School of Economics and Finance
Faculty of Commerce, Law and Management

Determinants and the Announcement Effect of Bond and Equity Issuance on JSE listed firms

Master of Commerce (50% Research) in Finance

Lerato Mapela **[788399]**

Supervisor: Professor Chimwemwe Chipeta

School of Economics and Finance

March 2022

Abstract

The main objective of this paper is to investigate which firm-specific determinants influence the likelihood of issuing debt and moreover if the announcement of debt and equity issues exhibit any abnormal returns on days surrounding the event. To discover what drives the likelihood of issuing debt as a form of financing decision, five firm-specific explanatory variables (*Size, Profitability, Managerial Ownership, Tangibility and Market-to-Book ratio*) have been selected and regressed against a debt issue announcement. A sample of 81 bond issue announcements and 113 equity issue announcements of 69 JSE-listed firms during the period January 2000 to January 2020 is used to conduct a regression analysis and an event study analysis. The main findings of the study indicate that size, managerial ownership and market-to-book variables are statistically significant in driving the likelihood of issuing debt over equity. Both size and managerial ownership established a positive relationship with a debt issuance and the market-to-book ration established a negative relationship with debt issuance. Over and above the regression analysis, the event study conducted reveal that there are negative significant abnormal returns associated with the announcement of equity issues on days surrounding the event date.

Keywords: *Equity, Debt Issuance, Event Study, Announcements, Abnormal Returns*

Declaration

I, Lerato Mapela, declare that this research paper is my own work and that I have correctly acknowledged the work of others. It is submitted to fulfil the requirements for the degree of Master of Commerce in Finance at the University of the Witwatersrand, Johannesburg. I declare that this research paper has not been submitted for any other degree or examination in this or any other institution.

Lerato Mapela

March 2022

Acknowledgements

I would like to express my utmost gratitude to my supervisor Professor Chipeta for the guidance and support throughout my journey. Thank you for always being available to offer unlimited assistance and advice. Your invaluable insights and profound belief in my work and abilities has inspired me to even reach greater heights, thanks Prof!

A special thanks to my mother who has always believed in my academic abilities and career choices. Your prayers and emotional support during this project kept me going. I cannot begin to express my appreciation to my dearest Tshepo for the overwhelming support and encouragement from beginning to end. The completion of this dissertation would not have been possible without your assistance offered and numerous pep talks.

A special thanks to all the members of the Sisterhood family for the great outings and memories we've created together when I needed an academic and work break. Snethemba and Bokamoso Tutors Pty (Ltd) thank you for the inspiration and drive that led to the pursuit of my academic interests. Puseletso and Kagiso my fellow Masters colleagues for keeping my progress and wellness in check. Lebogang Mapela, thank you for the love and unconditional support I needed from a brother.

I would like to acknowledge the Department of Higher Education and Training (DHET) in collaboration with Wits University for the funding provided through the Nurturing Emerging Scholars Programme (NESP) Masters Scholarship.

Lastly, this dissertation is dedicated to my late father Mr. E Mapela who always believed in his little girl's academic capabilities. May your soul rest in peace papa.

"Commit your work to the Lord and your plans will be established" – Proverbs16:3

Table of Contents

List of Tables

List of Figures

Abbreviations

AAR	Average Abnormal Return
AR	Abnormal return
ASE	American Stock Exchange
CAAR	Cumulative Average Abnormal Return
CAR	Cumulative Abnormal Return
CEO	Chief Executive Officer
CFO	Chief Financial Officer
EMH	Efficient Market Hypothesis
EO	Exchange Offer
GDP	Gross Domestic Product
H1 - H3	Hypothesis one to three
IPO	Initial Public Offering
JSE	Johannesburg Stock Exchange
MM	Modigliani and Miller
MTB	Market-to-book
NASDAQ	National Association of Securities Dealers Automated Quotations
NYSE	New York Stock Exchange
U.S	United States

CHAPTER 1

1. INTRODUCTION

This chapter introduces the topic on the relationship between corporate financing and the stock price reaction. It is structured as follows, Section 1.1 discusses the background and motivation. Section 1.2 discusses the research problem statement. Section 1.3 discusses the research objectives. Section 1.4 discusses the research questions. Section 1.5 discusses the development of the hypothesis. Section 1.6 discusses the importance and benefits of the study. Section 1.7 concludes this chapter.

1.1 Background and Motivation

The question of whether capital structure influences the value of a firm has been a topic of debate for many years across corporate finance. Modigliani and Miller (1958) began this ongoing debate and argued that capital structure is not relevant in perfect capital markets, and they later revised their seminal work in Modigliani and Miller (1963) where they incorporated market imperfections and taxes and found that in fact capital structure does matter in firm valuation. This work has been the main foundation of several papers (Barclay & Smith, 1999; Rajan & Zingales, 1995; Titman & Wessels, 1988) that looked at capital structure theories and its determinants. As a result, finance theories emerged with the aim of explaining the financing behaviour of firms such as Myers (2001) who outlines these theories as the "MM" capital structure irrelevance theorem, trade-off theory, pecking order theory, agency cost theory, signalling and market timing theory which will be discussed in more detail under the literature review chapter. Considering the nature of the different assumptions and findings of each theory, there has been numerous critiques that argue that capital structure does not have any significant influence on firm value. This debate is what we know today as the "capital structure puzzle" where Myers (1984) concludes that the proposed capital structure theories are mutually exclusive, and no one theory can fully explain why firms finance a certain way.

Literature surrounding capital structure and firm performance is widely researched in developed capital markets however, the conclusions thereof cannot be generalised in the African emerging

markets. Thus, it is imperative to assess the "capital structure puzzle" in an emerging perspective prior to making any conclusions on whether capital structure matters in African firms. Furthermore, it is also important to figure out which capital structure theory is prominent and can better explain the financing behaviour of firms in developing markets. Gwatidzo and Ojah (2009) developed an interest in this area where they looked at capital structure and its determinants from a Sub-Saharan Africa context. The study focused on five African countries and tested whether capital structure is dependent on variables such as size, age of firm, asset tangibility, taxes and profitability. The South African regression results suggest that profitability is negatively related to capital structure determination whereas age, size and asset tangibility are positive and significantly related to capital structure. The study concluded based on the results that the African market follows a pecking-order theory where firms will finance projects with internal funds first, followed by debt and as a last resort external equity. Moreover, country-specific factors that were employed in the analysis also contributed to the results of the paper with South African firms using more leverage than any other country in the study. Since the pecking order theory was found to be dominant in the selected African countries, one would expect that when it comes to external financing decisions, debt will be considered first over an equity transaction.

The abovementioned study provides an important overview of capital structure determinants and financing behaviour in the African market; however, this study takes on a different approach of capital structure research. The analyses will focus on two key issues. First it will investigate traditional firm specific and behavioural variables that could influence the likelihood of a debt issue over an equity issue which is motivated by the empirical results presented in Gwatidzo and Ojah (2009) which found size, profitability and asset tangibility to have a significant relationship with leverage. Secondly, it examines the market reaction as a result of capital structure announcements in the form of debt and equity issues by JSE listed companies. The share price behaviour before and after the announcement date will be analysed in several event windows to determine if there are any abnormal returns associated with such announcements. Based on the conclusions of Gwatidzo and Ojah (2009), one would expect that the amount of debt issues will dominate equity issues since South Africa was one of the countries in the study whose firms had leverage as a dominating capital structure choice. In short, the goal of this study is to determine firm-specific factors that drive capital structure decisions and examine whether there are any

abnormal share price effects following the issuance of debt or equity by firms on the JSE. In developed markets, the study of share price reactions as a result of security transaction announcements is not novel. Such a study was first documented by Howe and Shilling (1988) where they looked at how stock prices react to an announcement of a new equity and debt issue. The authors found that there was a negative reaction to equity announcements and a positive reaction to debt issue announcements in the absence of taxes.

In addition to capital structure and the firm value debate, an investigation on whether capital structure transactions have any statistically significant impact on stock returns is of paramount importance. As much as there is empirical evidence in this area of research, a lot has changed since the 1980s and 1990s as the financial markets have evolved, hence contribution of new evidence is required. Moreover, the impact of bond and equity issuance on the stock returns of issuing firms in emerging markets such as South Africa is a poorly researched area and the growing issuance activity on the JSE is further motivation of a need to study the effects of capital structure announcements on the share price of the issuing firms.

1.2 Research Problem Statement

Absent from literature is an examination of the relationship between firm-specific determinants and the choice between debt or equity. This research will determine the influence of capital structure variables such as size, profitability, managerial ownership, asset tangibility and the market-to-book (MTB) ratio on the likelihood of a debt or equity issue. In addition to the mentioned traditional firm determinants, the study will also include a behavioural variable namely CEO confidence which represents the collective behaviour of the executive board. The decision of whether to issue debt or equity is ultimately approved by the management of the firm often the CEO or CFO and the members of the executive board, therefore, the behavioural characteristics of management become a variable of interest in determining what drives capital structure decisions in addition to traditional determinants. Therefore, it would be valuable in a South African context to also investigate whether there is any statistically significant relationship between manager sentiments and the capital structure transaction choice.

As much as there have been studies that investigate financing decisions in the South African context (Correia & Cramer, 2008; Gwatidzo & Ojah, 2009; Wet & Gossel, 2016), little research is done on firm-specific determinants that drive the likelihood of issuing debt or equity including the effects of the announcement of this issuance activity on the share price. This study intends to close this gap by investigating firm determinants that drive financing decisions and further providing an indication on the effects of debt and equity issue announcements on the share price of the issuing firms for the JSE. To the author's knowledge, no study of this kind on the determinants that influence the debt-equity choice and the effects of the announcement of these transactions on the JSE has been conducted in South Africa. The existing literature examines either the effects of debt issuances (Lippert, 2010) or equity issuances (Bhana, 1998) on share price reaction, and not both. Thus, the main aim of this paper is to provide robust empirical evidence on the determinants of the debt-equity choice and the share price behaviour in response to these financing decisions by JSE listed firms, ultimately adding new findings to the South African literature.

The existing research on capital structure predominantly examines the traditional determinants of leverage particularly in developed (See Barclay & Smith 2005; Chen, 2004; Myers 1977) and other emerging markets (See Abor & Biekpe, 2005; Chipeta & Deressa, 2016; Gwatidzo & Ojah, 2009). However, the link between bond and equity issue determinants (both traditional and behavioural) and share price performance is not clear, particularly in respect to emerging markets as exemplified by the JSE. To this effect, and due to the puzzling nature and theories of capital structure, several empirical studies in developed markets have found that equity offerings follow a negative price reaction (Bhana, 1998; Masulis, 1980; Miller & Rock, 1985) and debt issues are followed by a price increase (Cornett & Travlos, 1989; Flammer, 2021; Masulis, 1983).

The share price behaviour following a debt issue can be described by the signalling and market timing theory of capital structure. The signalling theory of capital structure (Barclay & Smith, 1999; Leland & Pyle, 1977; Ross, 1977) suggests that the firm's management typically possess information that is not available to other stakeholders such as creditors and investors and they use this information to convey prospects of the firm. A firm's debt-equity choice conveys important information to investors, for example, management could be reluctant to issue debt when they possess inside information that the firm could potentially face financial difficulties in the future.

However, due to the nature of the tax-deductibility of interest payments associated with debt, management conveys favourable information to the public by issuing debt regarding prospects of the firm which will increase its share price. In other words, the addition of debt to the firm's capital structure can be seen as a way the manager communicates their confidence that the firm will have sufficient cash flow to meet interest payments in the future. Therefore, a debt issuance will result in an increase in the share price. Conversely the share price behaviour following an equity issue can be explained by the market timing theory of capital structure (Baker & Wurgler, 2002; Kayhan & Titman 2007; Lemmon et.al., 2005; Welch, 2004) which asserts that since management possesses superior information due to the information asymmetries that exists, firms are prone to issue equity when they believe that their share price is high relative to its book value. The intention of market timing by firms is to exploit temporary low levels of cost of equity, therefore an equity issue is an indication to the market of management's belief that the firm's stock price is overvalued therefore the share price will decline at this announcement. While the above literature indicates that a debt issue leads to an increase in share price and an equity issue leads to a decline in share price, it is not known to what extent this share price behaviour due to capital structure announcement is prevalent in the South African context.

1.3 Research Objectives

The main objective of this study is to investigate which firm specific determinants drive the likelihood of issuing debt or equity and to examine how the announcement of these issues affect the share price of the issuing firm in the short run. Therefore, the detailed objectives of this research are to examine the relationship between:

- company size and the likelihood of issuing debt
- profitability and the likelihood of issuing debt
- asset tangibility and the likelihood of issuing debt
- market to book variable (price-book value ratio) and the likelihood of issuing debt
- CEO confidence and the likelihood of issuing debt

1.4 Research Questions

The two main research questions of this study are as follows: firstly, what are the firm-specific determinants that drive the likelihood of issuing debt or equity? Secondly, what will be the impact of the announcement of these issues on the share price of the issuing firm? Furthermore, research questions which focus on the relationship between firm-specific variables and the likelihood of choosing leverage as a financing option are detailed as follows:

- What is the relationship between company size and the likelihood of issuing debt?
- What is the relationship between profitability and the likelihood of issuing debt?
- What is the relationship between asset tangibility and the likelihood of issuing debt?
- What is the relationship between the firm's ownership structure and the likelihood of issuing debt?
- What is the relationship between the industry market-to-book value and the likelihood of issuing equity?
- What is the relationship between CEO confidence and the likelihood of issuing debt?

Lastly, to determine the share price behaviour on days surrounding the announcement of security issues the proposed question is as follows: are there any significant abnormal returns following the issuance of debt and equity?

1.5 Hypothesis Development

The main capital structure theory used to develop the hypothesis is the signalling theory (Leland & Pyle, 1977; Ross 1977) that asserts that the market reacts to information released by firms and that management possesses information that an outside investor does not have access to due to information asymmetries that exist in the market. Evidently, not all information possessed by managers can be directly disclosed in financial statements therefore management will attempt to take valuable information-revealing decisions with the hopes that the market will react favourably to the news. These actions taken by managers in possession of insider information (Leland and Pyle, 1977) are perceived by outside stakeholders as 'signals' of firm quality. As mentioned in the objectives above, the main aim of this research is to investigate capital structure determinants that

could influence the choice between a debt and equity issue and the effect of this type of issue announcement on the share price of the issuing firm. The development of the first hypothesis will be established based on the determinants employed in the study.

Firm-specific determinants

Determinants that will be employed in this study are firm size, profitability, managerial ownership, asset tangibility, market-to-book and confidence.

Size

Larger firms are well diversified and are more likely to meet the interest payments that are followed by leverage. Due to this diversity, a larger firm faces a low probability of financial distress which enable them to take on more debt financing (Rajan & Zingales, 1995). Based on this finding, one would expect larger firms to issue debt over equity

Profitability

Profitable firms will follow the static trade-off theory as they would require large tax-shields to optimally balance the costs of financial distress. Therefore, they will issue debt over equity.

Managerial ownership

In accordance with the market timing theory of capital structure, managers can identify the "right time" to issue equity opposed to other external financing options (Elliott et al., 2007). This mispricing will benefit the existing shareholders including managers themselves at the expense of new shareholders who will purchase an overvalued stock. Therefore, firms with a high managerial ownership will tend to issue equity over debt.

Asset tangibility

The trade-off theory in Modigliani and Miller (1963) alludes that firms that have more tangible assets can take on more debt since they have collateral capacity to offer to debtholders. Therefore, one would expect that firms with greater tangible assets are likely to issue debt over equity.

Market-to-book

Fama and French (1992) indicates that firms with high MTB ratios have a high cost of financial distress therefore they will issue equity instead of debt since their stock price is considered overvalued.

CEO confidence

Under the traditional theories of capital structure, managers or decisions-makers are assumed to be rational. As found by De Bondt and Thaler (1987) and Shefrin (2001), capital structure decisions are based on perceptions that occur at cognitive level which are outside traditional theories. Moreover, behavioural finance suggests that CEOs are subject to sentiments such as being confident and optimistic, ultimately influencing their choice to issue debt over equity. Confident CEOs underestimate the probability for bankruptcy and will tend to issue more debt.

From the preceding arguments of the firm-specific determinants listed above, hypothesis one is formulated as follows:

H1: Firm specific variables influence the likelihood of debt and equity issues.

The following hypotheses are developed based on the announcement effect of debt and equity issues on the share price of the issuing firm as follows:

Announcement effects

Negative market reaction

Accounting issues such as earnings manipulation, and reporting errors make it difficult for outsiders to make an accurate stock valuation. Managers are often aware of the biased nature of their reporting; hence this enables them to derive a more accurate valuation of whether the stock is undervalued or overvalued than what an outsider would. Therefore, based on the assumption that managers are well informed when it comes to their own stock valuation, an equity issue may signal to the market that the firm does not have any financial resources or sufficient cash flow for future projects and its share price is overvalued. The literature on the effects of corporate financing activity (See Covitz & Harrison, 1999; Miller & Rock, 1985; Myers and Majluf, 1984) shows that the use of external financing by means of an equity issue is perceived as unfavourable news to the

market, consequently, an equity issue is likely followed by a decline in share price. Furthermore, the Myers and Majluf (1984) model illustrates that a manager with superior information will issue equity when the share price is overvalued in attempt to time the market. Therefore, an announcement of an equity issue will cause the share price to drop post the announcement. From the preceding lines of arguments, hypothesis two is formulated as follows:

H2: Equity issue announcements have a negative and statistically significant effect on the share price.

Positive market reaction

Since corporate financing decisions are perceived to be a sort of communication to outside stakeholders about the prospects of the firm, an issuance of debt is perceived as a firm obligating itself to make regular payments over a certain maturity period. Accordingly, Barclay and Smith (2005) argue that managers are aware of the costly risk associated with missing these payments, therefore increasing debt may convey a 'credible signal' to the market that management is confident regarding its ability to payoff future obligation in terms of interest payments. Theorists (e.g., Galai & Masulis, 1976; Jensen & Meckling, 1976; Leland & Pyle, 1977; Myers, 1977) posit that it is due to the tax deductibility nature of interest payments associated with debt, that causes the value of the firm to increase with an increase in debt over equity. The main assumption of this notion is that managers who act in the best interests of the firm are better informed, and they can foresee if the firm will be able to meet these obligations or not, therefore they would not risk adding more debt in the existing capital structure if bankruptcy is foreseeable in the future.

Accordingly, we formulate the following hypothesis:

H3: Bond issue announcements have a positive and statistically significant effect on the share price.

1.6 Importance and benefits of the study

This study will contribute towards the understanding of how corporate debt and equity issues announcements affect the share price performance of the issuing firm by closely looking at the price effect around the announcement date. Most studies surrounding the effects of bond and equity

announcements on stock prices are focused on developed countries. In South Africa, the views on capital structure are different as it is an emerging market. Therefore, inferences made from past studies in developed areas cannot be used in a South African context. It is important to conduct an event study that investigates the effect of security issues announcements on the JSE to provide decision-makers with an idea of how the share price will be affected by financing decisions made by a firm and to what extent these announcements affect the share price. The conclusions of the paper will provide insights and evidence to academia, boards of directors and CFOs on the signalling effect of capital structure.

1.7 Limitations

Given the time constraints of having to complete the research in a couple of months, a simple methodology is used and some considerations such as appropriate econometrics methods to use were not sufficiently investigated. A second limitation of this research is that due to its event study nature, certain control precautions such as eliminating the impact of firm-specific confounding events were not adequately implemented. However, this event study did not identify and address the firm specific confounding events which may have had an impact on the empirical results. In addition, due to the difficulty in empirically measuring CEO sentiments, the study is limited to only one behavioural variable.

1.8 Structure of the Dissertation

The dissertation comprises of five chapters as follows:

Chapter 1 - Introduction

This chapter introduces the research topic and outlines the background and motivation. The problem statement is identified and defined with supporting capital structure theories and empirical evidence from previous studies. Preceding the problem statement, the research objectives are then outlined which formed the basis of the research questions. The hypotheses are developed in line with existing theory and the basis of the research is now defined. Most importantly, the chapter ends of with discussing the importance and benefits of the study and the limitations that were encountered during the research project.

Chapter 2 – Literature Review

This chapter presents the traditional theories of capital structure and various models that are derived from theory that are relevant to the study. The chapter then follows by a review of the empirical evidence on debt and equity issues across South Africa and other African countries including evidence from developed markets.

Chapter 3 – Methodology

This chapter outlines the methodology used to conduct the study. The study is divided into two statistical methods in line with the objectives, one taking on the regression estimation approach and the second takes the event study approach. The chapter begins with an overview of the sampling and data collection techniques used, followed by the definition of variables that will be employed and the specified regression model used for estimations. The event study research design is explained on a step-by-step basis and the formulae used for various calculations are demonstrated.

Chapter 4 - Results

This chapter presents the results of the regression model estimations and event study outcomes. Diagnostic tests performed on the panel regression data and abnormal returns are also included in this chapter. The results interpretation and discussions are based on formulated objectives and hypotheses in Chapter 1.

Chapter 5 – Conclusion and Recommendations

This chapter summarizes the overall findings of the study based on the results of the analyses and provides further recommendations for future studies.

CHAPTER 2

2. LITERATURE REVIEW

This chapter generates the theoretical framework of the study by outlining the theories of capital structure and presenting empirical evidence from previous studies. The chapter is structured as follows, Section 2.1 discusses the issues in capital structure and its traditional theories. Section 2.2 discusses the tax hypothesis, agency theory and asymmetric information models. Section 2.3 reviews the empirical evidence on debt and equity issues in African and developed markets.

2.1 Traditional theories of capital structure

Financial markets have evolved over the years, as a result this has presented firms with numerous investment opportunities. In order to finance these opportunities, considerable thought and strategy goes into making an appropriate decision on which route to take. This forms the basis of why capital structure is relevant, much debated and developed in finance literature.

Decades later and there is still no clear accord on how firms choose their capital structure. However, current literature still refers to the MM irrelevance theorem which asserts the value of the firm is derived from its ability to use assets to generate foreseeable cash flows and how these assets are financed does not matter. The lack of compelling evidence in corporate finance to reject the irrelevance debate "beyond reasonable doubt" is indicative that the way in which a firm is financed matters and has an impact on firm value.

The main questions raised by Modigliani and Miller (1958) are as follows:

- How do firms choose their capital structure?
- Do firms have a specific target capital structure?
- What are some of the main determinants that influence a firm's choice in capital structure?
- Do country-specific economic factors have any impact in the level of debt that a firm has?

The above-mentioned study forms the foundation of further theories of capital structure, as mentioned earlier the "irrelevance theorem" does not exist and later studies have found that capital structure affects firm value and as a result, firms employ a target ratio known as optimal capital structure. In contrast, Myers (1984) argues that it does not make sense that firms are encouraged to employ an optimal capital structure when financing behaviour itself is not understood, he argues

that actual financing behaviour is not explained by any capital structure theory. The two opposing views ultimately gave rise to what we know as the "capital structure debate" which questions whether there is an optimal capital structure of a firm or whether leverage is irrelevant to the performance of the firm. Much of the studies on capital structure are built from the above theorem and have developed various theories which are discussed below.

2.1.1 The Trade-Off Theory

This theory of capital structure proposes that firms often trade-off the benefits associated with debt and financial distress when making financing decisions thereby gradually moving towards a target debt ratio that maximises the value of a firm (Myers, 1984). This theory is developed from the MM theory however as opposed to the irrelevance argument of the theory the trade-off theory considers taxes and bankruptcy costs. It aims to explain how firms make their financing decisions when choosing their capital structure when the irrelevance assumptions are relaxed.

Debt increases the risk of bankruptcy on the one hand but can also produce tax-deductible gains on the other. According to Brealy and Myers (2003), firms will "choose" a debt ratio that maximises shareholder value for instance, a target debt ratio where tax benefits are maximised, and where bankruptcy costs are minimised. Due to the interest of debt being deductible before paying taxes, firms maximise this benefit by increasing their levels of debt but are also exposing the firm to bankruptcy.

While debt is associated with tax benefits, the trade-off theory cannot be used to explain the debt-seeking behaviour of firms facing financial distress or firms operating in countries that do not have this tax advantage. Elsas and Florysiak (2008) argues that the tax-based explanation of capital structure emanates from an economic perspective where taxes are set irrationally by governments, hence taxes are not a reliable determinant of capital structure. Additionally, firms operating in the same country are subject to the same tax-regime thus taxes are unable to provide a compelling explanation on the observable differences in capital structure decisions among firms located in the same country (Graham, 2003). Its limitations have influenced the development of the pecking order theory discussed below which argues that firms do not necessarily have a target optimal capital structure, but financing decisions are based on management's capital raising preference. A key takeaway from the above theory is that as a firm increases its level of debt, there will be costs

of financial distress to consider, moreover beyond a certain level of debt, these tax advantages do not matter.

2.1.2 The Pecking Order Theory

While the trade-off theory emphasises the presence of an optimal capital structure, the pecking order theory does not have a defined target debt ratio. The tax benefits derived from the former theory is not enough to explain the financing decision behaviour taken by managers. The pecking order theory is a framework that aims to explain which source of financing managers prefer over another when faced with capital funding needs. The theory was originated by amongst others in Myers and Majluf (1984) which laid a solid foundation in finance literature describing the order in which managers make financing choices. Based on the theory, there is a set hierarchy of financing preference for managers, and if the first source of funds preferred is not available then the manager will try raising funds through the next preferred choice. Based on the above illustrated financing hierarchy, the pecking order theory states that firms prefer to finance investments with retained earnings as their first preference rather than external financing sources. Secondly, if a firm has exhausted all their retained earnings and other internal sources (cash), they will tend to issue safe securities first such as debt and issue equity. The preference path is clear and shows that managers will choose the cheapest source of funding that conveys little to no information at all to the public rather than choosing a financing option that is subject to information asymmetries. The role of information asymmetry in capital structure will be detailed further in the next section. Empirical evidence in support of the above theory is demonstrated in Elsas and Florysiak (2008) which states that opposed to the trade-off theory, such a preference on the order of financing suggests that firms will follow their preferences regardless of capital structure shocks.

The simplified narrative of a firm's choice between debt and equity is subject to criticism as it does not address the financing behaviour of much more complex decisions such as the choice between straight debt or convertible debt and other exchange offers. Moreover, the pecking order theory is not a prescription for all types of firms and some firms tend to deviate from this order of financing decisions when faced with growth opportunities. For example, Frank and Goyal (2003) finds that young firms do not follow a pecking order theory as they are likely to be facing larger investment needs that cannot be met by small debt issues. Furthermore, the above-mentioned two contrasting

theories of capital structure equally provide an insight in explaining the financing behaviour of firms facing an investment opportunity. Both theories can be used concurrently to explain the logic behind making a simple decision for instance, in each scenario, taking a decision among choices is normally influenced by which option is worthwhile at the time compared to the other alternatives (pecking order theory) and by choosing this option you're effectively trading the benefits with the risks that forms part of this option (trade-off theory). In other words, you simply can't enjoy the benefits without bearing the costs that come with the decision. Based on the above simple illustration, both theories are acknowledged without one being superior to the other.

2.1.3 Market-timing Theory

Similar to the pecking order theory, market-timing theory argues that in there is no optimal capital structure prescribed by the trade-off theory but instead the observed capital structure choices are as a result of managers' market timing behaviour (Baker and Wurgler, 2002). The main argument of the authors is that financing decisions are not limited by a pecking-order choice or a target leverage level, but rather are a result of management's actions in attempt to time the markets. The market-timing theory suggests that managers take advantage of market conditions and will issue equity when the market stock price is high relative to its book value and issue debt when the opposite is true. This theory concurs with the investment principle of buying "low" and selling "high" where managers are of the belief that they can successfully time the markets and benefit from short-term arbitrage profits.

The time series patterns of publicly traded U.S firms is explained in Huang and Ritter (2005). In contradiction to the pecking order theory where equity issues should be deemed as the last resort, the authors found that external equity financing was more prevalent in the 1990s. The study considered the effects of firm specific variables such as size and revealed that small firms are likely to rely heavily on debt as a form of financing however, they'll tend to resort to equity financing when the cost of equity is low jumping onto that "window of opportunity". Controlling for small growth firms and other capital structures determinants, the results of the study did not change, the effects of debt and equity issues were significant and persisted for as long as over 10 years. The authors conclude that due to the time-varying cost of equity, the time-series financing pattern of U.S firms is best explained by the market timing theory. In contrast to the above long-run effects of security issues findings, Kayhan and Titman (2007) analyses how past stock returns affect

capital structure, and they found that stock price history has an impact on debt ratios however in the long-term these effects are reversed and will move towards target ratios as explained by trade-off theories.

As much as historical prices influence capital structure, and equity transactions are due to market timing, it is found that this effect is not significant and equity market timing does not have any material long-term effects on capital structure (Hovakimian, 2006). In addition to equity issues being found to be economically insignificant, Hovakimian finds that debt issues on the other hand are statistically significant and have a long-term effect on capital structure. Further empirical evidence in contrast with the market timing theory are found in Leary and Roberts (2005), where the effects of equity issues disappear two to four years after issue and Welch (2004) who finds that the effects of equity issues dissolve when dividends do not form part of the issue. The contrasting results are in accordance with the efficient market hypothesis which asserts that prices reflect all available information as a result, it is near impossible to consistently "beat the market". In conclusion, the abovementioned theory suggest that capital structure is driven by market forces. Firms facing capital needs to fund projects will issue equity only when their share price is overvalued to quickly take advantage of the mispricing and this behaviour will only have a significant effect in the short-term.

2.1.4 Signalling Theory

Firm management are privy to information about the company's capabilities more than its outside investors. This information asymmetry makes it possible for managers to convey important information about the firm that would not have been known by the investors. Firms operate in a monopolistic competition market structure and in order to differentiate themselves from peer firms, managers could convey a message to outside investors with superior information that was otherwise unknown to the investor. This economic concept is illustrated in Spence (1973) in *Job Markey Signalling* as a means by which information transfer takes place in the job market application and hiring process. The author argues that upon hiring a candidate, the employer is unsure of the candidate's capabilities to perform the job and the only information in hand is personal data and educational background. Therefore, based on the little information that the employer possesses at the time of the job application, the decision to hire this candidate is based

on uncertainty. Individual characteristics that cannot be changed such as age, sex, race and gender are referred to as indices and other behavioural characteristics that are attached to the individual and manipulated by them are referred to as a signal. The author argues that there is not so much that the candidate can do to change their indices, but can alter signals such as education for example, which are subject to costs referred to as signalling costs. Spence's analogy is equally applicable at an organizational level for example, based on the above illustration, a firm cannot alter its main business operations (indices), however it can alter its financing behaviour i.e., a choice between debt and equity which is a signal used to convey the firm's prospects. Most crucially, a signal conveyed by a firm is only credible if the next firm is unable to mimic the same signal due to its costly nature. Consequently, this is how a firm would differentiate itself from a competitor by sending a credible signal to the market about its prospects that is almost too costly for the competitor firm.

The credibility of the information conveyed by management is at times somewhat questionable. For instance, since managers are aware that increasing leverage enhances the share price, they may have an incentive to take on more leverage than they would otherwise prefer with an aim of improving the share price. As a result, investors will not view the decision to issue debt as credible information for firms whose managers main goal is to increase current share prices. CEO tenure and compensation structures can also strongly influence the debt-equity financing choice, i.e., a CEO who is close to retirement has an incentive of increasing the share price in the short-term and a newly CEO who plans to stay for more than 10 years is more concerned about the long-term prospects rather than temporary share price increases (Hillier et al., 2011). Thus, information conveyed by a newly CEO led firm can be viewed as credible as there is little to no incentives to give an incorrect signal, however, one would also argue that the CEO may be overconfident, and the firm may not be able to afford the costs associated with a substantial increase in leverage.

2.2 Tax hypothesis, Agency theory and Asymmetric information models

2.2.1 Capital structure and the tax hypothesis model

The tax hypothesis stems from the foundational work of Modigliani and Miller (1963) where previous assumptions that were relaxed in their early paper were now considered. The 1963 model

incorporates the effect of corporate taxes, bankruptcy costs and asymmetric information. This is known as the second MM proposition which proposes that the cost of equity is directly proportional to the level of firm leverage. The proposition thereof is that due to tax shield benefits, cost of equity becomes less sensitive to the level of leverage. The model purports that although increasing debt is associated with a chance of default, investors are less likely to react negatively when a firm takes on additional leverage as a result of the tax shield that ultimately increases value.

The notion that at equilibrium the market value of a firm isn't affected by the capital structure assumes that markets are tax-free, however the tax hypothesis proposes that firm value can be enhanced by increasing the use of debt since interest payments are tax deductible. These benefits are accompanied by bankruptcy costs, which cannot be ignored, hence a balance of the tax benefits and costs is established by determining an optimal capital structure (Miller, 1977). Despite the ongoing critique in the tax assumptions of the irrelevance theorem, prior research following relaxed assumptions found that taxes do not have any substantial effects on financing decisions while others such as Mackie-Mason and Jeffrey (1990) argue that when one focuses on actual financing decisions made at margin rather than testing debt/asset ratios which contain several decisions taken over the years, the tax effects can be observed. The authors argue that prior researchers might have been "looking for the tax shield effects in the wrong places" In the study they find that firms that are near tax exhaustion from tax shields (close to facing a zero-tax rate) experience a larger marginal effect and are less likely to utilise debt financing. In essence, tax effects matter significantly in firms that are near tax exhaustion.

The tax hypothesis basically implies that the issuance of debt increases firm value, and this will cause a positive share price reaction. Conversely, since equity issuance decreases the shareholder's tax shield, this will cause a negative share price reaction. It is important to also bring to light that this hypothesis is mainly applicable in classical tax system operating countries, therefore for countries that operate under the imputation tax regime, an investor should be indifferent in financing choices that a firm makes.

2.2.2 Capital structure and the agency model

The agency model is based on the theory that suggests that the separation of ownership and control causes problems arising from the conflicting interests of owners and managers in large organizations. This concept in corporate finance was developed in Jensen and Meckling (1976)'s

"agency cost theory". The theory is derived from an argument that there are conflicting interests that exist between the firm's managers and the owners. The main aim of the paper was to model the relationship that exists between the owner (principal) and manager (agent). Conventionally, the owner of a firm enters into a contractual agreement with the manager to control the operations of a firm, however, due to the two having their own self-interests, each will seek to maximize their own utility which will give rise to conflicts of interests. Simply put, since managers are not the owners of the firm, they may engage in actions purely to maximize their own wealth at the expense of the principal. To avoid this problem, Jensen and Meckling (1976) proposes a model designed to monitor the actions taken by the agents which is ultimately prone to three costs, 1) monitoring costs associated with establishing incentives that will deter unwanted activities by the agent, 2) bonding costs associated with the agent making a guarantee that they will spend resources appropriately, 3) residual costs. The agency theory assumes that the principal-agent problem will be mitigated by these costs which may be very costly to perform. What the authors ultimately argue is that an optimal capital structure can be accomplished by trading off the costs of associated with debt against the benefits.

What does this theory mean for capital structure? Due to the self-interest characteristics of managers and the need to "keep" their jobs, managers may prefer the use of less debt during financing decisions due to the threat of bankruptcy. However, for managers who put the shareholder's interests first, they are more likely to make financing decisions that are value-increasing, and this can take the form of debt issues regardless of bankruptcy threats and equity issues regardless of a drop in the share price.

2.2.3 Capital structure and information asymmetry

Corporate finance defines asymmetric information as insiders having superior knowledge than other market players such as investors on the prospects and value of the firm. The choice between debt or equity used for financing opportunities or projects is known as capital structure. The information effects hypothesis states that changes in leverage conveys management's expectation regarding the prospects of the firm. Ross (1977) model suggests that managers that have informational advantage in the market are motivated to signal their inside knowledge through their choice of debt level. They argue that firms that are more likely to face bankruptcy have lower expected cash flows than do firms which are less likely to have face bankruptcy. Thus, a firm

facing a low probability of bankrupt can signal this information to the public by issuing a high amount of debt. Furthermore, the model indicates that financing with risky debt is less preferable and can lead to the same underinvestment problem as equity financing however, the impact on debt financing is less severe because the value of debt suffers less from under-pricing. Based on this argument, the authors conclude that an equity issue announcement will lead to a negative reaction causing the share price to drop moreover, there will be no share price reaction to the announcement of a debt issue, as good news are subject to a slight reaction if not at all. Finally, since the financial distress costs directly affect the debt-equity choice of a firm, when a firm is faced with a high probability of future financial difficulty, the manager will avoid increasing its leverage when seeking financing options. The reluctance to issue debt is a signal to investors that the prospects of the firm may not be looking so good, and conversely, the reluctance to issue equity is a signal that the shares are under-priced. The information effects hypothesis assumes that managers possess superior knowledge about the "true" intrinsic value of the firm therefore the abovementioned models suggest that capital structure changes are signals made to investors by management to convey valuable inside information.

2.3 Empirical Evidence on Debt and Equity issues

2.3.1 South African studies

The following section will review empirical evidence based on the South African context from 1998 to a later study published in 2020 in Nigeria.

Managerial incentives such as an equity-based compensation encourages managers to increase share prices and as a result, one should expect to observe a share price decline following an equity issue for firms whose management compensation depends on the share price. The first empirical evidence on equity issues announcements and share price performance in the South African context is found in Bhana (1998) who investigates the market reaction to equity financing announcements by companies listed on the JSE. The paper seeks an in-depth explanation for the negative response as a result of the announcement of equity issuance equity by listed companies. The study had two main hypotheses: (i) managerial ownership as developed by Jensen and Meckling (1976) and the (ii) slack abundance hypothesis as developed by Myers and Majluf (1984). With hypothesis one stated as *"the negative impact on share prices will decrease as insider*

ownership increases" and hypothesis two stated as "*the decline in share price as a result of an equity issue announcement diminishes as the amount of financial slack increases*".

A total of 100 listed companies from the JSE that announced additional equity shares during the period of 1980-1995 were selected from the JSE database. The methodology used in the paper is similar to the event study procedure proposed in Dann and Mikkleson (1984). The effects of the equity announcement to the share price were observed by obtaining abnormal returns for each share and the author found that the share price reduction was on average 3.51% over a two-day announcement period. Additionally, the share price decline is prominent around the announcement date however, this decline persists a month after the announcement. The results found are consistent with the first hypothesis and suggest that for firms whose insiders did not control no more than 30% of the new issue, the decline in share price was reduced. In terms of the financial slack hypothesis, the results suggest that the higher the level of financial slack, the lower the two-day announcement cumulative abnormal return. Based on the overall results of the study, the author concludes that there is a negative abnormal return relationship with additional equity share issues by JSE listed companies and this reduction in share price persists one month after the announcement date.

When it comes to debt financing, issuing debt can arguably convey mixed signals. On the one hand it is considered bad news because the firm does not have internal funds for new projects and on the other hand investors believe an increase in debt is good news for the firm. Due to these mixed signals conveyed by debt, Lippert (2010) has found little to no significant share price reaction due debt issue announcements. The author analyses the price behavior to the announcement of straight debt issues by JSE listed companies for the period 2000 to 2008. The study employs an event study by Bowman (1983) and MacKinlay (1997) which measures the impact of a specific event on the value of a firm. Similar to several studies of this nature, the author measures the abnormal stock returns to analyse the behaviour of the share prices. The hypothesis developed in the paper is that the announcement of straight debt issues does not have a significant effect on stock prices of JSE listed firms. Of the 783 bond issues in the period 2000 to 2008 the sample size was reduced to 29 following strict selection criteria. T-test results revealed that straight debt announcements had no significant impact on the share price on and after the announcement date. The author also tested these results by separately analysing companies in the banks and non-banks category and found

similar results, i.e., the announcement had no significant impact on the stock price. Based on the results, the author concludes that the announcement of straight debt on the announcement day by JSE companies is statistically insignificant.

Apart from issuing straight debt or equity, an alternative financing option is by use of convertible bonds which share both equity and debt features. A convertible bond is a type of debt security that provides the bondholder with the right to exchange the bond for a predetermined number of shares in the future (*Convertible Bond - Types & Advantages of Convertible Bonds*: 2021). Albanie (2019) examines the shareholder wealth effects of convertible bonds announcements in the South African context. The event of interest in this study is the public announcement of the convertible bond issue and issuance information was obtained from the JSE website, share prices were obtained from Bloomberg. A selection criterion was imposed on the data and resulted in a sample of 15 convertible bond issuances for the period of March 2004 and December 2017. Cumulative Abnormal Returns were calculated to determine the wealth effects of convertible bonds announcement and found that the announcements had significant negative price reactions. The biggest limitation of this study is that a small sample was used due to very few companies on the JSE issued convertible bonds during the period and the author recommends that it may be suitable to follow a qualitative approach when conducting research on convertible bonds in South Africa.

2.3.2 Other African studies

The efficient market hypothesis asserts that markets are efficient thus when information that is made publicly known does not have any material effect on the price of the firm. Due to the high volatility and small market size relative to developed markets Bello (2021) reviews corporate events announcements by companies in Nigeria with the focus being on equity issue announcements. The conceptual framework used to explain the market reaction is the concept of capital market efficiency with reference to the weak, semi-strong and strong market efficiency. Although the author did not conduct a quantitative study, he argues that the effect of corporate announcements is attributable to the inefficiencies of the stock market and such an effect is more prevalent in emerging markets. The author concludes that while there may be empirical studies in the emerging markets like dividend announcements and stock splits, seasoned equity offerings research is a very much under-researched area.

Following a review on corporate announcements and the stock market as seen from the above empirical analysis, one can conclude that there is limited research conducted in the South African context that investigated the market response to capital structure transactions. The next sub-section of the chapter reviews empirical evidence conducted for firms listed in developed market exchanges such as the NYSE, NASDAQ and ASE.

2.3.3 Developed markets

The following section of the paper will look at the revolution of empirical evidence across developed markets from the 1980s to more recent studies.

Testing the predictions developed from standing corporate finance literature was first conducted in Masulis (1980) where the study looks at the impact of capital structure change announcements on security prices. The author finds statistically significant effects on the share price returns due to pure capital structure announcements. In line with the tax hypothesis, capital structure changes are found larger particularly in cases where corporate taxes and redistribution are predicted to reinforce one another, and smaller where this is not the case. The author furthers this investigation in Masulis (1983) by estimating the effects of debt level adjustments and finds that share prices and firm value are positively related with changes in leverage. This evidence is consistent with theories of optimal capital structure, tax effects and information effects.

Price reactions to security announcements can also be explained by investors' expectations and what they consider "obvious" or "surprising" news when an announcement takes place. Bayless and Chaplinsky (1991) suggest that the market reaction that takes place at the announcement of an issue depends on the investor's expectations or prior beliefs for the issuer. To further explain their theory, they argue that investors may perceive little informational content from a debt issue in a circumstance where issuing debt is less costly and is more anticipated. Conversely, if a firm issues debt when it is more costly and less expected, then this could signal to the investors that the firm's equity is undervalued. The point that the authors are trying to make is that offers which conflict with investor's expectations signal information asymmetry. To test their theory, they develop a model whereby a probability is assigned to a particular firm for issuing debt or equity. For example, a high probability of debt issue will be assigned to a firm whose cost of debt issue is low and a high probability of equity issue will be assigned to a firm whose cost of equity issue is low.

The data used in the study consists of public offerings of debt and equity made by U.S industrial firms for a period of 1974-1983 with a total of 826 public offerings. The results of the logit prediction indicates that firms that issue equity when investors are expecting a debt issue since cost of debt issue is low, signal that the firm's equity is overvalued. Statistically the paper finds that debt issued by firms that are likely to issue equity generate a positive 1% abnormal return. At the announcement of equity, the market reaction is more negative when investors assign a high probability of debt issue for that firm. The market reaction of both debt and equity issue is smaller in value when the firm issues securities in line with investor's expectations suggesting that the information asymmetry is smaller when firms issue securities that conform with the beliefs of investors.

The findings in both African and developed markets above are consistent with capital structure changes effects predicted by theory and at best indicate that the announcements of debt and equity issues have a material impact on the share price of the issuing firm.

2.4 Conclusion

The MM irrelevance proposition and capital structure puzzle has drawn attention in academia. With a particular interest to how firms choose their capital structure and what are the main determinants of such a decision. Since the development of the puzzle, there has been extensive research conducted to explain how firms make capital structure decisions in the form of theories. The main theories that will be investigated in this study are the pecking order theory, trade-off theory, market-timing theory and the signalling theory. In addition to the theories, the tax hypothesis, agency hypothesis and information asymmetry hypothesis models are drawn from theory in attempt to explain the rationale behind financing decisions taken by firms. Each of these theories have presented mixed results in previous studies, thus the aim of this study is to determine which theories are applicable to the financing behavior of JSE listed firms.

CHAPTER 3

3. METHODOLOGY

This research employs an event study approach which is often used to examine share price reactions to the announcement of corporate actions. The main aim of this chapter is to ponder on the methods used to investigate capital structure determinants and measure the effects that debt and equity issues will have on the share prices. A full description of the sample selection and variables used will be discussed. This study will be conducted in two ways; by way of a panel regression analysis and by using an event study approach. The regression analysis entails the investigation of determinants that drive the likelihood of issuing debt/equity. Secondly, the event study approach analyses the movements of the stock price on the days surrounding the security issue announcement. The sections are structured as follows: Section 3.1 discusses the sampling and data collection techniques; Section 3.2 discusses the capital structure variables used and lastly Section 3.3 discusses the overall research design adopted from Bowman (1983).

3.1 Sampling and data collection techniques

The sample used in this study consists of bond and equity issues of JSE listed firms. The aim of the study is to investigate capital structure determinants that influence the debt-equity choice and the effect of the announcement of such a transaction on the share price of the issuing firm. Due to time constraints, the study is limited to South Africa only as an emerging market. The main data source used to obtain the security issues and daily price data is Bloomberg. Annual firm-specific capital structure determinants data is extracted from IRESS Expert and EquityRT.

The sample period is from 2 January 2000 – 2 January 2020. The following sample selection criteria were imposed on the data:

- Only bond and equity issues with an announcement date within the period of 2000 – 2020 by companies listed on the JSE at the time of data collection were included
- From 1088 bond issues initially collected, State-Owned Companies such as Eskom Holdings, Telkom SA, Transnet and Denel were excluded from the sample, therefore only corporate bond transactions were collected

- Further to the exclusion of SOEs, financial institutions such as banks, asset management firms and insurance companies were assigned a dummy variable to differentiate them from other industries for both the bond and equity issues data as these firms are highly regulated i.e., the Twins Peak model responsible for ensuring the safety and soundness of the financial system and ensuring that prevention measures for misconduct are in place Intermediaries Services Act (FAIS Act), No. 37 of 2002
- Furthermore, firms with which were missing data on one or more capital structure determinants were also excluded from the study
- The final panel data consisted of 69 JSE listed firms across various industries which made a total of 1080 observations
- The final sample for bond and equity data used for the event study after applying the above criteria is 81 issues and 113 (excluding Rights and IPO offers) issues respectively.

3.2 Capital structure determinants

Firm-specific variables that may drive the capital structure decision are considered in order to develop a regression model. The first part of the study takes on the probit logistic method where a binary of debt and equity will be an applied as proxies of dependent variables. Thus, there are a total of six independent variables which are capital structure determinants that will be used in this study.

Table 1 Definition of variables

Variables	Notation	Definition and measurement
Dependent variables		
DEBT	$DEBT_i$	The dependent variable is a binary that is 1 when the firm issues debt and 0 otherwise.
Independent variables		
Firm size	*SIZE*	The size of the firm is measured as the natural logarithm of total assets

Profitability	*PROFITABILITY*	Profitability is measured as earnings before interest and taxes (EBIT) divided by total assets
Managerial Ownership	*OWNER*	Managerial ownership is measured as the percentage of the equity owned by directors to total outstanding shares
Asset Tangibility	*TANGIBILITY*	Asset tangibility is measured as a ratio of fixed assets to total assets
Market to Book	*MTB*	The Market-to Book ratio is calculated as the market price per share divided by the book value per share
*Confidence	*CONF*	Managerial confidence is measured by the change in the number of shares held by the executive team
Industry dummy	*INDUSTRY*	An industry dummy variable is included to control for financial firms included in the study. Where all financial firms are assigned to 1 and non-financial firms a 0.

*In addition to the above traditional capital structure determinants, this study includes a behavioural variable that aims to capture the rationale behind the decision to issue debt or equity by the executive team of a firm. The confidence variable is measured by the change in the number of shares held by the executive team as follows:

If the % of shares held in the current year is greater than the % of shares held in the previous year, then we assume the executive team to have been confident in the current year therefore CONF = 1. Conversely, if the % of shares held by the executive team in the current year is less than the % of ownership in the previous year then CONF will be assigned a 0.

A binary probit regression analysis of the firm specific factors that drive the likelihood of issuing debt is performed. Therefore, a binary categorical variable with two possible outcomes will be used: a 1 when a firm issues debt in equation (1) and a 0 otherwise.

Accordingly, the binary probit regression model is estimated as follows:

$$DEBT_t = \alpha + \beta_{t1}SIZE + \beta_{t2}PROFITABILITY + \beta_{t3}OWNER + \beta_{t4}TANGIBILITY + \beta_{t5}MTB + \beta_{t6}CONF + \beta_{t7}INDUSTRY + \varepsilon_{i,8} \quad (1)$$

3.3 Event study research design

Due to the earnings manipulation often taken by top management, the use of accounting statements to analyse the performance of the firm may not be a true representation of the value of the firm. The event study approach eliminates this issue by solely investigating share price behaviour as a result of corporate announcements. An event study makes it simple for a researcher to determine whether there is a significant price effect associated with an unexpected corporate event. Compared to other finance methodology techniques, the structure of an event study is rather straightforward. Ball and Brown (1968) suggest that studies on market reactions to corporate announcements are to be conducted using this methodology due to its ability to capture the impact of an event announcement. One of the research questions posed at the beginning of this study is whether the stock market is "efficient" when it comes to capital structure changes which will be tested by analysing the share price behaviour following the event.

The structure of the event study as prescribed by Bowman (1983) is illustrated in 5 steps as follows:

Step 1 – identifying the event of interest.

The event of interest of this study is the announcement of debt and equity issues which occur for various companies at different points in the calendar. Due to these announcements occurring at different points in time, an event window is defined as the days surrounding the first public announcement date of capital structure issuances. The study investigates the market behaviour 20 days before and after the announcement date (Wolmarans & Sartorius, 2009) to give time for the market to adjust. The announcement date for the debt or equity issue is defined as time zero (t=0) and 20 days prior to the announcement is defined as t = -20 and 20 days post the announcement is defined as t = +20

One of the criticisms raised by McWilliams and Siegel (1997) is that the event window is one of the most vital aspects of an event study and if not specified correctly, misleading inferences could be drawn from the results. The authors argue that a short event window may not be sufficient to

capture price effects whereas a longer window may be subject to confounding effects. Therefore, to avoid this issue, one needs to strike a balance between selecting an event window that is not too short to capture the significant effect of the announcement and not too long that the results are subject to confounding events. To address these concerns, this study will examine the price effects by calculating the CAARs in five different windows over the 41-day period as conducted by Wolmarans and Sartorius (2009) as follows:

- Event window 1 will be used to examine the price effect 20 to 3 days before the announcement
- Event window 2 will be used to examine the price effect 1 day before the announcement and 1 day after the announcement
- Event window 3 will be used to examine the price effects 2 days before the announcement and 2 days after the announcement
- Event window 4 will be used to examine the price effect 3 to 20 days after the announcement
- Event window 5 will be used to examine the price effects 20 days before the announcement and 20 days after the announcement.

Table 2 Summary of event windows

Cumulative abnormal return measure	**Event window**	**Days relative to event**
CAAR1	-20 to -3	18 days prior to announcement
CAAR2	-1 to +1	2 days surrounding the announcement
CAAR3	-2 to +2	4 days surrounding the announcement
CAAR4	+3 to +20	18 days after the announcement
CAAR5	-20 to +20	41 days surrounding the announcement

Based on the illustration above, one would expect a significant price effect in event 1 (shorter window), consequently the effects on window 2 and 3 (longer windows) would not be significantly different from zero as the market has adjusted to the announcement news. The EMH implies an almost instantaneous adjustment to the release of firm specific information hence a 41-day period should be sufficient to effectively capture any abnormal returns caused by the announcements.

Step 2 – modelling the share price behaviour.

The second step following a clear definition of the event and event window is to develop a model which will capture the negative or positive security price reaction caused by the announcement. The first model of choice for capturing the abnormal returns is the Market Adjusted Return (MAR) model that assumes alpha = 0 and beta is equal to 1. The stock return for each security in the sample is compared to the market expected return over the event period. Thus, the abnormal return on a share at time t ($AR_{i,t}$) is as follows:

$$\boldsymbol{AR_{i.t} = R_{i,t} - R_{m,t}} \quad \textbf{(2)}$$

Where:

$AR_{i,t}$ = Abnormal return on security i in period t

$R_{i,t}$ = Return on security i in period t

$R_{m,t}$ = Return on the market index in period t

Based on the above model, an abnormal return is simply the difference between observed returns at time t and the market index return.

Step 3 – estimating the excess returns

Equation 1 above assumes the following $\alpha = 0 \; and \; \beta = 1$ to relax this assumption, a mean risk-adjusted model is used. This model defines the expected return ($R_{i,t}$) as the average of past security returns which Brown and Warner (1980) found to be a robust and sophisticated measure.

Therefore, the risk adjustment model used in this study is the popular market model which considers the risk component (beta) and an intercept of the linear relationship (alpha) between individual firm returns and a specified market index.

To estimate the abnormal returns of bonds and equity issues over a 20-year period using a market model that captures the relationship between share price behaviour and the issue is expressed in the equation below:

$$\boldsymbol{R_{i,t} = \alpha_i + \beta_i (R_{m,t}) + \varepsilon_{i,t}} \quad \textbf{(3)}$$

Where:

$R_{i,t}$ = return on security i in period t

α_i = relationship intercept (alpha) between the stock return i and the market index return

β_i = systematic risk (beta) of the firm

$R_{m,t}$ = return on the JSE market portfolio at time t

$\varepsilon_{i,t}$ = residual term (white noise) calculated as $\boldsymbol{\varepsilon_{i,t} = R_{i,t} - (\alpha_i + \beta_i R_{m,t})}$

In the absence of abnormal returns, the value of the residual term should be zero thus excess returns are non-zero values.

Step 4 – Grouping the excess returns

To be able to draw conclusions, each observation of the abnormal returns should be aggregated into across securities and through time to form a portfolio. Thus, the average abnormal return is estimated as follows:

$$\boldsymbol{AAR_t = \sum_{t=1}^{N} \varepsilon_{i,t} / N} \quad \textbf{(4)}$$

Where:

AAR_t = average abnormal return for the number of bond and equity issues N at time t

This calculation will be performed for the entire 20 days before and 20 after the bond and equity issue. To observe if there are any significant effects due to the security offer, a t-test will be calculated.

For long term effects, the AAR is summed up through the entire event window to form a cumulative abnormal return as follows:

$$\boldsymbol{CAAR_t = \sum_{t=1}^{N} AAR_t} \quad \textbf{(5)}$$

In an efficient market, it is expected that there an absence of abnormal returns hence the value of CAAR is expected to be zero. To test whether this is the case, a t-test will be calculated on the pre- and post-issue estimates of the CAAR.

To measure the degree of market efficiency, we study the stock price reaction caused by the announcement before and after the issue. Depending on how quickly the share price reverts to normal, then one could conclude as to whether the JSE stock market is efficient or not. This will be done by using the event study approach and employing the market model to calculate the abnormal returns over a -20 and +20 event window generated by a bond or equity issues of JSE listed firms.

3.4 Conclusion

The methodology of the study takes on two steps; the first step is to estimate a probit regression for the choice between debt and equity issues using a sample of firms that have made issues announcements for the period 2000 to 2020. The announcement data is extracted from Bloomberg and all firm-specific determinants which will be used as independent variables are collected from IRESS and EquityRT. The data is sorted and arranged accordingly to form a panel that is exported onto STATA, where the dependent variable equals one if the firm issues debt and zero otherwise. This first step of the methodology will estimate which determinants are significant in driving the likelihood of issuing debt. The second step involves the calculation of cumulative abnormal returns

in the days surrounding the announcement day for each bond and equity announcement event for all firms involved in the study. Five event windows are formed to capture the price reaction before and after the announcement. The two-step approach will answer the two questions; (i) what firm specific factors drive the issuance of debt and equity and (ii) does the announcement of the issues cause abnormal returns in days surrounding the announcement date.

4. RESULTS

The aim of this chapter is to discuss and interpret the findings from the regression analysis and event study. The results section is divided into four main sections as follows, Section 4.1 discusses the descriptive statistics results; Section 4.2 discusses the various panel data diagnostics tests performed; Section 4.3 presents and discusses the regression results and Section 4.4 discusses the event study results

4.1 DESCRIPTIVE STATISTICS

Table 3 shows the summary of the descriptive statistic of each independent and dependant variables. The table consists of the number of observations, mean, standard deviation and minimum and maximum values for the 1080 observations.

A total of 69 firms are included in the model. The profitability measure reveals that on average, the firms included in this study realise a return of 5.18% for the time period January 2000 to January 2020. The average size of the firm which is the logarithm of total assets ranges between a low of -0.88 and a high of 6.28 with the mean of 4.13. The average ratio of ownership of the stock held by the executive team of the firm is 6.47 and only 38% of the executive team were confident during the period (i.e the % ownership of holdings was increased in the following year). The ratio of the tangibility measure suggests that there are on average 29.28 fixed assets to total assets. Lastly, the ratio for the market price to book value of the firms hovers around 2.32 on average with the highest ratio being 24.96. The descriptive statistic also reveals that there were more equity announcements in the sample than debt.

Table 3 Summary of descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
DEBT	1080	0.0416667	0.1999189	-0.1007	1
SIZE	1080	4.138387	0.19475739	-0.8860567	6.284778
PROFITABILITY	1080	0.0518063	0.1010581	-0.669863	1.117986
OWNERSHIP	1080	6.475304	11.27716	0	79.92878
TANGIBILITY	1080	29.28159	27.41127	0	97.2
MTB	1080	2.324	2.506454	0	24.9638
CONFIDENCE	1080	0.381835	0.4860617	0	1
INDUSTRY	1080	0.2027778	0.4022546	0	1

4.2 PANEL DATA DIAGNOSTIC TESTS

Several diagnostics tests are performed to ensure that the results obtained are reliable.

4.2.1 Multicollinearity

To test for the existence of a linear relationship between the independent variables, a Pearson correlation which generates the pairwise correlation by way of coefficients between the variables is performed. Correlation coefficients falls between 1 and -1 with +1 indicating a perfect positive relationship and -1 indicating a perfect negative relationship. A correlation coefficient which is greater than 0.7 is a sign of the presence of multicollinearity between the variable as a result one of the variables may have to excluded from the regression model to avoid this problem.

The results of the matrix are presented in *Table 4* below. There appears to be a reasonable relationship with positive and negative correlation between the dependent and independent variables. None of the correlation coefficients between the variables is greater or equal to 0.7 which indicates that the panel is not affected by the multicollinearity problem.

Table 4 Pearson Correlation Matrix

	debt	size	profitability	owner	tangibility	mtb	conf
debt	1.00						
size	0.1675	1.00					
Profitability	-0.0384	0.0635	1.00				
owner	-0.0158	-0.3659	0.0505	1.00			
tangibility	0.0941	-0.0591	-0.0654	-0.2312	1.00		
mtb	-0.0958	-0.0034	0.1656	0.0002	-0.1193	1.00	
conf	0.0078	0.0486	-0.0029	0.1141	0.0420	-0.0476	1.00

4.2.2 Heteroskedasticity

The error term given by the probit regression equation (1) has an assumption that the disturbances thereof are homoscedastic (variance of the residual term is constant). This could be an issue for the firms involved in the investigation as they vary in size, profitability, ownership structures and other variations which may deem the regression to have heteroskedasticity in its error term. To avoid this assumption of homoscedasticity, one should then compute standard error estimates correcting for the presence of heteroskedasticity.

The test is performed by use of the Breusch-Pagan test where the null hypothesis is that all disturbance terms have equal variances. The test computed a very large chi-squared of 38822.71 and a p-value of less than 1%. Therefore, we reject the null hypothesis that there is no heteroscedasticity in the model and deduce that the dependent variables influence the variance of the error term as a result of heteroscedasticity. As a result, the regression estimation of this study will employ robust standard errors to control for heteroscedasticity.

4.2.3 Serial Correlation

The presence of serial correlation is tested by use of the Durbin-Watson d-statistic. The null hypothesis of this test is that there is no autocorrelation at lag one in the disturbance terms. The p-value obtained from the test is 1.79591 which is greater than 0.1 therefore we fail to reject the null hypothesis and conclude that the error terms of the model are not serially correlated.

4.3 REGRESSION RESULTS

The table below shows the results obtained from the probit binary regression. The table displays the estimations derived from the model in equation (1) above when the likelihood of issuing debt is measured by the six capital structure variables employed in this study. There are a total of 1078 observations from the 69 firms included in the sample. This subsection discusses the results from the binary probit regression performed where a bond issue is the binary dependent variable and firm specific determinants are employed as the independent variables.

One of the main research questions of this study is what are the firm-specific determinants that drive the likelihood of issuing debt or equity? The results from the regression output are as follows:

Table 5 Panel data regression estimation using the binary probit model

debt	Coefficient	Robust Std. err.	z	P > |z|	[95% conf.	interval]
size	1.803705	0.4358959	4.14	0.000***	0.9493651	2.658045
profitability	1.406193	1.706364	0.82	0.410	-1.938219	4.750604
owner	0.0462333	0.0155222	2.98	0.003**	0.0158104	0.0766563
tangibility	0.0048192	0.0112	0.43	0.667	-0.0171324	0.0267709
mtb	-0.4942335	0.1423671	-3.47	0.001***	-0.773268	-0.2151991
confi	-0.1492285	0.1945312	-0.77	0.443	-0.5305026	0.2320457
industry	-1.685759	0.97054	-1.74	0.082	-3.587982	0.2164646
_cons	-9.83352	1.938563	-5.07	0.000	-12.63303	-6.034005

/lnsig2u	-0.019917	0.6099279	-1.215354	1.17552
sigma_u	0.9900909	0.301942	0.5446146	1.799952
rho	0.4950209	0.1524668	0.2287552	0.7641413

Note: ** signifies a variable is significant at the 5% level of significance

*** signifies a variable is significant at the 1% level of significance.

Research questions raised earlier are discussed based on the results below:

4.3.1 What is the relationship between company size and the likelihood of issuing debt

The positive sign of the coefficient shows that there is a positive and statistically significant relationship between size and the likelihood of issuing debt. The p-value of the 1.8307 is 0.000 implying that the relationship is significant at both the 5% and 1% level. This result is not surprising as it is in line with the finding that larger firms tend to issue more debt than equity as they have a high probability of meeting their obligations and low transaction costs associated with debt financing as compared to much smaller firms (Fama & Jensen, 1983; Rajan & Zingales, 1995). Due to the diversification and low bankruptcy probability nature of larger firms, Titman and Wessels (1988) argue that large firms will tend to hold more debt than any other financing option in their capital structure to get the benefits of associated with the tax shields. The positive relationship between size and debt is in line with the trade-off theory that states that firms will choose a debt ratio that maximises tax benefits by choosing debt as their financing option and the signalling theory that suggest that news of debt issuance are likely to well received by the market. Lastly, the results imply that large JSE firms are more likely to issue debt over equity.

4.3.2 What is the relationship between profitability and the likelihood of issuing debt

As mentioned in the hypothesis development, profitable firms will tend to follow the static theory of capital structure elaborated in Frank and Goyal (2003) and are likely to issue debt over equity. This is due to high profitable firms having a large borrowing capacity a tendency of leveraging off interest tax shields. The agency theories also predict that high profitable firms are more likely to issue debt thus having more debt in their capital structure to monitor the activities undertaken by managers. From the above theories, one can expect a positive sign on the coefficient of the profitability variable.

The regression results shows that there is indeed a positive relationship between the return on equity of the firm and the likelihood of issuing debt. However, as can be seen from the p-value of 0.41, this relationship is not significant at all significance levels. The positive relationship between profitability and debt issuance supports the pecking order theory that implies that profitable firms will tend to use internally generated funds first and will use debt should these funds be exhausted.

4.3.3 What is the relationship between asset tangibility and the likelihood of issuing debt

Firms with a high ratio of asset tangibility are those with a high proportion of fixed assets. These fixed assets are then used as collateral to obtain more debt. In this study, tangibility has been found to have a positive but statistically insignificant relationship with bond issues. This result is in contradiction with the findings of Rajan and Zingales (1995) who found that across countries, asset tangibility is significantly and positively associated with leverage. Nevertheless, the positive reported sign of the relationship between tangibility and debt is in accordance with the trade-off, pecking order and agency cost theory that imply that high tangibility firms finance projects with external financing, with debt being preferable than equity.

4.3.4 What is the relationship between the firm's ownership structure and the likelihood of issuing debt

Managerial ownership has been used as a monitoring tool to curb agency costs between managers and shareholders consequently providing ease of borrowing. The findings reveal that managerial ownership has a positive and statistically significant relationship with the likelihood of debt issues. A 1% increase in ownership structure, increases the likelihood of issuing debt by approximately 4.62%. These findings are consistent with existing theory (Leland & Pyle, 1977) that found that debt is positively associated with managerial ownership. Additionally, the finding is in line with the information asymmetry model and confirms that agency costs as a result of conflicting interests between managers and shareholders can be reduced by debt financing.

4.3.5 What is the relationship between the market-to-book value and the likelihood of issuing equity

Market-to-book ratio is often used as a measure of a stock mispricing. Baker and Wurgler (2002) argue that managers are more likely to issue equity when the firm's market value is higher than its book value. Hence, managers time the market when making a capital structure decision. Further, the empirical study conducted in the above found that there is a negative significant relationship between the market-to-book ratio and leverage. Similarly, the result from this study finds that the MTB ratio has a negative and significant relationship with the likelihood of issuing debt. This finding is in line with the market timing theory of capital structure that suggests that managers tend to take advantage of the market mispricing and will issue equity when their stock is overvalued. Hence, one would expect a negative relationship between the MTB ratio and debt issuance and a positive relationship between MTB and equity issuance. The coefficient of -0.4942 implies that 1% increase in the MTB ratio decreases the likelihood of issuing debt by approximately 49%. The significance result at the 1% and 5% level enables one to conclude that the managers' belief when it comes to the mispricing of their share price influences the choice between debt issue and equity issue.

4.3.6 What is the relationship between CEO confidence and the likelihood of issuing debt

Managerial confidence in this study has been measured by a categorical variable that takes a value of 1 if the ownership percentage in the current year is higher than the percentage of holdings in the previous year. The coefficient of -0.1492 implies that there is a negative relationship between managers' confidence and the likelihood of issuing debt. A percentage increase in confidence level of the executive i.e, increasing the current years' holdings results in a 0.1492 decline of issuing debt. One of the limitations of capital structure decisions and behavioural finance is that a consensus on an agreed proxy has not been reached when it comes to the behavioural measurement of capital structure (De Bondt & Thaler, 1987; Shefrin, 2001). However, this study considers the effect of managerial decisions to issue debt or equity based on their confidence of the firm's prospects. Accordingly, Hackbarth (2004) finds overconfident managers tend to issue debt more often and that generally a manager who is confident is less worried about bankruptcy and will use more debt financing. The behavioural variable in this study has been found to insignificant at both

the 1% and 5% level of significance. The sign of the coefficient is also in contradiction to behavioural finance theory that argues that confident managers are more likely to issue debt when faced with a financing decision. Based on these results, one can conclude that confidence in this context is negatively associated with the likelihood of issuing debt, however, this relationship is insignificant.

From the findings above, it is evident that the significant factors that drive the likelihood of debt issues in South Africa are size, ownership and the market-to-book ratios. This implies that larger JSE-listed firms with high managerial ownership and a low market-to-book ratio will tend to issue debt as a form of financing. Therefore, we fail to reject hypothesis 1 that firm specific variables influence the likelihood of debt and equity issues. Having established the factors that drive debt issuance in South Africa, it is plausible to examine further the financial implications of the issuance. The next section explores an event study approach to achieving this objective.

4.4 EVENT STUDY RESULTS

The second research question of this study asks whether the announcement of bond and equity issues generate abnormal returns in days surrounding the event date. To answer this question, a total of 81 bond announcements and 113 equity announcements during the period 2000 to 2020 on the JSE were obtained. Daily share prices from -250 to 250 were obtained for each announcement, as well as share of the market index (J203) for the same period. The announcement date is regarded as day zero. Beta and alpha were estimated for each announcement event and these estimates were then used to calculate the abnormal returns 20 days before the announcement and 20 days after the announcement.

4.4.1 Normality Tests

a) Histogram plots

The following tests were undertaken to determine the normality of the average abnormal returns of the bond and equity announcements. The first step in determining whether the data is normal is by way of a histogram graphical test as shown below:

The histogram below indicates that equity announcements abnormal returns are skewed to the left.

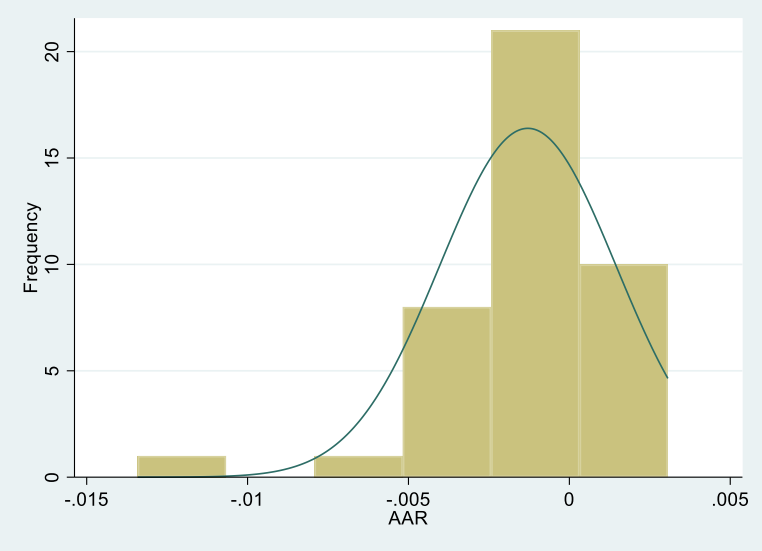

Figure 1 Graphical Test of Normality of the Equity Announcements AAR using the Histogram

As can be seen from the below histogram plot for the bond abnormal returns, the data for fitted values seem to be normal but there are a few outliers.

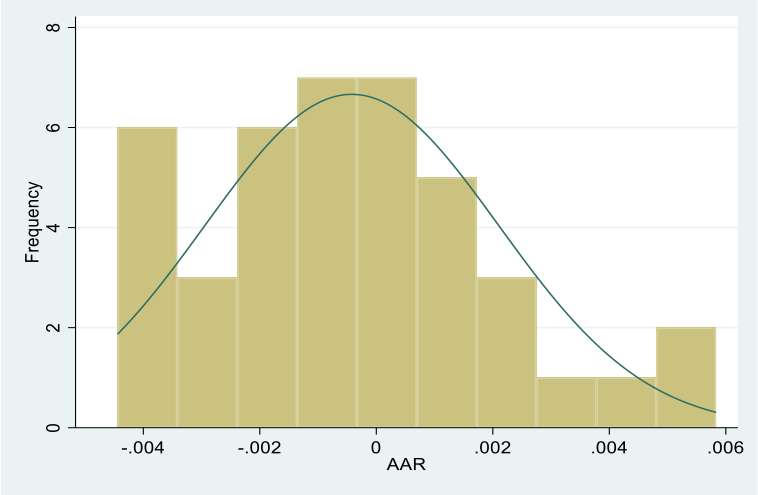

Figure 2 Graphical Test of Normality of the Bond Announcements AAR using the Histogram

.

b) Summary statistics

Furthermore, according to the summary statistics in *Appendix B.5* of the abnormal average returns of the equity announcements in the 41-day window, the AAR in response to equity issues is negatively skewed therefore rejecting the null of SKEW = 0 for normal returns. Normally distributed data should have a kurtosis value of 3, a value greater than 3 as reported above means that we have a high number of observations in the middle in comparison to the extreme ends as represented in the distribution curve for the bond announcements returns above. Contrary to the skewness and kurtosis values reported for the equity announcements, the average abnormal returns for the bond announcements in *Appendix B.6* are seemingly closer to normality.

c) Skewness and Kurtosis Tests for Normality

Based on the graphical and summary statistics, the test for normality is performed by two tests namely, the skewness and kurtosis tests for normality and the Shapiro-Wilk W test for normal data reported in *Appendix A.1*. The null hypothesis of this specification test is that the data for Equity AAR is normally distributed. The p-value of less than 5% indicates that we reject the null hypothesis of normality, and we can conclude that the abnormal returns are not normally distributed. The returns for the bond announcements reported in *Appendix A.2* have a p-value of 0.4345 which is greater than 5% hence we fail to reject the null hypothesis and the bond AARs are deemed to be normally distributed.

d) Shapiro-Wilk W Test for Normal Data

Similarly, the result of the Shapiro-Wilk W test for equity announcements shown in *Appendix A.3* also demonstrates that the p-value is less than 5%, thus rejecting the null hypothesis of normally distributed average returns. Conversely the result of the bond announcement reported in *Appendix A.4* on the other hand demonstrates that the average abnormal returns thereof are normally distributed as we fail to reject the null at the 5% level of significance.

From the above distribution tests, we can conclude that the average abnormal returns for the equity announcements are not normally distributed and the average abnormal returns for the bond announcements are distributed. Thus, both parametric and non-parametric tests were performed to test the significance of the abnormal returns associated with the announcements of bond and equity issues.

4.4.2 Equity Announcements Results

Due to the non-parametric nature of the equity announcements average abnormal returns, the Wilcoxon Signed-Rank test has been used to test for the statistical significance of equity issues announcements. The equity announcement share price reaction graph and significance results are reported below.

The CAAR graph in *Figure 3* below shows that equity issues generally experience a decline in returns over the 20 days before the event day and 10 days after the announcement. The returns over the 41-day period have been mostly below 0% with a huge decline in about 2 days before the announcement. The sudden increase of returns immediately after the announcement date is somewhat surprising as one would expect a further decline in stock price immediately after the equity announcement as this is a signal of an overvalued stock. However, when looking at the overall trend of the graph, there is a demonstration that on average there are negative CAARs indicating that there is a negative market reaction associated with equity announcements.

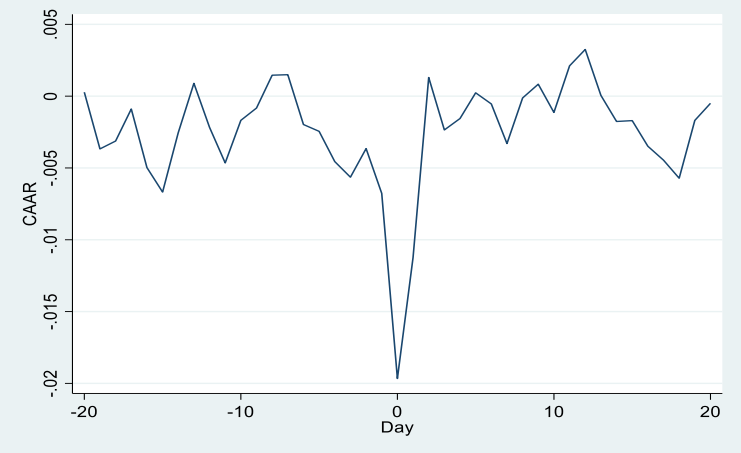

Figure 3 Equity Announcements Cumulative Average Abnormal Returns Time Series for the 41-day Event window

The results in *Table 6* below show the average values for CAAR1 to CAAR5 for the 113 equity issuance announcements involved. The Wilcoxon Sign-rank Test is then used to test whether the equity announcements CAARs are statistically different from zero. From the above table, on average, there is a significantly negative average abnormal return of 0.23% in CAAR1, 0.12 % in CAAR4 and 0.25% in CAAR 5.

With the p-value of CAAR1 being 0.0025 which is less than 5%, one can conclude that the average return for the event window from day -20 to day -3 (18 days prior to announcement date) is significantly negative. The large p-value in CAAR2 and CAAR3 of 0.0796 and 0.10800 respectively indicates that the negative returns in days surrounding the announcement are not statistically significant. Conversely for CAAR4 the p-value is 0.0311 which is less than 5%, this indicates that there are negative significant returns 3 days after the announcement. The measure of CAAR5 with a p-value of 0.0000 is significant at both the 1% and 5% level of significance. Thus, implying that there is a significant negative stock price reaction in the overall event window when equity issues are announced.

The below hypothesis is therefore accepted:

H2: Equity issue announcements have a negative and statistically significant effect on the share price.

Table 6 The average values of CAAR across different windows relative to the announcement of 113 equity issues

Variable	Window	Obs	Mean	Std. dev.	T-value	P-value
CAAR1	[-20; -3]	18	-.002318	.0024344	-3.027	0.0025***
CAAR2	[-2; +2]	5	-.0080043	.0079588	-1.753	0.0796
CAAR3	[-1; +1]	3	-.0125567	.0065454	-1.604	0.1088
CAAR4	[+3; +20]	18	-.0012135	.0022164	-2.156	0.0311**
CAAR5	[-20; +20]	41	-.0025266	.0039353	-4.114	0.0000***

4.4.3 Bond Announcements Results

As seen from the above normality tests for bond announcements, the bond average abnormal returns were found to be normally distributed, therefore a classical parametric t-test has been used to measure whether the returns are statistically different from zero. The results are reported using the time series plot and table below:

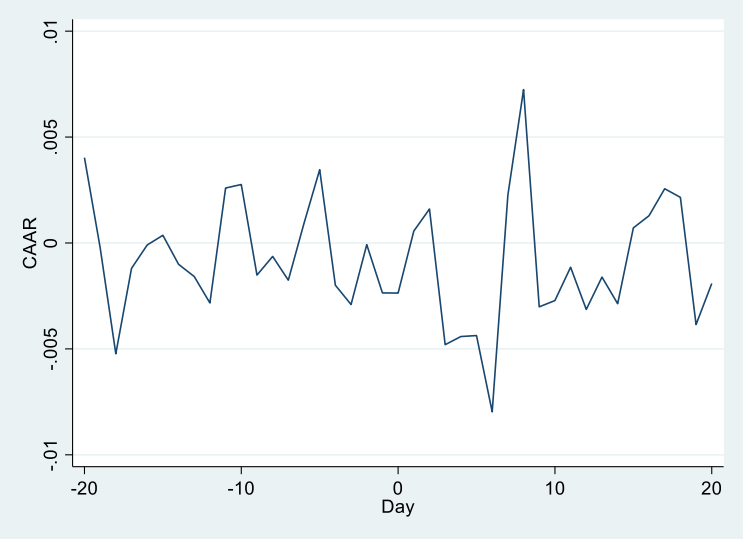

Figure 4 Bond Announcement Cumulative Average Abnormal Returns Time Series for the 41-day Event window

The above time series plot for the cumulative average abnormal returns for bond announcements indicates that on days before the announcement -20 to day 0 the returns are relatively close to zero hovering between +0.5% and -0.5%. Between day 0 and +3 there has been an increase in CAAR indicating the positive news associated with bond announcements. However, from day +3 to around day +6 the returns began to decline drastically. This reversal can be in accordance with the EMH that proposes that there is an almost instantaneous adjustment to the release of firm specific information. From day +6 onwards we see a spike in the returns reaching almost 1% followed by a decline.

Contrary to the positive hypothesized relationship between bond issues and the market reaction the results in *Table 7* below show that on average, the returns have been consistently below 0 for all event windows. The results do not exhibit positive abnormal returns as anticipated; hence we reject the proposed hypothesis that there is a positive relationship between bond issue announcement and share price performance. However, these negative abnormal returns are not statistically significant across all event windows. Similarly, the price patterns observed by a debt issue announcement from previous studies (Mikkleson and Partch 1986; Eckbo 1986) are insignificant and suggest that this may be due to the predictability of debt issues. These results however should not be interpreted in isolation as the time series graph clearly shows that there is indeed a positive market reaction to the announcement of bond issuance in the short run, although this reaction is not statistically significant.

Table 7 The average values of CAAR across different windows relative to the announcement of 81 bond issues

Variable	Window	Obs	Mean	Std. dev.	T-value	P-value
CAAR1	[-20; -3]	18	-.000379	.0024198	-0.6646	0.5152
CAAR2	[-2; +2]	5	-.0005268	.0017784	-0.6623	0.5440
CAAR3	[-1; +1]	3	-.0013865	.0016871	-1.4234	0.2906
CAAR4	[+3; +20]	18	-.001422	.0035696	-1.6901	0.1093
CAAR5	[-20; +20]	41	-.0008549	.0029121	-1.8799	0.0674

4.5 CONCLUSION

The main objective of this study is to identify determinants that influence the debt-equity choice and the effects of security issuance announcements on the JSE. To determine which firm-specific variables are significant, a binary probit model is used where a bond issuance is the dependent variable, and the firm-specific variables are the independent variable. The findings of the estimations indicate that from the five traditional determinants of capital structure and one behavioural variable, only three variables are statistically significant. Size, managerial ownership and market-to-book ratio significantly drive the likelihood of debt issuance in the JSE market. The sign and significance estimations for these determinants are in line with the pecking-order theory,

trade-off theory and market timing theory of capital structure. Following the identification of these determinants, an event study to figure out whether the announcement of debt and equity announcement exhibit abnormal returns is conducted. This test is performed to test the EMH and the signalling theory of capital structure. The results for the event study indicates that equity announcements exhibit a steep decline in CAARs 2-days before the announcement date and this is followed by a huge spike immediately after the announcement date. The equity announcement significance test indicates that there are indeed significant negative abnormal returns 18-days before the announcement and 3-days after the announcement. The bond time series results demonstrate that on the days before the announcement, the CAARs are much closer to zero and start increasing immediately after the announcement date up to the third day after the announcement. The positive reaction following the announcement of a debt issue is in line with signalling theory that state that news of debt financing is perceived as positive. However, the abnormal returns associated with bond announcements are not found to be statistically significant throughout the event window.

Chapter 5

5. CONCLUSION AND RECOMMENDATIONS

This chapter discusses the overall findings of the study and provides recommendations for future studies. The chapter is structured as follows; Section 5.1 discusses the conclusions of the research dissertation. Section 5.2 discusses recommendations.

5.1 Conclusion

Modigliani and Miller introduced capital structure to the body of finance literature. Since then, the subject of corporate finance has been built on its assumptions and the development of theories that seek to explain the behaviour surrounding capital structure decisions. Existing capital structure theories are based on Modigliani and Miller's (1958) irrelevance theory which implies that capital structure does not affect the value of the firm in the absence of distress costs and taxes. In other words, the company's value is not affected by its decision to obtain funding through equity or debt. Due to the irrelevance theorem, the topic of capital structure has received much criticism in the past decades across finance literature on whether it matters or not. This critique stems from the irrelevance theorem which underestimated the tax benefits of debt as a result of the tax deductibility nature of interest payments. At present, firms operate in countries with severe legal tax systems and often businesses opt for ways to avoid making heavy tax payments as much as possible by employing an optimal capital structure. Moreover, there is often some level of thought and strategy that managers follow when building a financial policy and one of them is setting up capital structure in a way that will optimize their organization's value.

Based on the above and recent studies, the question of whether capital structure matters or not is not so debatable anymore. With the JSE equity and debt issuance volume increasing, it is important to investigate determinants that drive capital structure transactions and the effects of these issues on the stock market. The study undertakes a regression analysis approach to find out the capital structure determinants that influence the debt-equity choice and an event study approach to investigate the effects of these capital structure announcements on the share price behaviour of

firms on the JSE. The results of the study provide insights on capital structure determinants and the stock market behaviour as a result of debt and equity issue announcements. Additionally, the results are robust to various additional checks to ensure that they can be relied upon.

The main research questions of the study are as follows: what are the firm-specific determinants that drive the likelihood of issuing debt or equity? Secondly, what will be the impact of the announcement of these issues on the share price of the issuing firm? The findings indicate that there are three firm-specific variables that drive the likelihood of issuing debt as a financing option for South African listed firms. These variables namely, size, ownership and market-to-book are statistically significant where size and managerial ownership has a positive relationship with a debt issuance and the market-to-book ratio is negatively associated with a debt issuance.

The positive sign of the size variable is supported by the trade-off theory that suggests that larger, diversified firms with a low default risk benefit from debt as a result of the low agency costs. On the contrary, the pecking order theory that suggests that large firms have abundant retained earnings, therefore will not rely on external funds such as bond and equity issues. Consequently, the theory predicts that there will be a negative relationship associated with size and the likelihood of issuing debt. Thus, the positive relationship between size and debt indicates that large JSE listed firms are more likely to be adopting the trade-off theory approach as opposed to the pecking order theory. Ownership is also found to have a positive significant relationship with the likelihood of issuing debt, this result is consistent with previous findings (Friend and Lang, 1988) that suggest that firms with a dilute ownership structure are inclined to issue more debt. This finding is in line with the agency theory in that managers tend to avoid further dilution of ownership thus debt is preferred over equity. Market-to-book is measured as the ratio of the market price per share divided by the book value per share. The negative association between MTB and debt issuance as found in the result indicates that firms whose market price are higher than the book value (overvalued) are less inclined to issue debt. This finding is consistent with the market timing theory of capital structure that states that firms' whose stock price is overvalued will tend to take advantage of the arbitrage profits by issuing equity over debt. Thus, the negative sign when MTB ratio is high is expected. This finding indicates that market timing plays a critical role in financing decisions.

The second step following the identification of significant determinants that drive the likelihood of debt issues, an event study analysis shows that indeed there is a market reaction associated with debt and equity issues. The equity time series analysis of the CAAR for 20 days before and 20 days after the announcement indicate that there are significant negative CAARs followed by the announcement of equity. Moreover, the bond time series analysis indicates that there is an increase in CAARs for 3 days following the announcement of a bond issue, however these returns are not statistically significant. These event study analysis results are consistent with the signalling theory of capital structure that state that equity issues announcements are perceived negatively by the market and bond issues announcement are perceived positively by the market. The question on whether the JSE is efficient or not, is answered by the apparent reversal that is observed immediately after a spike or steep decline of the returns. Based on the above findings, one can conclude that size, managerial ownership and market-to-book ratio are the main determinants that drive the likelihood of a debt issue and equity issue announcements have a negative and statistically significant effect on the share price.

5.2 Recommendations for future studies

The limitations of the study provide an opportunity for future research. Due to the simplicity nature of the chosen research methods, confounding effects were not considered. It is important to consider confounding effects during each event announcement to ensure that the results are only due to the announcement of debt and equity and no other event. There could be an instance that there were other events that took place during the chosen event windows that influenced the market reaction and therefore it is important to take additional measures to ensure that there were no other events that took place during the announcement window that could significantly influence the results. The decision to issue equity or debt could also be due to the economic conditions therefore, the second recommendation is to add macroeconomic factors such as GDP, inflation, interest rates and taxes in addition to the firm-specific determinants. Lastly, the behavioural variable that was chosen for this study is found to be insignificant, there is a further need to explore more behavioural finance proxies that influence capital structure decisions.

6. REFERENCES

Abor, J., & Biekpe, N. (2005). What determines the capital structure of listed firms in Ghana? *The African Finance Journal*, 7, 37–48.

Albanie, S. (2019). *Shareholder wealth effects of convertible bond announcements in South Africa* [Unpublished master's dissertation]. University of Cape Town Faculty of Commerce).

Baker, M., & Wurgler, J. (2002). Market timing and capital structure. *The Journal of Finance*, *57*(1), 1–32.

Ball, R., & Brown, P. (1968). An empirical evaluation of accounting income numbers. *Journal of Accounting Research*, 6(2), 159–178. https://doi.org/10.2307/2490232

Barclay, M. J., & Smith, C. W. (1999). The capital structure puzzle: Another look at the evidence. *Journal of Applied Corporate Finance*, *12*(1), 8–20. https://doi.org/10.1111/j.1745-6622.1999.tb00655.x

Barclay, M., & Smith, C. (2005). The capital structure puzzle: The evidence revisited. *Journal of Applied Corporate Finance*, 17, 8–17. https://doi.org/10.1111/j.1745-6622.2005.012_2.x

Bayless, M., & Chaplinsky, S. (1991). Expectations of security type and the information content of debt and equity offers. *Journal of Financial Intermediation*, *1*(3), 195–214. https://doi.org/10.1016/1042-9573(91)90007-M

Bello, M. A. (2021). Corporate governance and stock market reaction to seasoned equity offering announcement by firms in Nigeria. *Malaysian Management Journal*, 73-98. https://doi.org/10.32890/mmj2021.25.4.

Bhana, N. (1998). Share price reaction to announcements of equity financing by companies listed on the Johannesburg Stock Exchange. *Investment Analysts Journal*, *27*(48), 33–42. https://doi.org/10.1080/10293523.1998.11082389

Bowman, R. G. (1983). Understanding and conducting event studies. *Journal of Business Finance & Accounting*, *10*(4), 561–584. https://doi.org/10.1111/j.1468-5957.1983.tb00453.x

Brealey, R. A., Myers, S. C., (2003). Principles of corporate finance. New York, NY: McGraw-Hill/Irwin.

Brown, S. J., & Warner, J. B. (1980). Measuring security price performance. *Journal of Financial Economics*, *8*(3), 205–258. https://doi.org/10.1016/0304-405X(80)90002-1

Convertible Bond—Types & Advantages of Convertible Bonds. (n.d.). Corporate Finance Institute. Retrieved May 14, 2021, from https://corporatefinanceinstitute.com/resources/knowledge/trading-investing/convertible-bond/

Chen, J. J. (2004). Determinants of capital structure of Chinese-listed companies. *Journal of Business research*, *57*(12), 1341-1351.

Chipeta, C., & Deressa, C. (2016). Firm and country specific determinants of capital structure in Sub Saharan Africa. International Journal of Emerging Markets, 11, 649–673. https://doi.org/10.1108/IJoEM-04-2015-0082

Cornett, M. M., & Travlos, N. G. (1989). Information effects associated with debt-for-equity and equity-for-debt exchange offers. *The Journal of Finance*, *44*(2), 451-468.

Correia, C., & Cramer, P. (2008). An analysis of cost of capital, capital structure and capital budgeting practices: A survey of South African listed companies. Meditari Accountancy Research, 16(2), 31–52. https://doi.org/10.1108/10222529200800011

Covitz, D., & Harrison, P. (1999). The timing of debt and rating migration: Theory and evidence. *Federal Reserve Board, Washington DC*.

Dann, L. Y., & Mikkelson, W. H. (1984). Convertible debt issuance, capital structure change and financing-related information: Some new evidence. *Journal of Financial Economics*, *13*(2), 157–186. https://doi.org/10.1016/0304-405X(84)90022-9

De Bondt, W. F., & Thaler, R. H. (1987). Further evidence on investor overreaction and stock market seasonality. *The Journal of finance*, *42*(3), 557-581.

Debt Market | Johannesburg Stock Exchange. (n.d.). Retrieved July 1, 2021, from https://www.jse.co.za/raise-capital/debt-board

Eckbo, B. E. (1986). Valuation effects of corporate debt offerings. *Journal of Financial economics*, *15*(1-2), 119-151.

Elliott, W. B., Koëter-Kant, J., & Warr, R. S. (2008). Market timing and the debt–equity choice. *Journal of Financial Intermediation*, *17*(2), 175-197.

Elsas, R., & Florysiak, D. (2008). *Empirical Capital Structure Research: New Ideas, Recent Evidence, and Methodological Issues* (SSRN Scholarly Paper ID 1634932). Social Science Research Network. https://papers.ssrn.com/abstract=1634932

Equities Market | Johannesburg Stock Exchange. (n.d.). Retrieved July 1, 2021, from https://www.jse.co.za/raise-capital/equities-market

Fama, E. F., & French, K. R. (1992). The cross-section of expected stock returns. *the Journal of Finance*, *47*(2), 427-465.

Fama, E. F., & Jensen, M. C. (1983). Separation of ownership and control. *The journal of law and Economics*, *26*(2), 301-325.

Financial Advisory and Intermediary Services Act 37 of 2002 | South African Government. (n.d.). Retrieved August 16, 2021, from https://www.gov.za/documents/financial-advisory-and-intermediary-services-act

Flammer, C. (2021). Corporate green bonds. *Journal of Financial Economics*, *142*(2), 499-516.

Frank, M. Z., & Goyal, V. K. (2003). Testing the pecking order theory of capital structure. *Journal of Financial Economics*, *67*(2), 217–248. https://doi.org/10.1016/S0304-405X(02)00252-0

Friend, I., & Lang, L. H. (1988). An empirical test of the impact of managerial self-interest on corporate capital structure. *the Journal of Finance*, *43*(2), 271-281.

Galai, D., & Masulis, R. W. (1976). The option pricing model and the risk factor of stock. *Journal of Financial economics*, *3*(1-2), 53-81.

Graham, J. R. (2003). Taxes and corporate finance: A review. *The Review of Financial Studies*, *16*(4), 1075–1129. https://doi.org/10.1093/rfs/hhg033

Gwatidzo, T., & Ojah, K. (2009). Corporate capital structure determinants: Evidence for five African countries. *African Finance Journal*, *11*(1), 1–23.

Hackbarth, D. (2004). Determinants of corporate borrowing: A behavioral perspective. Working Paper, Indiana University

Hillier, D., Grinblatt, M., & Titman, S. (2011). *Financial Markets and Corporate Strategy European Edition 2e*. McGraw Hill.

Hovakimian, A. (2006). Are observed capital structures determined by equity market timing? *The Journal of Financial and Quantitative Analysis*, *41*(1), 221–243.

Howe, J. S., & Shilling, J. D. (1988). Capital structure theory and REIT security offerings. *The Journal of Finance*, *43*(4), 983–993.

Huang, R., & Ritter, J. R. (2005). Testing the market timing theory of capital structure. *Journal of Financial and Quantitative Analysis*, *1*, 221–246.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, *3*(4), 305–360. https://doi.org/10.1016/0304-405X(76)90026-X

Kayhan, A., & Titman, S. (2007). Firms' histories and their capital structures. *Journal of Financial Economics*, *83*(1), 1–32. https://doi.org/10.1016/j.jfineco.2005.10.007

Leary, M. T., & Roberts, M. R. (2005a). Do Firms Rebalance Their Capital Structures? *The Journal of Finance*, *60*(6), 2575–2619. https://doi.org/10.1111/j.1540-6261.2005.00811.x

Leary, M. T., & Roberts, M. R. (2005b). Do Firms Rebalance Their Capital Structures? *The Journal of Finance*, *60*(6), 2575–2619. https://doi.org/10.1111/j.1540-6261.2005.00811.x

Leland, H. E., & Pyle, D. H. (1977). Informational Asymmetries, Financial Structure, and Financial Intermediation. *The Journal of Finance*, *32*(2), 371–387. https://doi.org/10.2307/2326770

Lippert, J. M. (2010). *An Examination of The Price Reaction to The Announcement of Bond Issues by Johannesburg Stock Exchange Listed Companies on The Bond Exchange of South Africa*. 109.

MacKie-Mason, J. K. (1990). Do Taxes Affect Corporate Financing Decisions? *The Journal of Finance*, *45*(5), 1471–1493. https://doi.org/10.2307/2328746

MacKinlay, A. C. (1997). Event Studies in Economics and Finance. *Journal of Economic Literature*, *35*(1), 13–39.

Masulis, R. W. (1980). *The Effects of Capital Structure Change on Security Prices: A Study of Exchange Offers* (SSRN Scholarly Paper ID 1542183). Social Science Research Network. https://papers.ssrn.com/abstract=1542183

Masulis, R. W. (1983). The Impact of Capital Structure Change on Firm Value: Some Estimates. *The Journal of Finance*, *38*(1), 107–126. https://doi.org/10.1111/j.1540-6261.1983.tb03629.x

Mcwilliams, A., & Siegel, D. (1997). Event Studies in Management Research: Theoretical and Empirical Issues. *The Academy of Management Journal*, *40*, 626–657. https://doi.org/10.2307/257056

Mikkelson, W. H., & Partch, M. M. (1986). Valuation effects of security offerings and the issuance process. *Journal of financial economics*, *15*(1-2), 31-60.

Miller, M. H. (1977). Debt and taxes. *The Journal of Finance*, *32*(2), 261–275.

Miller, M. H., & Rock, K. (1985). Dividend Policy under Asymmetric Information. *The Journal of Finance*, *40*(4), 1031–1051. https://doi.org/10.1111/j.1540-6261.1985.tb02362.x

Modigliani, F., & Miller, M. H. (1958). The Cost of Capital, Corporation Finance and the Theory of Investment. *The American Economic Review*, *48*(3), 261–297.

Modigliani, F., & Miller, M. H. (1963). Corporate income taxes and the cost of capital: A correction. *The American Economic Review*, *53*(3), 433–443.

Myers, S. C. (1977). Determinants of corporate borrowing. *Journal of financial economics*, *5*(2), 147-175.

Myers, S. C. (1984). *Capital Structure Puzzle* (No. w1393). National Bureau of Economic Research. https://doi.org/10.3386/w1393

Myers, S. C. (2001). Capital structure. *Journal of Economic Perspectives*, *15*(2), 81–102.

Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, *13*(2), 187–221. https://doi.org/10.1016/0304-405X(84)90023-0

Rajan, R. G., & Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. *The journal of Finance*, *50*(5), 1421-1460.

Ross, S. A. (1977). The Determination of Financial Structure: The Incentive-Signalling Approach. *The Bell Journal of Economics*, *8*(1), 23–40. https://doi.org/10.2307/3003485

Securities Finance in South Africa—Lexology. (n.d.). Retrieved May 12, 2021, from https://www.lexology.com/library/detail.aspx?g=c1985c63-97cc-44f7-be7e-48b882ba3a02

Shefrin, H. (2001). Behavioral corporate finance. Journal of applied corporate finance, 14(3), 113-126.

Spence, M. (1973). Job Market Signaling. *The Quarterly Journal of Economics*, *87*(3), 355. https://doi.org/10.2307/1882010

Titman, S., & Wessels, R. (1988). The determinants of capital structure choice. *The Journal of finance*, *43*(1), 1-19.

Welch, I. (2004). Capital Structure and Stock Returns. *Journal of Political Economy*, *112*(1), 106–132. https://doi.org/10.1086/379933

Wet, L., & Gossel, S. (2016). South African Capital Structure Decisions: A Survey of Listed Companies. *Journal of African Business, 17, 1–21.* https://doi.org/10.1080/15228916.2016.1132509

Wolmarans, H., & Sartorius, K. (2009). Corporate social responsibility: The financial impact of Black Economic Empowerment transactions in South Africa. *South African Journal of Economic and Management Sciences*, *12*(2), 180–193.

Appendix A: Normality and Specification Tests

Appendix A.1: Skewness/Kurtosis Test for Normality for the 41-day Equity Announcements Event Window

Skewness and kurtosis tests for normality

Variable	Obs	Pr(skewness)	Pr(kurtosis)	Joint test Adj chi2(2)	Joint test Prob>chi2
AAR	**41**	**0.0000**	**0.0000**	**25.84**	**0.0000**

Appendix A.2: Skewness/Kurtosis Test for Normality for the 41-day Bond Announcements Event Window

Skewness and kurtosis tests for normality

Variable	Obs	Pr(skewness)	Pr(kurtosis)	Joint test Adj chi2(2)	Joint test Prob>chi2
AAR	**41**	**0.2309**	**0.7106**	**1.67**	**0.4345**

Appendix A.3: Shapiro-Wilk W Test for the 41-day Equity Announcements Event Window

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
AAR	41	0.83299	6.728	4.018	0.00003

Appendix A.4: Shapiro-Wilk W Test for the 41-day Bond Announcements Event Window

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
AAR	**41**	**0.96539**	**1.394**	**0.700**	**0.24182**

Appendix B: Event Study Summary Statistics

Appendix B.5: Equity Issues Announcements Average Abnormal Returns Summary Statistics for the 41-day Event Window

AAR

	Percentiles	Smallest		
1%	-.0134123	-.0134123		
5%	-.0039492	-.0062485		
10%	-.0033656	-.0039492	Obs	41
25%	-.0023493	-.0034202	Sum of wgt.	41
50%	-.001439		Mean	-.0012898
		Largest	Std. dev.	.0027391
75%	.0003118	.0017568		
90%	.0016768	.0021734	Variance	7.50e-06
95%	.0021734	.0023236	Skewness	-2.055963
99%	.0030613	.0030613	Kurtosis	10.61013

Appendix B.6: Bond Issues Announcements Average Abnormal Returns Summary Statistics for the 41-day Event Window

AAR

	Percentiles	Smallest		
1%	**-.004442**	**-.004442**		
5%	**-.0043954**	**-.004421**		
10%	**-.0042199**	**-.0043954**	Obs	**41**
25%	**-.0015488**	**-.0042442**	Sum of wgt.	**41**
50%	**-.0003587**		Mean	**-.0004207**
		Largest	Std. dev.	**.0025227**
75%	**.0012343**	**.0035362**		
90%	**.0022611**	**.0040288**	Variance	**6.36e-06**
95%	**.0040288**	**.0050925**	Skewness	**.4142987**
99%	**.0058353**	**.0058353**	Kurtosis	**2.946102**