

Senior management characteristics and firm performance: An application of
upper echelons theory to firms listed on the JSE

A research report submitted by

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I understand what plagiarism entails and am aware of the University's policy in this regard.

I declare that this research report is my own work and that all sources have been accurately reported and acknowledged. It is submitted in partial fulfillment of the requirements of the degree of Master of Commerce at the University of the Witwatersrand, Johannesburg. This research has not been submitted for any degree or examination at any other university. I further declare that I have obtained the necessary authorization and consent to carry out this research.



Signature(s)

Date: 31/03/2021

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Abstract

Upper echelons theory states that the background and characteristics of a firm's senior management has an impact on its operations and performance. This study applies the upper echelons theory to the largest 100 JSE listed firms by market capitalisation. For these firms, the study explored the relationships between performance and senior management characteristics using panel data from 2015 to 2019 in a regression. The performance of the firms as indicated by share price, return on assets and Tobin's Q were regressed on characteristics of qualifications, age, tenure and professional accreditation. The findings indicate that the performance of firms has no significant relationship with the above senior management characteristics. There was a negative relationship identified between the qualifications of the senior management and the financial performance of the firm suggesting a slight better performance by those less qualified. Further there appears to be a negative relationship between the financial performance of the firm and whether the senior management are accredited to a professional body. This suggests that firms whose senior management are found not to be affiliated to a professional body are outperforming those that are affiliated with a professional body. These findings have potential implications for the investment community whose investment criteria may include management characteristics.

Keywords: accreditations, qualifications, age, tenure, share price, Tobin's Q, return on assets, upper echelons theory

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Chapter I – Introduction

There is a considerable amount of academic theory to suggest that better educational backgrounds will make for better senior management (Wally and Baum, 1994, Barker III and Mueller, 2002, Gottesman and Morey, 2010). An executive's age, experience and quality have been suggested to affect their decision-making and the ability to perform their work which will ultimately affect firm performance (Peni, 2014). Upper echelons theory (UET) states organisational outcomes from strategic choices and performance levels are partially predicted by managerial background characteristics (Hambrick and Mason, 1984, Hambrick, 2007). From the existing literature, it is apparent that the financial performance of a firm is largely dependent on choices made by the management that direct the strategic operations of that firm.

Zuckerman (1989, pg 25) classifies the role of the Chief Executive Officer (CEO), a member of senior management, using three metaphors. These metaphors can equally be applied to all senior management personnel. Firstly, senior management are seen as "*Perimeter Players*", concerned with steering the firm in line with its external environment. Secondly, the senior management is described as "*Interior Designers*", concentrating on internal operations management of the firm. Finally, the senior management is viewed as "*Leader of the Band*", setting the direction for corporate values and setting the strategic vision and direction of the firm. This is consistent with the UET, in which the firm is seen as a reflection of its senior management team (Hambrick and Mason, 1984).

Finding the right senior management is an important hiring event for firms as the research suggests that their characteristics are likely to impact corporate policies (Hamori and Koyuncu, 2015). Hiring firms assess potential employee performance based on characteristics such as prior experience (Hamori and Koyuncu, 2015) and educational qualifications (Dragoni et al., 2011).

Hamori and Koyuncu (2015) discuss a trend where firms seem increasingly risk averse to hiring a CEO who does not have prior experience in leadership roles. The characteristic of age has been linked to the risk appetite of the executive, with evidence of older executives preferring less risky investments (Serfling, 2014). In a South African context, Sewpersadh (2019) shows a positive relationship between new CEO appointments and growth, indicating that new CEOs introduce new and appropriate growth strategies. These findings point to the importance of hiring appropriate senior management.

The salary costs of senior management have attracted research as well as shareholder attention. Deyssel and Kruger (2015) explain CEO pay in the context of agency theory. Linking CEO compensation to firm performance aligns the actions of agents (management) to principals (shareholders). Sewpersadh (2019) also discusses the separation of ownership and control in South African firms, indicating that the issue may be particularly relevant in the country's context. Recent reports of CEO remuneration indicate that shareholders are willing to sacrifice a significant portion of returns to ensure this congruence of goals. According to the PwC (2019) report, the average package earned by CEOs of listed firms in 2018 was R5.4 million. The Chief Financial Officer (CFO) earned on average, R3.8 million while other directors earned an average of R3.3 million.

There are significant variations in compensation to CEOs that may not be directly linked to agency theory. Differences in management compensation appear to be based on managers having earned an undergraduate and graduate degree as well as their tenure (Jalbert et al., 2002). The prior research above indicates that senior management with higher qualifications and more experience in their position earn more, however there is little empirical evidence of whether these senior managers improve the financial performance of their firm in comparison to those with lower-level qualifications and experience. The question is then whether these firms are being adequately

rewarded for the extra compensation made to senior management with higher qualifications and a longer tenure as suggested by Jalbert et al. (2002).

Statement of the problem

Firms invest a significant amount of money into highly qualified senior management on the premise that they will have a crucial impact on the strategic direction and performance of the firm. Senior management possess positions of power within an firm and are the highest-ranking executives of that firm. They define the visions and goals of the firm. This is in line with the Upper Echelons Theory. However, the link between senior management characteristics and firm performance has been challenged by the empirical evidence in various studies (Gottesman and Morey, 2006, Jalbert et al., 2011, Rakhmayil and Yuce, 2011).

There is also evidence from prior literature to suggest that there should be greater financial performance for firms with better senior management. Several studies have found that senior management with higher educational fulfilment and a greater tenure in charge have a greater volume of knowledge to process information and to innovate when compared to senior management with lower educational accomplishments (Gottesman and Morey, 2006). Education plays a notable role in the appointment of any new CEO (Bhagat et al., 2010). An analysis performed by Francis (2016) showed that the top 20% highest-paid CEOs of U.S. firms significantly underperformed when compared to the performance of the bottom 20% lowest-paid CEOs.

Purpose

The purpose of this study is to evaluate whether the characteristics of the senior management have any effect on the financial performance of the South African firms that they lead.

Significance of the study

Considering the strategic importance of the role of senior management, as postulated in Upper Echelons Theory (Hambrick and Mason, 1984), shareholders and potential investors are in search of capable senior managers who will increase firm value. The background characteristics of the senior management may be important to shareholders as it may provide an insight into the thought processes of management and how they will perform (Gottesman and Morey, 2010). Firms are willing to increase the compensation of senior management with higher educational qualifications (Gottesman and Morey, 2006). Firms will be expecting an improvement in their financial performance due to their greater investment into their senior management. There appears to be a preferred educational background for selection of new senior executives as major firms would prefer to hire senior management with higher qualifications (Jalbert et al., 2002).

The risks involved in hiring the incorrect management team and having to remove management is enormous. The dismissal of senior management can cost millions in severance compensation and the firm could lose out on opportunities due to the disruption to the firm (Khurana, 2001). Besides these direct costs, the consequences of having poor management teams include poor decision-making, especially during times of unprecedented uncertainty. Fitriasari (2020) emphasises the importance of businesses' strategic responses to the COVID-19 pandemic. These strategic decisions are made by senior management are likely to be influenced by their background and characteristics.

Appointing the correct personnel in senior management positions is crucial to the success of the firm. It is expected that the qualifications, knowledge and experience these senior managers possess would dictate the way in which their firm operates. However, the empirical evidence in this regard appears to be lacking in a South African context. Based on a search of research databases including Springer, ProQuest, Elsevier and Emerald, it appears that limited research

has examined the effect of senior management characteristics on various indicators of firm performance.

Upper echelons theory adds a new outlook on research into senior management decision-making capabilities in accounting by focusing on the individual managers personality and characteristics.

“These characteristics are often considered as information producers in decision-making processes without paying extra attention to their idiosyncratic “input factors” in cognitive processes” (Plöckinger et al., 2016, pg 9).

This study will help firms during the hiring process for future senior management that will enhance the firm’s investment decision-making process. This study will also aid investors and potential investors as to the expectations of the performance of the firm based on the characteristics of the senior management. An analysis of the impact on the financial performance of a firm due to the characteristics of senior management may aid firms in their future search for and appointment of senior management. The firms may also be able to determine whether selecting senior management that are accredited to a professional body is indicative of a better performing firm.

Research question

The primary research question is, “What impact does the senior management’s characteristics have on a firm’s financial performance?” The researcher proposes to answer this question using the following secondary questions:

Does the senior management’s accreditation to a professional body influence the financial performance of the firm?

Does the level of senior management’s education influence the financial performance of the firm?

Does the senior management’s tenure influence the financial performance of the firm?

Does the senior management's experience (approximated by age in this study) have an effect on the firm's financial performance?

Assumptions, limitations and delimitations

For the purposes of this study, the researcher limited the senior management to the executive members of the board of directors. These executives were chosen because, by the nature of their roles, they are the employees most likely to be able to influence a firm's performance. The executive members used for this study was limited to a maximum of the top-5 ranking executives on the executive committee for each selected firm. These were primarily the Chief Executive Officer (CEO), Chief Financial Officer (CFO), Chief Operations Officer (COO), Chief IT Executive and Human Resources Manager. Some firms investigated had less than these five executives or the information for these executives were not disclosed, so these firms were limited to the remaining executives with data available.

Characteristics have been limited to the senior management's education, age, tenure and accreditation to a professional body. Hambrick and Mason (1984) stated that younger managers are likely to achieve a higher growth than older managers. They also state that the management's educational background will affect the decision-making capabilities of the manager.

All firms that were listed on the Johannesburg Securities Exchange after the 2015 financial year were excluded from the study. Whilst this may introduce survivorship bias, it has the benefit of allowing for the lagged performance measures that capture the effect of managements' decisions in a consistent manner. Firms that did not have satisfactory information regarding their senior management personnel were also excluded from the study.

Since the study makes use of measurement approximations, the results of the analysis may differ depending on the choice of approximations. These approximations have been chosen based on precedent in prior research in order to enhance reliability.

Chapter II – Background

Literature review

As per Drucker (1954, pg 1),

“In a competitive economy, above all, the quality and performance of the managers determine the success of a business; indeed, they determine its survival”

In developing the upper echelons theory, Hambrick and Mason (1984) stated that the top executives of the firm have a significant impact on the strategic decisions of the firm. The theory suggests that the organisational outcomes and performance levels are partially predicted by the background of the senior management responsible for the decision-making of the firm. Hambrick (2007, pg 334) explained that management are influenced by their background and characteristics when they identify potential obstacles to a firm’s achievement of its objectives. This is consistent with Sewpersadh (2019, pg 380) who found that the decisions they make will be built around the “personalized interpretations of the strategic situations they face”. Upper echelons theory has become one of the most important theories to emerge from the management field over the half-century due to its predictive power (Whitler et al., 2020). Upper echelons theory can be an appropriate framework used to examine the relationship between senior management characteristics and firm financial performance (Plöckinger et al., 2016). Recent applications of the theory indicate that, despite its initial formulation many decades ago, it is still a relevant theoretical lens through which the modern firm may be analysed.

Investigating executives’ characteristics and the impact of these on the financial performance of the firm contributes to the increasing number of empirical inquiries in this field of upper echelons research (Chen et al., 2019). There is considerable empirical research based upon upper

echelons theory which confirms there is managerial influence on firm's strategic decisions and financial performance (Plöckinger et al., 2016).

Education

One of the factors considered by Hambrick and Mason (1984) as key to the background of the senior management was the education received by them. According to Hambrick and Mason (1984, pg.200):

“A person's formal educational background may yield rich but complex information. To some degree, education indicates a person's knowledge and skill base.”

Another factor not considered by them, but which is related to the level of education of the senior management, is whether the management are accredited to a professional body. This would mean they are bound by that body's codes and policies and would have to adhere to the principles embodied by that body. In this study, professional accreditations are dealt with separately from education levels.

As per Gottesman and Morey (2006), many papers (Wally and Baum, 1994, Barker III and Mueller, 2002) in the management literature have suggested that management with higher educational qualifications will have better cognitive abilities, training and social connections that may then improve financial performance of the firm they operate.

Gottesman and Morey (2006) investigated the relationship between CEO education and firm financial performance using three hypotheses. The first being that educational background affects the CEO's cognitive ability. The second being that the education affects the behaviour of the CEO. The third states that the education affects the social capital of the CEO. All these factors were expected to influence the way the CEO operates and therefore affect firm financial performance. The research found that there was very little evidence that the educational background of the

CEO impacted the financial performance of the firm. Despite this, the CEOs with more prestigious educational backgrounds were found to be more highly compensated for their work. These findings provide evidence that firms are paying higher remunerations to higher qualified senior management despite insignificant returns in their firm's financial performance.

Gottesman and Morey followed up this research with further research in 2010. A study was conducted on 390 firms in the United States examining the relationship between the CEO's educational background and firm financial performance. This research was performed by applying binary variables to distinguish their different treatment groups and control variables to isolate the impact of the data being tested. The results found that there is no evidence that the type of education of the CEO is related to the firm financial performance (Gottesman and Morey, 2010).

Wang et al. (2016) performed a meta-analytic investigation based on upper echelons theory over 308 studies. The results support the majority of the upper echelons theory's predictions. CEO characteristics (including educational background) are significantly related with the strategic decision-making of the firm, which is significantly connected with organisational performance. The formal education of the CEO was found to be positively related to the firm's financial performance. The reasons for this relationship were thought to be due to more highly educated CEOs having better training, greater cognitive ability, and a greater knowledge base, which increases the firm's financial performance as there is a better decision-making process and more pertinent strategic action (Dragoni et al., 2011).

The educational background of CEOs of large US firms, as identified in the Forbes 800 Compensation List, were examined by Jalbert et al. (2002) to determine the relationship between CEO education, CEO compensation and organisational performance. The performance of the firm was measured using ROA and Tobin's Q. This study found that CEOs with no degree earn significantly more than those that do have a degree. They also found a notable relationship between the level of degree possessed by the CEO and the financial performance of the firm.

Interestingly, they also found that firms which have CEOs with no degrees are performing better than those that are operated by CEOs with degrees (Jalbert et al., 2002). Bhagat et al. (2010) analysed the effects of CEO education and firm performance on the largest 1500 firms in the US and found that in terms of short-term operating performance, CEOs with MBA degrees performed better than those with less prestigious degrees. However, they could not find a significant systematic relationship between a CEO's education and long-term financial performance (Bhagat et al., 2010).

Rakhmayil and Yuce (2011) examined the relationship between the qualifications of top management and firm market valuation in Canada. The study looked at how the education and experience of CEOs and CFOs affected Tobin's Q valuations for firms. They found that firms whose CEOs and CFOs had MBA degrees and/or graduated from highly reputable business schools on average had larger firm valuations compared with the firms whose managers do not have these same qualifications.

In terms of research performed in more comparable developing countries to South Africa, a study was performed on the relationship between CEO and board member educational backgrounds and firm financial performance for firms listed on the Indonesia Stock Exchange. Using four different measures for qualification (specifically postgraduate degrees, degrees obtained from respected domestic universities, degrees obtained from developed countries, and degrees in financial disciplines) they found that the educational background does have an impact on financial performance. The firms of board members with higher ranked qualifications performing significantly better than those with a lower ranked educational background (Darmadi, 2013). Higher ranked qualifications were classified as postgraduate degrees or higher with lower ranked degrees being undergraduate degrees or lower.

In China, Lu and Zhang (2015) examined the impact of CEO education on firm performance for Chinese publicly listed firm. Their research found that CEO education significantly affected the

value of the firm but does not significantly affect profitability or future growth in the firm. They conclude how the education of the CEO is seen to enhance the expectations of the firm without achieving these expectations. In Brazil, Serra et al. (2016) examined the influence of CEOs on the performance 73 Brazilian listed firm. They found that the formal education of the CEO does not show better short-term performance.

The studies analysed have contrasting results. The majority of research indicates that the education of the senior management has little to no impact on the financial performance of the firm. The education of the senior management does affect the expectations of the firm and therefore the market's valuation.

Experience and Age

Hamori and Koyuncu (2015) examined the relationship between the experience of the manager at the CEO position and the firm performance of the firm they direct. The findings indicated that CEOs with no prior experience performed better than new CEO appointments with prior experience in the position. The CEO experience was negatively related to organisational performance.

In Waldman et al. (2004), they controlled for the CEO tenure due to its prominence in prior upper echelons research. From their results they stated it was necessary to control for the tenure of the CEO during the performance period as this showed a slightly significant positive relationship with the firm performance.

Rakhmayil and Yuce (2011) determined that the prior work experience and tenure of the CEO and CFO will significantly increase the financial performance of the firm. These results, along with those above regarding the qualifications, support the human capital theory that higher

qualifications and experience will improve management's productivity by helping them to decide on better strategic choices and improve the implementation of these choices.

In addition to the education findings above, Serra et al. (2016) found that the tenure of the CEO has an inverted U-shaped relationship with firm performance. This finding indicates that the relationship between the tenure and firm financial performance is worse at the beginning of the tenure and after a period of time, the relationship increases with a few years of experience. This suggests there is a learning curve to the executive position and after an initial upturn in performance there will inevitably be a decline in firm performance after a period of time in charge.

Serfling (2014) performed a study which suggested that CEO age can have a significant impact on the decision-making ability of the CEO as well as the firm financial performance. The study found a negative relationship between age of the CEO and stock return volatility. The study revealed that older CEOs use less risky investment decisions which reduces the risk to the firm.

Based on a large sample of unlisted firms, Waelchli and Zeller (2013) found a significant negative relationship between the age of the chairmen of firm boards and firm performance. As the chairmen age, their cognitive abilities decline. These deteriorating cognitive abilities are the primary reason of the decline in firm performance as chairmen grow older.

From the meta-analytic investigation performed by Wang et al. (2016) based on the upper echelons theory for over 308 studies, they found that the financial performance of a firm is positively affected by the age of the CEO in charge.

Accreditations

Akerlof (1978) explains that accreditations with professional bodies serve to decrease information asymmetries in the labour market. They provide a level of assurance regarding the competence and abilities of prospective employees. This assurance is provided by a certification from the

establishment. The research on accreditations appears to be dominated by studies in the field of education. These studies appear to evaluate the impact of professional accreditation on students' learning (Volkwein et al., 2007) and the importance of professional bodies in monitoring the quality of tertiary education (Harvey et al., 1995). Similarly, the processes and criteria for accreditations with professional engineering and actuarial bodies have received research attention (for example, see Prados et al. (2005)). There appears to be a gap in the literature that evaluates the influence of management's professional accreditation and its impact as a characteristic of management. The researcher believes this presents an area worthy of research, especially considering the advertisement in Figure 1. The advertisement is evidence of the value that potential employers may place on an accreditation. It shows how the accreditation may reduce the possibility of adverse selection as explained in Akerlof (1978).

Figure 1: Advertisement

When you recruit a
SAICA AGA(SA), you increase
your **placement opportunities**.

As a recruiter, your credibility rests on the quality of talent that you recruit. When recruiting an accountant, you want to be sure that you're getting someone who is highly skilled and able to deliver great value. When you recruit an AGA(SA), you're getting an accountant who has a SAICA BCom Accounting degree and a completed SAICA training contract. You're getting a best-in-class accountant who has the competencies to drive accounting excellence and performance in companies.

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Source: South African Institute of Financial Accountants and Risk Managers (SAIFA), 2021

Other determinants of firm performance

The control variables to be used in this research study have been selected based on the variables that have been found to significantly affect the financial performance of a firm in the prior literature. Gottesman and Morey (2010) found a significant impact on the financial performance of a firm based on the leverage position and liquidity of the firm. Hamori and Koyuncu (2015) found that the size of a firm, measured using the average annual logarithm of sales, is significantly related to the financial performance of the firm. Ozkan (2011) analysed the relationship between CEO compensation and firm financial performance. Their research found that there is a positive relationship between the compensation received by the CEO and the firm's financial performance with larger firms willing to compensate their CEOs greatly.

The current global pandemic due to the COVID-19 virus has negatively affected most South African firms as most businesses were unable to operate at 100% capacity during the nation-wide lockdown. The economic difficulties caused by the lockdown is likely to see future reductions in output from these firms and this could affect the compensation received from by the executives in the foreseeable future.

Table 1 summarises the relevant findings from the literature.

Table 1: Summary of research findings

<u>Study</u>	<u>Context</u>	<u>Relationship between senior management characteristics and firm performance</u>
Gottesman and Morey (2006)	Educational background affects cognitive ability, behaviour and social capital of CEO.	Very little evidence that the educational background of the CEO affected the financial performance of the firm.
Gottesman and Morey (2010)	Relationship between CEO education and firm financial performance in 390 firms in the United States.	No evidence that the type of education of the CEO is related to the firm financial performance. The age of the CEO was found to significantly affect firm performance.
Wang et al. (2016)	Meta-analytic investigation on upper echelons theory over 308 studies.	CEO educational background is significantly related to strategic decision-making which is significantly connected to firm performance. The age of the senior management positively affects firm financial performance.

Jalbert et al. (2002)	Educational background of CEOs of large US firms.	Identified a notable relationship between the level of degree possessed by the CEO and the financial performance of the firm. Found that age did not significantly affect firm performance.
Bhagat et al. (2010)	The effects of CEO education and firm performance on the largest 1500 firms in the US.	In the short-term, CEOs with higher qualifications performed better. No significant relationship for long-term financial performance.
Rakhmayil and Yuce (2011)	The relationship between the qualifications of top management and firm performance in Canada.	Found that CEOs and CFOs with MBA degrees had larger firm valuations. Additionally, found that the work experience and tenure positively affect firm performance.
Darmadi (2013)	Examined the relationship for firms listed on the Indonesia Stock Exchange.	Found that board members with higher ranked qualifications performed

		better than those with lower ranked qualifications.
Lu and Zhang (2015)	Examined the impact of CEO education for Chinese publicly listed firms.	CEO education significantly affected the value of the firm but does not affect profitability or future growth.
Serra et al. (2016)	Impact of CEOs on the performance of 73 Brazilian listed firms.	They found that the education of the CEO does not show better short-term performance.
Hamori and Koyuncu (2015)	Relationship between CEO experience and firm performance.	CEO experience is negatively related to the firm's financial performance.
Waldman et al. (2004)	Relationship between the tenure of the CEO and firm performance.	The tenure of the CEO was found to have a slightly significant relationship with firm performance.
Serfling (2014)	Relationship between CEO age and CEO decision-making and therefore firm performance.	The study found a negative relationship between the age of the CEO and stock return volatility.
Waelchli and Zeller (2013)	Relationship between the chairman age and firm financial performance.	The study found a significant negative relationship between the age of the firm chairmen and firm performance.

Development of hypothesis

Hypothesis

Based on the prior literature and the findings on the upper echelons theory, the following hypotheses can be formed:

H1: The education level (qualifications) of the senior management team will have a significant positive effect on the financial performance of the firm.

The researcher attempted to research the impact of senior management accreditation on the financial performance of firms. The only articles that were found were in the field of education and it can therefore be concluded that minimal research has been performed analysing the impact on the financial performance of a firm due to the accreditations of its senior management. Nevertheless, the researcher reasons that the effect of the accreditation of the qualifications of management are worth analysing. This is especially relevant in a South African context where a significant portion of CFOs have qualifications that are accredited with the South African Institute of Chartered Accountants (AccountancySA, 2017). Therefore, the second hypothesis for this study is:

H2: The accreditation of the senior management will have a significant positive effect on the financial performance of the firm.

Besides the characteristics directly related to the level of education, the literature indicates other characteristics that are likely to influence firm performance. Management age and level of experience have also been shown to affect firm financial performance (Waldman et al., 2004, Rakhmayil and Yuce, 2011, Serra et al., 2016, Wang et al., 2016). Whilst age and number of years of experience are related, they will be analysed separately since younger members of

management may have started their careers earlier than some of their older counterparts. Furthermore, younger management teams may possess technical knowledge that their older counterparts do not have by virtue of the former being trained more recently (Wang et al., 2016). Therefore, we hypothesise that:

H3: The average age of senior management of the firm will have a significant impact on the financial performance of the firm.

H4: The average number of years of experience of senior management will have a significant positive impact of the financial performance of the firm.

Chapter III – Methodology

Overview of method

The purpose of this study is to determine if organisational performance is affected by the characteristics of the senior management that set the strategic direction of the firm. The study also evaluates whether an accreditation to a professional body will affect the financial performance of the firm. To this end, the study followed a quantitative method of research. This was appropriate because the data analysis allowed the researcher to identify significant relationships and explain patterns that could confirm or reject the hypotheses. The intention of quantitative research is to examine relationships and patterns in data so that it may be interpreted and compared to a particular standard (Leedy and Ormrod, 2005). In the case of this study, the data relates to the Johannesburg Securities Exchange (JSE) listed firms and the characteristics of their senior management personnel.

Sample size and selection of sample

The population for the study is all South African firms that are not owner managed. Considering the detailed senior management information that is required, the sample of firms to be analysed in this study was chosen as firms that are listed on the JSE. These firms tend to disclose the details of their senior managers in their annual integrated reports which are publicly available. The sample size will be the top 100 firms publicly listed on the JSE by market capitalization. The top 100 firms listed on the JSE by market capitalization comprise approximately 81% of the total market capitalization of the JSE and is representative of the population of listed firms in South Africa.

All firms that were listed on the Johannesburg Securities Exchange after the 2015 were excluded from the study so as to allow for the reliable measurement of lagged performance indicators. Firms that did not have satisfactory information regarding their senior management personnel were excluded from the study.

Sources of data

The researcher obtained the senior management characteristics and the firm financial performance from the IRESS Expert database. Data not obtained from this database was obtained by the researcher from the annual integrated reports of the firm that are publicly available on their firm websites.

Collection of data

The researcher collected the data from the IRESS Expert database and the relevant annual integrated reports of the firm and then imported this data to Microsoft Excel for safekeeping and data analysis. The data pertaining to the industry sector GDP was obtained using the documents provided on the South African government's statistics South Africa web page (StatsSA, 2020).

The researcher verified the data collected on the IRESS Expert database by analysing the firm's annual financial statements. The control variables were also obtained from the IRESS Expert database. The accreditations were determined by verifying the senior management with their respective professional body's website to confirm their affiliation to that professional body. The professional bodies used in this study were the main professional body for each respective industry in South Africa. For example, the accounting and finance industry was verified with the South African Institute of Chartered Accountants (SAICA, 2020), the law industry was verified with the Legal Practice Council (LPC, 2020), the mining industry was verified with the South African Institute of Mining and Metallurgy (SAIMM, 2020), the engineering industry was verified with the

Engineering Council of South Africa (ECSA, 2020) and the medical industry was verified with the Health Professions Council of South Africa (HPCSA, 2020).

Data analysis

The researcher used an ordinary least squares regression model in a statistical software package, R (version 3.4.4). The sample of firms were analysed for the 5-year period from 2015 to 2019 both inclusive. The returns for these periods were averaged for the 5-year period and this average return will form the input for the “performance” variable. The senior management characteristics were recorded as per the 2015 financial reports (i.e. 5 years ago). The researcher adjusted the data for any changes in the senior management personnel such as any changes to the executive committee for the 5-year period being analysed. The relative education levels were scored using a ranking system. The scores for each senior manager were averaged over the 5-year period to form the “qualification” variable. The age of the senior managers was averaged over the 5-year period to form the “age” variable while the tenure of each manager was averaged over the 5-year period as well to form the “tenure” variable (Akpan and Amran, 2014).

The financial performance of the firm is the dependent variable and is represented by Tobin’s Q, the share price and the return on assets (ROA) for this study. ROA is a proxy for the accounting-based performance (internal). Tobin’s Q and the share price are used as a measure of the market-based performance (external) (Bhagat et al., 2010, Darmadi, 2013, Hamori and Koyuncu, 2015). Tobin’s Q is the ratio between an asset’s market value and its replacement value (Kaldor, 1966). The replacement value of the firm’s assets will be calculated using the book values to determine an approximate ‘q’ value (Chung and Pruitt, 1994). The regression analysis was performed three times using the three different measures of performance. The third hypothesis was tested by looking at the descriptive stats regarding the different fields of study and the financial performance of those firms.

The researcher analysed the results further into the different fields of degree which were assessed to determine whether the results are significant for any specific field. An analysis of the impact as per the relevant industry of the firm was also performed.

The following equation was used:

$$Performance_{it} = \alpha + \beta_1 Qualifications_{it} + \beta_2 Accreditations_{it} + \beta_3 Age_{it} + \beta_4 Tenure_{it} + \beta_5 Leverage_{it} + \beta_6 Size_{it} + \beta_7 Liquidity_{it} + \beta_8 SectorGDPGrowth_{it} + \varepsilon$$

Jalbert et al. (2011)

Where:

- *Performance*: The dependent variable representing the measure of financial performance for firm *i* at time *t*, using the average of Tobin's Q (Gottesman and Morey, 2010), the average share price and the average of return on assets (Jalbert et al., 2011) for the period under analysis. The model will be run three times – once for each measurement approximation for the “performance” variable.
- $\beta_1 Qualifications$: The level of education the senior management personnel has obtained as at the end of the 2015 financial year.
- $\beta_2 Accreditations$: The independent binary variable represented by the affiliation of the senior management to their respective professional body. The accreditation will be coded with a 0 representing no accreditation and a 1 representing an accreditation to a professional body.
- $B_3 Age$: This is the average age of the senior management of the firm as at the end of the firm's 2015 financial year.
- $B_4 Tenure$: The tenure will be the average number of years the senior management worked in their current position as at the end of the firm's 2015 financial year.
- The control variables are: $\beta_5 Leverage$, $\beta_6 Size$, $\beta_7 Liquidity$, $\beta_8 SectorGDPGrowth$.

- *B₅Leverage*: The leverage is the annual average leverage of the firm during the sample period. It will be calculated as the sum of total long-term debt and debt in current liabilities, divided by total assets.
- *B₆Size*: The size of the firm which will be measured using the annual average natural logarithm of total assets.
- *B₇Liquidity*: The liquidity of the firm which will be measured using the annual average liquidity ratio (the ratio between the current assets and current liabilities of the firm).
- *B₈SectorGDPGrowth*: *The change in sector contribution to GDP growth year on year.* ε : The normal error term.
- α : The constant.

The researcher acknowledged that the determinants of firm performance are as diverse as they are difficult to disentangle. Therefore, the researcher extracted the main drivers of performance from South African research evidence since 2016. The possible drivers of performance were included in the report to determine which control variables have the strongest relationship with the financial performance of the firm. The purpose of this research is to determine the effect (if any) of senior management characteristics on performance. The determination of factors which influence firm performance (social, governance and legal) is a broader research objective and is excluded from the scope of this research project. Therefore, a correlation matrix was used to find those control variables with a correlation of 0.4 or higher (Gujarati, 2009). These relatively highly correlated control variables were included in the regression model, along with the independent variables of management characteristics.

The following table indicates the precedents for the variables that have been used:

Table 2: Precedent for variables used

<u>Variable</u>	<u>Precedent</u>	<u>Measurement Proxy</u>
<i>Performance</i>	Gottesman and Morey (2010), Hamori and Koyuncu (2015), Darmadi (2013)	Tobin's Q (using book values); Share Price; Return on Assets
β_1 <i>Qualifications</i>	Serra et al. (2016), Clarke et al. (2013), Rakhmayil and Yuce (2011)	
β_2 <i>Accreditations</i>	N/A	
B_3 <i>Age</i>	Bhagat et al. (2010), Serra et al. (2016), Wang et al. (2016)	Average Age
β_4 <i>Tenure</i>	Rakhmayil and Yuce (2011), Serra et al. (2016), Bhagat et al. (2010)	Average Tenure
B_5 <i>Leverage</i>	Gottesman and Morey (2010), Ntim and Osei (2011), Campbell and Mínguez-Vera (2008)	Sum of total long-term debt and debt in current liabilities, divided by total assets
B_6 <i>Size</i>	Serra et al. (2016), Hamori and Koyuncu (2015), Wang et al. (2016)	Annual average natural logarithm of total assets
B_7 <i>Liquidity</i>	Gottesman and Morey (2006)	Current assets to current liabilities

<i>B₈SectorGDPGrowth</i>	Jalbert et al. (2011), Gottesman and Morey (2006), Bhagat et al. (2010)	Change in sector contribution to GDP
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The equation was performed in categories per the field of study so as to determine the second hypothesis regarding the performance of the specific fields of study.

Validity and reliability

The researcher gathered the data from the IRESS database. The IRESS database has reliable information about the senior management's background information and education. The financial information of the firm is reliable, and a random sample was confirmed with the annual financial statements of the firm. The data obtained from the database was validated to information about the relevant CEOs from the specific firm's website as well as the annual financial statements of the firm which are credible as these are required to have been audited (Bussin and Modau, 2015). The researcher verified the senior managers' accreditations by analysing the list of verified members for the senior manager's professional body as per their website. The researcher tested the assumptions needed in order to perform a regression model. The researcher tested that the data is normally distributed by performing a Q-Q plot (refer to Appendix A) to determine the goodness of fit test. The researcher tested that there is little to no autocorrelation in the data by calculating the variance inflation factor (VIF) for each variable. The researcher tested that there is no heteroscedasticity in the data by using the Breusch-Pagan test to analyse whether the variance in the errors of the regression is dependent on the values of the independent variable.

Chapter IV – Results

Descriptive Statistics

Considering the high levels of responsibility that senior management have, as well as the large compensation packages that they earn relative to the rest of the staff in the firm, it is reasonable to assume that they are “highly qualified”. In total data was collected for 256 senior management personnel. An analysis of the senior management of the top 100 firms listed on the JSE by market capitalization showed that approximately 42% (107) of senior management have at most an undergraduate degree, 27% (70) have an honours level degree and 29% (75) have a master’s level degree from a university. There was also 2% (4) of senior management members who held no official qualifications or whose qualifications were not disclosed. The positions held by these senior managers that held no qualifications (or whose qualifications were not disclosed) include a chief operating officer (COO), two chief executive officers (CEOs) and a IT executive. The data also determined that 130 (51%) of the senior management were accredited to their respective professional body while the remaining 126 (49%) were not accredited to any professional body.

Figure 2: Percentage for each level of degree held by senior management

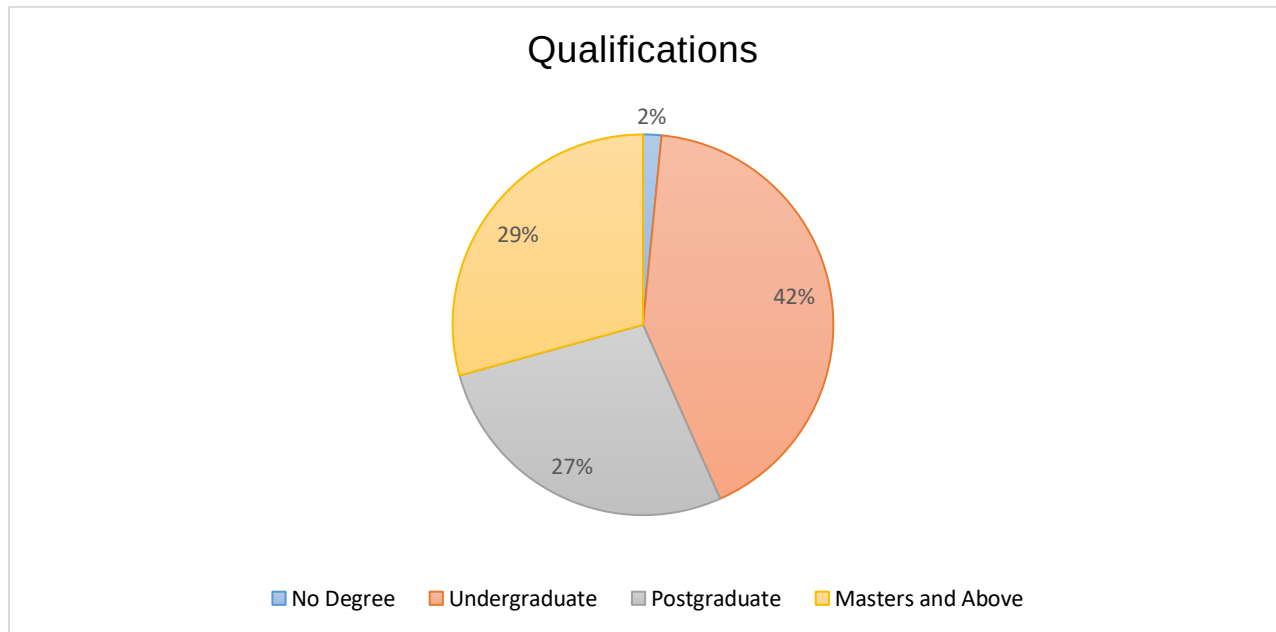
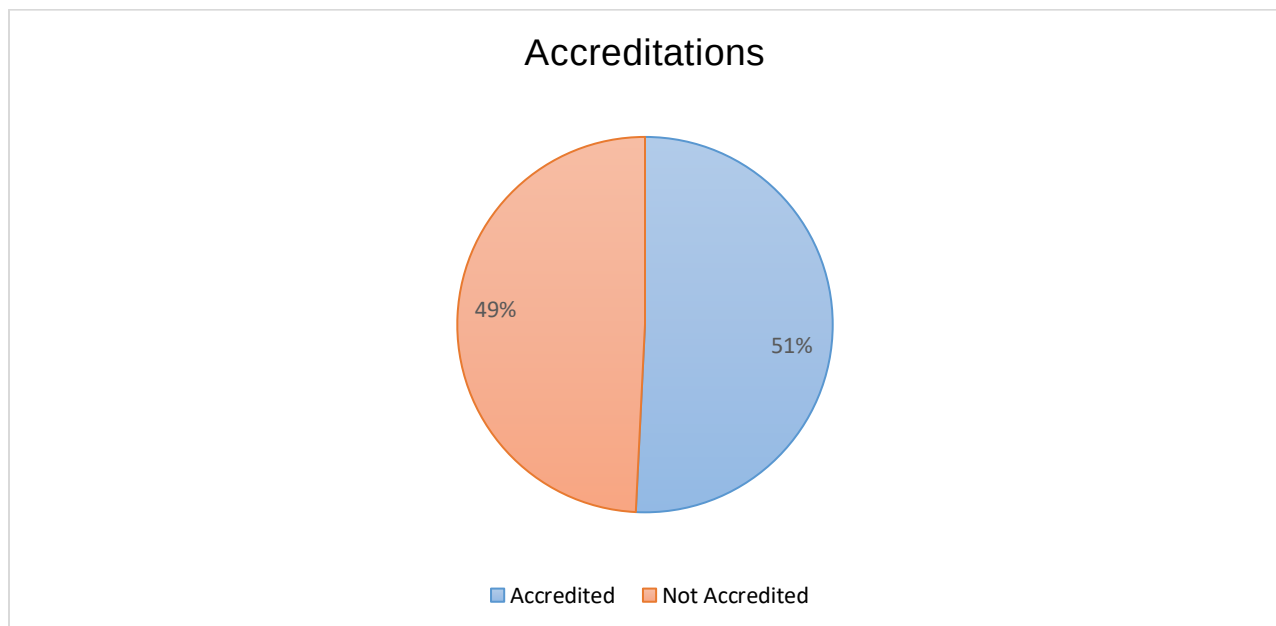
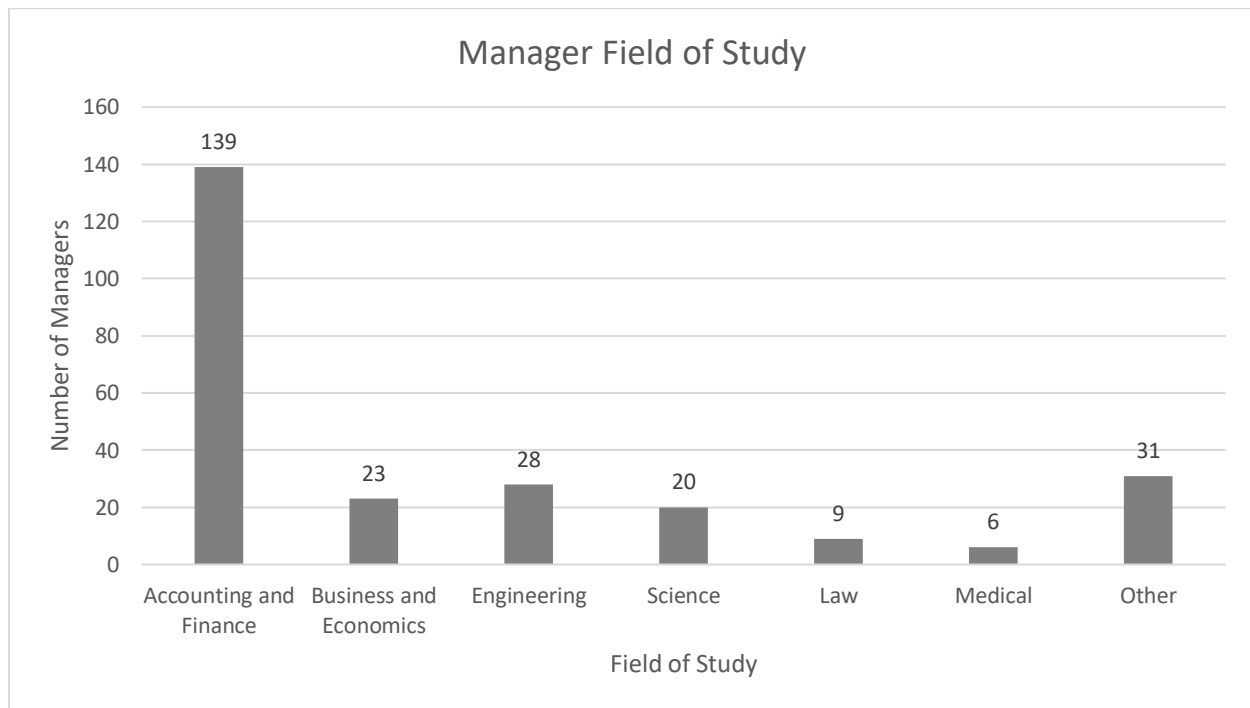


Figure 3: Percentage of accreditation of senior management



Of the 256 senior management researched in this study, 139 (54%) were found to have an accounting or finance degree, 28 (11%) possessed engineering degrees, 23 (9%) possessed a business or economics degree. Another 20 (8%) senior managers possessed a scientific degree, 9 (4%) possessed law degrees, 6 (2%) possessed a medical degree and 31 (12%) possessed other degrees apart from those identified above.

Figure 4: Fields of study of senior management



An analysis of the ages of the 256 senior management personnel found the large majority of senior managers were between the ages of 40 and 60 with this range containing 229 (89%) of all senior managers. The analysis showed that there were 0 senior managers aged 30 years or below, 18 senior managers between the ages of 30 years and 40 years, 119 senior managers

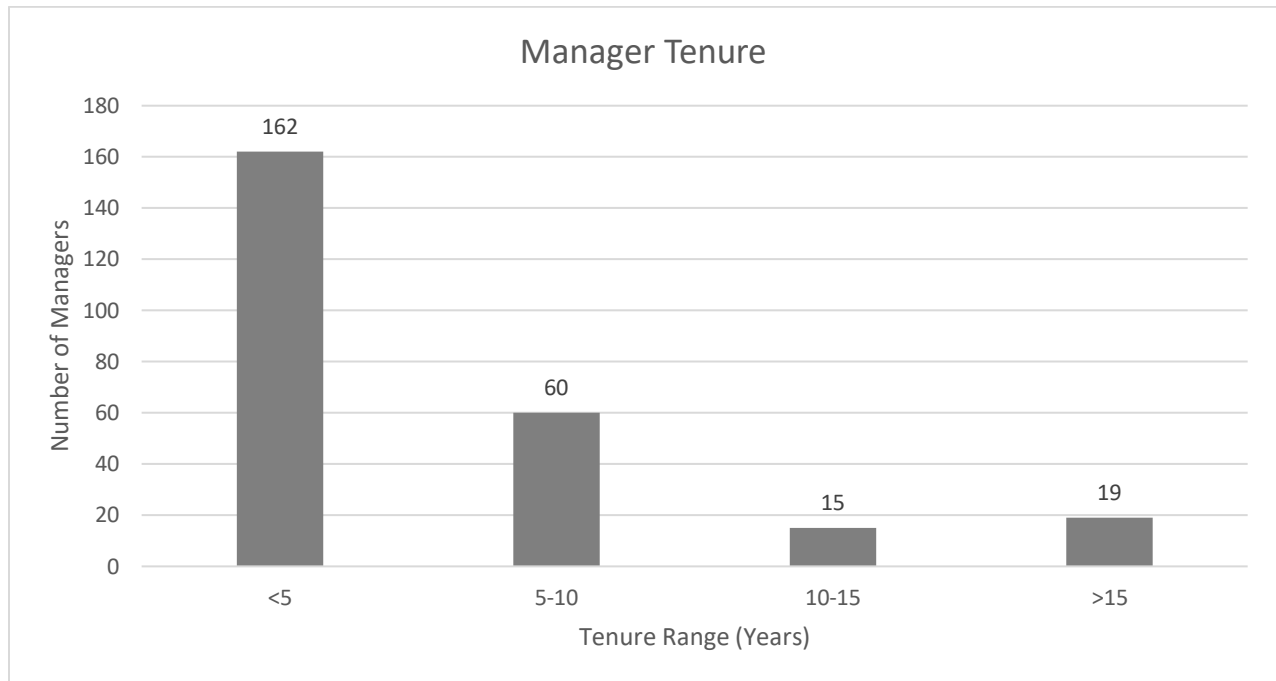
between the ages of 40 years and 50 years, 100 senior managers between the ages of 50 years and 60 years, and 19 senior managers found to be older than 60 years.

Figure 5: Age ranges of senior management



An analysis of the tenures of the 256 senior management personnel found the large majority of senior managers were employed in their current position as at 2015 for less than 5 years with this accounting for 162 (63%) of all senior management. The analysis showed that there were 162 senior managers employed in their positions for less than 5 years, 60 senior managers employed in their positions for between 5 years and 10 years, 15 senior managers employed in their positions for between 10 years and 15 years, and 19 senior managers were employed in their positions for more than 15 years.

Figure 6: Tenure ranges of senior management



Regression results

Prior to conducting further analysis, several tests were conducted to determine if the assumptions of a regression were met (Gujarati, 2009). All the data approximated normal distributions except ROA. This was confirmed by the Kolmogorov-Smirnov test. Where the data was not normal, robust standard errors were calculated. Also, based on the Cook's distances, the following outliers were removed:

Price: Capitec 2018, Naspers 2015 – 2018

Tobin's Q: Capitec 2018, Naspers 2015 – 2018

ROA: Cartrack 2015, Royal Bafokeng 2015, AngloAmerican Platinum 2015, Naspers 2015 - 2018

In analysing the relationship between management characteristics and the share price, Tobin's Q and Return on Assets (ROA), the fixed effects model and the random effects model have been used. The random effects model assumes that the relationship between the error term and the explanatory variable is uncorrelated. The fixed effects model allows the error term to be correlated with that variable (Schmidheiny, 2013). To choose between the random effects model and the fixed effects model, the Hausman Test was conducted. The Hausman Test works to determine whether there is a correlation between the error term and the independent variable. Under this test, the null hypothesis is that the random effects model is preferred. This essentially means that under the null hypothesis is, there is no correlation between the error term and the explanatory variable. In terms of the Hausman Test, where the p-value is insignificant, namely smaller than 0,05, the null hypothesis is rejected, and the fixed effects model will be used. Where the p-value is statistically significant, the null hypothesis cannot be rejected, and the random effects model is used (Gujarati, 2009). Refer to Table 4 in Appendix B for the results of the Hausman Test for each measure of performance and the model that was selected based on these results

Table 3: Regression Results

Performance	Share Price	Tobin's Q	ROA
(Intercept)	-52951.698	4.996	39.955
	(0.0524) ^	(0.0000) ***	(0.0001) ***
Size	13307.744	-0.246	1.524
	(0.0000) ***	(0.0001) ***	(0.3185) **
Liquidity	1875.3	-0.032	0.635
	(0.0579) ^	(0.3909)	(0.301)
Growth	-76.245	0.002	-0.146
	(0.6995)	(0.8420)	(0.2366)
Age	327.201	0.009	0.149
	(0.1802)	(0.3207)	(0.3271) ^
Tenure	54.713	0.001	-0.135
	(0.8458)	(0.9096)	(0.4412)
Leverage	-30705.592	0.842	-6.023
	(0.0025) **	(0.0129) **	(0.3373)
Qualifications	-2006.429	-0.018	-1.553
	(0.4985)	(0.8670)	(0.4005)
Accreditations	-4371.274	0.041	-3.591
	(0.4539)	(0.8364)	(0.2774) **
R squared	0.1815	0.0786	0.0305

P value	0.0000	0.0017	0.0004
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Notes: Robust standard error values are given in parentheses. ^Indicates significance at 10%; **indicates significance at 5%; ***indicates significance at 1%

Share Price

The fixed effects model was used for this regression as the null hypothesis under the Hausman Test was rejected ($P < 0.05$). Analysing the results of the regression for the equation where *Performance* is represented by the share price of the firms, we see that none of the defined characteristics of senior management have a significant relationship with the share price of the firm.

Size is seen to be the key determinant of share price as it is significant at the 1% level. It is observed that firms with higher levels of debt have lower share prices as the leverage was seen to be significant at the 5% level. The liquidity of the firm was significant at the 10% level indicating that the higher the liquidity of the firm, the higher the share price of the firm.

The accreditations and qualifications of the senior management do not have a significant impact on the firm's share price, however, accreditations and qualifications have a negative relationship with the share price and so non-accredited senior management personnel reflect a higher share price than those that are accredited. This also indicates that the less qualified the senior management are, the better the share price will be for the firm, albeit insignificantly. This finding is consistent with the results of (Gottesman and Morey, 2006, Hamori and Koyuncu, 2015, Serra et al., 2016). They provide interesting insights into the strategies used by investors in large South African firms. The evidence indicates that the investors do not value shares of firms with higher qualified, professionally accredited managers higher than their counterparts. Managements' ages also appear to have no significant effect on the share price of the firm. However, considering the

direction of the relationship (albeit insignificant), it is apparent that the share prices of firms that have older management teams are higher.

The major determinants of the share price appear to be the size of the firm (represented by the annual average natural logarithm of total assets), the leverage of the firm (represented by the annual average leverage), the liquidity of the firm (represented by the annual average liquidity ratio) and other factors that were not included in the model (represented by the intercept).

Return on Assets

The fixed effects model was used for this regression as the null hypothesis under the Hausman Test was rejected ($P < 0.05$). Analysing the results of the regression for the equation where *Performance* is represented by the return on assets of the firms, we see that the age of the senior management has a significant relationship with the return on assets as this is significant at the 10% level. This indicates that older senior management are able to generate a greater return on their assets. This ability to generate a greater return on assets is not recognised by the market as there is no significant relationship between age and share price as indicated above. This finding is consistent with the results of (Waelchli and Zeller, 2013, Serfling, 2014, Wang et al., 2016).

The accreditations of the senior management were also found to have a significant relationship with the return on assets at the 5% level. Interestingly, the relationship between the accreditations and return on assets is negative indicating that those senior managers who are not accredited to a professional body are able to generate better return on assets for their firm.

Size is seen to be the key determinant of the return on assets as it is significant at the 5% level. Neither the qualifications nor the tenure of the senior management has a significant relationship with the firm's return on assets. The qualifications of the senior management have a negative

relationship with the return on assets indicating that, although insignificantly, less qualified senior management are able to generate a higher return on assets.

The major determinants of the return on assets appear to be the size of the firm (represented by the annual average natural logarithm of total assets), the accreditations of the senior management (represented by the independent binary variable indicated by the affiliation of the senior management to their respective professional body), the age of the senior management (represented by the average age of the senior management) and other factors that were not included in the model (represented by the intercept).

Tobin's Q

The random effects model was used for this regression as we failed to reject the null hypothesis under the Hausman Test ($P > 0.05$). Analysing the results of the regression for the equation where *Performance* is represented by the Tobin's Q of the firms, we see that none of the defined characteristics of senior management have a significant relationship with the share price of the firm. This finding is consistent with the results of (Gottesman and Morey, 2010, Hamori and Koyuncu, 2015, Serra et al., 2016).

Besides the intercept, both the size of the firm and the leverage were found to have a significant relationship with Tobin's Q. Contrary to the results of the regression from the other two models for performance measures, size is shown to have a negative relationship with Tobin's Q of the firm. This is potentially due to the difficulty in measuring Tobin's Q.

The accreditations and qualifications of the senior management do not have a significant impact on the firm's measure of Tobin's Q, however, accreditations and qualifications have a negative relationship with Tobin's Q and so non-accredited senior management personnel reflect a higher

Tobin's Q than those that are accredited. This also indicates that the less qualified the senior management are the better the measure of Tobin's Q will be for the firm, albeit insignificantly.

The major determinants of Tobin's Q appear to be the size of the firm (represented by the annual average natural logarithm of total assets), the leverage of the firm (represented by the annual average leverage) and other factors that were not included in the model (represented by the intercept).

Chapter V – Conclusions and Recommendations

Conclusion

The first objective of this study was to assess whether the level of qualifications possessed by senior management impacted the financial performance of the firm they work for. The results indicate that the qualifications have very little correlation with the financial performance of the firm. Interestingly, the qualifications were found to have a negative relationship with all three measures of performance. The second objective of this study was to determine whether senior management being accredited to a professional body impacted the financial performance of the firm they work for. The results indicate that the accreditations have very little correlation with the share price and Tobin's Q of the firm they work for. There was a significant negative relationship found with the accreditation of the senior management to a professional body and the firm's return of assets. For all measures of performance, there was a negative relationship between the accreditation of the senior management and the financial performance of the firm. The third objective of this study was to assess whether the age of the senior management impacted the financial performance of the firm they work for. The results indicate that the senior manager's age has a very little correlation with the share price and Tobin's Q of the firm. There was a significant positive relationship found with the age of the senior management and the firm's return of assets. The final objective of this study was to assess whether the tenure of the senior management impacted the financial performance of the firm they work for. The results indicate that the tenure has very little correlation with the financial performance of the firm. Interestingly, the qualifications were found to have a negative relationship with the return on assets of the firm.

The overall findings from this study indicate that, in a South African context, the framework proposed by the upper echelons theory is not supported based on the empirical evidence

obtained. The characteristics of senior management have very few significant relationships with the financial performance of the firms these managers are operating. The changes in the decision-making capabilities of these senior managers which is influenced by the characteristics included in this study, have no significant influence over the financial performance of the firm.

Possible Extensions

The effect of the size of the firm on its performance is confirmed by the significance of size in the analysis contained in Chapter IV: Results. This is possibly because the large firms which comprise the sample in this research, tend to have more resources available and have an existing reputation in the market. The research could be expanded to include more firms that are not as financially powerful as those selected in this study. This sample of firms would possibly represent a more accurate reflection on the impact of the senior management team.

The results of the analysis in this study show that, largely, the characteristics of senior management do not have any significant relationship with firm performance. Viewing these results in the context of the corporate governance environment in South Africa presents a possible extension of the present study. Further analysis may provide insights on the control mechanisms of company board oversight and approval.

Since management's behaviour could be influenced by factors other than their educational characteristics and background, additional variables could be included in further analysis. The application of agency theory could be incorporated in extensions to the present study. For example, to consider the effect of incentives, the analysis in the present study could be done in the context of management-owned firms. In these cases, the interests of management are likely to be aligned with those of the firm (Jalbert et al., 2002).

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Appendices

Appendix A: Normal Probability Plots

Figure 7: Normal Probability Plot for Return on Assets

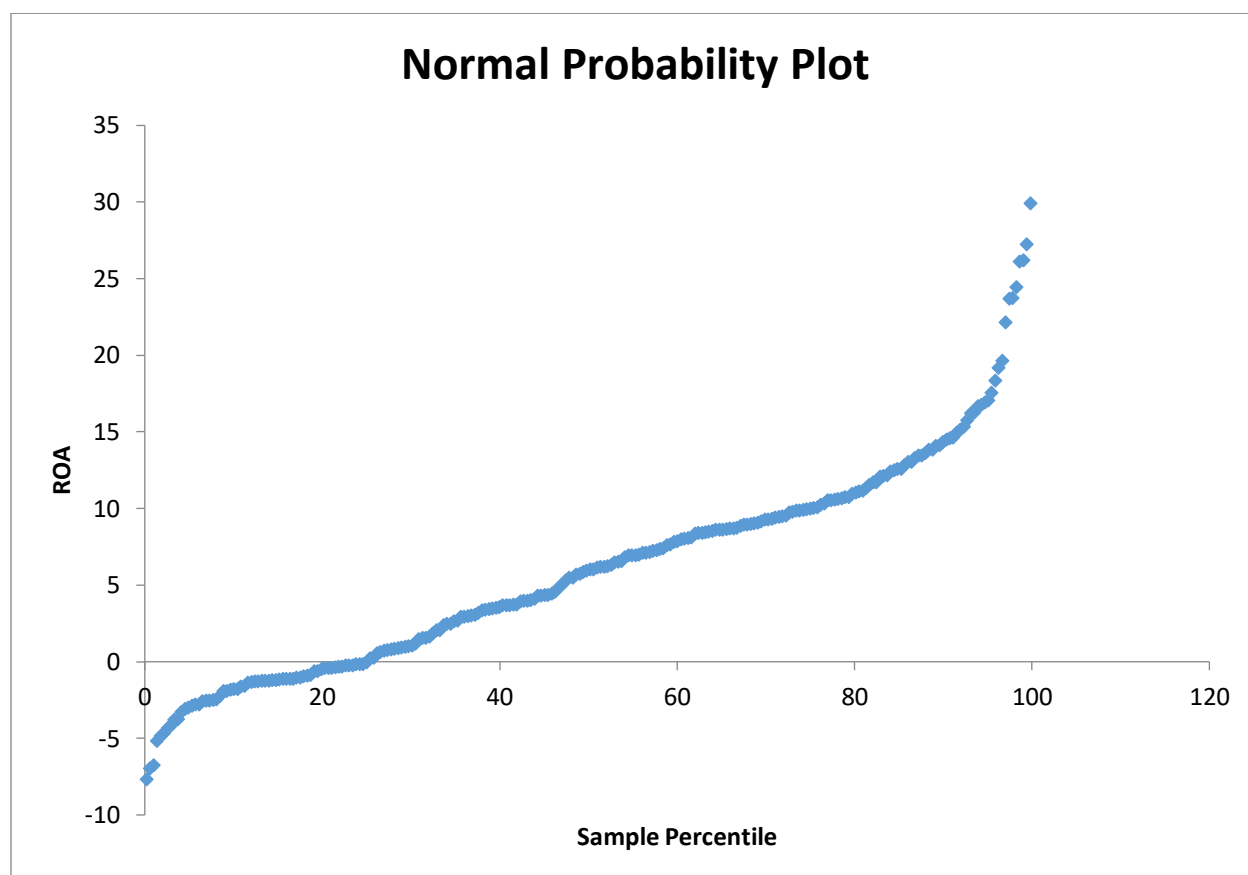


Figure 8: Normal Probability Plot for Tobin's Q

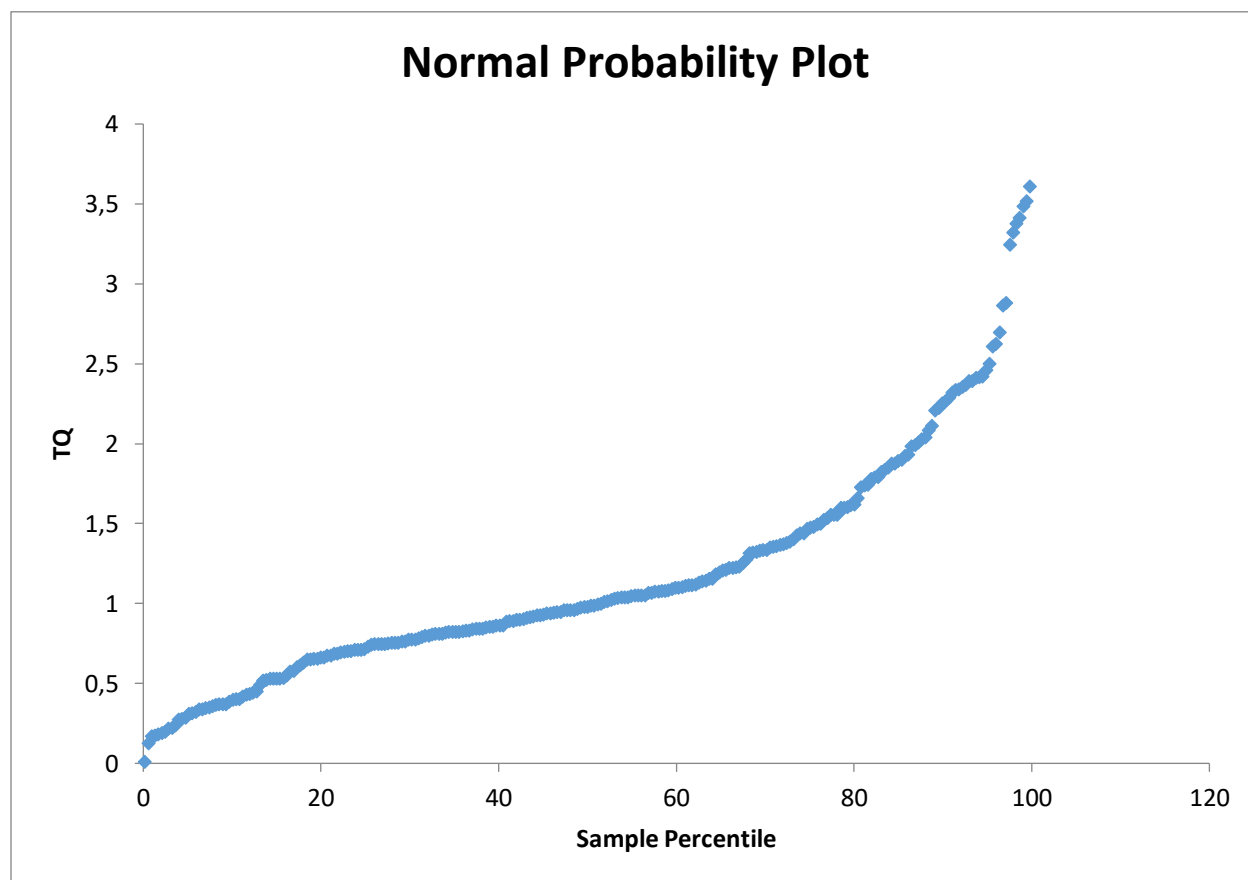
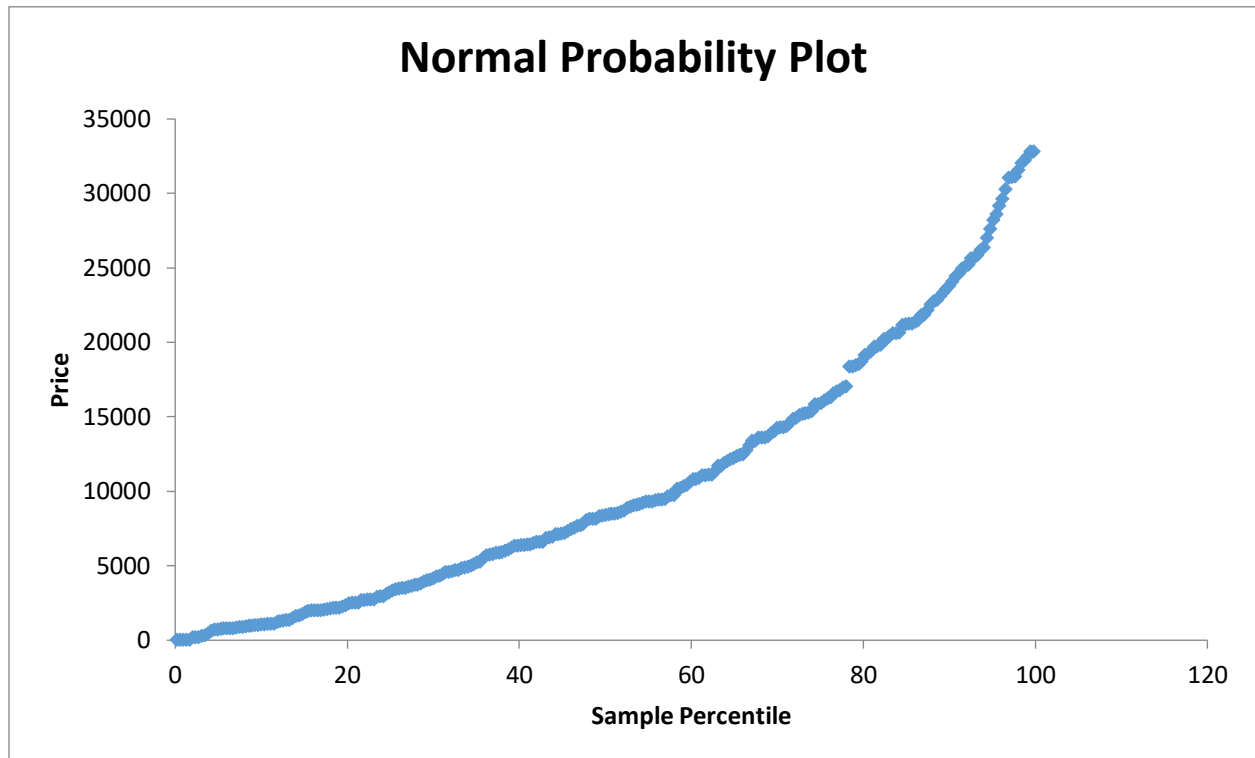


Figure 9: Normal Probability Plot for Share Price



Appendix B: Hausman Test Results

Table 4: Hausman Test Results and Model Chosen

Performance	Share Price	Tobin's Q	ROA
Hausman Test (p-value)	0.000	0.158	0.039
Model chosen	Fixed effects	Random effects	Fixed effects