THE IMPACT OF RIGHTS ISSUES ANNOUNCEMENTS ON SHARE PRICE PERFORMANCE IN SOUTH AFRICA

BY

HEIN VAN DER MERWE

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Table of Contents

List of Tables

Abstract

This study investigates the effect that announcements of rights issues have on abnormal share price returns on the JSE over the period January 2009 to December 2014. This study will focus specifically on the equity element of the capital structure and the issuing of new equity in the form of rights issues. There have been a few studies done in this regard in the South African context but the prior papers have been conducted over significantly different time periods and data samples and there is therefore merit in combining all four approaches into a single study focused on one consistent data sample. Secondly, this study also investigates the impact the motivation for the rights issue as provided by the issuer, has on the share price returns of the issuers. Thirdly, this study investigates the effect of the "financial health" of the rights issuer, as measured in terms of the Altman Z-score, has on the abnormal returns of the share prices of the issuers. The final area of investigation is to test the ability of rights issuers on the JSE to time the market when performing rights issues. An event study methodology was followed to calculate the abnormal share price returns of the events. An initial sample of 72 rights issue events were identified for the period between January 2009 and December 2014, but this was reduced to 25 events after various confounding events were eliminated. In line with the literature, the study found negative post-announcement abnormal share price returns following a rights issue. This indicates that the market perceives a rights issue as a negative signalling event and shows its unhappiness by punishing the share price. It was further found that issuers that reported that the proceeds of the rights issue was going to be used to repay outstanding debt had a larger negative post-announcement abnormal share price return than issuers reporting that the proceeds was going to be used for investment purposes. Thirdly, it was found that issuers that were classified as "healthy" had larger negative post-announcement abnormal share price returns than issuers classified as "unhealthy" and in the "grey" zone. No evidence of market timing was found. The evidence suggest that the market interprets rights issues as a negative signal from the management of the business, but that the signal is less negative when the issuer is "unhealthy" and the proceeds is used for investment purposes. The interpretation of the latter two findings, however, should be treated with some caution as size of the samples available for some of these tests were quite small.

Keywords: Rights Issues, JSE, Event Study, Market Timing, Financial Health.

Chapter One: Introduction and Background

When applying financial management in practice, there are three crucial elements that must be considered at all times. These three elements, namely the company's cost of capital, its value, and its capital structure, act as the financial lifeblood of any business, and are crucial in maintaining the financial wellbeing of the business. More important is the relationship between the three elements. When a company's cost of capital is low, it conversely means that the value of the company is high. The relationship between the cost of capital and the capital structure of the company on the other hand is not so clear. This relationship has been the subject of much academic research and it still is not clear if different capital structures will have an impact on the cost of capital. One thing however is clear: good corporate financial management should strive to create the capital structure which will maximise the intrinsic value of the business. This will be to the benefit of all parties invested in the business. Therefore the need arises to investigate the different elements that make up the capital structure. This study will focus specifically on the equity element of the capital structure and the issuing of new equity in the form of rights issues. There have been a few studies done in this regard in the South African context but the prior papers have been conducted over significantly different time periods and data samples, and there is therefore merit in combining all four approaches into a single study focused on one consistent data sample.

In any business the financial backbone can be divided into two parts. The first part is the opportunity to invest in an asset that will generate economic benefits, mostly in the form of earnings. The second part is the funding of the investment into the economic benefit generating asset. These two parts are labelled in modern day finance management theory as the investing decision and the financing decision. These two components are also found on the balance sheet of any business, which indicates the investment of funds (the company's assets), and the sources of the funds used for investment (its capital and debt).

The capital structure of a company is a conscious strategic financial management decision. The decision comprises that management must consider how much debt and equity it wants to carry on its balance sheet, and to maintain in the future. This decision translates into the business' debt-to-equity ratio, as reflected in its balance sheet. Management must also decide on which types of debt and equity it wants to take on. These decisions are directly affected by the type of financing that are available to management, as well as the financial policy that has been decided on. The risk profile of a company plays a fundamental role in determining the type of financial policy to follow, and this in turn affects the ability to maximise the value of the business.

The optimal capital structure is the point where the debt to equity ratio is so that the average cost of capital is at its lowest. In 1958 Modigliani and Miller published a paper in which it was argued that there is no optimal capital structure, and that the level of debt to equity will not have an effect on the average cost of capital of a business. This is because as the business increases its debt (which is a cheaper form of funds than equity, and hence the average cost of capital goes down) it also increases its financial risk. The equity holders will want a higher return for the increased risk that they have to take thus offsetting the reduction in the average cost of capital created by the debt funds. Their fundamental argument is that it is the economic benefit (earnings or profits) generating assets that give rise to the value of the business and not the source of the funds to acquire the assets. Modigliani and Miller find that the capital structure has no effect on the earnings or profits generated by the assets. In their model they assumed that there were no taxes, no costs associated with financial distress and no agency costs.

However, including taxation as well as the costs associated with financial distress the picture changes drastically. When taxation is not excluded, the interest paid on the capital amount of the debt is deductible for taxation purposes, and this increases the earnings after taxation that is generated by the assets. This means that the value of the business will now be increased by the taxation saving created by funding the assets through debt. This causes a decrease in the cost of capital as the debt to equity ratio increases. As the debt funding increases so does the financial risk, and hence the risk of potential financial failure also increases. Modigliani and Miller's model furthermore ignores the fact that earnings or profits could decline due to too much debt funding on the balance sheet. Other factors not incorporated into this model include potential agency costs, and the possibility of increased interest rates on debt due to the increased risk profile of a more indebted business. When taking these factors into account a much better picture of reality can be formed. It is shown that initially the taxation deductibility of the interest expense does increase the value of the business, but from a certain point the value declines again due to the costs of potential financial failure and distress when too much debt funding has been taken on.

Examples in the South African context of companies that have been negatively affected by too much debt are Edcon and Primedia. Edcon is a fashion retailer and owns brands like Edgars and CNA. Edcon was bought in 2007 by private equity firm Bain Capital Partners. The firm used a leveraged buyout to acquire Edcon and in the process took on too much debt and as a result put Edcon under huge financial distress. Similarly, Primedia is a media group who also experienced financial distress due to taking on too much debt.

At this point, where the benefit of the interest deductibility is matched by the cost of too much debt funding, the optimal capital structure ratio is found, which leads to the pragmatic trade-off theory.

The Trade-Off theory, (Myers 1984; Stiglitz 1974; Kane et al., 1984), stipulates that the cost of equity and the cost of debt will increase as the debt to equity ratio increases. Businesses are trading off the benefits of debt financing with the cost of taking on additional debt funding, which includes potential financial distress and failure, as well as higher interest rates (Titman and Wessels, 1988; Rajan and Zingales, 1995; Fama and French, 2002b; Stiglitz, 1974). The average cost of capital will initially fall, will then remain at a constant level for a variety of capital structures, and will finally increase as the debt to equity ratio increases, and with it the financial risk (Myers and Shyam-Sunder, 1999, p220). This indicates that there are a wide range of optimal capital structures available to the business, as long as the average cost of capital does not increase.

In practice assets are acquired by using debt and equity funding, and thus the capital structure will change very slightly every time an asset is acquired. Borrowers will also not lend businesses funds unless there are sufficient cash flows and/or security in the form of assets on the balance sheet. In practice a business that has been operating for many years and is generating positive cash flows should have no problem in obtaining debt funding from borrowers. Again the magnitude of the debt funding will be determined by the risk profile of the business – in other words, how likely is the business to continue operating as a going concern? The Trade-Off theory thus may be able to explain why businesses in the real world have such varying debt to equity ratios.

Businesses try to limit the use of debt funding in order to reduce the risk profile of the company and the potential of going into bankruptcy. Thus it seems likely that businesses are conscious of the fact that additional debt funding comes at a price. Evidence of this is the lending practices of commercial banks where the banks specifically analyses financial debt ratios such as debt service cover ratios and interest cover ratios to help decide whether to finance potential clients. A low debt to equity ratio *signals* to the market and potential borrowers of funds that the businesses is healthy and will continue to be healthy for some time even if economic difficulties do arise. If the Trade-Off theory holds then businesses that are profitable and have low debt to equity ratios should make use of debt funds more often. This, however, is not always the case in the real world. Hennessy and Whited (2005), for example, find that profitable firms tend to be less highly leveraged, and suggests that the Trade-Off theory is not the whole story. Two other theories, namely the Pecking Order theory (Donaldson, 1961; Myers 1984; Shyam-Sunder and Myers, 1999) and Signalling theory (Spence, 1973; Ross, 1977), may explain this occurrence.

Pecking Order theory states that there is no optimal target capital structure. Funding will be raised according to a set hierarchy. Firstly, funding will be generated out of the retained earnings, secondly from debt funding, and lastly from the issue of new equity. This hierarchy preserves two very important functions that management value very highly – control and flexibility. Retained earnings preserve existing control of the business, because borrowers can impose restrictive covenants on the business and issuing new equity will dilute existing shareholder control. Flexibility is given up when taking on debt funding because this reduces the flexibility to raise new debt funding from borrowers in the future. According to the pecking order it would be expected that businesses with low debt to equity ratios would have strong operating cash flows and would be classified as healthy businesses.

Information Asymmetry (Ross, 1977; Myers and Majluf 1984; Miller and Rock 1985; Stiglitz, 2002) also plays an important role when looking at the capital structure. It is obvious that internal managers of the business will have much more information available about the value of the business when compared to external investors or borrowers. Thus, managers will know when a business's financial instruments (ordinary shares, debentures etc.) are over- or undervalued. It then makes sense that management will be reluctant to issue ordinary equity that is undervalued, as the objective would be to get as much value for every share that is issued. This implies that an equity issue may signal that a business's shares are overvalued at a point in time (Miller and Rock, 1985; Asquith and Mullins, 1986). As per the Pecking Order theory it is expected that management will always try to use the lowest cost funding available to them. Management will firstly use internally generated profits and cash flows so as to keep control and flexibility as discussed above. If no internally generated funds are available only then will management look at external funding like debt or equity. Again the Pecking Order theory states that management will first look at debt (because it is at a lower cost than equity) and as a last option only look at equity funding. This then implies that business will only issue equity (for funding) in situations when they have no other option due to the fact that the business cannot get any debt funding due to its high debt levels (flexibility) (Frijins, Navissi, Rad and Tsai, 2006).

As this research project is specifically focussed on the issue of additional equity by companies listed on the Johannesburg Stock Exchange (JSE), it is important to define an equity issue. The most common forms of equity issues are initial public offerings (IPO), rights issues and seasoned equity issues (mostly in the United States of America). Initial public offerings can take the shape of one of two forms. The first is an offer for sale where existing shareholders in the business offer their existing shares for sale to the public. The second form is an offer for subscription where the business

(in the form of a company) invites the public to subscribe for new ordinary shares that have not yet been issued, in the business (Firer, Ross and Westerfield, 2012). A rights issue is where a listed company wants to raise more equity capital. The company makes a rights issue to its existing shareholders in the ratio of current shares held by the shareholders (Prabrina, Raghunathan and Raghunathan, 2007). In other words for every ordinary share held the shareholder receives a right to a new ordinary share. The existing shareholders may opt to exercise the right or may opt to not exercise the right and forfeit the new ordinary shares in which case their shareholding will be diluted. The price of the right to subscribe for the additional shares is normally at a discount to the prevailing market price (Lhabitant and Gregoriou, 2008).

Another form of equity issue is a private placement of shares. A private placement of shares is where a small group of investors subscribe for ordinary equity. The investors that normally subscribes to this kind of equity issuance are institutions like big banks, mutual funds and pension funds. In essence a private placement is the opposite of a public placement. The reason for a rights issue also plays an important part as will be discussed later in the study. The rights issue could be for normal operational reasons such as to finance new growth projects or it could be to avoid going bankrupt as in the case of Lonmin that recently had to issue equity to ensure that it had enough operational cash flow to continue operating.

As mentioned earlier, issuing equity could act as a signal to the market that management of the business perceives the ordinary shares to be overvalued. Businesses will not want to issue equity when their debt to equity ratios are low and they have spare capacity to take on debt, due to the negative signalling effect of such an action. This implies that a business will try to maintain as low a debt to equity ratio as possible to ensure the most flexibility (rather get debt funding which is cheaper than issuing equity funding).

This raises the first question to be investigated for the JSE: what is the share market's reaction to equity issued (which is more expensive than debt funding) by a business, considering the Trade-Off theory, Pecking Order theory and the Signalling theory? The only logical way to measure the market's reaction to this signal (positive or negative) is to observe what the business's share price does in reaction to this signal. In other words, does the market interpret the signal as negative (value destroying) in which case the share price will fall, or positive (value creative) in which case the share price will rise?

The "health" of the business can be expressed as the likelihood that it will still be able to operate successfully even when economic times are tough. In other words, the business and financial risk is

low and there is no significant threat of bankruptcy in the medium term (one to three years). A firm is financially constrained when it has taken on more debt than it can comfortably service, and its flexibility to take on additional debt funding is limited. It follows that "unhealthy" businesses only have the option of generating funding through equity issues (rights issues), while "healthy" businesses have the option of both debt and equity funding available. Thus the question arises: if "unhealthy" businesses are perceived as "bad" investments, how will the investors (market) react when an "unhealthy" business conducts an equity issue in the form of a rights issue, taking in consideration that this is the only funding option available to the "unhealthy" business because it already has too much debt on its balance sheet? This represents the second area of research applied to the JSE that is described in this document.

In other words is the share price of the issuing "unhealthy" business punished for the equity issue? Vice versa, how do investors (market) react when a "healthy" business issues equity in the form of a rights issue, considering that the "healthy" business can opt for the cheaper debt funding instead? This study will investigate the impact of the "financial health" of a business on the reaction of its share price to an equity issue.

A further area that this study will investigate is the share price reaction to an equity issue in the context of the reasons given for it by management. Specifically, a comparative investigation of the share price reaction to equity issues aimed at repaying debt *versus* equity issues conducted with a view to investments will be performed. These two categories of equity issue will further be considered in the context of financially constrained and financially non-constrained companies, respectively. As far as I am aware, this type of investigation into the reasons provided by management has only been done once by Setati, (2012) in the South African context and this presents a case for further study in this area especially considering the world wide recovery after the global economic crisis of 2009/2010.

The final area of interest for this study is the question whether there is an element of market timing present when businesses decide to obtain funding by way of equity issues. The Market Timing theory assumes that through information asymmetry management is aware when the financial instruments of the business are mispriced. This theory implies that management will try to time the market and issue equity when the market price of the ordinary shares is high, and repurchase equity when the market price of the ordinary shares is low. Recent studies have shown that management in their corporate finance policy considers the timing of equity issues and repurchases, as well as debt issues. Indeed Graham and Harvey (2001) did not find much support for the Trade-off and Pecking

order theories, and instead revealed that management try and time the market when issuing and repurchasing equity.

The remainder of this study will be divided into four sections, namely the literature review and hypothesis development section, data and methodology section, the results and analysis section, and lastly the conclusion and recommendations section.

Chapter 2: Literature Review and Hypothesis Development

When analysing capital structure, the seminal theory is the irrelevance of capital structure theory of Modigliani and Miller (1958), wherein these authors argued that there is no optimal capital structure, and that in a frictionless capital market the value of a business is not dependent on how it finances its operations or assets. As mentioned before they ignored taxes, transaction costs, agency costs and costs associated with financial distress. Later a tax adjusted Modigliani and Miller theory was developed, wherein the tax deductibility of the interest expense of debt funding was acknowledged (Modigliani and Miller, 1963).

Over the years various other capital theories were developed to add to Modigliani and Miller's effort. Amongst the theories developed in this regard that are relevant to this study, include the Trade-off theory and the Pecking Order theory.

2.1 Trade-Off Theory

The Trade-off theory, was developed by Myers in 1984, and postulated that businesses trade-off the benefits of the tax deductibility of the interest expense of debt funding against the potential cost of having too much debt on the balance sheet, such as higher interest rates and potential bankruptcy (Fama and French, 2005). This is in line with the tax-adjusted Modigliani and Miller theory. Evidence against the Trade-Off Theory have been found by Titman and Wessels (1988) and Rajan and Zingales (1995), amongst others. These authors found that contrary to the Trade-off theory, businesses that were highly profitable did not have high debt to equity ratios. Titman and Wessels studied the period 1974 to 1988 and had a sample of 469 companies. Rajan and Zingales (1995) studied the period 1987 to 1991 and had a sample of 2 583 companies. When a business generates high operating cash flows and is profitable, trade-off theory expects that it will try to reduce its tax liability. The tax liability can be reduced by using debt funding (due to the tax deductibility of the interest expense), rather than equity funding. The risk profile of the business also plays an important part when looking at the Trade-off theory. Marsh (1982) found that when the financial risk of a business is high, the probability of failure and bankruptcy is higher, and thus a business in such a position will rather prefer to issue equity to reduce the financial risk. Marsh's study focused on United Kingdom companies for the period 1959 to 1974.

Studies that support the Trade-off theory includes those of Marsh (1982), (Hovakimian, Opler and Titman (1999) and Korajczyk and Levy (2003). Hovakim, Opler and Titman (1999) and Korajczyk and Levy (2003) approaches were similar in the sense that they looked at the relation between firm-specific variables, target leverage and issue choice. Korajczyk and Levy, however, split their sample

into financially constrained and financially unconstrained companies similar to this study. These studies all found that targeted debt to equity ratios does play a role when financial securities are issued and repurchased. Leary and Roberts (2004) found that businesses do not actively implement their financial policy in general, but try to move in line with a targeted optimal capital structure by issuing and buying back equity. Research by Myers and Lakshmi (1999), however, found that businesses do consider the trade-off benefit of the tax deductibility of the interest expense from the debt funding, as well as business size and the types of assets that the business owns, when deciding on a target capital structure. It seems that in the real world debt and equity levels on the balance sheets of businesses do change over time, and that it varies from any specific targeted optimal capital structure. It also seems plausible that when the debt-to-equity ratio differs substantially from the targeted optimal capital structure, that the management will either issue or repurchase equity to align the ratio back to the target. Myers and Lakshmi (1999) find that changes in capital structure could be as a result of the need for funding, rather than trying to achieve a targeted optimal capital structure. Thus, it seems that the trade-off theory does not fully explain empirical observation, and there is therefore a need for further capital structure theories.

2.2 Pecking Order Theory

The Pecking Order Theory was developed by Myers in 1984, and further extended by Myers and Majluf (1984). This theory is based on the premise, in line with Modigliani and Miller, that there is no optimal capital structure, and that funding will be raised according to a preferred hierarchy. The theory implies that funding behaviour is determined by the adverse selection costs of retained earnings, debt and equity. According to Frank and Goyal (2002), retained earnings has no adverse selection problems, debt has more adverse selection problems due to financial risk, and equity has the most adverse selection problems as it is both expensive and results in reduced control. These authors find that an outside investor views equity as riskier than debt, and that both have an adverse selection risk premium, but that the premium on equity is much higher than that on debt, the equity premium being the cost of capital required for the risk taken by the ordinary shareholder. Shyam-Sunder and Meyers (1999) found that when funding is needed by businesses, they prefer debt funding over equity funding due to the lower information costs associated with debt funding, and that equity is only issued as a last resort.

Shyam-Sunder and Meyers (1999) further found strong support for the Pecking Order theory in a sample of 157 publicly traded companies in the United States of America over the period 1971 to 1989. Myers (2001) reports that in the United States of America equity issues play a relatively minor role, and that the bulk of funding that is generated comes from debt funding. The Pecking Order

theory predicts that businesses with high growth rates and large funding needs will have high debt-to-equity ratios because management will be reluctant to issue equity. Smith and Watts (1992) and Barclay (2001) found exactly the opposite. Smith and Watts (1992) focused on data between 1965 to 1985, while Barclay (2001) focused on companies in the United States industrial corporate sector for the period 1950 to 1999 and had 9 037 companies in its sample. They found that high growth businesses use less debt in their capital structures, and more equity. As mentioned earlier, the Trade-off theory predicts that profitable businesses should have higher debt-to-equity ratios. Titman and Wessels (1988) and Fama and French (2002), however, find a negative correlation between profitability and debt-to-equity ratios. This is in line with the Pecking Order theory. Titman and Wessels studied the period 1974 to 1988 and had a sample of 469 companies. Fama and French (2005) subsequently contradicted their own 2002 results by finding empirical evidence against the pecking order. Specifically, they found that businesses issued and repurchased equity at a faster rate than what the Pecking Order theory implied. All three of these elements needs to be considered when looking at the capital structure, as they all appear to influence the decision between using debt or equity funding in the capital structure. Another factor that influences this decision is the information asymmetry between management and the suppliers of funds (investors and borrowers) as well as the signalling effect of either form of funding.

2.3 Information Asymmetry

Stiglitz (2002) explained that information asymmetries will occur when "different people know different things". This implies that there is an information gap between the individuals that have the information and the individuals that do not have the information. Connelly, Certo, Ireland and Reutzel (2011) indicate that "because some information is private, information asymmetries can arise between those who hold the information and those who could potentially make a better informed decision if they had the information". Stiglitz (2000) found that markets with minor information imperfections would behave more or less the same as markets with perfect information. According to Stiglitz (2000), there are two types of information where asymmetry is important: information about quality and information about intent. The second type is where one party is concerned about the behaviour of another party, or the intentions of the behaviour of the party. Information Asymmetry Theory is related to two capital structure theories that are relevant to this study, and which are discussed in the next two sections, namely Market Timing Theory, and Signalling Theory.

2.4 Market Timing Theory

Market Timing Theory suggests that the management of businesses try to issue equity when the equity is perceived to be overvalued, and repurchase equity when the equity is perceived to be undervalued (Baker and Wurgler, 2002). Asquith and Mullins (1986), Jung et al (1996) and Hovakimian, Opler and Titman (2001) all found that management issues equity when the market prices of the equity are perceived to be high. Empirical evidence by Baker and Wurgler (2002) supports the Market Timing Theory and found that management issued equity when the share price was high compared to historical share prices, and preferred to repurchase equity when the share price was low compared to historical share prices. Baker and Wurgler (2002) also found that management issued equity when the equity premium (cost of equity) was low, and repurchased equity when the equity premium was high. Jung et al. (1996) find that equity issuers have higher market-to-book ratios and experience higher share price run-ups prior to the announcement of a rights issue than debt issuers. DeAngelo et al., (2010) find that while equity issuers have higher valuations as measured by the market-to-book ratio, the high valuation only has a small effect on the decision to issue equity when compared to the short-term cash needs of the business. Baker and Wurgler (2002) further investigated how market timing affected the business capital structure by using the market-to-book ratio as a proxy for the business's valuation. Dong, Loncarski, Horst and Veld, (2012), in a paper that analysed the effects of market timing and the pecking order, examined the market-to-book-ratios of Canadian businesses from 1998 to 2007, and reported that companies that repurchased shares had the lowest market-to-book ratios (2.041 – cheap) and share issuers had the highest (5.3 – expensive). Dong, Loncarski, Horst and Veld, (2012) also found that the effect of market timing on the equity issuance was conditional on the degree of financial constraints that the business is facing at the time of issuing the equity. In other words, these authors find that market timing is only feasible when businesses are less financially constrained. Using the KZ-index developed by Kaplan and Zingales (1997) and applied by others, such as Baker, Stein and Wurgler, (2003) and Chang, Tam, Tan and Wong, (2007), Dong, Loncarski, Horst and Veld, (2012) tested market timing in the Canadian market by investigating the correlation between the share price abnormal returns and the market-to-book ratio. Barberis and Huang, (2001) and, Daniel, Hirshleifer and Subrahmanyam, (2001), argue that market-to-book ratio can measure under/over valuation of a business, and the latter was therefore chosen as a proxy for the business' valuation. Dong, Loncarski, Horst and Veld (2012) find that, in a sample of equity and debt issuers, only when businesses are not financially constrained is there evidence that they issue equity when their shares are overvalued.

However, evidence is also found that overvalued issuers earn lower post-announcement abnormal share price returns.

Graham and Harvey (2001) confirm the findings of Baker and Wurgler (2002) when they conducted a survey of 392 chief financial officers, who reported that share prices are a very important factor considered when management decide whether to issue equity or to repurchase equity in the market. As is evident in the literature provided above, there is clear evidence that management try to time the market when issuing new equity. Baker and Wurgler (2002) also found that market timing was better executed by businesses with low debt-to-equity ratios than businesses with high debt-to-equity ratios. This implies that businesses with low debt levels can raise equity whenever they want to, and at times that suits them. Businesses with high leverage do not have this luxury, and are often forced to raise equity in times when the share price is low compared to historical share prices, as well as when economic times are difficult. This could be to their detriment. Rights issues can also be used for positive signals to the market such as acquisitions of new businesses to further secure future growth for the business. A recent example in the South African context was Woolworths that issued equity in the form of a rights issue to acquire David Jones an Australian company. This event was also part of the original events sample.

2.5 Signalling Theory

Signalling Theory states that signallers are insiders (typically the management of the business) who have information about the business (Ross, 1977) that is not publicly available to outsiders (investors, lenders, and the financial market in general). The information that management have can be positive or negative (Connelly, Trevis, Certo, Duane, Ireland and Reutzel, 2011), and management have the power to decide whether they want to communicate the information to the outsiders through their actions. This is known as the signal. Myers and Majluf (1984) and Asquith and Mullins (1986) find that issuing new equity (ordinary shares) of the business is generally considered a negative signal, because management may issue equity when they perceive that the share price (equity of the business) is overvalued. Different corporate actions such as issuing of equity (rights issues) and repurchase of equity can be interpreted as negative and positive signals to outsiders. Ross (1973) and Bhattacharya (1979) found that business debt and dividends signalled quality of business to the market. Their models found that only high quality businesses could pay interest on debt funding and dividends on equity funding in the long-term, and that low quality businesses would not be able to do the same. This had the effect that the providers of funding (the investors and borrowers) looked at these qualities to establish what businesses were quality investments, and which were not. Similarly, Spiess and Affleck-Graves, (1995) conducted a study on a sample of 1 247

company equity rights issue events in the United States over the period 1975 to 1989, that by finding a 60 month negative cumulative abnormal return of 31.24% confirm the negative signalling effect of rights issues. Following these theories it seems that the Trade-Off theory and the Pecking Order theory should be applied together with the financial "health" of the business.

The following section will discuss South African evidence on rights issues in more detail.

2.6 South African Evidence

A study that supported the idea that an equity issue (rights issue) is seen as a negative signal was performed in the South African context by Bhana, (1999), who reports an average share price decline of 3.51%, over a two day announcement period for a sample of companies listed on the Johannesburg Stock Exchange (JSE) over the period 1980 to 1995. In a subsequent study of equity rights issues on the JSE for the period 1989 to 2002, Pascoe, Ward and MacKenzie, (2005) found a statistically significant decline of 3.8% in the share prices over an event window of twenty days. More recently Cotterel (2011) performed a similar study of equity rights issues on the JSE for the period 2001 to 2010, and reported a statistically significant share price decline of 3.2% over an event window of 20 days. All three of the above studies, therefore, find very similar results, all supporting signalling theory.

Setati (2012), however, performed an event study on the JSE using a much longer event window of 73 days. Conducted for the period 2002 to 2011, this study reported a statistically significant share price decline of 12.79%. The sample was furthermore classified according to the reasons advanced for the rights issues, being debt repayment, general and investment. The following statistically significant results were reported for the various categories: a decline of 10.17% over a post-event window of 28 days for the debt repayment sample, a decline of 24.82% over a post-event window of 31 for the general sample, and a decline of 16.89% over a post-event window of 68 days.

Cotterel (2011), on the basis of the market viewing rights issues by financially constrained companies differently to financially healthy companies, classified his sample according to the Altman Z-score bankruptcy prediction model (used as a proxy for financial distress) into two groups, namely "healthy", and "grey zone/unhealthy". For the "healthy" group a statistically significant decline of 0.28% over a post-event period of 20 days was found, in contrast to a statistically significant decline of 10.41% for the "grey zone/unhealthy" group over the same event window.

2.7 Problem Statement and Hypotheses

As mentioned earlier, the literature on Optimal Capital Structure Theory, Trade-off Theory, Pecking Order Theory, Information Asymmetry Theory, Signalling Theory and the financial health of a business, all within of equity rights issues, suggest an interesting area of research. As the literature reports, equity issues are perceived as negative signalling events, and the equity market (investors) can be expected react negatively to this signal, resulting in a declining share price.

Questions that arise in this context include:

1. How do suppliers of equity react to an equity issuing event (rights issue), that presumably sends out a negative signal by the management of the business?
2. Does the financial health of a business issuing equity play a role in the reaction by the providers of equity? In other words will the share price decline for a business classified by the Altman Z-score as healthy, be less than for a business that is financially constrained?
3. Can the management of the business that sends out the negative signal try and manage the reaction by the outsiders (the market) by actively providing a valid reason for the equity that is being issued? In other words if management reports that the proceeds of the rights issue (equity issue) will be used for investing purposes, will that business' share price decline by less than for a business that reports that the proceeds will be used to repay outstanding debt"?
4. Is there an element of market timing present when management issues equity in the form of rights issues? In other words, can management time the equity market by issuing equity when the share prices are at a high level compared to the value of the business issuing the equity?

It is these questions that this study will attempt to investigate and answer. Out of the above questions, the following hypotheses have been developed to form the basis of this study:

Hypothesis One:

The null hypothesis states that rights offers do not affect cumulative average abnormal returns (CAARs) in share price performance. As indicated by the literature review, the alternative hypotheses states that rights issues negatively affect cumulative average abnormal returns (CAAR's).

The following equation represents this:

H_0: CAAR = 0 Equation 1

H_a: CAAR <0 Equation 2

This hypothesis follows the rationale as formulated by Pascoe, Ward and Mackenzie (2005), which seeks to confirm the negative share price response to the rights issues in the selected period. The expected finding is that there will be a negative share price reaction similar to that found in previous studies.

Hypothesis Two:

The null hypothesis states that the financial position of a business making a rights issue, as measured by the Altman Z-score, will have no impact on the nature of its post-issue abnormal share price returns. The alternative hypothesis states that the financial position of the issuer will affect the nature of the abnormal share price returns post the rights issue. The following equation represents this:

H_0: CAAR(financially healthy) = CAAR(financially unhealthy) Equation 3

H_a: CAAR(financially healthy) ≠ CAAR(financially unhealthy) Equation 4

There is very little literature available on the impact of an equity issuers' financial position (health) on the nature of its post-issue abnormal share price returns. Dong, Loncarski, Horst and Veld, 2012 find that when businesses are not financially constrained , there is evidence that they issue equity when their shares are overvalued, and also evidence that overvalued issuers earn lower abnormal post-announcement share returns. Various arguments can be made in this regard. The first is that if a business is financially distressed and decides to execute a rights issue, the market may see this as a positive step in order for the business to remain viable, especially if the company's financial distress is well-known and already priced into its share price. An alternative argument could be that by sending out the negative signal of an equity issue, the business could further communicate to the market that it is in a desperate situation, and that this last desperate corporate action could possibly only be postponing the inevitable. Thus the market would react even more negatively to the rights issue and the share price would decline even more drastically.

On the other hand, if a business is financially healthy, an argument could be made that the business has sufficient flexibility available to be able to rather use cheaper debt funding, or preferably (based on the Pecking Order theory), internal funds (retained earnings), instead of more risky and expensive equity funding. Thus the market could react negatively to a rights issue, either as a negative signal that the business is not as financially strong as previously thought, or because of the dilution of shareholding associated with additional share issuance.

Hypothesis Three:

The null hypothesis states that the post-issue abnormal share price returns will not be affected by whether a business indicates that the intended use of the proceeds of a rights issue is to repay debt, or to invest (including in growth opportunities). The alternative hypothesis states that whether a business reports that it will use the proceeds of a rights issue to repay debt or for investment purposes, will affect the nature of the abnormal share price returns post the rights issue. The following equation represents this:

H_0: CAAR(debt repayment) = CAAR(investment) Equation 5

H_a: CAAR(debt repayment) ≠ CAAR(investment) Equation 6

Again, as in the case of hypothesis two, very little literature is available linking the market's reaction to equity issuance with the reason provided by an issuer. A couple of arguments can be made out of the theory discussed above. The first is that if the issuer reports that the proceeds will be used to repay debt, the market will interpret the rights issue as negative signalling, as discussed under the reported literature. The rights issue will be considered even more negative due to the fact that less risky and cheaper debt funding is replaced by riskier and more expensive equity funding on the balance sheet. By decreasing the debt-to-equity ratio the average cost of capital will increase by the additional risk premium added, due to the new equity in the capital structure. By issuing equity in the place of debt, the control of the business will be diluted, and the existing shareholders will be affected negatively. A counterargument is that by replacing debt funding with equity funding the financial risk of the business will decline, which could be interpreted by the market as a positive development.

If the issuer reports that the proceeds will be used for investment purposes, the market could see this as a positive signal that the company intends exploiting growth opportunities that will benefit shareholders in future.

Hypothesis Four:

The Market Timing theory implies that businesses should issue equity when the equity is overvalued and that if the Market Timing theory holds, equity valuation should negatively predict announcement abnormal share price returns. Furthermore, businesses can only practice market timing when they are not financially constrained (Dong, Loncarski, Horst and Veld, 2012). This reasoning leads to the following hypothesis regarding the correlation between the post-

announcement abnormal share price returns, the market-to-book ratio, and the degree of financial constraint of the business issuing the equity.

Hypothesis four: Post-announcement abnormal share price returns should be negatively correlated to the market-to-book ratio, and degree of financial constraint faced by the business issuing the equity.

The next chapter will describe the data used and the methodology applied in this study.

Chapter 3: Data and Methodology

In this chapter the data that was used for this study will be described, as well as the methodology employed. In order to establish what the effect of the rights issue (equity issue) is on the share price of the business issuing, the best approach is to study the share price reaction around the rights issuing event date. It thus follows that this study will apply an event study methodology, with the rights issue being the event that will be studied.

3.1 Data and Sample Selection

The data used for this study comprised the following elements:

- Daily total returns (in other words, inclusive of both dividends and share price returns) were obtained from individual share's total return indices sourced from Datastream.
- Share prices were obtained from the I-Net BFA Macgregor.
- Total return index data for the JSE Mining index, Financial-Industrial index, All Share Index and the R157/R186 government bonds were obtained from Datastream.
- SENS announcements from which rights issue events were identified were obtained from the Sharedata website
- Market capitalisations were obtained from I-Net BFA Macgregor, and confirmed by being calculated manually by multiplying the outstanding shares with the market price on the JSE.
- Annual financial statements for businesses involved in the rights issue events were obtained from the corporate websites of the relevant businesses. This was needed to obtain the inputs for the Altman Z-score calculation for every event's business. The inputs that was obtained from the annual financial statements were; working capital (inventory, trade and other receivables, trade and other payables); retained earnings; total liabilities; capital expenditure; book value of equity; total assets; earnings before interest and taxation; sales.

This study focuses on equity rights issues performed on the Johannesburg Stock Exchange from January 2009 to the end of December 2014. The event day is specifically defined as the date on which the rights issue was announced to the public. The first step was therefore to determine the selection criteria for equity issue events to be included in the sample of study.

Rights issues had to satisfy the following selection criteria, which are similar to those adopted by Cotterell (2011), MacKinlay, (1997) and Pascoe, Ward and Mackenzie (2005), in order to be in the sample:

- The shares issued had to be ordinary shares. Issues of other listed instruments such as preference shares, debentures and linked units (used by South African listed Property Funds) were excluded from the sample.
- The issued shares had to be ZAR denominated.
- Companies had to be listed on the JSE.
- Rights issues had to be in shares of the listed company. Therefore, rights issues of shares in other companies, such as the holding company or subsidiary company, were excluded.
- Rights issues had to be made for ordinary shares held prior to the rights issue. Rights issues for preference shares held or convertible instruments held were excluded.
- The rights issues had not to be issued for the purposes of Black Economic Empowerment. Issues for Black Economic Empowerment purposes were excluded from the sample.
- Rights issues had not to be issued for the purpose of a script dividend to replace a cash dividend.
- No confounding events had to occur simultaneously to the rights issue. Confounding events for example were mergers and/or acquisitions, simultaneous announcement of annual financial statements and simultaneous issuing of another instrument etc.
- Rights issues had to be for companies that had been listed for at least 340 trading days before the rights issue event day (the announcement of the rights issue day) and at least 60 days after this date.
- The rights issue had to be for more than R100 million Rand. This would ensure that only companies with large market capitalisation and highly liquid shares were included in the sample.

In addition to the above criteria, when companies had more than one rights issue in the sample period, only the most recent rights issue by date was included. Initially there were 72 rights issues that occurred from January 2009 to December 2014. Eleven events were excluded due to more than one rights issue occurring during the sample period, fifteen events were excluded due to them being property income funds, six were excluded due to lack of data, five events were excluded due to illiquidity and issue size being less than R100 million, four events were excluded due to the annual financial statements being released on the announcement day, and six events were excluded due to confounding events, such as acquisitions and sale of material assets, occurring on the announcement day. After applying the above criteria, there therefore remained twenty-five events in the final sample. Although this is a small sample in comparison to the other South African studies, (Bartholdy et al, 2007) has demonstrated that as few as 20 events is sufficient to establish significance in results, even in thinly-traded markets. In Table 1 below, the full original sample of companies issuing rights issues from January 2009 to December 2014 can be seen, as well as the

reasons for exclusions from the final sample. The events shaded in grey were excluded from the event sample.

Table 1: The full initial rights issue sample

	Company name	Ticker code	Announcement date	Nominal value	Reason for exclusion
1	Ellies Holdings Ltd	ELI	06-Oct-14	4 950 000 000	
2	Woolworths Holdings Ltd	WHL	29-Aug-14	10 000 000 000	Confounding event: acquisition David Jones
3	Putprop Ltd	PPR	06-Feb-14	100 039 703	
4	Oando Plc	OAO	02-Dec-14	2 913 042 999	Confounding event: acquisition Conoco Phillips Nigeria
5	Invicta Holdings Ltd	IVT	10-Nov-14	2 250 000 000	
6	Ellies Holdings Ltd	ELI	06-Oct-14	49 500 000	Subsequent rights issue(s) made
7	Investec Australia Property Fund	IAP	18-Sep-14	1 197 290 389	Issue of linked unit
8	Steinhoff International Holdings Ltd	SHF	02-Jul-14	18 200 000 000	
9	Curro Holdings Ltd	COH	18-Feb-14	589 594 780	
10	Fortress Income Fund	FFA	09-May-14	609 604 196	Issue of linked unit
11	Fortress Income Fund	FFB	09-May-14	390 322 111	Issue of linked unit
12	Resilient Poperty Income fund	RES	14-Apr-14	999 999 988	Issue of linked unit
13	Aquarius Platinum Ltd	AQP	07-Apr-14	2 352 658 643	
14	Into Properties Plc	ITU	*	*	No SENS data available
15	Seardel Investment Corporation Ltd	SER	*	*	No SENS data available
16	Royal Bafokeng Platinum Ltd	RBP	04-Mar-14	800 000 025	
17	Efficient Group Ltd	EFG	05-Mar-14	28 000 000	Confounding event: acquisition Verso
18	Sacoil Holdings Ltd	SCL	07-Nov-13	336 582 418	
19	Jasco Ltd	JSC	05-Dec-13	57 600 000	Issue value to low
20	Northam Platinum Ltd	NHM	20-Sep-13	600 000 000	
21	Vunani Property Investment Fund	VPF	*	*	No SENS data available
22	New Europe Property Investment Fund	NEP	13-Jun-13	1 349 999 654	Issue of linked unit
23	Sycom Property Fund	SYC	28-Mar-13	900 000 002	Issue of linked unit
24	Curro Holdings Ltd	COH	22-Feb-13	605 879 376	Subsequent rights issue(s) made
25	Delta Property Fund Ltd	DLT	28-Feb-13	1 000 000 000	Issue of linked unit
26	Rainbow Chicken Ltd	RBW	*	*	Confounding event: AFS released simultaneously
27	Rebosis Property Fund Ltd	REB	18-Dec-12	650 000 000	Issue of linked unit
28	Oando Plc	OAO	21-Dec-12	2 941 799 223	Subsequent rights issue(s) made
29	Pan African Resources Plc	PAN	07-Nov-12	703 000 000	Confounding event: acquisition Evander
30	Lonmin Plc	LON	09-Nov-12	7 122 635 206	
31	New Europe Property Investment Fund	NEP	21-Sep-12	-	Issue of linked unit
32	Capitec Bank Holdings Ltd	CPI	26-Sep-12	2 248 000 000	
33	Investec Property Fund Ltd	IPF	27-Aug-12	1 560 000 000	Issue of linked unit
34	Mediclinic International	MDC	01-Aug-12	5 000 000 000	
35	Pallinghurst Resources Ltd	PGL	11-Jun-12	800 000 000	
36	Octodec Investments Ltd	OCT	11-Jul-12	300 000 000	
37	Hospitality Property Fund	HPA	28-Mar-12	413 280 000	Issue of linked unit
38	Hospitality Property Fund	HPB	28-Mar-12	117 000 000	Issue of linked unit
39	Murray & Roberts Holdings Ltd	MUR	29-Feb-12	2 000 000 000	
40	Finbond Group Ltd	FGL	09-Dec-11	20 000 000	Issue value to low
41	New Europe Property Investment Fund	NEP	21-Oct-11	428 571 420	Issue of linked unit
42	Curro Holdings Ltd	COH	26-May-11	322 428 160	Subsequent rights issue(s) made
43	Brait Ltd	BAT	02-Mar-11	5 900 000 000	Confounding event: acquisition Pep Ltd
44	Tradehold Ltd	TDH	09-Mar-11	650 000 000	
45	Sovereign Food Investments Ltd	SOV	21-Oct-10	150 000 000	
46	Esorfranki Ltd	ESR	25-Nov-10	200 000 000	
47	Digicore Holdings Ltd	DGC	16-Nov-10	90 000 000	
48	Capitec Bank Holdings Ltd	CPI	25-Nov-10	1 050 000 000	Subsequent rights issue(s) made
49	New Europe Property Investment Fund	NEP	21-Sep-10	390 000 000	Issue of linked unit
50	Buildmax Ltd	BDM	24-May-10	300 502 033	Confounding event: AFS released simultaneously
51	Hospitality Property Fund	HPA	18-Aug-10	269 184 550	Issue of linked unit
52	Hospitality Property Fund	HPB	18-Aug-10	220 815 452	Issue of linked unit
53	Omnia Holdings	OMN	20-May-10	1 000 000 000	
54	Mediclinic International	MDC	21-Jun-10	1 400 000 000	Subsequent rights issue(s) made
55	Eqstra Holdings Ltd	EQS	19-Apr-10	650 000 001	
56	Hulamin Ltd	HLM	26-Apr-10	750 000 000	
57	Ellies Holdings Ltd	ELI	25-Feb-10	100 000 000	Subsequent rights issue(s) made
58	Anglo Platinum Ltd	AMS	08-Feb-10	12 500 000 000	Confounding event: AFS released simultaneously
59	Rockwell Diamonds Inc	RDI	03-Feb-10	23 450 000	Issue value to low
60	Oando Plc	OAO	19-Jan-10	997 848 227	Subsequent rights issue(s) made
61	Tawana Resources NL	TAW	08-Dec-09	9 443 944	Issue value to low
62	Distribution and Warehousing Network Ltd	DAW	21-Oct-09	299 999 995	
63	Sentula Mining	SNU	06-Oct-09	501 920 340	Confounding event: sale of mine
64	Sovereign Food Investments Ltd	SOV	20-Oct-09	144 475 000	Subsequent rights issue(s) made
65	York Timber Holdings Ltd	YRK	30-Sep-09	500 000 000	Confounding event: AFS released simultaneously
66	Super Group Ltd	SPG	18-Mar-09	1 000 000 000	
67	Pallinghurst Resources Ltd	PGL	11-Aug-09	800 000 000	Subsequent rights issue(s) made
68	Illovu Ltd	ILV	26-May-09	3 000 000 087	Confounding event: AFS released simultaneously
69	Lonmin Plc	LON	11-May-09	3 964 553 462	Subsequent rights issue(s) made
70	Zeder Investments Ltd	ZED	26-Mar-09	500 000 000	
71	Liberty International Plc	LBT	*	*	No SENS data available
72	Aquarius Platinum Ltd	AQP	26-Mar-09	733 403 900	Subsequent rights issue(s) made

* No announcement date or nominal rights issue value was available.

3.2 Methodology

This study is based on an event study approach. The first published event study was that of Dolley (1933). Hundreds of event studies were subsequently performed, with some of the well-known early ones being those of Myers and Bakay (1948), Barker (1956) and Ashley (1962). Fama, Fisher, Jensen and Roll's (1969) paper was the first real introduction of modern event study methodology. Event study methodology has become the standard method of measuring the share price reaction to some announcement or event (Binder, 1998), and has been used mainly to test the null hypothesis that the market efficiently incorporates all available information (Fama, 1991) and, under the assumption of the market efficiency hypothesis, to investigate the effect of an event on a business's share price (Fama, 1991). Event studies have been used to study events such as mergers and acquisitions, earnings announcements and the issue of debt and equity (MacKinlay, 1997). The procedure of the event study that was applied in this study, and the data on which it was applied, will be discussed in the following sections.

The event window for this study was chosen as 60 days before the announcement day, and 60 days after the announcement day. A three-day announcement period will also be investigated to see the short term reaction of the market on the announcement of the rights issue event. By investigating two months before and after the announcement day of the rights issue, both the long-term and the short-term market reaction will be observed, and for comparative purposes this is in accordance with the study of Dong, Loncarski, Horst and Veld (2012), on which this study is in part based. A too short observation period could lead to missed observations and a too long period could factor in other market movements not related to the rights issue.

3.2.1 Part 1: Cumulative Average Abnormal Returns for Rights Issues

The first step, as per the traditional events study methodology as developed by Fama, Fisher, Jensen and Roll (1969), involves calculating the cumulative average abnormal returns (the "CAAR's"), of each of the companies' shares in the selected sample with respect to the rights issue events.

This process normally has three steps. The first step is to calculate the daily abnormal returns (the "AR's") for each of the companies in the sample for every day in the event window. As mentioned earlier the event window stretched from 60 days before the event day (the announcement day) to 60 days after the event day. To do this the daily total returns (including dividends) of all the companies in the sample had to be obtained. This data was obtained from the I-NET BF McGregor data base for each company in the sample. The next consideration is to calculate the abnormal

return and to decide on an "expected return" also called a "benchmark return". There are various benchmark return models available and the following models have been developed over the years to calculate abnormal returns:

The capital asset pricing model (CAPM-model) can also be used to determine the expected return.

The model is as follows:

$AR_{it} = R_{it} – R_{ft} – \beta_i[(R_{mt} – R_{ft})]$ ……..Equation 7

Where

- β_i is the slope that is derived when regressing $(R_{1it} – R_{1ft})$ on $(R_{mt} – R_{ft})$ for a period not in the event window called the estimation period. The regression has a y-intercept of zero.
- R_{ft} is the risk free rate during period t.

In this study the CAPM-model was used in conjunction with the Arbitrage Pricing Theory model (APT-model) to determine an expected return. The Arbitrage Pricing Theory (APT) was developed mainly by Ross in 1976. The APT-model is a one period model in which every investor believes that the stochastic properties of returns of capital assets will be consistent with a factor structure (Huberman and Wang, 2005). The APT-model can be seen as a substitute for the CAPM-model. The main difference between the CAPM and the APT models is that the APT-model allows more than just one generating factor (Roll and Ross, 1980). Secondly, according to Roll and Ross, 1980 the APT-model demonstrates that market equilibrium is consistent with no arbitrage profits, every equilibrium will be characterised by a linear relationship between each asset's expected return, and its return's response amplitudes on the common factors. The CAPM-model is derived from a market equilibrium argument and the APT-model is derived from an arbitrage argument. Put very simply, the APT-model reports that the return of a risky asset (such as a share) is a linear function of a number of macroeconomic and financial factors and that the value of the factors change over time (Dynamic Portfolio Theory and Management Handbook, 2003).

The APT-model can be formulated as follows:

$E(r_j) = r_f + \beta_{j1}R_{mt1} + \beta_{j2}R_{mt2} + ... \beta_{jn}R_{mtn}$ ……Equation 8

Where

- $E(r_j)$ is the expected return of security j.
- R_f is the risk free rate.

- B_{j1} is the sensitivity of the j^{th} asset to the factor 1, this is also called factor loading.
- R_{mt} is the risk premium of factor 1.

This can be stated as the expected return of an asset j is a near function of the asset's sensitivities to the n factors.

The benchmark to be used to calculate the abnormal returns will be the FTSE/JSE All share index (ALSI). Van Rensburg (2002) found that a dichotomy exists in the South African market, and specifically that the Financial-Industrial (FINDI) and Resources/Mining indices (MINING) are the best proxies for the South African market. The latter study was focussed on applying the appropriate market proxy for beta estimation when calculating the fair values of securities, and concluded that the two above indices most closely represents the South African market. Therefore, predicted/expected returns were modelled using both the conventional CAPM, as well as an APT model incorporating the JSE FINDI (J250) and the JSE Mining Index (J258) as factors.

The factors used in the CAPM-model and the APT-model to determine the expected returns of each share over the event window as well as the sample period were the following:

- The total return for the JSE all share index (code: J203) for the event period being 60 days prior to the rights issue and 60 days after the rights issue, as well as a sample period being 220 trading days before the event day.
- The total return for the financial-industrial index (code: J250) (FINDI) for the event window and the sample period.
- The total return for the mining index (code: J258) (MINING) for the event window and the sample period.
- The total return for the R157/R186 South African Government bond (code: R157/R186) over the event window and the sample period.

All the data was then processed through an Excel CAPM-model, as well as an excel APT-model. The Excel CAPM-model and APT-model then predicted what the return on the companies share prices in normal conditions should be. The daily abnormal returns could then be calculated by taking the difference in the daily returns of the companies share prices and deducting it from the expected daily returns as calculated by the CAPM and APT-models. The following formula was used:

$AR_{it} = R_{it} – E(R_{it})$ ……..Equation 9

Where

- AR_{it} is the daily abnormal return of share i for the period t
- R_{it} is the expected return for share i for the period t

The second step is to calculate the average abnormal return ("AAR") for each day in the event window. This calculates the average of the abnormal returns of all the shares in the sample for each day over the event window. This helps eliminate idiosyncrasies in the measurement due to individual shares. The formula used is as follows:

$AARt = 1/N \sum_{i=1}^{N} ARit$ ……Equation 10

The third step is to calculate the cumulative average abnormal return ("CAAR"). This is the sum of all the AAR's over the event window. The formula used is as follows:

$CAART = \sum_{t=1}^{T} AARt$ ……Equation 11

In order to determine the statistical significance of the results obtained from the event study, a paired two samples for means test was used in order to calculate a t-stat and the accompanying p-value.

3.2.2 Part 2: Testing the Impact of Financial Health on Market Reaction to Rights Issues

After the AAR's and the CAAR's were calculated, the next step was to investigate what impact the financial health of the business would have on the post rights issue share returns of the businesses performing rights issues. As discussed in the introduction and literature review chapters, the financial health of a business should have an impact on the reaction by the market when a business decides to make use of equity funding in the form of a rights issue.

In order to establish whether a business is financially healthy or unhealthy, a method to assess the financial health of the business had to be established. One such method of corporate failure prediction is the Altman Z-score model developed by Professor Edward Altman in 1968. The model takes into consideration among other factors the debt equity ratio of the business to establish financial health. The model is used to predict the probability that a business will go into bankruptcy within two years (Narayanan, 2010). When the model was initially tested it was found to be 72% accurate in its predictions. In subsequent tests over a period of 31 years it was found to be 80-90% accurate in predicting bankruptcy one year before the event. The Altman Z-score model will be used in this study to measure the financial health (distress) of a business.

Data to calculate the Altman Z-score was obtained from the latest annual financial statements that were issued prior to the announcement date of the rights issues (being the event date). Other relevant data used in the calculation was obtained from the I-Net BNF McGregor database.

The formula for the Z-score is as follows:

$Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 0.99X_5$ ……Equation 12

The inputs for the Z-score are as follows:

- X_1 = Working Capital/Total Assets
- X_2 = Retained Earnings/Total Assets
- X_3 = EBIT/Total Assets
- X_4 = Market Capital/Book value of Total Liabilities
- X_5 = Sales/Total Assets

The result can be interpreted as follows:

Healthy: > 2.99

Grey zone: 1.81 – 2.99

Unhealthy zone: < 1.81

For purpose of grouping the companies according to the Altman Z-score model the above ranges were used, resulting into three groups of events. The event companies were then classified as "healthy", "grey zone" and "unhealthy" according to their respective Altman Z-scores. An event study was then performed on the 25 events in the event sample after being classified according to their Altman Z-score. The abnormal returns were calculated using the APT-model, as described above, for the event windows -60 to -2 days, -1 to 1 days and 2 to 60 days.

A paired two samples for means test was used to calculate the t-statistic for the event windows. The t-statistic was used to calculate the p-value and the results were tested for statistical significance at the 95% confidence level.

3.2.3 Part 3: Testing the Impact of Reason for Rights Issues on Market Reaction

The next step in the methodology of this study, as described in the introduction and the literature review, was to classify the rights issue events according to the reason for equity being raised. This classifying process involved that the reason for the event had to be established. The SENS announcements of the events were obtained from the Sharedata website. The SENS announcements

were scrutinised to ascertain exactly what the reason provided for the use of the rights issue proceeds was. After scrutinising the SENS announcements for the sample of equity issuing events, two distinct reasons for the use of the proceeds were identified. The reasons were firstly to repay outstanding debt, or to invest in growth opportunities, which for the purpose of this study were classified as “invest”. Interestingly, all SENS announcements for all the events provided a clear reason for the rights being issued.

The event companies were then classified according to the reason provided in the SENS announcement as either “investment” or “debt repayment”, according to their respective announcement. An event study was then performed on the 25 events in the event sample after being classified according to their reason why the rights were being issued. The abnormal returns were calculated using the APT-model as described above for the event windows -60 to -2 days, -1 to 1 days and 2 to 60 days.

A paired two samples for means test was used to calculate the t-statistic for the event windows. The t-statistic was used to calculate the p-value and the results were tested for statistical significance at the 95% confidence level. Table 2 graphically shows the final sample of companies issuing rights issues, as well as their financial health classification according to Altman Z-score, and the reason provided for the intended use of the proceeds of the rights issue.

Table 2: The final event sample by categorisation

	Company name	Ticker code	Announcement date	Nominal value	Z-Score	"Health"	Proceeds Reason
1	Ellies Holdings Ltd	ELI	06-Oct-14	4 950 000 000	3.32	Healthy	Debt repayment
2	Putprop Ltd	PPR	06-Feb-14	100 039 703	5.24	Healthy	Investment
3	Invicta Holdings Ltd	IVT	10-Nov-14	2 250 000 000	2.36	Grey zone	Investment
4	Steinhoff International Holdings Ltd	SHF	02-Jul-14	18 200 000 000	1.74	Unhealthy	Investment
5	Curro Holdings Ltd	COH	18-Feb-14	589 594 780	4.99	Healthy	Investment
6	Aquarius Platinum Ltd	AQP	07-Apr-14	2 352 658 643	4.03	Healthy	Debt repayment
7	Royal Bafokeng Platinum Ltd	RBP	04-Mar-14	800 000 025	1.81	Grey zone	Investment
8	Sacoil Holdings Ltd	SCL	07-Nov-13	336 582 418	1.82	Grey zone	Debt repayment
9	Northam Platinum Ltd	NHM	20-Sep-13	600 000 000	2.88	Grey zone	Debt repayment
10	Lonmin Plc	LON	09-Nov-12	7 122 635 206	2.08	Grey zone	Debt repayment
11	Capitec Bank Holdings Ltd	CPI	26-Sep-12	2 248 000 000	2.13	Grey zone	Investment
12	Mediclinic International	MDC	01-Aug-12	5 000 000 000	1.31	Unhealthy	Debt repayment
13	Pallinghurst Resources Ltd	PGL	11-Jun-12	800 000 000	562.92	Healthy	Investment
14	Octodec Investments Ltd	OCT	11-Jul-12	300 000 000	0.86	Unhealthy	Investment
15	Murray & Roberts Holdings Ltd	MUR	29-Feb-12	2 000 000 000	2.36	Grey zone	Debt repayment
16	Tradehold Ltd	TDH	09-Mar-11	650 000 000	-0.42	Unhealthy	Investment
17	Sovereign Food Investments Ltd	SOV	21-Oct-10	150 000 000	2.12	Grey zone	Investment
18	Esorfranki Ltd	ESR	25-Nov-10	200 000 000	3.20	Healthy	Investment
19	Digicore Holdings Ltd	DGC	16-Nov-10	90 000 000	4.92	Healthy	Investment
20	Omnia Holdings	OMN	20-May-10	1 000 000 000	3.49	Healthy	Investment
21	Eqstra Holdings Ltd	EQS	19-Apr-10	650 000 001	1.49	Unhealthy	Debt repayment
22	Hulamin Ltd	HLM	26-Apr-10	750 000 000	2.12	Grey zone	Investment
23	Distribution and Warehousing Network Ltd	DAW	21-Oct-09	299 999 995	3.67	Healthy	Investment
24	Super Group Ltd	SPG	18-Mar-09	1 000 000 000	1.54	Unhealthy	Debt repayment
25	Zeder Investments Ltd	ZED	26-Mar-09	500 000 000	14.32	Healthy	Investment

3.2.4 Part 4: Testing Managements Ability to time the Market when Performing Rights Issues

The final component of the methodology applied by this study, as discussed in the introduction and literature review sections, was to investigate whether there was an element of Market Timing theory present when the rights issue events occurred. It was decided to use a regression methodology to ascertain whether there was a relationship between the abnormal returns of the shares and the valuation of the shares as measured by the market to book ratios of the companies (as used by Baker and Wurgler, 2002, and discussed in the literature review section) in the sample. Dong, Loncarski, Horst and Veld, 2012 find that in order to test the Market Timing theory a measure of equity valuation and share price performance must be defined. They use the market-to-book ratio as the proxy for value, and the abnormal share price returns as the measure for share price performance. The market-to-book ratio is measured as the market value of the equity of the business divided by the book value of the equity. Dong, Loncarski, Horst and Veld, 2012 performed a cross-sectional multivariate regression analysis to provide a more robust test of the Market Timing hypothesis and to also explore the Pecking Order theory. They find that when businesses are not financially constrained (measured by the KZ-index/Altman Z-score) there is evidence that businesses issue equity when their shares are overvalued, and evidence that overvalued issuers earn lower post-announcement abnormal share price returns. Their findings highlight an interaction between the Market Timing and Pecking Order theories. This study uses the post-announcement abnormal share price returns as the dependent variable, which is regressed against the market-to-book ratio, the Kaplan-Zingales (1997) index as a measure of financial constraint, capital expenditure incurred by the business divided by the total assets of the business, and an interaction term (the KZ-index multiplied by the market-to-book ratio of equity), as independent variables.

In the current study the Altman Z-score was used as the measure for financial constraint as used by Coelho, Correia and West (2013). A regression analysis was performed on the event sample of 25 events. One event, Pallinghurst Resources Ltd, which had an Altman Z-score of 562.92, was excluded from the sample, as this value was an extreme outlier (See the regression sample in Table 8 in the appendix). The dependent variable was the cumulative abnormal returns for the event sample from day +2 to day +60. The first independent variable was the market-to-book ratio. The second independent variable was the capital expenditure as reported in the last published annual financial statements before the rights issue event. The third independent variable was the market capital five days before the rights issue announcement day. The fourth independent variable was the Altman Z-score calculated on the last reported year end. The fifth independent variable was the control variable Altman Z-score as a function of the market-to-book ratio.

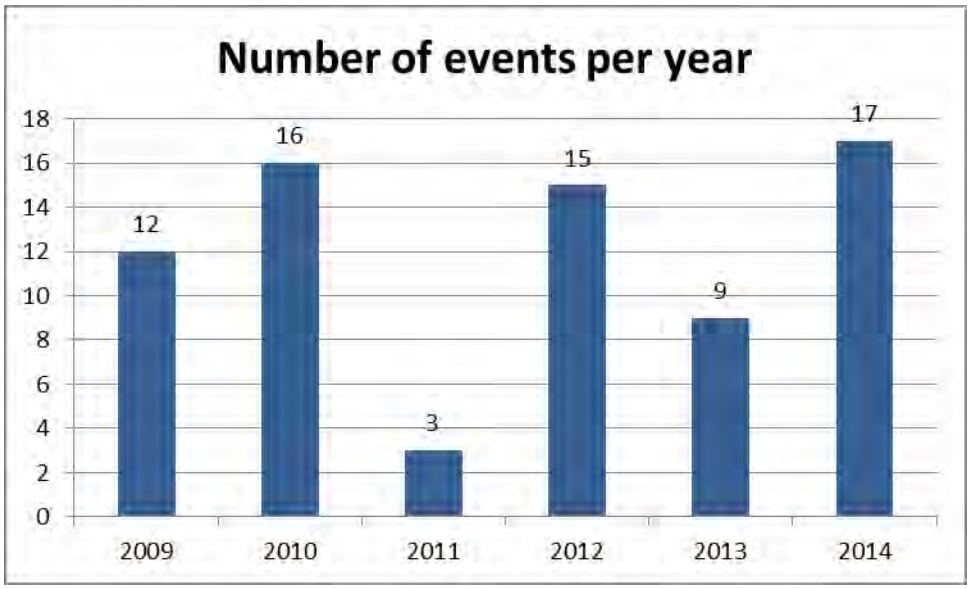
Chapter 4: Results and Analysis

In previous chapters four hypotheses were stated, and the methodology described that was used to test these hypotheses. In this chapter the results of this study will be discussed and analysed for each hypothesis in turn.

4.1 Period disbursement of the initial events sample

In the figure below the initial 72 rights issue events are grouped over the sample period of five years, to show when the events occurred. This indicates a surprisingly large number of events shortly after the financial crisis of 2008, with a slowdown in rights issue events in 2011. During 2012 rights issues events picked up again which seem logical considering that in 2012 worldwide stock exchanges had record share price returns after the earlier financial crisis.

Figure 1: Events occurrence over the sample period.

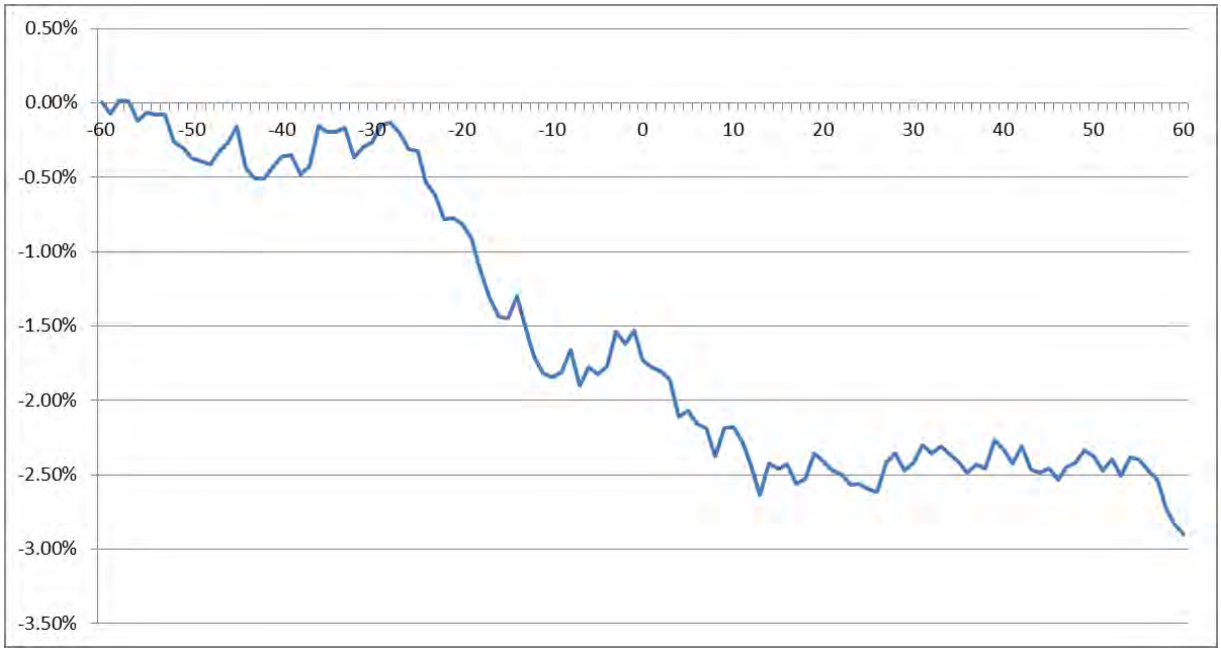


4.2 The impact of rights issue announcement events on share prices

For hypothesis one, the null hypothesis stated that rights offers do not affect cumulative average abnormal returns (CAARs) in share price performance, while the alternative hypothesis states that rights issues negatively affect cumulative average abnormal returns (CAAR's). A graphical representation of the results found for this hypothesis for the JSE over the study period, using respectively the APT and CAPM models, is shown in Figures 2 and 3 below. As can be seen, there is a slight decrease in abnormal returns from day -60 to day -42 from no real cumulative abnormal return (CAAR) to -0.5% cumulative abnormal return. From day -42 to day -31 there is a recovery in the cumulative abnormal returns of almost 0.5%. After that an abnormal share price decline roughly from day -31 to day -10 prior to the rights issue announcement day from -0.30% CAAR to -1.84%

cumulative abnormal return, which may suggest that there may be some level of pre-emption by the market, at least as measured by the APT-model. This finding is similar to that of Cotterel (2011). From the -10 day to the event day (announcement day) there seems to be a slight increase in the cumulative abnormal returns from -1.84% to -1.73%. This could be due to investors being optimistic about the reason provided for the rights issue event, and that they interpret the rights issue event as a positive signal to the market of potential things to come in the future. From the event day to day +14 the cumulative abnormal returns takes a drastic drop from -1.73% to -2.34%, which shows the effect of the rights issue announcement on the abnormal return of the share price. Then from day +14 to roughly day +55 the cumulative abnormal returns seems to drift rather flat at the -2.40% level until day +57 when it drastically takes a dip to -2.73% on day +58 and to -2.90% on day +60. This last negative movement in the cumulative abnormal returns of the share price could be the start of the medium to long-term negative reaction to the rights issue announcement.

Figure 2: The APT-Model Cumulative Average Abnormal Returns

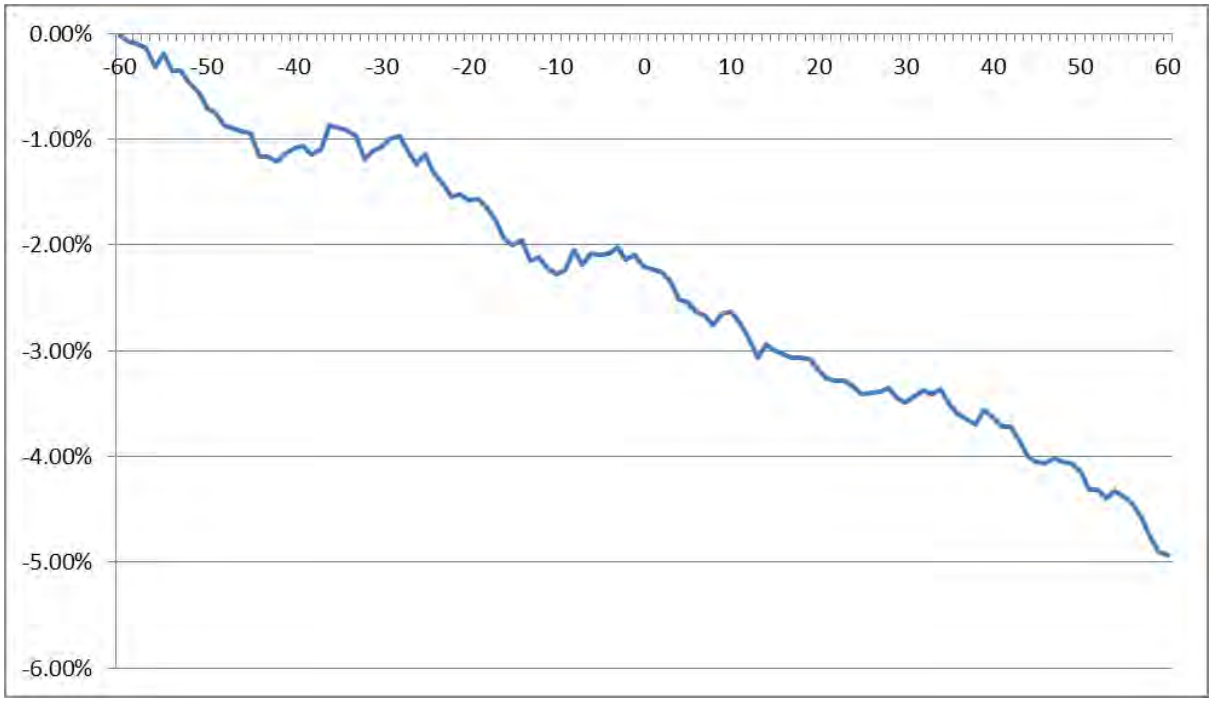


In Figure 2 the CAAR's for the CAPM-model can be seen graphically. The shape of the line of the CAPM-model differs from the shape of the line of the APT-model, with a much steeper downward gradient than the APT-model line. This occurrence could be due to the fact that the APT-model incorporates into its market premium both the financial and industrial index as well as the mining or in other words the resources index while the CAPM-model only incorporates the JSE all share index (ALSI) as its market premium component. Thus, in the APT-model the abnormal returns fluctuate with the combination of the financials and industrial as well as the mining indexes. While with the

CAPM-model the abnormal returns of the share prices only fluctuates with one component the all share index.

When we analyse the CAPM-models graph we can see that there is a negative cumulative abnormal return (CAAR) in the share price from -0.02% on day -60 to -1.2% on day -44. From day -44 to day -34 there is a slight recovery to a cumulative abnormal return of only -0.9%. From day -33 there is a steady decline in the cumulative abnormal returns of the share price returns from -1.0% to -2.1% on day -2. This could indicate some level of pre-emption by the market of expecting a possible corporate action- in this case specifically a rights issue. For the event announcement period of day -1 to day +1 the cumulative abnormal returns stays relatively stable at the -2.1% which could indicate that the market already factored in the rights issue into the share price. From day +2 to day +60 the cumulative abnormal returns takes a turn for the worse as it declines from -2.2% to -4.9% on day +60. This shows the full effect of the rights issue's impact on the abnormal returns of the share prices.

Figure 3: The CAPM-Model Cumulative Average Abnormal Returns



The average abnormal returns for the selected sample report a negative 0.20% average abnormal return on the day that the company announces the rights issue, followed by an additional negative 0.05% AAR on the following day for the APT-model. The CAPM-model showed a negative AAR of 0.12% followed by a negative 0.02% one day after the announcement. Below are the graphs that depict the AAR's of the two models. See Appendix 2 for the detailed AAR's.

Figure 4: APT-Model Daily Average Abnormal Returns

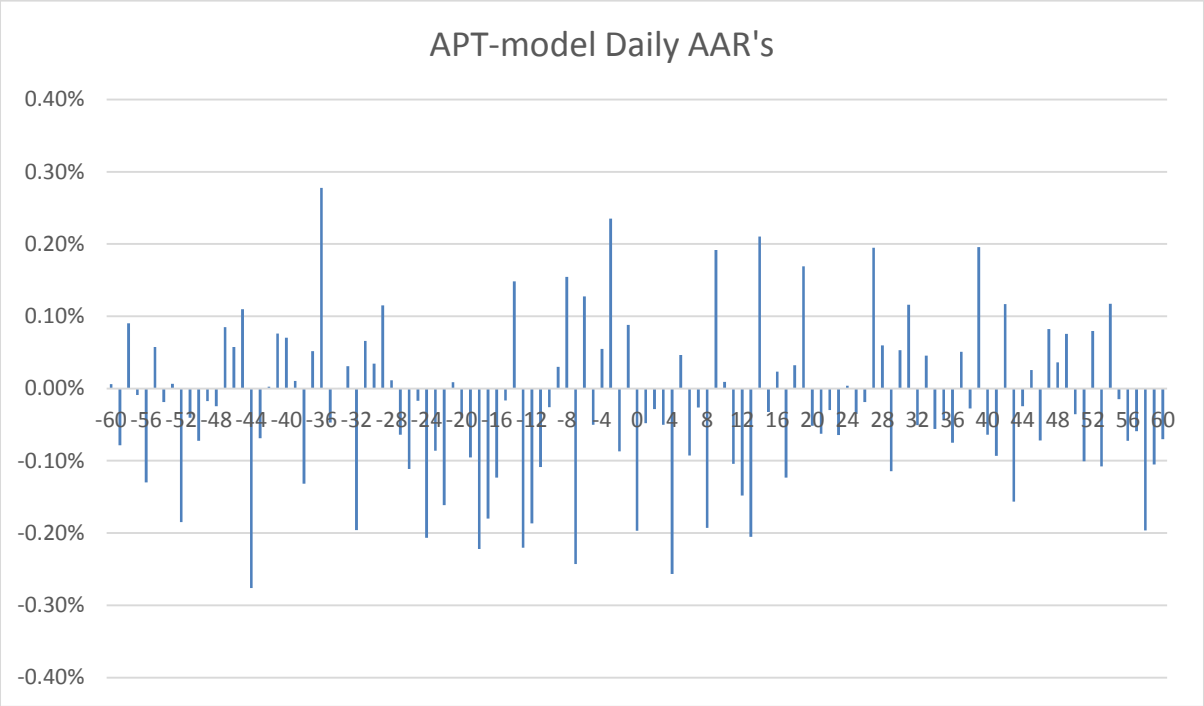
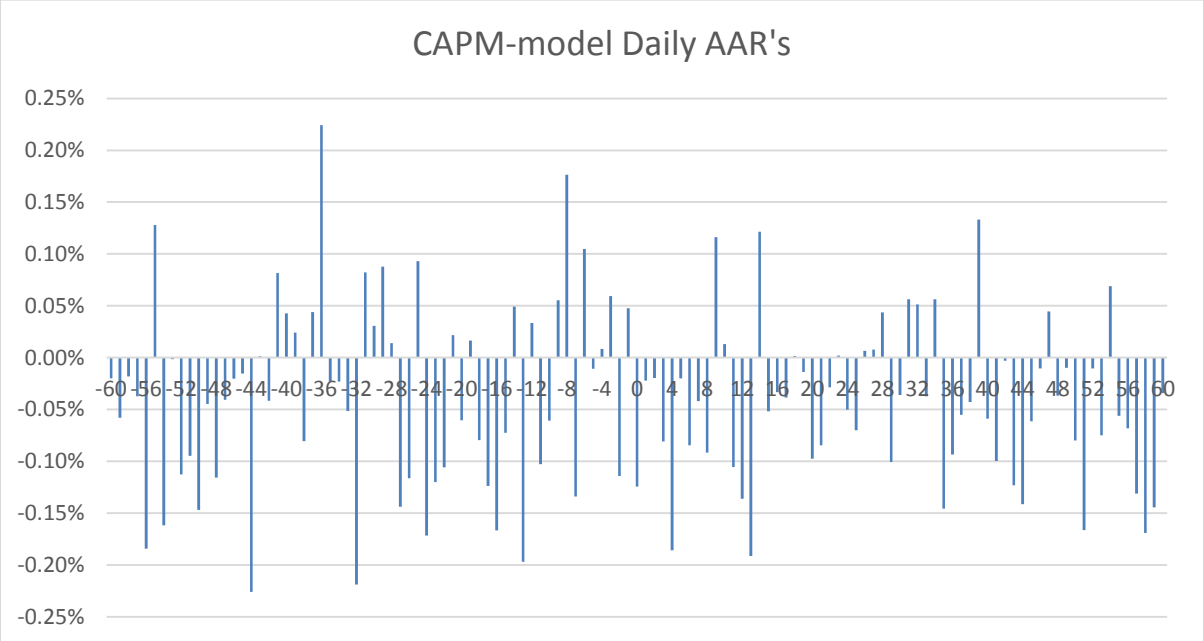


Figure 5: CAPM-Model Daily Average Abnormal Returns



Cumulative Average Abnormal Returns, according to the APT-model, were -1.73% on the day that the rights issue was announced, and -1.78% on the day after the announcement. CAAR's, according to the CAPM-model, were -2.2% on the day that the rights issue was announced. CAAR's in Table 3

indicate for the period 60 days prior to the announcement to 2 days prior to the announcement were -1.62% for the APT-model and -2.14% for the CAPM-model with the returns from the CAPM-model showing statistical significance for the period. The CAAR's for days (-1,1) were -0.16% for the APT-model and -0.10% for the CAPM-model. CAAR's for days (2,60) were -1.12% for the APT-model and -2.69% for the CAPM-model with the returns from the CAPM-model showing statistical significance at the 95% confidence level.

Table 3 CAAR's for specific intervals:

Event Days	APT Model CAAR	P-Value	CAPM Model CAAR	P-Value
(-60,-2)	-1.62%	0.076*	-2.14%	0.0058***
(-1,1)	-0.16%	0.5907	-0.10%	0.5775
(2,60)	-1.12%	0.1613	-2.69%	0.0001***

*denotes significance at the 10% level ** denotes significance at the 5% level *** denotes significance at the 1% level.

Comparing the two models the CAAR's at day 60 for the APT-model is -2.90% and statistically significant at the 95% level with a p-value of 0.0181, and for the CAPM-model was -4.9% which is statistically significant at the 99% level with a p-value of 0.0001.

Comparing the two models the APT-model shows more erratic behaviour than the CAPM-model as can be seen in Figures 1 and 2. The results nonetheless are similar in magnitude and in a consistent direction, and thereby confirming each other. The results for both models around the event date are not as negative as those found by Bhana (1999), who found a -3.51% cumulative average abnormal share price return over the two day announcement period, Pascoe, Ward and MacKenzie, who found -3% abnormal returns on the announcement day by using two different models, or Eckbo, Masulis and Norli (2000), who found a -3% cumulative average abnormal share price return over the two-day announcement window (2000).

The CAPM-model also indicates a -3.4% cumulative average abnormal share price return at day t+25 and a -3.7% cumulative average abnormal share price return at day t+37 with the maximum negative CAAR being -4.9% at day t+60 which indicates a gradual decline in the CAAR's. Interestingly in the APT-model there is a slight increase in the CAAR's just before the rights announcements, being roughly around t-14 days. Both models agree on the negative impact that a rights issue has on the share price performance and this is confirmed by the statistics conducted.

Hypothesis 1 is restated below:

H_0: CAAR = 0 Equation 1

H_a: CAAR <0 Equation 2

Based on the results presented, specifically Table 3 and Figures 1 and 2, the null hypothesis is rejected. Rights issue announcements are found to have a statistically significant negative impact on the cumulative average abnormal returns of the issuers share price performance after the announcement period when using the CAPM-model.

4.3 The impact of the financial position ("health") of a rights issuing company on abnormal share price returns

For Hypothesis 2 two, the null hypothesis states that the financial position of a business making a rights issue, as measured by the Altman Z-score, will have no impact on the nature of its post-issue abnormal share price returns. The alternative hypothesis states that the financial position of the issuer will affect the nature of the abnormal share price returns post the rights issue.

Table 4 shows the Daily Average Abnormal Returns of the companies grouped according to the three categories as determined by the Altman Z-score model to be Healthy, Unhealthy or in the Grey (uncertain) zone. It was not possible to obtain sufficiently large samples for each of the categories to do a meaningful statistical analysis, but the results are nonetheless presented for interest sake. This will be one of the areas that can be addressed in future research. See Appendix 3 for the detailed daily AAR's.

Table 4: Sample categorised according to Altman Z-score.

Data Used	Group	Frequency	Percent
APT Model	Healthy	10	40%
	Grey Zone	9	36%
	Unhealthy	6	24%
	Total	**25**	**100%**

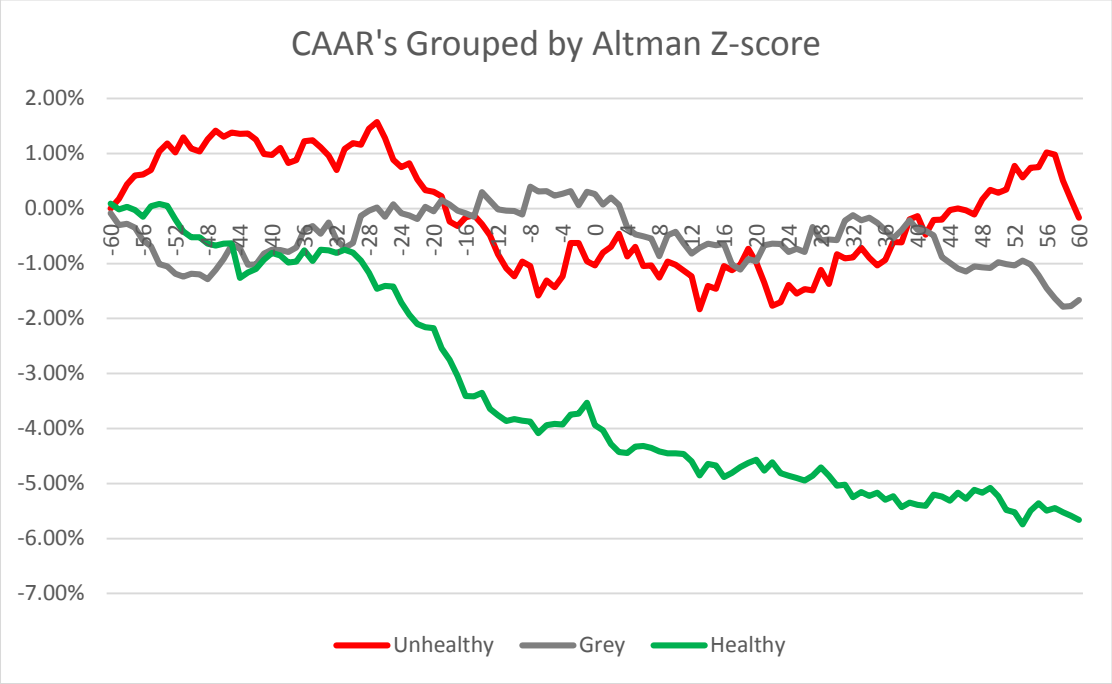
The Cumulative Average Abnormal Results as shown in Table 5 and shown graphically in Figure 5 indicate that the share price abnormal returns of companies classified as healthy are the most negatively impacted when compared to companies classified as in the grey zone or unhealthy.

Table 5: Cumulative Average Abnormal Returns grouped by Altman Z-score

Event Days	Unhealthy CAAR	P-Value	Grey Zone CAAR	P-Value	Healthy CAAR	P-Value
(-60,-2)	-0.62%	0.7191	0.06%	0.9676	-3.73%	0.0038
(-1,1)	-0.17%	0.7572	0.01%	0.9739	-0.30%	0.6237
(2,60)	-0.63%	0.7499	-1.74%	0.199	-1.63%	0.1046

Analysis of Figure 6 and Table 5 indicates that all companies (unhealthy, healthy or grey zone) have negative post rights issue announcement Cumulative Average Abnormal Returns. Very interestingly, companies classified as healthy have -3.73% CAAR's for the -60 day to -2 day, -0.30% for the period t-1 days to t+1 days, and -1.63% for the period t+2 days to t+60 days.

Figure 6: Cumulative Average Abnormal Returns categorised in to the Altman Z-score groups.



Companies in the grey zone have CAAR's prior to the rights issue of 0.06 and during the announcement period 0.01 with the CAAR's falling dramatically to -1.74% after the announcement period. Companies classified as unhealthy have CAAR's before the announcement period of -0.62%, during the announcement period -0.17% and after the announcement period -0.63%.

Hypothesis 2 was stated as follows:

H_0: CAAR(financially healthy) = CAAR(financially unhealthy) Equation 3

H_a: CAAR(financially healthy) ≠ CAAR(financially unhealthy) Equation 4

Unfortunately the sample sizes were not big enough to conduct a proper statistical test of these hypotheses. Given the graphical results presented in Figure 3, it appears that there is at least qualitative evidence that the financial position of the issuer of a rights issue, as categorised by their Altman Z-score, may have an impact on the share price reaction to the announcement of a rights issue. In other words, there is preliminary evidence that for financially healthy companies the market indeed is negatively surprised by a rights issue (although there is signs of anticipation of this from 30 days prior to the announcement) , while the same may not true for financially constrained and borderline companies. Negative CAARs for healthy companies seem to persist for at least the 60 days window period subsequent to the announcement date. A larger sample size will however be required in order to robustly test this hypothesis, and is one of the suggestions for future research. It is interesting to note that two companies Mediclinic and Steinhoff both calculated an "unhealthy" Altman Z-score. Subsequent to the event study period both these companies performed exceptionally well and are seen as blue chip share investments by the market. Steinhoff calculated an "unhealthy" score mainly due to the low earnings before interest and tax (EBIT). Mediclinic calculated a low score and subsequent "unhealthy" status due to low retained earnings, earnings before interest and tax, and low market capital compared to its total assets. The main contributor in both cases was the low EBIT as a percentage of the total assets which contributes the biggest to the Altman Z-score. This indicates that both companies did not succeed enough in sweating the high asset base into producing more earnings before interest and taxes (EBIT).

4.4 The impact of the reason for the rights issue on abnormal share price returns

For Hypothesis 3, the null hypothesis states that the stated reason for the rights issue (here classified as either repaying debt or investing (for growth opportunities) does not impact the nature of post-issue abnormal share price returns. The alternative hypothesis states that the market will react differently depending on the reason given for the right issue (again differentiated as above) Table 6 shows the classification according to the stated reason for the rights issue. Similarly to the sample available for Hypothesis 3, the sample available for this part of the study by category was quite small, and hence limits the robustness of results reported.

Table 6: Sample grouped by stated reason for equity issue

Data Used	Group	Frequency	Percent
APT Model	Invest	16	64%
	Repayment of Debt	9	36%
	Total	25	100%

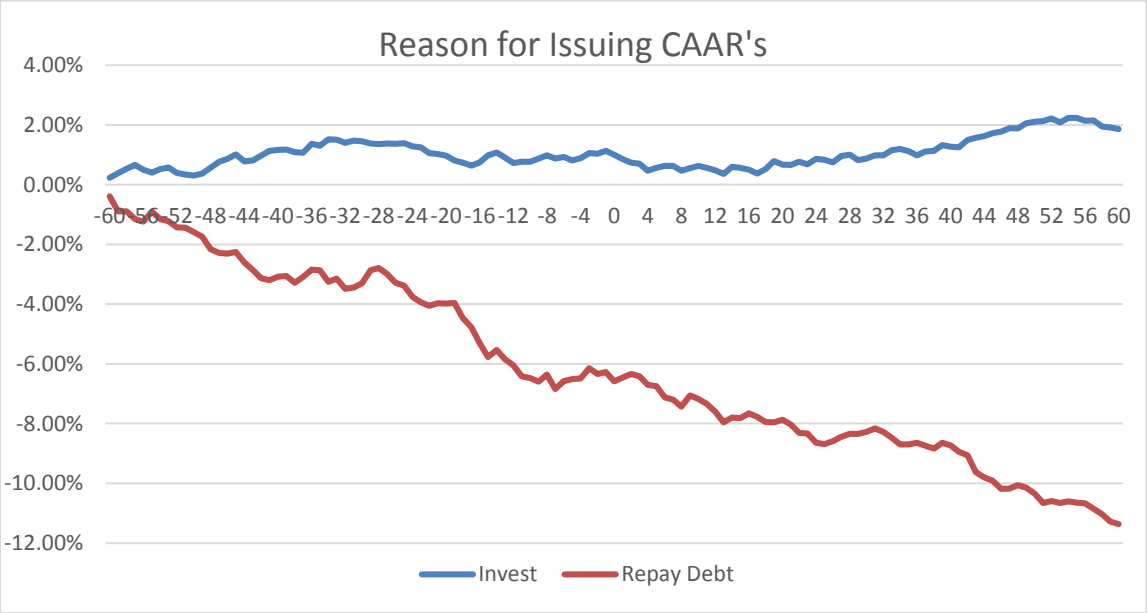
In Table 7 the Cumulative Average Abnormal Returns can be seen for the APT-model. The returns are categorised according to the reason provided by the issuing companies for the rights issue. The classification was done by grouping the companies into companies that will use the proceeds of the rights issue to invest in new opportunities and those that will repay outstanding debt obligations. For companies that communicated that the proceeds will be used to invest in new opportunities, the average abnormal share price returns for the period t-60 days to t-2 days were 1.03%, for days t-1 to days t+1 -0.18%, and for the days t+2 to t+60 days were 1.01%. None of the results were statistically significant. See Appendix 4 for detailed daily AAR's.

Table 7: Cumulative Average Abnormal Returns grouped by Reason for Issuing

Event Days	Invest CAAR	P-Value	Repay Debt CAAR	P-Value
(-60,-2)	1.03%	0.2815	-6.34%	0.0009
(-1,1)	-0.18%	0.5228	-0.11%	0.816
(2,60)	1.01%	0.2805	-4.91%	0.0003

However, companies that communicated that the proceeds of the rights issue will be used to settle outstanding debt obligations, average abnormal share price returns for the period t-60 days to t-2 days were -6.34%, and were statistically significant at the 95% confidence level. The returns for the period t-1 days to t+1 days were -0.11%, and not statistically significant. The returns for the period t+2 days to t+60 days were -4.91%. Figure 4 gives a graphical depiction of the CAAR's.

Figure 7: Cumulative Average Abnormal Returns classified by the reason given for the rights issue.



Hypothesis 3 was stated as follows:

H_0: CAAR(debt repayment) = CAAR(investment) Equation 5

Again, given the small sample sizes at the category level, a robust statistical conclusion cannot be drawn. However, again the qualitative results (Figure 4) shows preliminary evidence that there is a difference between companies that conduct rights issues to repay debt, and those that do this to invest in growth. However, as there is no discernible CAAR effect on the date of the announcements (day 0), in this case it does not appear that there is a clear market reaction to the actual announcement. Rather, companies that do issue equity for investment display a substantially flat CAAR pattern, while those who issue equity to repay debt show a continuous negative CAAR trend over the event window, perhaps indicating that the market on average sees these companies in a negative light well before the actual debt rights issue announcement. It is thus quite reasonable to assume that these companies are mostly those in financial trouble for an extended period of time before the actual event. This is confirmed when it is found that 50% of the businesses that are classified according to Altman Z-score as "unhealthy", actually reported that the proceeds of the rights issue was going to be used to repay outstanding debt. A more robust test will, however, probably require a larger sample, and is a possible avenue for future research.

4.5 The ability of management to time the market when performing rights issues

The final aspect of the study was to investigate if there were any indication of an ability to time the market when performing rights issues.

Hypothesis four was stated as follows:

Post-announcement abnormal share price returns should be negatively correlated to the market-to-book ratio, and degree of financial constraint faced by the business issuing the equity.

Table 8: Regression analysis sample

Company name	Ticker Code	Dependent Variable Y CAR(2,60)	Independent Variables X1 Market/Book - Ratio 5 trading days before announcement	Independent Variables X2 Capex/Total Assets	Independent Variables X3 Market Capital (ZAR) 5 trading days before announcement	Independent Variables X4 Altman-Z-Score Last reported year end	Independent Variables X5 Altman Z-Score x Market/Book - Ratio
Ellies Holdings Ltd	ELI	-12.32%	0.56	0.02	573 625 755	3.32	1.85
Putprop Ltd	PPR	5.51%	0.58	0.00	191 185 261	5.24	3.02
Invicta Holdings Ltd	IVT	4.60%	2.15	0.02	7 641 267 888	2.36	5.06
Steinhoff International Holdings Ltd	SHF	15.54%	1.79	0.04	119 689 929 416	1.74	3.12
Curro Holdings Ltd	COH	12.70%	5.04	0.33	7 876 906 127	4.99	25.13
Aquarius Platinum Ltd	AQP	-2.44%	10.31	0.02	3 049 891 117	4.03	41.50
Royal Bafokeng Platinum Ltd	RBP	-0.17%	0.66	0.05	10 629 276 352	1.81	1.21
Sacoil Holdings Ltd	SCL	3.98%	0.74	0.01	267 713 199	1.82	1.34
Northam Platinum Ltd	NHM	3.18%	1.47	0.13	15 858 193 430	2.88	4.22
Lonmin Plc	LON	-6.62%	3.94	0.03	14 236 352 140	2.08	8.19
Capitec Bank Holdings Ltd	CPI	8.72%	4.32	0.01	21 265 958 448	2.13	9.18
Mediclinic International	MDC	4.54%	2.22	0.03	25 368 543 611	1.31	2.91
Octodec Investments Ltd	OCT	5.55%	1.28	0.06	1 585 030 128	0.86	1.10
Murray & Roberts Holdings Ltd	MUR	-12.63%	1.77	0.04	9 392 561 117	2.36	4.16
Tradehold Ltd	TDH	-9.46%	0.69	0.00	240 700 001	-0.42	-0.28
Sovereign Food Investments Ltd	SOV	-6.04%	0.56	0.06	234 302 256	2.12	1.19
Esorfranki Ltd	ESR	-14.55%	0.80	0.06	649 648 674	3.20	2.57
Digicore Holdings Ltd	DGC	-4.09%	1.55	0.09	772 725 915	4.92	7.64
Omnia Holdings	OMN	4.05%	1.52	0.07	3 000 836 385	3.49	5.32
Eqstra Holdings Ltd	EQS	7.37%	0.85	0.31	1 550 339 220	1.49	1.27
Hulamin Ltd	HLM	-2.44%	6.33	0.05	2 226 806 810	2.12	13.40
Distribution and Warehousing Network Ltd	DAW	-9.17%	1.91	0.04	1 604 496 003	3.67	7.01
Super Group Ltd	SPG	-19.72%	0.04	0.04	360 040 668	1.54	0.07
Zeder Investments Ltd	ZED	11.90%	0.51	0.15	880 236 465	14.32	7.30

When running the regression analysis between the dependent variable CAR (2,60) and the market-to-book ratio, a t-statistic of 1.079 is found with a corresponding p-value of 0.2945 (see appendix). No statistical significant relationship between the cumulative abnormal returns from day 2 to day 60 and the market-to-book ratio of each company was observed when performing a regression analysis on the below sample. This indicates that there is no real evidence or support for the Market Timing theory in the sample. The regression analysis descriptive statistics is included in Appendix 1.

Chapter 5: Conclusion

The purpose of this study was to firstly investigate what the impact of the announcement of rights issues would have on the cumulative average abnormal returns (CAARs) in the share price performance of companies issuing. This study was conducted on companies issuing rights issue on the JSE in the period January 2009 to December 2014. This study found, using the APT-model, over the event window of t-60 days to t+60 days a negative CAAR of 2.90% and applying the CAPM-model a negative CAAR of 4.90%. This finding is similar to the findings of Cotterell, (2011); Bhana (1998) and Pascoe, Ward & MacKenzie, (2005). This shows support for the Signalling theory as investigated by Myers and Majluf, 1984; Asquith and Mullins, 1986 where issuing of equity are perceived as negative signals to the market. This also shows support for the information asymmetry theory created by Stiglitz, 2002 that the issue of equity (rights issues) convey information from the insiders (management) to the outsiders (the market and providers of funding). This study also supports the findings of Spiess & Affleck-Graves (1995); Loughran and Ritter, (1995); Bayless and Jay, (2008) and Autore, Bray and Peterson (2009) who found negative share price reaction after a rights issue.

The second area of investigation of this study was if the financial "health" of the issuer of the rights issue had an impact on the cumulative average abnormal returns of the company performing the issue. The study found a negative cumulative average abnormal return of 1.67% for companies classified as in the "grey zone". A negative CAAR of 0.17% was found for companies classified as in the "unhealthy zone" and a negative CAAR of 5.66% was found for companies classified in the "healthy zone". These findings was in contrast to the findings of Cotterell, 2011 who found that companies classified as in the "healthy zone" recovered faster than companies classified in the "unhealthy and grey zone". The above results are, however, based on a small sample, and hence not statistically definitive.

The third area that this study investigated was the impact that the reason provided by the management of the company performing the rights issue for what they were going to use the proceeds for had on the cumulative average abnormal returns in the share price of the companies issuing the rights issue. Issuers who reported that the proceeds of the rights issue was going to be used to "invest" had a positive CAAR over the total event period of 1.86%. Issuers who reported that the proceeds of the rights issue was going to be used to repay "debt" had a negative CAAR over the total event window of 11.37%. Similarly to the previous research area, this component of the study was also restricted by a small sample, and hence is also not statistically definitive.

The final area that this study investigated was whether there was any indication of market timing evident when companies were performing rights issues. A regression analysis was performed to investigate whether there was a relationship between the cumulative average abnormal returns for day +2 to +60 and the market-to-book value which was used as a proxy for the value of the company. No statistical significant relationship could be found that indicated that the valuation of the company played an important role in the abnormal returns of the share price. Thus no real evidence for market timing was found in the event sample.

In summary, this study found evidence that rights issues affect share price performance negatively. It was shown that after a rights issue announcement the share price of an issuing company had immediate negative abnormal returns when measured against the market. In provisional investigations, this study also found that the financial position of an issuing company, and the reason specified by management for the rights issue, affects the market's reaction as measured by share price abnormal return. With regards to the latter, when management specified that the reason for the rights issue was for investment purposes abnormal share price returns were positive, in contrast to debt repayments, where the abnormal share price returns were negative. Both of the latter areas of investigation were hampered by small sample sizes, however. Lastly, it was found that South African company managements are either not able (or not attempting) to time the market in their decision to issue additional shares.

This study had some limitations. The first was that it was conducted only on shares listed on the JSE for the period January 2009 to December 2014. The second was a small sample compared to the initial sample mostly due to confounding events occurring at the same time of the rights issue event.

Areas for future research could possibly focus on using a larger sample and collecting data over a longer period which will give the study more depth and breadth to any statistical results that will be extracted. Another area for future study could be that the JSE all share index is not so mining heavy weighted as proved by Van Rensburg (2002) and that this argument may not hold for future research.

Reference List:

Altman, E.I., 1968. Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. *The journal of finance*, 23(4), pp.589-609.

Ashley, J.W., 1962. Stock prices and changes in earnings and dividends: some empirical results. *The Journal of Political Economy*, pp.82-85.

Asquith, P., & Mullins, D.W. (1986). Equity issues and offering dilution. *Journal of Financial Economics 15,* 61-89*.*

Baker, M., & Wurgler, J. (2002). Market Timing and Capital Structure. *The Journal of Finance Vol. LVII, No.*1, 1-32.

Barberis, N. & Huang, M., 2001. Mental accounting, loss aversion, and individual stock returns. *The Journal of Finance*, 56(4), pp.1247-1292.

Barclay, M.J., Morellec, E. & Smith, C.W., 2001. On the debt capacity of growth options. Simon School of Business Working Paper No. FR, pp.01-07.

Barker, C.A., 1956. Effective stock splits. Harvard Business Review, 34(1), pp.101-106.

Bartholdy, J., Olsen, D. & Peare, P. (2007): Conducting event studies on a small stock exchange; *European Journal of Finance*, *13*, No. 3, 227-252.

Bayless, M., & Jay, N. (2008). A multiperiod evaluation of returns following seasoned equity offerings. *Journal of Economics and Business 60,* 291-311.

Bhana, N. (1999). Share price reactions to announcements of equity financing by companies listed on the Johannesburg Stock Exchange. *Investment Analysts Journal* no 48, 33-42.

Bhattacharya, S., 1979. Imperfect information, dividend policy, and "the bird in the hand" fallacy. Bell journal of economics, 10(1), pp.259-270.

Binder, J., 1998. The event study methodology since 1969. Review of quantitative Finance and Accounting, 11(2), pp.111-137.

Bray, D.E. & Peterson, D.R., 2009. Intended use of proceeds and the long-run performance of seasoned equity issuers. *Journal of Corporate Finance*, 15(3), pp.358-367.

Chang, X., Tam, L.H., Tan, T.J. & Wong, G., 2007. The real impact of stock market mispricing—Evidence from Australia. Pacific-Basin Finance Journal, 15(4), pp.388-408.

Chordia, T., Roll, R. & Subrahmanyam, A., 2001. Market liquidity and trading activity. *The Journal of Finance*, 56(2), pp.501-530.

Coelho, Correia & West, 2013, an application of Altman's Z and Z-EM models to determine financial distress and corporate failure on the Alternative Exchange (AltX)

Connelly, B.L., Certo, S.T., Ireland, R.D. and Reutzel, C.R., 2011. Signaling theory: A review and assessment. *Journal of Management*, 37(1), pp.39-67.

Correia, Flynn, Uliana & Wormald, *Financial Management 7th ed.,* Juta & Co., 2011.

Cotterel, 2011, the impact of rights issues announcements on share price performance in South Africa.

Daniel, K.D., Hirshleifer, D. & Subrahmanyam, A., 2001. Overconfidence, arbitrage, and equilibrium asset pricing. *The Journal of Finance*, 56(3), pp.921-965.

DeAngelo, H., DeAngelo, L. & Stulz, R.M., 2010. Seasoned equity offerings, market timing, and the corporate lifecycle. *Journal of Financial Economics*, 95(3), pp.275-295.

DeAngelo, H.,L. DeAngelo, and R. Stulz, 2010, "Seasoned Equity Offerings, Market Timing, and the Corporate Lifecycle," *Journal of Financial Economics* 95, 275-295.

Dolley, J.C., 1933. Characteristics and procedure of common stock split-ups. Harvard Business Review, 11(3), pp.316-326.

Donaldson, G., Corporate Debt Capacity: A Study of Corporate Debt Policy and the Determination of Corporate Debt Capacity, Boston, Division of Research, Harvard Graduate School of Business Administration, 1961.

Dong, M., Loncarski, I., Horst, J.t., & Veld, C. (2012). *What drives security issuance decisions: market timing, pecking order, or both?*

Eckbo, B. E., Masulis, R. W., & Norli, O. (2000). Seasoned public offerings: resolution of the 'new issues puzzle'. *Journal of Financial Economics 56*, 251-291.

Fama, E. F., & French, K. R. (2005). Financing decisions: who issues stock? *Journal of Financial Economics no 76*, 549-582.

Fama, E.F., 1991. Efficient capital markets: II. *The journal of finance*, 46(5), pp.1575-1617.

Fama, E.F., Fisher, L., Jensen, M.C. & Roll, R., 1969. The adjustment of stock prices to new information. International economic review, 10(1), pp.1-21.

Firer, C., Ross, S.A., Westerfield, R.W., & Jordan, B.D. (2012). Fundamentals of Corporate Finance (5th Ed ed.). Berkshire McGraw-Hill Education.

Frank, M.Z. & Goyal, V.K., 2002. Testing the pecking order theory of capital structure.

Frank,M.Z. and V.K Goyal, 2003, "Testing the Pecking Order Theory of Capital Structure," *Journal of Financial Economics* 67, 217-248.

Frijns, B., Navissi, F., Tourani-Rad, A. & Tsai, L., 2006. Stock price performance of seasoned equity offerings: completed vs withdrawn. Managerial Finance, 32(3), pp.234-246.

Graham, J.R. & Harvey, C.R., 2001. The theory and practice of corporate finance: Evidence from the field. *Journal of financial economics*, 60(2), pp.187-243.

Hennessy, C.A. & Whited, T.M., 2005. Debt dynamics. The Journal of Finance, 60(3), pp.1129-1165.

Hovakimian, A., Opler, T. & Titman, S., 2001. The debt-equity choice. *Journal of Financial and Quantitative analysis*, 36(01), pp.1-24.

Huberman, G., 2005. Arbitrage pricing theory (No. 216). Staff Report, Federal Reserve Bank of New York.

Jung, K., Kim, Y.C. & Stulz, R., 1996. Timing, investment opportunities, managerial discretion, and the security issue decision. *Journal of Financial Economics*, 42(2), pp.159-186.

Kaplan, S.N. & Zingales, L., 1997. Do investment-cash flow sensitivities provide useful measures of financing constraints?. *The Quarterly Journal of Economics*, pp.169-215.

Korajczyk, R.A. & Levy, A., 2003. Capital structure choice: macroeconomic conditions and financial constraints. *Journal of financial economics*, 68(1), pp.75-109.

Lambrechts, I. J., & Mostert, F. J. (1980). An analysis of the behaviour of market prices during rights issues. *Investment Analysts Journal No 15*, 25-33.

Leary, M.T. & Roberts, M.R., 2004. Financial slack and tests of the pecking order's financing hierarchy. Unpublished working paper, Duke University

Lhabitant, F.S. & Gregoriou, G.N., 2008. Stock market liquidity: implications for market microstructure and asset pricing (Vol. 420). John Wiley & Sons.

Loughran, T. & Ritter, J.R., 1995. The new issues puzzle. *The Journal of finance*, 50(1), pp.23-51.

MacKinlay, A. C. (1997). Event Studies in Economics and Finance. *Journal of Economic Literature Vol XXXV* , 13-39.

Marsh, P. (1982). The Choice Between Equity and Debt: An Empirical Study. *The Journal of Finance vol XXXVII, No 1*, 121-144.

Miller, M.H. & Rock, K., 1985. Dividend policy under asymmetric information. *The Journal of finance*, 40(4), pp.1031-1051.

Modigliani, F., & Miller, M.H. (1985). The cost of capital, corporation finance and the theory of investment. *The American Economic Review 48(3),* 261-281.

Modigliani, F. and Miller, M.H., 1958. The cost of capital, corporation finance and the theory of investment. *The American economic review*, *48*(3), pp.261-297.

Modigliani, F. and Miller, M.H., 1963. Corporate income taxes and the cost of capital: a correction. *The American economic review*, *53*(3), pp.433-443.

Myers, J.H. & Bakay, A.J., 1948. Influence of stock split-ups on market price. Harvard Business Review, 26(2), pp.251-255.

Myers, S. (1984). The Capital Structure Puzzle. *Journal of finance 39(3),* 575-583.

Myers, S. C., & Lakshmi, S.-S. (1999). Testing static trade-off against pecking order models of capital structure. *Journal of Financial Economics Vol. 51 Issue 2*, 219-244.

Myers, S., & Majluf, N. (1984). Corporate Financing and Investment Decisions When firms have information that investors do not have. *Journal of Financial Economics 13(2),* 187-221.

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

Narayanan, L., 2010. How to calculate Altman Z score of customers and suppliers. *Managing Credit, Receivables & Collections*, 3, pp.12-14.

Oberuc, R., The Dynamic Portfolio Theory and Management Handbook, McGraw-Hill, 2003.

Pascoe, G. A., Ward, M. J., & MacKenzie, D. J. (2005). The influence of economic factors on rights issue announcements. *Investment Analysts Journal, No 61*, 17-28.

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

Roll, R. & Ross, S.A., 1980. An empirical investigation of the arbitrage pricing theory. *The Journal of Finance*, 35(5), pp.1073-1103.

Ross, S.A., 1973. The economic theory of agency: The principal's problem. *The American Economic Review*, 63(2), pp.134-139.

Ross, S.A., 1977. The determination of financial structure: the incentive-signalling approach. *The bell journal of economics*, pp.23-40.

Setati, K, the long run impact of rights issues on share price performance and operating performance*,* 2012.

Shyam-Sunder, L. & Myers, S.C., 1999. Testing static tradeoff against pecking order models of capital structure. *Journal of financial economics*, 51(2), pp.219-244.

Smith, C.W. & Watts, R.L., 1992. The investment opportunity set and corporate financing, dividend, and compensation policies. *Journal of financial Economics*, 32(3), pp.263-292.

Spence, M., 1973. Job market signaling. *The quarterly journal of Economics*, pp.355-374.

Spiess, D.K. & Affleck-Graves, J., 1995. Underperformance in long-run stock returns following seasoned equity offerings. *Journal of Financial Economics*, 38(3), pp.243-267.

Stein, J.C., 2003. Agency, information and corporate investment. Handbook of the Economics of Finance, 1, pp.111-165.

Stiglitz, J. (1974). On the irrelevance of corporate financial policy. *The American Economic Review 64(6),* 851-867.

Stiglitz, J.E., 2002. Information and the Change in the Paradigm in Economics. *The American Economic Review*, 92(3), pp.460-501.

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

Van Rensburg, P., 2002. Market segmentation on the Johannesburg stock exchange II. *Journal for Studies in Economic and Econometrics*, 26(1), pp.83-99.

Walker, M., & Yost, K. (2008). Seasoned Equity Offerings: What firms say, do, and how the market reacts. *Journal of Corporate Finance 14,* 376-386.

Appendix 1:

Below are the descriptive statistics of the regression analysis which was performed to test the market timing theory.

Table 10: Descriptive statistics for the regression analysis

Regression Statistics	
Multiple R	0.69
R Square	0.47
Adjusted R Square	0.32
Standard Error	0.08
Observations	24

Table 11: Descriptive statistics for the regression analysis

	Coefficients	***Standard Error***	***t Stat***	***P-value***
Intercept	-0.11	0.04	-2.87	0.01
Market/Book - Ratio	0.02	0.02	1.08	0.29
Capex/Total Assets	0.46	0.21	2.22	0.04
Market Capital (ZAR)	0.00	0.00	2.64	0.02
Altman-Z-Score	0.01	0.01	1.74	0.10
Altman Z-Score x MB	-0.01	0.01	-0.92	0.37

Appendix 2:

The table below shows the daily average abnormal returns (AAR's) for the events.

Table 12: Daily AAR's for the events.

Day	APT Model AAR%	APT Model P-value	CAPM Model AAR%
-60	0.01%	0.958	-0.02%
-59	-0.08%	0.481	-0.06%
-58	0.09%	0.377	-0.02%
-57	-0.01%	0.939	-0.04%
-56	-0.13%	0.253	-0.18%
-55	0.06%	0.668	0.13%
-54	-0.02%	0.866	-0.16%
-53	0.01%	0.956	0.00%
-52	-0.19%	0.059	-0.11%
-51	-0.04%	0.642	-0.09%
-50	-0.07%	0.647	-0.15%
-49	-0.02%	0.865	-0.04%
-48	-0.02%	0.827	-0.12%
-47	0.09%	0.442	-0.04%
-46	0.06%	0.665	-0.02%
-45	0.11%	0.355	-0.02%
-44	-0.28%	0.120	-0.23%
-43	-0.07%	0.582	0.00%
-42	0.00%	0.984	-0.04%
-41	0.08%	0.552	0.08%
-40	0.07%	0.574	0.04%
-39	0.01%	0.885	0.02%
-38	-0.13%	0.374	-0.08%
-37	0.05%	0.332	0.04%
-36	0.28%	0.004	0.22%
-35	-0.05%	0.664	-0.02%
-34	0.00%	0.961	-0.02%
-33	0.03%	0.869	-0.05%
-32	-0.20%	0.250	-0.22%
-31	0.07%	0.614	0.08%
-30	0.03%	0.612	0.03%
-29	0.12%	0.374	0.09%
-28	0.01%	0.924	0.01%
-27	-0.06%	0.588	-0.14%
-26	-0.11%	0.303	-0.12%

-25	-0.02%	0.885	0.09%
-24	-0.21%	0.196	-0.17%
-23	-0.09%	0.514	-0.12%
-22	-0.16%	0.108	-0.11%
-21	0.01%	0.944	0.02%
-20	-0.04%	0.615	-0.06%
-19	-0.10%	0.470	0.02%
-18	-0.22%	0.170	-0.08%
-17	-0.18%	0.085	-0.12%
-16	-0.12%	0.423	-0.17%
-15	-0.02%	0.907	-0.07%
-14	0.15%	0.188	0.05%
-13	-0.22%	0.207	-0.20%
-12	-0.19%	0.066	0.03%
-11	-0.11%	0.374	-0.10%
-10	-0.03%	0.771	-0.06%
-9	0.03%	0.823	0.06%
-8	0.15%	0.237	0.18%
-7	-0.24%	0.024	-0.13%
-6	0.13%	0.246	0.10%
-5	-0.05%	0.708	-0.01%
-4	0.05%	0.526	0.01%
-3	0.24%	0.061	0.06%
-2	-0.09%	0.516	-0.11%
-1	0.09%	0.503	0.05%
0	-0.20%	0.132	-0.12%
1	-0.05%	0.670	-0.02%
2	-0.03%	0.831	-0.02%
3	-0.05%	0.705	-0.08%
4	-0.26%	0.161	-0.19%
5	0.05%	0.633	-0.02%
6	-0.09%	0.366	-0.08%
7	-0.03%	0.771	-0.04%
8	-0.19%	0.244	-0.09%
9	0.19%	0.090	0.12%
10	0.01%	0.917	0.01%
11	-0.10%	0.326	-0.11%
12	-0.15%	0.034	-0.14%
13	-0.21%	0.099	-0.19%
14	0.21%	0.087	0.12%
15	-0.03%	0.701	-0.05%
16	0.02%	0.826	-0.03%
17	-0.12%	0.164	-0.04%
18	0.03%	0.724	0.00%
19	0.17%	0.088	-0.01%

20	-0.05%	0.631	-0.10%
21	-0.06%	0.618	-0.08%
22	-0.03%	0.843	-0.03%
23	-0.06%	0.548	0.00%
24	0.00%	0.976	-0.05%
25	-0.04%	0.557	-0.07%
26	-0.02%	0.827	0.01%
27	0.19%	0.063	0.01%
28	0.06%	0.663	0.04%
29	-0.11%	0.264	-0.10%
30	0.05%	0.654	-0.04%
31	0.12%	0.173	0.06%
32	-0.05%	0.567	0.05%
33	0.05%	0.560	-0.04%
34	-0.06%	0.647	0.06%
35	-0.04%	0.680	-0.15%
36	-0.07%	0.449	-0.09%
37	0.05%	0.671	-0.06%
38	-0.03%	0.700	-0.04%
39	0.20%	0.013	0.13%
40	-0.06%	0.502	-0.06%
41	-0.09%	0.324	-0.10%
42	0.12%	0.282	0.00%
43	-0.16%	0.180	-0.12%
44	-0.02%	0.813	-0.14%
45	0.03%	0.761	-0.06%
46	-0.07%	0.467	-0.01%
47	0.08%	0.385	0.04%
48	0.04%	0.700	-0.04%
49	0.08%	0.251	-0.01%
50	-0.04%	0.793	-0.08%
51	-0.10%	0.252	-0.17%
52	0.08%	0.500	-0.01%
53	-0.11%	0.357	-0.07%
54	0.12%	0.252	0.07%
55	-0.01%	0.882	-0.06%
56	-0.07%	0.465	-0.07%
57	-0.06%	0.496	-0.13%
58	-0.20%	0.095	-0.17%
59	-0.11%	0.306	-0.14%
60	-0.07%	0.512	-0.03%

Appendix 3:

The table below shows the daily average abnormal returns (AAR's) for the events classified according to the Altman Z-score.

Table 13: Daily AAR's classified according to Altman Z-score

Day	Unhealthy AAR	Grey Zone AAR	Healthy AAR
-60	0.00%	-0.08%	0.09%
-59	0.17%	-0.22%	-0.11%
-58	0.26%	0.02%	0.05%
-57	0.16%	-0.07%	-0.06%
-56	0.02%	-0.24%	-0.12%
-55	0.08%	-0.11%	0.19%
-54	0.34%	-0.32%	0.04%
-53	0.15%	-0.04%	-0.04%
-52	-0.16%	-0.14%	-0.24%
-51	0.27%	-0.05%	-0.22%
-50	-0.20%	0.05%	-0.10%
-49	-0.05%	-0.01%	0.00%
-48	0.22%	-0.08%	-0.12%
-47	0.16%	0.17%	-0.03%
-46	-0.11%	0.20%	0.03%
-45	0.07%	0.25%	0.00%
-44	-0.02%	-0.06%	-0.62%
-43	0.01%	-0.30%	0.09%
-42	-0.11%	0.01%	0.07%
-41	-0.26%	0.20%	0.17%
-40	-0.01%	0.07%	0.12%
-39	0.13%	-0.01%	-0.04%
-38	-0.28%	-0.04%	-0.13%
-37	0.06%	0.08%	0.02%
-36	0.34%	0.32%	0.20%
-35	0.02%	0.07%	-0.19%
-34	-0.13%	-0.14%	0.21%
-33	-0.15%	0.20%	-0.01%
-32	-0.26%	-0.32%	-0.04%
-31	0.39%	-0.14%	0.05%
-30	0.10%	0.08%	-0.05%
-29	-0.03%	0.50%	-0.14%
-28	0.29%	0.09%	-0.23%
-27	0.12%	0.06%	-0.29%
-26	-0.29%	-0.17%	0.05%

-25	-0.40%	0.23%	-0.01%
-24	-0.13%	-0.16%	-0.29%
-23	0.07%	-0.04%	-0.22%
-22	-0.29%	-0.07%	-0.17%
-21	-0.20%	0.22%	-0.06%
-20	-0.03%	-0.08%	-0.02%
-19	-0.08%	0.20%	-0.37%
-18	-0.46%	-0.08%	-0.21%
-17	-0.08%	-0.11%	-0.30%
-16	0.16%	-0.04%	-0.36%
-15	0.04%	-0.07%	-0.01%
-14	-0.16%	0.45%	0.07%
-13	-0.20%	-0.16%	-0.29%
-12	-0.35%	-0.16%	-0.12%
-11	-0.25%	-0.02%	-0.10%
-10	-0.15%	-0.01%	0.03%
-9	0.27%	-0.06%	-0.03%
-8	-0.08%	0.50%	-0.02%
-7	-0.53%	-0.09%	-0.21%
-6	0.27%	0.01%	0.15%
-5	-0.12%	-0.08%	0.02%
-4	0.20%	0.03%	-0.01%
-3	0.61%	0.05%	0.18%
-2	0.00%	-0.26%	0.02%
-1	-0.33%	0.25%	0.20%
0	-0.08%	-0.04%	-0.40%
1	0.24%	-0.19%	-0.09%
2	0.10%	0.13%	-0.25%
3	0.24%	-0.13%	-0.15%
4	-0.41%	-0.41%	-0.02%
5	0.18%	-0.12%	0.12%
6	-0.35%	-0.03%	0.01%
7	0.01%	-0.04%	-0.04%
8	-0.22%	-0.32%	-0.06%
9	0.29%	0.38%	-0.04%
10	-0.06%	0.06%	0.00%
11	-0.10%	-0.21%	-0.01%
12	-0.11%	-0.19%	-0.14%
13	-0.60%	0.11%	-0.25%
14	0.42%	0.07%	0.21%
15	-0.05%	-0.02%	-0.03%
16	0.42%	0.02%	-0.21%
17	-0.08%	-0.37%	0.08%
18	0.10%	-0.09%	0.10%

19	0.29%	0.19%	0.08%
20	-0.25%	-0.04%	0.06%
21	-0.37%	0.29%	-0.20%
22	-0.42%	0.03%	0.15%
23	0.07%	0.00%	-0.20%
24	0.32%	-0.14%	-0.05%
25	-0.16%	0.05%	-0.04%
26	0.08%	-0.06%	-0.04%
27	-0.02%	0.46%	0.09%
28	0.37%	-0.25%	0.15%
29	-0.26%	0.02%	-0.15%
30	0.54%	-0.01%	-0.18%
31	-0.08%	0.36%	0.01%
32	0.02%	0.10%	-0.22%
33	0.17%	-0.09%	0.09%
34	-0.18%	0.05%	-0.07%
35	-0.14%	-0.09%	0.06%
36	0.10%	-0.13%	-0.13%
37	0.32%	-0.14%	0.06%
38	0.00%	0.14%	-0.20%
39	0.42%	0.18%	0.08%
40	0.06%	-0.17%	-0.04%
41	-0.34%	-0.02%	-0.01%
42	0.27%	-0.08%	0.20%
43	0.01%	-0.39%	-0.04%
44	0.17%	-0.11%	-0.07%
45	0.03%	-0.10%	0.14%
46	-0.04%	-0.05%	-0.11%
47	-0.07%	0.09%	0.17%
48	0.27%	-0.02%	-0.05%
49	0.18%	-0.01%	0.09%
50	-0.06%	0.11%	-0.15%
51	0.06%	-0.04%	-0.25%
52	0.43%	-0.02%	-0.04%
53	-0.20%	0.09%	-0.22%
54	0.17%	-0.07%	0.25%
55	0.01%	-0.20%	0.13%
56	0.27%	-0.23%	-0.13%
57	-0.04%	-0.19%	0.05%
58	-0.47%	-0.15%	-0.08%
59	-0.34%	0.01%	-0.06%
60	-0.33%	0.11%	-0.08%

Appendix 4:

The table below shows the daily average abnormal returns (AAR's) for the events classified according to the reason provided for the rights issue.

Table 14: Daily AAR's classified according to reason provided for the events issue

Day	Invest AAR	Repay Debt AAR
-60	0.23%	-0.39%
-59	0.16%	-0.50%
-58	0.15%	-0.01%
-57	0.13%	-0.25%
-56	-0.15%	-0.09%
-55	-0.10%	0.33%
-54	0.11%	-0.25%
-53	0.05%	-0.08%
-52	-0.18%	-0.20%
-51	-0.06%	-0.01%
-50	-0.03%	-0.15%
-49	0.06%	-0.15%
-48	0.19%	-0.41%
-47	0.20%	-0.13%
-46	0.10%	-0.02%
-45	0.14%	0.05%
-44	-0.23%	-0.36%
-43	0.04%	-0.25%
-42	0.16%	-0.27%
-41	0.16%	-0.07%
-40	0.04%	0.12%
-39	0.01%	0.01%
-38	-0.08%	-0.22%
-37	-0.02%	0.19%
-36	0.29%	0.25%
-35	-0.06%	-0.02%
-34	0.22%	-0.38%
-33	-0.01%	0.10%
-32	-0.11%	-0.34%
-31	0.08%	0.04%
-30	-0.03%	0.14%
-29	-0.07%	0.45%
-28	-0.02%	0.07%
-27	0.01%	-0.20%
-26	-0.01%	-0.29%

-25	0.03%	-0.10%
-24	-0.11%	-0.37%
-23	-0.03%	-0.18%
-22	-0.19%	-0.12%
-21	-0.04%	0.09%
-20	-0.06%	-0.01%
-19	-0.16%	0.02%
-18	-0.07%	-0.50%
-17	-0.10%	-0.31%
-16	0.11%	-0.54%
-15	0.23%	-0.46%
-14	0.10%	0.23%
-13	-0.17%	-0.31%
-12	-0.18%	-0.20%
-11	0.04%	-0.37%
-10	0.00%	-0.07%
-9	0.11%	-0.12%
-8	0.11%	0.24%
-7	-0.10%	-0.49%
-6	0.05%	0.27%
-5	-0.11%	0.06%
-4	0.07%	0.02%
-3	0.18%	0.34%
-2	-0.03%	-0.20%
-1	0.10%	0.07%
0	-0.13%	-0.31%
1	-0.15%	0.13%
2	-0.11%	0.12%
3	-0.03%	-0.08%
4	-0.24%	-0.29%
5	0.10%	-0.05%
6	0.06%	-0.37%
7	0.00%	-0.08%
8	-0.17%	-0.24%
9	0.08%	0.38%
10	0.08%	-0.12%
11	-0.07%	-0.16%
12	-0.08%	-0.27%
13	-0.12%	-0.36%
14	0.24%	0.16%
15	-0.04%	-0.02%
16	-0.06%	0.17%
17	-0.13%	-0.12%
18	0.15%	-0.17%

19	0.27%	-0.01%
20	-0.12%	0.08%
21	-0.01%	-0.15%
22	0.11%	-0.28%
23	-0.09%	-0.02%
24	0.19%	-0.32%
25	-0.04%	-0.03%
26	-0.08%	0.09%
27	0.22%	0.16%
28	0.04%	0.09%
29	-0.18%	0.01%
30	0.05%	0.06%
31	0.11%	0.12%
32	-0.01%	-0.13%
33	0.18%	-0.19%
34	0.04%	-0.22%
35	-0.07%	0.00%
36	-0.15%	0.06%
37	0.14%	-0.11%
38	0.01%	-0.10%
39	0.19%	0.20%
40	-0.05%	-0.09%
41	-0.02%	-0.22%
42	0.25%	-0.11%
43	0.07%	-0.56%
44	0.06%	-0.18%
45	0.10%	-0.10%
46	0.05%	-0.28%
47	0.12%	0.01%
48	-0.01%	0.12%
49	0.17%	-0.08%
50	0.06%	-0.21%
51	0.02%	-0.32%
52	0.09%	0.06%
53	-0.13%	-0.06%
54	0.15%	0.06%
55	0.00%	-0.04%
56	-0.10%	-0.02%
57	0.01%	-0.18%
58	-0.20%	-0.18%
59	-0.02%	-0.25%
60	-0.06%	-0.08%