest, 2009), we hypothesise that corporate performance will differ across different industries and financial years. Therefore, we include industry (*INDUST*) dummies for the 5 remaining industries[2]: basic materials and oil & gas; consumer goods; consumer services and health care; industrials; and technology & telecoms; and year (*YD*) dummies for the financial years 2003 to 2007.

Empirical Analyses

Summary Descriptive Statistics

Table 1 contains full definitions and summary descriptive statistics of all variables that we employ in carrying out our empirical investigation. All values generally indicate a wide spread. For example, and in line with the findings of Beiner *et al*. (2006), Henry (2008) and Guest (2009), *Q* ranges from a minimum of 0.58 and a maximum of 3.58 with mean of 1.52, depicting wide spread. *DOWN* also displays wide variation, ranging from a minimum of 0% to a maximum of 100% with an average of 19%. The alternative corporate performance measures (i.e., *ROA* and *TSR*), and the control variables (i.e., *BIG4*, *CAPEX*, *CGCOM*, *CROSLIST*, *GEAR*, *GOVOWN*, and *GROWTH*) indicate wide spread, implying that our sample has been sufficiently selected to achieve adequate variation, and thus eschews any possibilities of sample selection bias.

Insert Table 1 about here

[2] As there was insufficient number of observations in 3 industries, namely health care, oil and gas, and telecoms industries with three, one and three listed companies, respectively, were merged with the closest remaining five major industries. Consequently, the three *health care* companies were included in the *consumer services* industry, the one *oil and gas* firm was added to the *basic materials* industry, whilst the three *telecoms* firms were also shared out to the *technology* industry.

We also tested linear regression assumptions of multicollinearity, autocorrelation, normality, homoscedasticity, and linearity. We tested the multicollinearity assumption by carrying out the Spearman non-parametric and Pearson parametric bivariate correlation tests among the variables. The results, which for brevity not reported, but available upon request, suggested that no serious non-normalities and multicollinearities existed among the variables. In addition, we examined scatter, *P-P* and *Q-Q* plots, studentised residuals, Cook's distances and Durbin-Watson statistics of the variables, and the tests also indicated no serious violation of the linear regression assumptions of homoscedasticity, linearity, normality and autocorrelation, suggesting that it is appropriate to carry out multivariate regression analyses.

Multivariate Regression Analyses

Companies tend to differ in the challenges and prospects that they encounter over time (Henry, 2008; Ntim *et al*., 2012). This can lead to situation whereby *DOWN* and *Q* are jointly and dynamically determined by company-level heterogeneities, such as corporate complexity, culture and managerial talent (Guest, 2009; Ntim, 2009), which simple OLS regressions may fail to identify (Gujarati, 2003; Wooldridge, 2010), and thereby leading to misleading results (Agrawal and Knoeber, 1996; Beiner *et al*., 2006). Thus, given the panel nature of our data, as well as in line with past studies (Henry, 2008; Guest, 2009; Ntim *et al*., 2012), we carry out fixed-effects regressions in order to address possible unobserved company-level characteristics. We start our analysis with basic fixed-effects regression specified as follows:

$$Q_{it} = \alpha_0 + \beta_1 DOWN_{it-1} + \sum_{i=1}^{n} \beta_i CONTROLS_{it-1} + \delta_{it-1} + \varepsilon_{it-1} \quad (1)$$

where: *Q* is the dependent variable, *DOWN* is the independent variable, *CONTROLS* refers

to the control variables, including *BIG4*, *CAPEX*, *CGCOM*, *CROSLIST*, *GEAR*, *GOVOWN*, *GROWTH*, *INDUST* and *YD*, and δ refers to the company-level fixed-effects, consisting of a vector of 168 year dummies to represent the 169 sampled companies.

Table 2 contains fixed-effects regressions results of the impact of *DOWN* on *Q*. First, to determine whether *DOWN* affects *Q*, we regress *Q* on the *DOWN* excluding the control variables using equation (1). Statistically significant and positive effect of *DOWN* on *Q* is noticeable in Model 1 of Table 2. However, the coefficient on the constant term is statistically significant, suggesting that there may be omitted variables bias. Thus, to ascertain whether our evidence is spuriously caused by omitted variables bias, we re-run equation (1) by including the control variables. The coefficient of *DOWN* on *Q* in Model 2 of Table 2 is statistically significant and positive, and thereby providing support for H_1, as well as the recommendations of the King Reports.

Our evidence also provides support for the results of past studies (Krivogorsky, 2006; Kapopoulos and Lazaretou, 2007) that report a positive association between *DOWN* and corporate performance, but inconsistent with those that report a negative effect of *DOWN* on corporate performance (Laing and Weir, 1999; Demsetz and Villalonga, 2001). Theoretically, our results provide support for agency theory, which suggests that *DOWN* can reduce agency problems by aligning more closely the interests of shareholders and corporate executives, and thereby improving corporate performance.

Second, and to explore possible non-linear association between *DOWN* and corporate performance, as suggested by Morck *et al*. (1988), we re-estimate equation (1) by replacing *DOWN* with $DOWN^2$. Positive, but statistically insignificant impact of $DOWN^2$ on *Q* is observable in Model 3 of Table 2. However, the coefficient on the constant term in Model 3 of Table 2 is statistically significant and seems to suggest that the model may be

suffering from omitted variables bias. Thus, to ascertain whether our results are not falsely driven by omitted variables bias, we add the control variables in Model 4 to address potential omitted variables bias. Positive, but statistically insignificant effect of $DOWN^2$ on Q is still clearly noticeable in Model 4 of Table 2. As further check, we investigate additional non-monotonic link between *DOWN* and performance by cubing ($DOWN^3$) instead of squaring *DOWN* with the results presented in Model 5 of Table 2 being similarly statistically insignificant, and thereby failing to provide support for H_1, as well as the results of past studies that report significant curvilinear association between *DOWN* and corporate performance (McConnell and Servaes, 1990; Davies *et al*., 2005; Cheung and Wei, 2006).

Insert Table 2 about here

Finally, and the coefficients on the control variables in Models 2, 4 and 5 of Table 2 are generally consistent with our hypotheses. For instance and as predicted, the coefficients on *CAPEX*, *GEAR* and *LNTA* are statistically significant and negatively related to *Q*, whereas *BIG4*, *CGCOM*, *CROSLIST*, *GOVOWN* and *GROWTH* are statistically significant and positively associated with *Q*, in Models 2, 4 and 5. Finally, the *F*-values in Models 2 to 5 of Table 2 consistently reject the null hypothesis that the coefficients on the main independent and the control variables are equal to zero. Similar to the results of previous studies (Yermack, 1996; Beiner *et al*., 2006), the adjusted R^2 is between 2% and 30%, indicating that our fixed-effects regressions can explain significant differences in our sampled companies' *Q*.

Robustness Analyses

Our fixed-effects estimations so far do not take into account the presence of potential endogeneity problems and alternative corporate performance measures. This

implies that our evidence of a significant positive link between *DOWN* and corporate performance, for instance, may be spurious. In this subsection, we investigate how sensitive our results are to the presence of: (i) alternative corporate performance measures; and (ii) endogeneity problems.

First, and as previously noted, we investigate the robustness of our findings to two alternative corporate performance measures: return on assets (*ROA* – an accounting based proxy) and total share returns (*TSR* – a market based measure). Models 6 and 7 of Table 2 present findings obtained by using *ROA* and *TSR*, respectively, instead of *Q*. Statistically significant and positive effect of *DOWN* on *ROA* and *TSR* in models 6 and 7 of Table 2, respectively, is observable, and thereby indicating that our results are robust to the use of either an accounting (*ROA*) or a market (*TSR*) based corporate performance measure, instead of *Q*.

Second, to account for additional endogeneity problems that may arise due to omitted variables, we conduct the widely applied two-stage least squares (*2SLS*) technique (Beiner *et al*., 2006; Henry, 2008). However, to make sure that the *2SLS* methodology is appropriate, and following Agrawal and Knoeber (1996) and Beiner *et al*. (2006), we first carry out Durbin-Wu-Hausman exogeneity test (see Beiner *et al*., 2006, p. 267) to determine whether an endogenous link exists between *DOWN* and *Q*. Applied to equation (1), the test rejects the null hypothesis of exogeneity, and thus we conclude that the *2SLS* technique may be appropriate and that our earlier results based on the fixed-effects regressions may be misleading. In the first stage, we conjecture that *DOWN* will be determined by the control variables specified in equation (1). In the second stage, we employ the predicted portion of the *DOWN* (*PRE_DOWN*) as an instrument for the *DOWN* and re-estimate equation (1) as specified below:

$$Q_{it} = \alpha_0 + \hat{\beta}_1 DOWN_{it} + \sum_{i=1}^{n} \beta_i CONTROLS_{it} + \delta_{it} + \varepsilon_{it} \quad (2)$$

whereby everything remains unchanged as specified in equation (1)[3] except that we use the predicted *DOWN* (*PRE_DOWN*) from the first-stage regression as an instrument for the *DOWN*. Statistically significant and positive effect of the *PRE_DOWN* on *Q* is clearly observable in Model 8 of Table 2, and thereby suggesting that our evidence of a positive effect of *DOWN* on *Q* is robust to endogeneity problems that may be caused by potential omitted variables. Overall, the robustness analyses indicate that our results are fairly robust to different types of potential endogeneity problems and alternative corporate performance measures.

Summary and Conclusion

This paper has investigated the association between director shareownership (*DOWN*) and corporate performance using a sample of 169 South African (SA) listed firms from 2002 to 2007. This coincides with a period during which the SA authorities pursued incentive alignment and corporate governance (CG) reforms that primarily focused on raising CG standards in SA firms, primarily in the form of the 1994 and 2002 King Reports. More specifically, the reforms have focused on reducing agency costs by aligning the interests of shareholders and executives, as well as improving the independence and monitoring capacity of corporate boards, and thereby enhancing corporate performance.

Our results suggest a statistically significant and positive association between *DOWN* and corporate performance. By contrast, we find no evidence of a non-linear effect of *DOWN* on corporate performance. Our findings are robust across a raft of econometric

[3] As estimating a lagged structure will invalidate the *Durbin-Wu-Hausman* test (Gujarati, 2003; Wooldridge, 2010), we estimate equation (2) as un-lagged structure. An additional advantage is that it allows us to ascertain the robustness of our results against estimating an un-lagged structure.

models that control for different types of endogeneity problems and corporate performance proxies. Overall, our results provide support for agency theory, which suggests that *DOWN* can reduce agency problems by aligning more closely the interests of shareholders and corporate executives, and thereby improving corporate performance.

Our evidence also has important policy and regulatory implications. Whereas our evidence that high levels of *DOWN* impacts positively on corporate performance provides support for the recommendations of the King Reports, the relatively low levels of *DOWN* among the sampled firms indicates that there is the need to strengthen compliance and enforcement. In this case, setting-up a "compliance and enforcement committee" to regularly encourage and monitor the levels of compliance among listed firms may help in improving CG standards by enhancing incentive and monitoring mechanisms in SA.

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Table 1

Summary Descriptive Statistics of All Variables for All 845 Firm Years

Variable	Mean	Median	S.D.	Maximum	Minimum
Panel A: Corporate Performance (Dependent) variables					
Q	1.52	1.33	0.69	3.58	0.58
ROA (%)	10.26	10.97	12.21	36.55	-23.19
TSR (%)	33.57	29.60	48.68	173.41	-55.20
Panel B: Corporate governance (Independent) variable					
DOWN (%)	19.24	88.73	18.25	100.00	0.00
Panel C: Control variables					
BIG4 (%)	73.25	100.00	44.29	100.00	0.00
CAPEX (%)	11.08	6.28	13.86	64.46	0.00
CGCOM (%)	35.80	0.00	48.00	100.00	0.00
CROSLIST (%)	21.66	0.00	41.21	100.00	0.00
GEAR (%)	34.78	14.63	55.02	270.65	0.00
GOVOWN (%)	38.00	0.00	49.00	100.00	0.00
GROWTH (%)	14.40	12.60	24.94	88.26	-41.88
LNTA	5.95	5.97	0.89	7.60	4.08

Notes: Variables are defined as follows: Tobin's Q (*Q*), measured as the ratio of total assets minus book value of equity plus market value of equity to total assets. Return on assets (*ROA*), defined as the ratio of operating profit to total assets. Total shareholder returns (*TSR*), calculated as annualised total share returns made up of share price and dividends. Director shareownership (*DOWN*), measured as the percentage of common shares held by all directors. Audit firm size (*BIG4*), measured as a dummy variable that takes the value of 1, if a firm is audited by a big four audit firm (PricewaterhouseCoopers, Deloitte & Touché, Ernst & Young, and KPMG), 0 otherwise. Capital expenditure (*CAPEX*), calculated as the ratio of total capital expenditure to total assets. Cross-listing (*CROSLIST*), measured as a dummy variable that takes the value of 1, if a firm is cross-listed to a foreign stock market, 0 otherwise. The presence of a corporate governance committee (*CGCOM*), defined as a dummy variable that takes the value of 1, if a firm has set up a corporate governance committee, 0 otherwise. Gearing (*GEAR*), calculated as the ratio of total debts to market value of equity. Government ownership (*GOVOWN*), measured as a dummy variable that takes the value of 1, if government ownership is at least 5%, 0 otherwise. Sales growth (*GROWTH*), calculated as the current year's sales minus last year's sales to last year's sales. Firm size (*LNTA*), measured as the natural log of total assets.

Table 2

Fixed-Effects Regressions of the Impact of Director Shareownership on Corporate Performance

Dependent variables	*Q*	*Q*	*Q*	*Q*	*Q*	*ROA*	*TSR*	*2SLS (Q)*
Adjusted R^2	0.035	0.296	0.018	0.249	0.257	0.310	0.335	0.342
F-value	5.062***	7.380***	3.470***	6.573***	6.709***	8.236***	8.497***	8.659***
(*N*)	(845)	(845)	(845)	(845)	(845)	(845)	(845)	(845)
Constant	1.360***	1.686***	1.197***	1.412***	1.470***	-0.194	2.358***	1.798***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.482)	(0.000)	(0.000)
Independent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
DOWN	0.054***	0.049***	-	-	-	0.520***	0.563***	-
	(0.000)	(0.010)	-	-	-	(0.000)	(0.000)	-
$DOWN^2$	-	-	0.002	0.004	-	-	-	-
	-	-	(0.594)	(0.548)	-	-	-	-
$DOWN^3$	-	-	-	-	0.006	-	-	-
	-	-	-	-	(0.520)	-	-	-
PRE_DOWN	-	-	-	-	-	-	-	0.064***
	-	-	-	-	-	-	-	(0.000)
Control variables								
BIG4	-	0.145**	-	0.195***	0.157**	0.210***	0.243***	0.220***
	-	(0.016)	-	(0.000)	(0.015)	(0.000)	(0.000)	(0.000)
CAPEX	-	-0.014***	-	-0.010**	-0.013***	-0.062***	-0.009**	-0.018***
	-	(0.000)	-	(0.011)	(0.000)	(0.000)	(0.014)	(0.000)
CGCOM	-	0.203***	-	0.256***	0.195***	1.193**	2.092***	0.265***
	-	(0.000)	-	(0.000)	(0.000)	(0.016)	(0.000)	(0.000)
CROSLIST	-	0.112*	-	0.278***	0.112*	0.374**	0.896***	0.298***
	-	(0.055)	-	(0.000)	(0.054)	(0.030)	(0.000)	(0.000)
GEAR	-	-0.024***	-	-0.009**	-0.026***	-0.540***	-0.026*	-0.023***
	-	(0.000)	-	(0.017)	(0.000)	(0.000)	(0.053)	(0.000)
GOVOWN	-	0.109**	-	0.302***	0.102**	3.411***	3.590***	0.420***
	-	(0.015)	-	(0.000)	(0.025)	(0.000)	(0.000)	(0.000)
GROWTH	-	0.128**	-	0.186***	0.123**	0.260***	0.310***	0.206***
	-	(0.011)	-	(0.000)	(0.016)	(0.000)	(0.000)	(0.000)
LNTA	-	-0.140**	-	-0.297***	-0.140**	-2.821***	-2.976***	-0.390***
	-	(0.013)	-	(0.000)	(0.013)	(0.000)	(0.000)	(0.000)
INDUST	-	Included	-	Included	Included	Included	Included	Included
YD	-	Included	-	Included	Included	Included	Included	Included

Notes: Coefficients are on top of *p*-values in parenthesis. ***, ** and * indicate that *p*-value is significant at the 1%, 5% and 10% level, respectively. Following Petersen (2009), coefficients are estimated by using the robust clustered standard errors technique. Variables are defined as follows: Tobin's (*Q*), return on assets (*ROA*), total share return (*TSR*), the percentage of director shareownership (*DOWN*), *DOWN* squared ($DOWN^2$), *DOWN* cubed ($DOWN^3$), predicted *DOWN* (*PRE_DOWN*) – obtained by regressing *DOWN* on the control variables and used as an instrument for the *DOWN* in model 8, audit firm size (*BIG4*), capital expenditure (*CAPEX*), the presence of a corporate governance committee (*CGCOM*), cross-listing (*CROSLIST*), gearing (*GEAR*), government ownership (*GOVOWN*), firm size (*LNTA*), industry dummies (*INDUST*), and year dummies (*YD*). Table 1 fully defines all the variables used.