

Corporate governance and financial performance in the midst of exogenous shocks: A study of companies listed on the Johannesburg Stock Exchange

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ABSTRACT

This study investigates the impact of corporate governance on financial performance in the wake of exogenous shocks such as corporate governance reforms and the 2007/8 global financial crisis. The nexus is examined in the context of listed firms in the African emerging economy of South Africa – a jurisdiction with a history of implementing international best practices in corporate governance. Three significant patterns emerged. First, corporate governance structures function differently in crisis and non-crisis periods. Generally, some corporate governance attributes exert a positive impact on financial performance during steady-state periods and provide a hedging mechanism during crisis periods. Secondly, accounting returns appear to favour stewardship theory, while market returns seem to favour agency and resource dependency theories. The results point to an important issue, which is the need to re-evaluate corporate governance, not only during stable periods but also during turbulent times, and to evaluate the ability of corporate governance structures to perform effectively under such different conditions. Crafting a robust corporate governance structure well in advance of a crisis could be beneficial. Uniquely, the results indicate that the relationship between corporate governance and financial performance is of a dynamic nature and suitable for estimation techniques such as the two-staged least squares (2SLS), the generalised method of moments (GMM) and generalised least squares (GLS).

well as from policymakers. This increased interest is attributable to scandals and failures that have led to some companies having to close down. Even though the literature on corporate governance is extensive, there has not been any consensus on the relationship between internal corporate governance and financial performance. In the main, the lack of congruence has been attributed to inadequate estimation methods, endogeneity inherent in corporate governance studies, economic periods and country-specific differences.

In addition, the 2007/8 global financial crisis also heightened the interest in corporate governance. Proponents of corporate governance argue that the financial crisis was an exogenous shock that hit poorly-governed companies more than their better-managed counterparts. On the other hand, critics of corporate governance blame the global financial crisis squarely on poor corporate governance. Against this background, it is important to understand the relationship between effective internal corporate governance and financial performance in the wake of exogenous shocks such as corporate governance reforms and the 2007/8 global financial crisis, whilst being cognisant of endogeneity issues, prevailing economic circumstances and the estimation methods used to investigate these phenomena.

South Africa is an interesting domain for this study. Unlike many African countries, South Africa is ahead of most African emerging markets in the implementation and enforcement of corporate governance standards (African Corporate Governance Network, 2016). The Johannesburg Stock Exchange (JSE) continues to dominate the sub-Saharan Africa (SSA) region, representing 38 per cent of all listed companies and 83 per cent of total market capitalisation in the region in 2012 (World Bank, 2013). As a result, South Africa, and therefore the JSE, is an appropriate choice for this study.

INTRODUCTION

In the past two decades, corporate governance has received much attention from academics, investors and managers as

Effective internal corporate governance attributes are expected to enhance company performance during normal economic times by effectively monitoring directors and ensuring that their interests and those of shareholders are synchronised (Afrifa and Tauringana, 2015). However, the cogency of these expectations in abnormal economic times, such as a financial crisis has been questioned (Van Essen, Engelen and Carney, 2013).

The literature also attributes the mixed results of corporate governance studies to potential endogeneity problems, which can significantly affect empirical corporate governance findings (Afrifa and Tauringana, 2015). In order to overcome the problem of endogeneity, this study utilises several robust alternative specifications and estimation techniques for analysis purposes, which include generalised method of moments (GMM), two-staged least squares (2SLS) and generalised least squares (GLS), with the latter emerging as the more effective estimator in this study based on displaying the smallest residuals (S^2) and the highest adjusted R^2 as well as the size of the F-value. In addition, to reduce the potential endogeneity problem of simultaneity, which is the most common endogeneity problem in corporate governance research (Larcker and Rusticus, 2010), the study lags all independent variables and investigates the association between changes in the independent variables and the dependent variable, based on the studies of Afrifa and Tauringana (2015) and Mina, Lahr and Hughes (2013).

An important issue in most corporate governance empirical studies is its dynamic nature, which introduces another source of endogeneity, namely dynamic endogeneity (Wintoki, Linck and Netter, 2012). To obviate this problem and similar to the studies of Ayadi, Ojo, Ayadi and Adetula (2015) as well as Schultz, Tan and Walsh (2010), the effect of historical performance on current governance is considered when estimating the empirical models.

The study is novel because it is the first to explore the relationship of corporate governance with financial performance using a dynamic modelling approach for the South African market during three different economic periods. First, the findings of the study significantly contribute towards a better understanding of international diversity in corporate governance by providing empirical evidence from the African emerging markets, before, during and after the global financial crisis. The period of this study is unique, because it covers a relatively stable economic period before the financial crisis, a challenging and unstable period of time when the financial crisis materialised, followed by the aftermath of the financial crisis. The period of the study also covers the two corporate governance reforms in South Africa, namely the King II Report in 2002 and the King III Report in 2009, as well as the new Companies Act No. 71 of 2008.

Secondly, the study departs from the conventional system of prior studies of related literature by using a range of measures of corporate governance instead of solely focusing on a single-measure framework. In addition, the performance metrics are represented by both accounting-based and market-based measures.

CORPORATE GOVERNANCE AND FINANCIAL PERFORMANCE

One of the hedging mechanisms that shareholders rely upon is effective internal corporate governance structures. Corporate governance refers to mechanisms that are in place to ensure that an agency relationship is nurtured. This section reviews the empirical literature on the relationship between corporate governance characteristics and financial performance. Based on this review, the hypotheses on the effect of board size, board independence, the presence of key board committees, board activity, board diversity and leadership structure on financial performance are developed. These hypotheses are derived from agency theory, resource dependency theory and stewardship theory.

Board size and financial performance

The issue of board size as a corporate governance mechanism has received considerable attention in recent years from academics, regulators and market participants. It continues to receive attention because empirical evidence of the impact of board size on financial performance is inconclusive (Johl, Kaur and Cooper, 2015; Uadiale, 2010), and even fundamental theories of corporate governance are inconsistent. For instance, agency theory predicts an inverse relationship between board size and financial performance (Jensen, 1993), while the resource dependence theory foresees a positive relationship (Dalton, Daily, Johnson and Ellstrand, 1999).

From the perspective of agency theory, Jensen (1993) argues that bloated boards are less likely to function effectively and recommends that the optimal size of the board should be eight members. These sentiments are supported by Lipton and Lorsch (1992) as well as Sonnenfeld (2002), among others. An opposing view by Dalton *et al.* (1999) is that, according to resource dependency theorists, a large board leads to better financial performance.

Given the conflicted prediction on the relationship between board size and financial performance, the first hypothesis addressed by this study is:

H0¹: There is no relationship between board size and financial performance

H1: There is a positive relationship between board size and financial performance.

Board independence and financial performance

There are a few South African studies that investigated the relationship between independent non-executive directors (INEDs) and financial performance. For the purposes of this study, board independence is defined as the extent or proportion of independent non-executive directors serving on a board of directors. Some of the studies conducted in South Africa on the subject are those by Meyer and De Wet (2013), Muchemwa, Padia and Callaghan (2016), Ntim (2011), Pamburai, Chamisa, Abdulla and Smith (2015), Semosa (2012) as well as Tshipa and Mokoaleli-Mokoteli (2015b). Consistent with the conflicting nature of the theoretical literature on INEDs, empirical evidence of the relationship between the percentage of INEDs and financial performance is mixed. In fact, there are three streams of research: the first stream of research posits a positive correlation between the proportion of outside directors and financial performance (Gupta and Fields, 2009; Lin and Chang, 2014; Ntim, 2011; Pamburai *et al.*, 2015), the second stream of research reports no correlation between compositional independence and financial performance (Burton, 2000; Wintoki *et al.*, 2012), while the third stream of research highlights an inverse relationship (Vintilă and Gherghina, 2013; Wahba, 2015).

Based on these considerations, the second hypothesis is proposed as follows:

- H0²: There is no relationship between board independence and financial performance
- H2: There is a positive relationship between board independence and financial performance

Presence of board committees and financial performance

Board committees are a critical aspect to the financial wellbeing of a company as they render a monitoring service to the board. This is because critical processes and decision-making are not done at a board level but at a committee level such as the nomination committee, audit and risk committee and the remuneration committee (Dalton *et al.*, 1999). To this end, the establishment of board sub-committees has been strongly recommended as a suitable mechanism for improving corporate governance, by delegating specific tasks from the main board to a smaller group and harnessing the contribution of non-executive directors (Spira and Bender, 2004).

To investigate the impact of the existence of board committees on financial performance, the third hypothesis is proposed:

- H0³: There is no relationship between the existence of board committees and financial performance
- H3: There is a positive relationship between the existence of board committees and financial performance

Board activity and financial performance

One aspect in relation to the board internal structure is board activity (Arosa, Iturralde and Maseda, 2013). Following Jackling and Johl (2009) as well as Pamburai *et al.* (2015), one way to measure board activity is the frequency of board meetings during a year. The frequency of the meetings can be a factor that may help to assess whether the board of directors is an active or a passive board.

There is limited evidence of the relationship between board activity and financial performance. Secondly, the limited evidence is also conflicting, which makes the frequency of board meetings and financial performance association an area worthy of further research. For instance, in a six-year study between 1999 and 2005, Brick and Chidambaram (2010) investigated the relationship between board monitoring activity and company value, using a sample that consisted of 5 228 firm-year observations. They found that board activity (i.e. board meetings) had a positive impact on company value. According to Agyemang, Antwi and Frimpong (2014), this finding implies that, as the number of board meetings increases, the monitoring and advisory role of boards improves, translating into improved financial performance. In contrast, El Mehdi (2007) found that the frequency of board meetings was not associated with economic performance, using a small sample of 24 Tunisian listed companies studied between 2000 and 2005.

Based on this review, the fourth hypothesis is put forward:

- H0⁴: There is no relationship between board activity and financial performance
- H4: There is a positive relationship between board activity and financial performance

Board diversity and financial performance

Boards of directors are becoming more and more gender-balanced across the world due to the increased pressure of legislators, regulators, advocacy groups and institutional investors (Kumar and Zattoni, 2016). Board diversity is broadly defined as a board with members having various attributes, such as age, gender, ethnicity, culture, religion, constituency representation, independence, knowledge, educational and professional background, technical skills and expertise, commercial and industry experience, and career and life experience (Van der Walt and Ingley, 2003). This study confines itself to board diversity in terms of gender and ethnicity.

There are mixed theoretical propositions on the impact of board diversity on financial performance: those who argue for more diversity in boardrooms and those who are in favour of corporate monoculture and boardroom uniformity. Some studies found positive links between increased board diversity and financial performance

(Ayadi *et al.*, 2015; Julizaerma and Sori, 2012; Kim, Pantzalis and Park, 2013; Lückerath-Rovers, 2013; Nielsen and Nielsen, 2013; Taljaard, Ward and Muller, 2015; Zhang, 2012), while others found no relationship (Jhunjhunwala and Mishra, 2012; Mahadeo, Soobaroyen and Hanuman, 2012). Yet, other authors still indicated that increased levels of diversity could be detrimental to financial performance (Akpan and Amran, 2014; Carter, D'Souza, Simkins and Simpson, 2010).

To address the issue of board diversity, the following hypothesis is proposed:

H0⁵: There is no relationship between board diversity and financial performance

H5: There is a positive relationship between board diversity and financial performance

Leadership structure and financial performance

Leadership structure is defined as CEO duality if one person occupies both the position of CEO and chairperson, and CEO non-duality refers to when the positions are separated (Yasser and Al Mamun, 2015). The evidence of the relationship between CEO duality and financial performance is mixed (Gill and Mathur, 2011; Moscu, 2013). According to agency theory, CEO duality exerts a negative influence on financial performance as it compromises the monitoring and control of the CEO. However, in the last few years, many companies have converted from the dual CEO leadership structure to a non-dual structure, while a much smaller number of companies converted in the opposite direction (Moscu, 2013). Hence the problem of the desirability of separating the roles of CEO and chairperson of the board still seems unresolved. Interestingly, Yang and Zhao (2014) report that duality companies outperform, in terms of market value, non-duality companies by three per cent to four per cent, which underscores the benefits of CEO duality in saving information costs and making speedy decisions.

Based on these arguments, the sixth hypothesis addressed by this study is:

H0⁶: There is no relationship between leadership structure and financial performance

H6: There is a positive relationship between leadership structure and financial performance

EMPIRICAL ANALYSIS

Sample and data

The sample companies used to examine the internal corporate governance and financial performance nexus were drawn from companies listed on the JSE Ltd,

South Africa. To be included in the final sample, a company had to meet the following three criteria:

- at least 12 full sets of the company's annual reports from 2002 to 2014 had to be available on the INET BFA database, a prominent South African supplier of financial data;
- the company's corresponding market and accounting information had to also be available on the INET BFA database;
- the company's primary listing had to be on the JSE in South Africa.

The sample selection criteria were important in order to allow for the assessment of the compliance levels for the South African JSE-listed companies over a period of time. The sample period starts with 2002, which is the year when King II came into force. Year 2014 is the most recent year at the time of undertaking the analysis of the study. The study ended with a sample of 90 companies doing business in five major industries and covering the period 2002 to 2014. The five major industries, namely basic materials, industrials, financials, consumer services and consumer goods, constituted 93 per cent of the prevailing market capitalisation. This number of companies and the period of examination translated into 1 170 firm-year observations.

Model specification

As mentioned, one of the most daunting tasks in corporate governance empirical studies is dealing with the endogeneity of corporate governance independent variables. Ignoring the impact of endogeneity may result in spurious and unreliable causality inferences (Roberts and Whited, 2013).

Against this background, Wintoki *et al.* (2012) recommend that the appropriate empirical model for the corporate governance and financial performance nexus should be a dynamic model instead of a static model, in which lagged performance is used as one of the independent variables. Therefore, this study also adopts a dynamic modelling approach to investigate the relationship between corporate governance and financial performance. By doing so, this study responds to recent calls by Arora and Sharma (2016: 430), Nguyen, Locke and Reddy (2015a), Nguyen, Locke and Reddy (2014), Waweru (2014) as well as Schultz *et al.* (2010) to use dynamic panel models in corporate governance and finance studies.

In view of the preceding discussion, the model specification for this study is as follows:

$$Y_{it} = \alpha_0 + \alpha_1 Y_{it-1} + \beta_1 BS_{it} + \beta_2 BI_{it} + \beta_3 BC_{it} + \beta_4 BA_{it} + \beta_5 BD_{it} + \beta_6 LS_{it} + \beta_7 AGE_{it} + \beta_8 SIZE_{it} + \beta_9 LEV_{it} + \beta_{10} GROWTH_{it} + \epsilon_{it} \quad (1)$$

where Y_{it} measures the financial performance indicators, ROA, and Tobin's Q, Y_{it-1} represents the performance lag of one year. BS_{it} , BI_{it} , BC_{it} , BA_{it} , BD_{it} and LS_{it} are corporate governance variables, namely board size, board independence, presence of key board committees, board activity, board diversity and leadership structure respectively, of company i at period t . AGE, SIZE, LEV and GROWTH are used as control variables for company age, company size, leverage and growth prospects. The intercept is α_0 , the error term is ε_{it} and α_1 is the unknown estimated coefficient. The following models are thus used for the entire period (2002-2014), the pre-financial crisis (2005-2007), during the crisis (2008-2010) and the post-financial crisis (2011-2013), for the whole sample as well as for each industry.

Model 1

$$\text{Tobin's Q} = \alpha_0 + \text{Tobin's Q}_{it-1} + \beta_1 BS_{it} + \beta_2 BI_{it} + \beta_3 BC_{it} + \beta_4 BA_{it} + \beta_5 BD_{it} + \beta_6 LS_{it} + \beta_7 AGE_{it} + \beta_8 SIZE_{it} + \beta_9 LEV_{it} + \beta_{10} GROWTH_{it} + \varepsilon_{it} \quad (2)$$

Model 2

$$\text{ROA} = \alpha_0 + \text{ROA}_{it-1} + \beta_1 BS_{it} + \beta_2 BI_{it} + \beta_3 BC_{it} + \beta_4 BA_{it} + \beta_5 BD_{it} + \beta_6 LS_{it} + \beta_7 AGE_{it} + \beta_8 SIZE_{it} + \beta_9 LEV_{it} + \beta_{10} GROWTH_{it} + \varepsilon_{it} \quad (3)$$

As already mentioned, for corporate governance measures, the study considers board size, board independence, board committees, board activity, board diversity and leadership structure, while the control variables are company age, company size, leverage and growth prospects. Data for the performance measures, ROA and Tobin's Q were not manually calculated but were retrieved from the INET BFA database. INET BFA database is South Africa's leading provider of financial data as well as organisation information statutory including annual reports and financial statements (Bussin and Modau, 2015).

The construction of these variables for the empirical analysis is presented in Table 1. Definitions of variables are largely adopted from existing literature with the purpose of making a meaningful comparison with earlier empirical studies.

TABLE 1
DESCRIPTION OF VARIABLES USED IN THE STUDY

Abbreviation	Variable	Definitions of variable	Source
Corporate governance			
BS	Board size	The total number of directors sitting on the board	Annual report
BI	Board independence	Percentage of independent non-executive directors	Annual report
BC	Board committees	A dummy variable that takes a value of 1 if the company has nominations, remuneration and audit committees, otherwise 0	Annual report
BA	Board activity	The number of times the board of directors meets in a financial year	Annual report
BD	Board diversity	Percentage of non-white females on a board	
LS	Leadership structure	A dummy variable that takes the value of 1 if the positions of CEO and chairman are held by two different persons, otherwise 0	Annual report
Control			
Age	Company age	Present year minus incorporation year	INET BFA database
Size	Company size	Natural logarithm of the book value of total assets	INET BFA database
Lev	Leverage	Borrowing divided by total assets	INET BFA database
Growth	Growth prospects	Ratio of capital expenditure to total assets	INET BFA database
Yit-1	Lagged dependent	One-year lag of company performance	INET BFA database
Performance			
ROA	Return on assets	Accounting-based measure	INET BFA database
Tobin's Q	Tobin's Q	Market-based measure	INET BFA database

Source: INET BFA (2016)

Note: The first column in the table presents the abbreviations used in Equation 1; the second column reports the variables in full; the third column defines the variables while the fourth column provides the data sources

Preliminary data analysis

The panel dataset for the South African market included 1 170 firm-year observations, which had relatively full information on key corporate governance variables, covering a 13-year period from 2002 to 2014. Multiple regression analysis was used to investigate the relationships between corporate governance characteristics and financial performance. Before conducting the regression analysis, several preliminary tests were conducted (Pamburai *et al.*, 2015; Haniffa and Hudaib, 2006). The following section discusses the assumptions of the ordinary least squares (OLS) to assess which estimation technique is appropriate for the analyses. These assumptions include normality, linearity, homoscedasticity, multicollinearity, autocorrelation and the presence of outliers.

The estimation method utilised

Table 2 presents the weighted statistics for the three estimation tools considered in the study. The results show that the F-value for the GLS estimator is statistically significant at the one per cent significance level for all performance measures, which means that there is a significant linear relationship between the explanatory variables and the performance measures. However, the

F-values for GMM and 2SLS are not significant for all performance measures.

In addition, of all the estimators, the GLS estimator has the smallest residuals (S^2) and the highest adjusted R^2 , regardless of the performance measures. For instance, for Tobin’s Q, the adjusted R^2 is 46.23 per cent for GLS and 3.78 per cent and 3.98 per cent for GMM and 2SLS respectively. Return on assets displays the same pattern. Considering the residuals, the GLS estimator presents a residual of 93.89 for Tobin’s Q, while GMM and 2SLS report residuals of 155.08 and 154.79 respectively. In the same vein, GLS has a residual of 95.92 for ROA, to 103.56 and 103.55 for GMM and 2SLS respectively.

Therefore, based on displaying the smallest residuals (S^2) and highest adjusted R^2 as well as the F-value as guided by the study of Rad (2014:114), the GLS estimator emerged as the estimation method which best fits the model. This estimation technique accounts for potential sources of endogeneity inherent to the corporate governance characteristics and financial performance relationships, including dynamic endogeneity, simultaneity and unobserved time-invariant heterogeneity across companies. Table 2 presents the weighted adjusted R^2 , residuals and F-statistic for the three estimation models.

**TABLE 2
SELECTION OF THE APPROPRIATE ESTIMATION METHOD**

GLS		
Panel A – Entire period (2002-2014)		
	Tobin’s Q	ROA
Adjusted R ²	0.4623	0.5645
Residuals (S ²)	93.89	95.92
Prob (F-statistics)	0.0000	0.0000
GMM		
Panel B – Entire period (2002-2014)		
	Tobin’s Q	ROA
Adjusted R ²	0.0378	0.4778
Residuals (S ²)	155.08	103.56
Prob (F-statistics)	0.9892	0.8645
2SLS		
Panel C – Entire period (2002-2014)		
	Tobin’s Q	ROA
Adjusted R ²	0.0398	0.4779
Residuals (S ²)	154.79	103.55
Prob (F-statistics)	0.9659	0.4270

Assumption of autocorrelation

The Durbin-Watson (DW) statistic indicates independence between the residuals when the DW statistic encompasses values between 1.5 and 2.5 (Diebold, 2016; Greene, 2002) where values near 2 indicate the absence of autocorrelation (Schwarz, 2015). In this study, such a condition is met for all dependent variables, which indicates that the data are not auto-correlated. For instance, the results indicate that DW is 1.84 for Tobin's Q and 2.19 for ROA (entire period), 1.71 and 1.84 for Tobin's Q and ROA respectively (pre-crisis period), 2.09 and 2.27 for Tobin's Q and ROA respectively (during crisis period) and 1.82 and 2.18 for Tobin's Q and ROA respectively (after the crisis period).

Panel data unit root test

In this study, the test of Levin, Lin and Chu (2002) is applied and the test provides absence of unit roots by rejecting the null hypothesis. Using variables without taking the first difference in the estimation model may provide spurious results. Therefore, the study used the first difference to obviate unit root.

Assumption of normality

Data with a normal distribution has a bell-shaped probability density (Hansen, 2017) within standard skewness of ± 1.96 and standard kurtosis of ± 3 to be normal (Haniffa and Hudaib, 2006). An analysis of the

skewness and kurtosis indicates that most of the variables used in this study do not meet the assumption of normality – only the board committee (BC) independent variable meets the assumption of normality with a skewness of 0.625 and kurtosis of 1.39. Consequently, the non-normal distribution of the variables indicates that OLS regression is not appropriate for the study. An alternative is to use a GLS model, which will provide more robust estimates (Wahba, 2015; Olsson, Foss, Troye and Howell, 2000).

Descriptive statistics

Table 3 presents the descriptive statistics of the corporate governance variables and financial performance. It is expected that companies will exhibit a steady positive trend from 2002 as the compliance with King II increases and as a result of listing rules that require companies to report on their corporate governance practices.

Board size

The average size of a board reported in 2002 and 2014 was 9.76 and 11.07 members respectively. The overall mean of the size of the board is 10.66 members, which is in line with the findings of Meyer and De Wet (2013) as well as Tshipa and Mokoaleli-Mokoteli (2015b), who reported board size averages of 10.09 and 10.28 members respectively. Table 3 presents the descriptive statistics of all variables based on a sample of 1 170 firm-year observation for South African-listed companies.

**TABLE 3
DESCRIPTIVE STATISTICS OF THE VARIABLES**

Variables	Mean	Median	Min	Max	Std. dev.	Skewness	Kurtosis	Jarque-Bera	Observations
Dependent variables									
Tobin's Q	2.200	1.080	0.040	299.370	12.822	21.559	488.060	11521196	1170
EVA	-730309.4	20125.33	-77615734	28247528	6450999	-6.014246	53.85678	132685.8	1170
ROE	17.08574	17.53500	-639.53	384.0300	36.35168	-8.614988	155.4962	1144233	1170
ROA	11.13275	10.74000	-84.01	78.4200	13.65236	-0.580636	11.65601	3705.695	1170
Independent variables									
BS	10.66	10.00	4.00	31.00	4.01	1.024	4.627490	332.4930	1170
BI	0.44	0.45	0.00	1.83	0.21	-0.188	4.131519	69.1354	1170
BC	0.649	1.00	0.00	1.00	0.47	-0.625	1.391146	201.7664	1170
BA	5.039	5.00	0.00	18.00	1.67	1.582	8.714135	2073.025	1170
BD	0.157	0.13	0.80	0.00	0.15	1.075	4.206148	295.4539	1170
LS	0.935	1.00	0.00	1.00	0.24	3.551	13.61541	7926.302	1170
Control variables									
SIZE	15.236	15.18	5.94	21.366	2.30	0.197	3.236	10.30654	1170
GROWTH	0.092	0.051	0.00	6.495	0.325	13.105	207.340	2061969	1170
LEV	-1.094	1.200	-943.1	762.11	47.594	-4.196764	210.755	2100401	1170
AGE	31.688	24.00	0.00	117.00	21.824	1.016	3.67	2222.5907	1170

Board independence

The number of independent non-executive directors was a maximum average of 27 per cent in 2002. In 2014, the maximum average was 53 per cent, which almost doubled – an indication that South African companies recognise the need to increase the representation of non-executive directors on company boards. The steady increase from 2010 could be attributed to the implementation of King III, which requires boards to consist of a majority of non-executive directors, of whom the majority should be independent. This binding suggests that King III has assisted in making South African corporate boards more independent. Notwithstanding, the average of 44 per cent for the pooled sample is still below the threshold proposed by the King III Report. However, the finding is in line with the evidence of prior South African studies. In separate studies, Meyer and De Wet (2013) as well as Pamburai *et al.* (2015), found an average percentage of 47 per cent for independent non-executive directors, whereas Tshipa and Mokoaleli-Mokoteli (2015b) reported a mean of 39 per cent for the pooled sample. Prior to the global financial crisis, the representation of independent non-executive directors was 42 per cent, increasing to 46 per cent after the crisis.

Board committees

Overall, 65 per cent of the listed companies had commissioned all three committees while in 2002, a mere 31 per cent of companies had all committees. This figure increased to 86 per cent in 2014, which showed that the number of companies complying with the King III Code of best practice on corporate governance had more than doubled. As also reported in the study of Mans-Kemp and Viviers (2015), the majority of the considered companies had audit, remuneration and nomination committees.

Board activity

The mean frequency of board meetings is 5.04 per year, with some companies having not met once during the study period and others having met 18 times. The mean of board meetings held five times a year is aligned to King III, which recommends a minimum of four annual meetings per year. This result is consistent with previous studies of Ntim and Osei (2013), Pamburai *et al.* (2015) as well as Tshipa and Mokoaleli-Mokoteli (2015b), who reported averages of 5.33, 4.70 and 5.06 annual meetings respectively. Overall, board activity increased from meeting 4.96 times annually before the financial crisis to meeting 5.18 times annually after the crisis.

Board diversity

The mean percentage of non-white female directors is 16 per cent, which is low but still higher than in other countries such as China (8.50%), Hong Kong (9%), Indonesia (4.50%), Japan (0.90%), Malaysia (7.80%),

Singapore (6.90%), South Korea (1.90%) and Thailand (8.70%), as reported by Catalyst (2012). Only Norway (40.5%), Sweden (27%), Finland (26.8%), France (18.3%), UK (20.7%) and Denmark (17.2%) outperform South Africa in terms of board seats held by women (Catalyst, 2012).

It is noteworthy that the number of non-white females on South African boards increased significantly up to 2011. This finding concurs with the study of Taljaard *et al.* (2015), who reported similar results in a study of 40 companies listed on the JSE from 2000 to 2013. However, there was a significant decline in non-white female representation from 23 per cent in 2011 to 12 per cent in 2012. This low representation of women on South African boards calls for a business case to advocate the implementation of quota legislation in South Africa (Tshipa and Mokoaleli-Mokoteli, 2015a).

Leadership structure

The analysis of the leadership structure for the study period indicates that 94 per cent of the companies separated the leadership roles; this separation was 80 per cent in 2002 and increased to 96 per cent in 2014.

The upward trend is consistent with the views of Chen, Lin and Yi (2008), who noted the recent trend of converting from a dual to a non-dual CEO structure by a growing number of companies. Only six per cent of the sampled companies did not separate the position of chairperson and CEO and consequently did not comply with the King III Code of best practice. This finding is in line with the study of Tshipa and Mokoaleli-Mokoteli (2015b), who reported that nine per cent of South African companies did not separate the roles of the CEO and chairperson.

Interestingly, the leadership structure prior to the global financial crisis was 93 per cent and increased to 95 per cent after the crisis. In some cases, it could be that the arrangement was on a temporary acting appointment while the recruitment of a CEO was underway. It is common practice to appoint the chairperson to act as a CEO while the recruitment process of appointing a permanent CEO is underway.

Multi-variate empirical results

Tobin's Q

The mean value for Tobin's Q for 2002 was 1.91 and decreased to 1.26 in 2014. The results of Tobin's Q show that the market value of South African companies declined over the period under review. The value plummeted to 1.23 in 2009 after the global financial crisis, which is an indication that the market performance of South African companies was severely hit by the global financial crisis. Notwithstanding, the lowest value in 2008 was still above 1, which indicates good investment prospects.

The overall Tobin's Q decreased from 2.84 before the global financial crisis to 1.23 after the global financial crisis. As expected, the basic materials industry was the hardest hit with a drastic drop of 449 per cent, from 8.07 to 1.47. Overall, the mean of Tobin's Q is consistent with those reported by prior South African studies. Pamburai *et al.* (2015) reported an average Tobin's Q of 1.56, for a sample of 158 companies listed on the JSE for the year 2012. Meyer and De Wet (2013) reported an average Tobin's Q value of 1.46 for a sample of 126 companies listed on the JSE for the years 2010 to 2012.

Return on assets (ROA)

The mean value for ROA was 10.30 per cent in 2002 and decreased to its all-time lowest point of 8.06 in 2014. The financial industry contributed the least to the overall ROA with a meagre 2.72, while the consumer services sector contributed the most with an ROA of 17.8. In particular, the lowest ROA point was reached in 2014 and the highest ROA was prior to the global financial crisis at 14.35. In fact, all industries were affected after the global financial crisis with only the consumer goods sector returning a meagre increase of 5 per cent from 17.35 to 18.31, after the global financial crisis

Overall, the averages of the ROA are consistent with those reported by prior South African studies. Tshipa and Mokoaleli-Mokoteli (2015b) reported an average ROA of eight per cent, for a panel study sample of 137 JSE-listed companies from 2002 to 2011. Pamburai *et al.* (2015) reported an average ROA value of six per cent for a sample of 158 companies listed on the JSE for the year 2012. Similarly, using a panel dataset of 247 company years for the 50 largest JSE-listed companies, Waweru (2014) reported an ROA average of nine per cent. A positive mean ROA value in both periods indicated that listed companies created value for their shareholders.

Regression analysis results

The results for the econometric model for both accounting-based and market-based performance measures are presented in this section.

Tobin's Q and corporate governance: Model 1

Column 2 of Table 4 reports the GLS regression results for Model 1 based on the market-based measure of financial performance (Tobin's Q). The variables investigated in this model are only the corporate governance attributes that are significantly related to the performance measurement. The F-value is statistically significant at the one per cent significance level, which means that there is a significant linear relationship between the explanatory variables and Tobin's Q (F-value is 99.23 at p-value of 0.000). The adjusted R² is approximately 46 per cent. This means that at least 46 per cent of the variation in the sampled companies' market-based returns (Tobin's Q) can be explained jointly by the six corporate governance variables.

The statistical *t* and its significance level for each coefficient indicate that by rejecting the null hypothesis, the regression coefficient value is zero in the data population. In this analysis, only the null hypotheses for the variables board size (= 0.0593, *t* = 4.7020, *p* < 0.01), board committee (= 0.2536, *t* = 2.7496, *p* < 0.01) and board activity (= -0.0808, *t* = -2.8537, *p* < 0.01) are rejected and, therefore, these are the only variables that significantly contribute to explain Tobin's Q.

Consistent with accounting returns, board size is positively associated with the market-based performance measure and statistically significant for the entire sample period. This result lends support to Hypothesis 1, namely that there is a statistically significant and positive relationship between Tobin's Q and board size. This finding also supports the evidence of prior studies, which recorded a positive and statistically significant relationship between board size and Tobin's Q (Arora and Sharma, 2016; Shukeri, Shin and Shaari, 2012). However, the finding contradicts the results of other studies that report a statistically significant and negative link between board size and Tobin's Q (Garanina and Kaikova, 2016; Samuel, 2013) as well as those who document no association (Wintoki *et al.*, 2012).

Theoretically, this finding indicates that the market perceives larger boards to be more effective in the boardroom than smaller boards. This is because if the board is bloated, the chances of board members having external networks are higher, thus creating a virtual link to other entities or external resources (Shropshire, 2010), which may generate positive returns for the company (Mace, 1971). Interestingly, board size is statistically positively related to Tobin's Q, both during pre- and post-crisis periods. However, similar to accounting returns, there was no association between board size and market returns during the crisis period. This result implies that board size influences market performance only during steady-state times.

The statistically significant and negative relationship between board independence and Tobin's Q means that Hypothesis 2 could not be supported. The finding is consistent for the entire period, that is during pre-crisis and crisis periods. This finding is also contrary to the expectations of various corporate governance codes, including King III, which promotes the inclusion of more independent non-executive directors on corporate boards. Empirically, it also does not support the results of recent South African studies such as the studies of Muchwemwa *et al.* (2016) and Pamburai *et al.* (2015), who also contrary to the expectations of King III, report that board independence has no impact on Tobin's Q. However, the findings are consistent with stewardship theory, which states that independent non-executive directors often command less knowledge about the business, and find it difficult to understand its complexities (Weir and Laing, 2000).

TABLE 4
REGRESSION RESULTS OF THE IMPACT OF CORPORATE GOVERNANCE CHARACTERISTICS ON TOBIN'S Q AND ROA

White heteroskedasticity-consistent standard errors and covariance		
Panel A – Entire period (2002-2014)		
CG variables	Tobin's Q	ROA
Perf(-1)	(0.6750)***	(0.7409)***
BS	(0.0593)***	(0.2119)***
BI	N/S	(-2.7197)**
BC	(0.2536)***	N/S
BA	(-0.0808)***	(-0.2856)*
BD	N/S	N/S
LS	N/S	N/S
Panel B – Pre-crisis (2005-2007)		
Perf(-1)	(0.5815)***	(0.5746)***
BS	(0.0802)***	N/S
BI	(0.8351)**	(-3.5526)**
BC	(0.5538)***	N/S
BA	N/S	N/S
BD	N/S	N/S
LS	N/S	N/S
Panel C – During the crisis period (2008-2010)		
Perf(-1)	(0.7677)***	(0.7925)***
BS	N/S	N/S
BI	N/S	(-3.8980)*
BC	N/S	(1.5827)**
BA	N/S	(-0.4276)*
BD	N/S	N/S
LS	(0.2754)**	N/S
Panel D – After the crisis period (2011-2013)		
Perf(-1)	(1.0510)***	(0.8800)***
BS	(0.0126)**	(0.3464)***
BI	N/S	N/S
BC	(-0.0662)*	(-1.3793)*
BA	N/S	(-0.3756)*
BD	(-0.2392)**	N/S
LS	N/S	N/S

Notes: ***Significant at the 0.01 level; **significant at the 0.05 level; *significant at the 0.10 level; coefficients are in parentheses. The table excludes control variables. N/S denotes no statistical significance

The first column lists the corporate governance variables. The second column shows the impact of corporate governance on Tobin's Q, while the third column presents the impact of corporate governance on ROA.

Table 4 shows the regression results of the impact of corporate governance characteristics on Tobin's Q and ROA for South African-listed companies for the entire period (2002-2014), the pre-crisis period (2005-2007), the crisis period (2008-2010) and the post-crisis period (2011-2013).

The presence of board committees is positively related and significant to market valuation over the entire sample period. This empirical relationship supports Hypothesis 3 as well as the recommendations of King III that companies should establish nomination, audit/risk and remuneration committees. This is because critical processes and

decision-making are often not done at board level but at committee levels (Dalton *et al.*, 1999). The finding implies that the market values the establishment of the three board committees as a monitoring mechanism on behalf of the board. Empirically, this finding corroborates the prior study of Fauzi and Locke (2012), who report a statistically significant nexus between the board committees and Tobin's Q.

The significant influence of the existence of board committees and Tobin's Q is consistent during the non-crisis periods, although the coefficient signs are opposite. In the period leading to the crisis, board committees exhibited a positive relationship with market returns for South African companies, while after the global financial crisis, there was an inverse relationship. This apparent contradiction could be attributed to the fact that most companies were going through the recovery phase during this time. On the contrary and similar to the accounting returns, the presence of nomination, remuneration and audit/risk committees did not have an influence on market returns during the crisis period.

Given that constant monitoring could reduce the agency problem, it is interesting to note that board activity appears to be significantly negatively related with Tobin's Q. The statistically significant and negative coefficient of board activity and Tobin's Q is consistent with the results reported by Pamburai *et al.* (2015) for South African listed companies. Therefore, Hypothesis 4 is rejected. The finding contradicts the recommendations of King III and the results of Agyemang, Aboagye, Antwi and Frimpong (2014), Brick and Chidambaran (2010) and Ntim and Osei (2013), who reported a statistically significant and positive association between board activity and financial performance. This finding is also inconsistent with the results reported by El Mehdi (2007) and Tshipa and Mokoaleli-Mokoteli (2015b), who found that the frequency of board meetings has no association with performance. The no-impact relationship is observed during all three economic periods under investigation.

The statistically insignificant relationship between board diversity and Tobin's Q means that Hypothesis 5 is rejected. Empirically, the finding supports the South African study of Taljaard *et al.* (2015), who found no relationship between gender diversity in terms of race and financial performance. However, the findings contradict Ararat, Aksu and Cetin (2015), who posit that demographic diversity has an effect on board monitoring and therefore on company performance.

Interestingly, the no-significance findings are consistent across all periods, except for the post-crisis period, where it is significantly negative. This is less empirically surprising as the number of non-whites and female representation on South African corporate boards is so small that they may not have any significant impact on board decisions.

The statistically significant and positive association between leadership structure and Tobin's Q reject Hypothesis 6, namely that separating the position of CEO and chairman significantly impacts negatively on financial performance. It also does not lend empirical support to the recommendations of corporate governance codes, including King II, that the roles of chairman and CEO should be split. Empirically, this finding supports the studies of Lin and Jen (2011) and Nath, Islam and Saha (2015), who also established a non-significant relationship between leadership structure and Tobin's Q. Notably, the no-impact relationship is consistent across all periods except for the crisis period, where it is positive and significant, an indication that during the crisis period, it is imperative for South African companies to separate the roles of chairperson and CEO.

ROA and corporate governance: Model 2

For the entire period (2002-2014), the F-value of Model 2 is statistically significant at the one per cent significance level, which means that there is a statistically significant linear relationship between the explanatory variables and ROA (F-value is 140.475 at p-value of 0.000). The adjusted R² is approximately 56 per cent. This means that at least 56 per cent of the variation in the sampled companies' accounting returns (ROA) can be explained jointly by the six corporate governance variables. This adjusted R² is better than in most recent studies such as those of Rodriguez-Fernandez, Fernandez-Alonso and Rodriguez-Rodriguez (2014) and Schultz *et al.* (2010), who reported 16 per cent and 16.7 per cent respectively where the dependent variable is ROA.

The statistical *t* and its significance for each coefficient indicate that by rejecting the null hypothesis, the regression coefficient value is zero in the data population. In this analysis, only the null hypothesis for the variables board size (= 0.21195, *t* = 2.628, *p* < 0.01), independent non-executive director (= -3.552, *t* = -2.198, *p* < 0.05) and board activity (= -0.285, *t* = -1.718, *p* < 0.1) is rejected, and therefore, these are the only variables that significantly contribute to explain ROA.

To start with, the coefficient on the first corporate governance variable, namely board size, was positive and statistically significant over the entire sample period and post-crisis period. This result provides empirical evidence to support Hypothesis 1. This result is also in agreement with the studies of Topal and Dogan (2014) and Malik and Makhdoom (2016), who documented a statistically significant and positive nexus between board size and ROA. However, the results differ from prior studies that report that board size is negatively related to ROA (Arora and Sharma, 2016) and other studies that posit that board size has no impact on the financial performance of South African companies (Pamburai *et al.* 2015; Meyer and De Wet, 2013).

The positive impact of the size of the board on financial performance is consistent with another performance measure, Tobin's Q, signifying that this finding is robust to alternative proxies of financial performance. This finding is also consistent with the prediction of agency theory. However, board size did not have an impact on ROA during the pre-crisis period and crisis period.

Notwithstanding, between the period 2005 and 2007, which was the period prior to the global financial crisis, referred to as "normal times/non-crisis/steady-state" in this study, the size of the board had no impact whatsoever on ROA. This finding corroborates the results reported by Van Essen *et al.* (2013), who found no relationship between the two parameters during "normal times". The results of this study show that the number of directors on a board did not have any impact on ROA during the crisis period. This finding contradicts those of Van Essen *et al.* (2013), who reported a significant positive correlation between board size and ROA during the financial crisis time. Therefore, this study does not support the theoretical assumption that through their network and interlocking relationships, larger boards make more effort to reduce uncertainty during a recessionary period.

Similar to the study of Orazalin, Mahmood and Lee (2016), board size and ROA had a positive relationship after the recession period. The study posits that the size of the board is only significant and positive if the number of board members is greater than four but equal to or less than 14 ($4 < \text{Board Size} \leq 14$) depending on the industry nuances. As is revealed later, this study argues that the optimal size of the board differs not only because of country differences but also due to industry dynamics.

Contrary to the finding of Malik and Makhdoom (2016), who posit a positive relationship between board independence and ROA, the study reports that higher proportions of independent, outside directors on boards lead to lower levels of ROA. This inverse effect was the same during the pre-crisis period as well as during the crisis period. Similar to the studies of Darko, Aribi and Uzonwanne (2016), Sheikh, Wang and Khan (2013) and Ehikioya (2009), this finding does not support Hypothesis 2 and the theoretical framework which predicted a greater symbiotic relationship between the proportion of independent directors and ROA.

Ehikioya (2009) attributes the inverse relationship to a very low representation of independent directors, which may encourage management to expropriate company resources due to poor monitoring for their personal benefits, hence negatively affecting ROA. A lack of adequate knowledge about the business may also be responsible for this negative relationship (Adams, 2012). As Rebeiz (2015) points out, independent non-executive directors are part-timers to the company, and more often than not they do not possess requisite knowledge about the internal and external environment of the company to digest large volumes of complex information and to make informed decisions.

Noticeably, the proportion of independent non-executive directors in this study is 44 per cent, which could also mean that the number is too small to make a meaningful and positive contribution to the bottomline. However, simply increasing the number of independent non-executive directors may therefore not be sufficient to improve financial performance.

With regard to the mixed results of the relationship between independent directors and financial performance, Sharifah, Syed, Syahrina, Abdul and Julizaerma (2016) argue that having independent directors on the board not only leads to better financial performance but also to better corporate governance, including corporate social performance.

In respect of Hypothesis 3, the results indicate that the presence of nomination, remuneration and audit/risk committees was positively but statistically insignificantly related to ROA during all periods, except after the crisis period, when it was negatively related. This finding does not support Hypothesis 3, as well as the recommendations of King III, which call for the establishment of board committees. Empirically, it also contradicts the results of Fauzi and Locke (2012), who reported a positive relationship between the existence of nomination, remuneration and audit committees and ROA.

Owing to the high adoption rate of these committees since 2002, their insignificance in explaining ROA is not empirically surprising. The results could be attributed to variations as less than 15 per cent of sampled companies did not have these committees. The results are surprising because it can be argued that if all companies fully complied or not completely complied with some of the single corporate governance provisions, there would simply be no cross-sectional variations in the variables for them to be of value in any regression analysis and therefore resulted in an insignificant relationship.

Theoretically, the establishment of board committees can improve the efficacy of the board. First, the nomination committee is responsible for the appointment of board members, succession planning of the CEO as well as ensuring that the board is balanced in terms of skills, experience and diversity. Secondly, the remuneration committee ensures, among others, that long-term incentives seeking to align the interests of shareholders and management are in place. Thirdly, the audit committee is concerned with the internal control and financial reporting quality. Arguably, all these committees have a role to play in ensuring that the board carries out its oversight role.

In respect of Hypothesis 4, it is clear that board activity had a negative impact on ROA during the entire period, crisis period and post-crisis period. The statistically significant and negative ROA and board activity nexus means that Hypothesis 4 can be rejected. It also implies that the recommendations of King III, namely that South African corporate boards must hold a minimum

of four meetings in a year, are not empirically supported. Empirically, this finding is inconsistent with the result of Ntim and Osei (2013), who reported a statistically insignificant association between board activity and ROA.

One of the reasons for the inverse relationship could be that during a recession, board meetings are more concerned about the turnaround strategy with the aim of improving financial performance. In contrast, when financial performance declines, board meetings are more active to manage performance crisis as opposed to improving financial performance.

The statistically insignificant relationship between board diversity (in terms of ethnicity and gender) and ROA means that Hypothesis 5 is rejected. The insignificant nexus was consistent across all periods. However, the finding is less empirically surprising. This is because the number of non-white female representation on South African boards is so small that female representation may not have any significant impact on board decisions.

Empirically, the insignificant relationship concurs with the results of previous South African studies such as those of Taljaard *et al.* (2015) and Tshipa and Mokoaleli-Mokoteli (2015a), that board diversity in terms of ethnicity and gender does not have an influence on South African-listed companies. In contrast, the findings contradict the

studies of Ayadi *et al.* (2015), Julizaerma and Sori (2012), Lückerrath-Rovers (2013) and Zhang (2012), who found a positive association between gender diversity and financial performance.

The statistically insignificant association between leadership structure and ROA rejects Hypothesis 6, namely that separating the roles of chairperson and CEO is financially beneficial for the company. The results are consistent in all periods. The finding does not lend empirical support to the recommendations of King III that the roles of a chairperson and CEO should be split.

Empirically, this finding is consistent with the results of Moscu (2013), who reported a statistically insignificant relationship between ROA and leadership structure. Theoretically, the finding indicates that combining the roles of chairperson and CEO may give the CEO autonomy to focus on the objectives of the company without board interference (Haniffa and Cooke, 2002). This arrangement may also facilitate quick decision-making, which may improve financial performance.

Endogeneity tests

The study is mindful of potential endogeneity problems which may compromise the validity of the empirical findings. One way of reducing the endogeneity problem

TABLE 5
THE EFFECT OF LAGGED INDEPENDENT VARIABLES ON COMPANY PERFORMANCE FOR THE ENTIRE PERIOD

Entire period (2002 -2014)		
	Tobin's Q	ROA
Adj R ²	0.4674	0.5687
Observations	1163	1163
Perf(-1)	(0.6702)***	(0.415)***
BS(-1)	(0.0256)**	(0.1058)
BI(-1)	N/S	(-2.1955)*
BC(-1)	N/S	N/S
BA(-1)	(-0.0645)	(-0.0842)
BD(-1)	N/S	N/S
LS(-1)	N/S	N/S

Notes: The model specification for the study is as follows:

$$Y_{it} = \alpha_0 + \beta_1 BS_{it-1} + \beta_2 BI_{it-1} + \beta_3 BC_{it-1} + \beta_4 BA_{it-1} + \beta_5 BD_{it-1} + \beta_6 LS_{it-1} + \beta_7 AGE_{it-1} + \beta_8 SIZE_{it-1} + \beta_9 LEV_{it-1} + \beta_{10} GROWTH_{it-1} + \epsilon_{it}$$

Y_{it} is the performance measure, ROA and Tobin's Q, α_0 is the coefficient, BS_{it-1} is the board size in the previous year, BI_{it-1} is the board independence in the previous year, BC_{it-1} is the board committees in the previous year, BA_{it-1} is the board activity in the previous year, BD_{it-1} is the board diversity in the previous year, LS_{it-1} is the leadership structure in the previous year, AGE_{it-1} is the company age in the previous year, $SIZE_{it-1}$ is the company size in the previous year, LEV_{it-1} is the leverage in the previous year, $GROWTH_{it-1}$ is the growth prospects in the previous year and ϵ_{it} is the error term. These models provide t-statistics, which are in parentheses. ***, ** and * denote significance at the 0.01, 0.05 and 0.1 levels respectively. Due to limited space, control variables are not reported but are available on request. N/S denotes no statistical significance.

of omitted variable bias is to adapt a system of 2SLS using an appropriate instrument. However, this approach introduces the difficulty of identifying the correct instruments (Dam and Scholtens, 2012). Similar to the study of Afrifa and Tauringana (2015), this study attempted to reduce the potential endogeneity problem of simultaneity, which is the most common endogeneity problem in corporate governance research, by lagging independent variables and investigating the association between changes in the independent variables and the dependent variable (see Table 5).

The second issue of endogeneity, which is unobserved heterogeneity, is resolved by staggering the investigation of the relationship of corporate governance and company performance over three economic periods (Afrifa and Tauringana, 2015; Van Essen *et al.*, 2013; Abzari, Fathi and Torosian, 2012). The third issue of endogeneity, which is referred to as dynamic endogeneity, is addressed in Table 6.

Dynamic endogeneity is present when the current value of a variable is influenced by its value in the preceding period of time (Schultz *et al.*, 2010). Most prior studies of the impact of corporate governance on financial performance have estimated “static” models of the form: performance = f (corporate governance), where corporate governance reflects attributes such as board size, board independence, presence of key board committees, board activity, board diversity and leadership structure. In agreement with the studies of Ayadi *et al.* (2015) and Schultz *et al.* (2010), this study also posits that the appropriate empirical model

should be a “dynamic” model of the form: performance = f (past performance, corporate governance).

Table 6 provides justification for the choice of a “dynamic” model over a “static model” for this study using only the GLS estimator. Other estimators such as 2SLS and GMM are not presented but reflect the same findings.

Table 6 shows that when GLS is applied to the dynamic model, the results reveal the first clear indication of the importance of past performance in the corporate governance and financial performance relationship. For Tobin’s Q (see Columns 2 and 3 of Table 6), the adjusted R² rises from a meagre 4.4 per cent in the static model to 46.2 per cent in the dynamic model, while the residual drops from 161.89 to 93.89 during the transition. The magnitudes of the estimated coefficients on all variables fall drastically and the significance levels are generally unchanged.

In respect of ROA (see Columns 4 and 5 of Table 6), the adjusted R² increases from a scanty 2.37 per cent in the static model to 56 per cent in the dynamic model, while the residual reduces from 181.196 to 95.92 during the transition. However, the signs of the coefficients do not change, while the significance levels experience modest adjustments.

Similarly, Table 6 shows that the explanatory power of the dynamic models is improved when compared with the static ones (as evidenced by the considerably higher values of adjusted R² and low values of residuals) regardless of

TABLE 6
THE EFFECT OF PAST PERFORMANCE ON THE GLS ESTIMATOR

Dependent variables	Tobin’s Q		ROA	
	Static	Dynamic	Static	Dynamic
Performance lag (-1)	N/A	(0.6725)***	N/S	(0.738095)***
Board size	(0.0925)***	(0.0573)***	(0.247524)*	(0.207475)*
Board independence	N/S		(-5.063747)**	(-2.728265)*
Board committees	(0.4560)***	(0.2513)**	N/S	N/S
Board activity	(-0.1657)***	(-0.0792)**	(-0.594813)**	(-0.332465)*
Board diversity	N/S	N/S	N/S	N/S
Leadership structure	N/S	N/S	N/S	N/S
Firm size	(-0.2340)***	(-0.1386)***	(-0.461676)*	(-0.462384)**
Growth prospects	(-0.3579)**	(-0.1964)**	N/S	N/S
Leverage	N/S	N/S	N/S	N/S
Company age	N/S	N/S	(0.038881)**	N/S
Adjusted R ²	0.0439	0.4623	0.0237	0.5645
Residual	161.89	93.89	181.196	95.92

Note: Each dependent variable shows the effect of excluding past performance (Static) as well as the effect of including past performance (Dynamic) on the explanatory power of the model

the estimation techniques used. This result indicates that an appropriate regression specification should include a lagged dependent variable in the right-hand side of Equation 1 to control for potential dynamic panel biases (Flannery and Hankins, 2013). This result also supports the view of Schultz *et al.* (2010) and Wintoki *et al.* (2012), that the relationship between corporate governance structures and financial performance should be investigated in a dynamic framework. Consistent with previous studies, this study follows Nguyen *et al.* (2015b), who used a one-year lagged performance measure as an explanatory variable to control for the dynamic nature of the corporate governance and financial performance relationship, as suggested by Wintoki *et al.* (2012).

Testing for robustness

It is possible that companies may modify their corporate governance structures in response to past or future anticipated performance. To test for evidence of this change, a series of robustness checks were conducted. These checks ensure that the results are rigorous and immune from sensitivities. First, both the companies and corporate governance practices used by them may be affected by the financial crisis that started in 2007. To resolve this, the study divided the sample into three periods: pre-recession (2005-2007), during the recession (2008-2010) and after the recession (2011-2013). As already reported, corporate governance was indeed affected by the financial crisis. Secondly, corporate governance may differ based on whether the company made a profit or not. Simply put, there could be reverse causality, where financial performance influenced corporate governance structures. Therefore, the sample is split into two, based on whether a company made a profit or loss in a particular year, using ROA as a performance measure.

Generally, the results presented in Table 7 are not significantly different across all scenarios. The results show that past performance, board size, board independence and board committees had a positive influence on Tobin's Q regardless of the profitability of the company, dispelling any suspicion of reverse causality. The coefficient of board activity was negative in all scenarios but only significant for companies with a positive ROA and for the entire sample. Therefore, no clear pattern emerged to provide evidence that companies were changing their corporate governance arrangements as a result of prior performance or profitability.

Sensitivity analyses

To assess the sensitivity of the results to omitted variables, first, a regression analysis was conducted with all control variables, company size, growth prospects, leverage and company age included. The second regression analysis was conducted after removing all control variables. The third regression analysis was conducted having only added age as a control variable. The regression outputs were the same in terms of coefficient signs and significance levels in all instances. Only the results of ROA are presented. The Tobin's Q results exhibited the same pattern. Table 7 presents the regression results of running the model for both profitable and unprofitable observations for the period 2002-2014.

CONCLUSION AND IMPLICATIONS

The study found that a number of corporate governance mechanisms had significant effects on financial performance, while some variables did not have any significant effect. However, the impact differed when comparing the crisis to the non-crisis period as well as among different industries. As proposed by agency theory,

TABLE 7
SEGMENTED REGRESSION RESULTS FOR BOTH PROFITABLE AND UNPROFITABLE COMPANIES
FOR ALL FIRM-YEAR OBSERVATIONS (2002-2014)

Entire period (2002-2014) – Tobin's Q			
CG variables	Positive ROA	Negative ROA	All samples
Perf(-1)	(0.6876)***	(0.0986)***	N/S
BS	(0.0604)***	(0.1608)***	(0.0593)***
BI	(0.5572)**	N/S	N/S
BC	(0.1899)*	(0.9328)***	(0.2536)***
BA	(-0.0881)***	(-0.0448)	(-0.0808)**
BD	N/S	(2.1211)**	N/S
LS	N/S	(-1.4065)***	N/S

Notes: Column 2 reflects profitable observations, while Column 3 reflects unprofitable observations. Column 4 shows the results of all companies regardless of positive or negative ROA. T-statistics are in parentheses and ***, ** and * denote significance at the 0.01, 0.05 and 0.1 levels respectively. Due to limited space, control variables are not reported but are available on request. N/S denotes no statistical significance. The abbreviations and definitions of the independent and control variables presented in this table are contained in Table 1.

the study provides evidence showing the positive impact of board effective monitoring on financial performance during non-crisis periods. It also provides support for the stewardship view that management is a critical resource during crisis periods. Further, it lends support to the resource dependence theorists, namely that board independence provides requisite skills and knowledge prior to the financial crisis.

Accounting returns appear to be in favour of stewardship theory, while market returns seem to favour agency and resource dependence theories. This finding indicates that accounting returns see independent boards as adding no value, while market returns see independent boards as a means of bringing adequate resources to the company. Secondly, the market perceives larger boards, board activity, board committees and leadership structure to be structures that could provide adequate monitoring and reduce agency costs. It presumes that managers are disingenuous and will embark on malpractices of personal embezzlement at the expense of the shareholders.

South African companies recorded high levels of corporate governance compliance especially during the crisis period, in all aspects. One implication is that the authorities should encourage listed companies to invest in corporate governance structures, mindful of their circumstances. Such investments could substantially improve attracting investors (Pae and Choi, 2011) and yield higher market valuation (Tshipa, Brummer, Wolmarans and Du Toit, 2017).

Importantly, the regression results indicate that the relationship between corporate governance and financial performance is of a dynamic nature and robust for all estimation techniques such as 2SLS, GMM and GLS. This finding corroborates the studies of Ayadi *et al.* (2015), Nguyen *et al.* (2014), Wintoki *et al.* (2012) as well as Schultz *et al.* (2010), amongst others, who believe that the relationship between corporate governance and financial performance should be investigated in a dynamic framework. This finding implies that past performance should be part of the independent variables to control for potential effects of unobserved historical dynamics on the current performance.

MANAGERIAL RECOMMENDATIONS

The outcomes of the analyses imply that South African companies may enhance their business performance by implementing sound corporate governance practices based on their unique circumstances. The study also found that good governance could have reduced vulnerability and mitigated the adverse influence of the financial crisis on companies. Therefore, companies could gain from implementing the recommended governance policies, mindful that it is not a one-size-fits-all situation. In addition, South African companies should maintain a culture of flexible corporate governance compliance. Those companies doing business outside the national

borders should also cultivate the same culture elsewhere, mindful of differing national cultures. This study concludes that the optimal size of the board should depend on the type of industry in which the company operates. However, the size of the board should not be less than four members, or larger than 14 members, depending on the industry type.

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