THE SIGNALLING EFFECT OF DIVIDENDS ON FUTURE FINANCIAL PERFORMANCE: A CASE OF SOUTH AFRICAN LISTED COMPANIES IN THE POST-APARTHEID ERA

by

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DECLARATION

STUDENT NUMBER: 50885073

I **FAUSTINA MASOCHA**, declare that the research entitled: **"The signalling effect of dividends on future financial performance: A case of South African listed companies in the post-apartheid era.**" is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

I further declare that i have not previously submitted this work or part of it, for examination at UNISA for another qualification or at any other higher education institution.

NOVEMBER 2017

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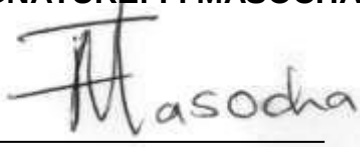

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DEDICATION

I dedicate this to the following people:

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ABSTRACT

Many theorists have linked dividends with the ability to carry signals regarding a firm's expected financial performance. Despite being grounded on a sound theoretical framework, empirical evidence has failed to unanimously corroborate the dividend signalling hypothesis, with some authors resignedly concluding that dividends are the puzzle of finance literature. Recent empirical evidence has shown that limiting the dividend signalling hypothesis to earnings has contributed to that puzzle. To try and decipher the puzzle, this study extends the dividend signalling hypothesis to measures of financial performance seldom linked with dividend signalling such as liquidity and gearing. Using panel data regression models and data for 39 firms listed on the JSE from 1995 to 2016, the study reveal that when one controls for the mean reversion and autocorrelation of profitability, dividends lose the power to signal earnings. The results further show that managers in South Africa use dividends to signal expected changes in liquidity and gearing.

Key words: dividend signalling, dividend policy, dividend puzzle, financial performance, profitability, liquidity, gearing, mean reversion, panel models.

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CHAPTER 1

1 ORIENTANTION

1.1 INTRODUCTION

Miller and Modigliani (1961) once argued that in a perfect world, a firm's value is not determined by the dividend policy that it adopts. Instead, the authors asserted that in a frictionless market with no transactional costs and information asymmetry, dividend decisions have no effect on the value of a firm. In this regard, the conclusion less commonly drawn from their argument is the irrelevance of dividends in determining the value of a firm. To augment their argument, the authors made an alternative proposition that the sole determinant of a firm's value is its investment policy. In summary, Miller and Modigliani (1961) concluded that when a firm considers different dividend payout decisions, it is simply taking different slices of the same pie, which consequentially has no effect on the value of a firm, hence rendering dividend decisions irrelevant.

Interestingly, the foregoing discussion is based on the authors' assumption that markets are perfect, characterised by information symmetry, and that firms and investors alike are not subject to transactional costs. In real life, however, markets are not only imperfect, but are also characterised by taxes, transactional costs and information asymmetry. Because of the latter, the level of dividends declared or paid by firms becomes economically meaningful to outsiders (Iqbal, 2014). This is because markets interpret changes in dividends as signals sent by managers regarding the future of a firm, hence the dividend signalling hypothesis (Vieira, 2005).

The dividend signalling concept has been a topic of research and debate ever since Lintner's (1956) proposition regarding the concept (Njonge, 2014). Despite the amount of attention the topic has received, there is still inconclusive evidence regarding what exactly is signalled by dividends, if they do carry signals at all (Njonge, 2014). In fact, if one looks at the dividend signalling picture, it still consists of different unsolvable puzzle pieces, a fact acknowledged by Black (1976) and reinforced by Bernstein (1996). Later on, Frankfurter (1999:83) excellently summed it all up by noting that "it is either not possible, or extremely difficult, to find an economically rational solution to the dividend puzzle".

Indeed, in an attempt to solve the dividend signalling puzzle, scholars and analysts have failed to unanimously agree on the exact information that is embedded in dividend changes (Al-Makawi, Rafferty and Pillai, 2010). For instance, authors such as Lee (2010a), Lee (2010b), Lukose and Rao (2010), Lee, Isa and Lim (2012), and Guo (2014) used the dividend-profitability test to investigate whether managers use dividends to convey information regarding future changes in a firm's profitability. The authors' dominant profitability measures were Return on Assets (ROA) and Return on Equity (ROE).

On the other hand, authors such as Gonedes (1978), DeAngelo, DeAngelo and Skinner (1996), Benartzi, Michaely and Thaler (1997), Nissim and Ziv (2001), Grullon *et al.* (2003), Flint, Tan and Tian (2010), Braggion and More, (2011), Al-Yahyaee, Pham and Walter (2011), and Vermeulen and Smit (2013) took the stance that when firms change dividends, they will be conveying information regarding changes in a firms' future earnings. Interestingly, this group of authors differentiated their studies from their dividend-ROA/ROE counterparts by arguing that dividends are not a signal of profitability per se, but specifically reflect the expected level of earnings growth (Pandey, 2015). In fact, the basis of their argument emanated from Lintner's (1956) view that managers can only increase dividends when they believe that earnings have permanently increased.

Evidence from the two groups of authors discussed above substantiates Black's (1976) claim that the dividend signalling concept is a puzzle. While both groups may agree that dividends carry signals regarding financial performance, they fail to agree on the exact information embedded in the signals, with the first group claiming that dividends carry signals regarding ROA/ROE, while the latter support the signalling of earnings. This lack of conclusion has been a prominent feature in the dividend signalling literature for a long time. This prompted the researcher to carry out this study to determine the exact signals carried when firms announce dividends.

According to Vieira and Raposo (2007), one of the reasons why authors have failed to solve the dividend signalling puzzle is because many have limited the dividend signalling hypothesis to measures of profitability. For instance, over the years, there has been a notable trend for authors to examine the relationship between movements in dividends and movements in either ROA, ROE or earnings, as has been shown by the studies cited above.

However, there have only been a few authors who conducted empirical tests on other dividend signalling hypotheses such as Bhattacharya's (1979) hypothesis that dividends may carry information regarding future cash flows. It has only been in recent years that signalling studies have turned to investigate the possibility of dividends as a signal of liquidity. Authors such as Bessler and Nohel (2000), Kauko (2012), Forti and Schiozer (2015), and Oliveira, Schiozer and Barros (2015) have come to the conclusion that if managers possess information regarding future and/or current cash flows that investors do not have, investors will interpret dividend increases or decreases as signals that management anticipates permanently higher or lower cash flows.

Their argument is based on the fact that even though dividends are declared from profits earned, they are still paid from a firm's cash reserves (Forti and Schiozer, 2015). In light of this, firms can only commit to high dividends if they have confidence that they have enough cash reserves to sustain the change in dividends (Fama and Babiak, 1968).

It becomes apparent from the above discussion that dividends may carry information regarding liquidity levels, just as much as they may carry information regarding ROA, ROE or even earnings. Indeed, dividends may carry signals regarding any aspect of financial performance, as has been suggested by Brigham and Houghton (2007). According to the authors, a firm's dividend policy reflects its overall financial performance. In this regard, when a firm changes its dividend policy, it may be sending signals regarding any aspect of its financial performance (Brigham and Houghton, 2007).

In a bid to better understand if dividends may carry signals regarding any aspect of financial performance, as suggested by Brigham and Houghton (2007), the famous dividend signalling guru, Gustavo Grullon, teamed up with Michaely and Swaminathan to determine whether dividend changes are signals of changes in the risk level of a firm (Grullon, Michaely and Swaminathan, 2002). Their argument was that firms with high debt levels will have to commit to the payment of high interests, which will in turn reduce the amount of dividends declared (Grullon *et al.*, 2002). In fact, according to the authors, firms expecting an increase in debt and interest payments would reduce dividends. This argument was empirically supported by Waswa (2013) and Ndeto (2014). It can therefore be reasoned that firms can only increase their dividend levels when they believe that there has been a

decrease in their debt level, thereby releasing them from the commitment to pay interest.

Based on the different approaches discussed above, it seems as if changes in dividends could be a signal of different aspects of future financial performance. This is especially true because a firm's dividend policy is a reflection of the overall financial performance of a firm, as mentioned by Brigham and Houghton (2007). In fact, as Vieira (2005) proposed, exploring the dividend signalling hypothesis should not be limited to one aspect of a firm's financial performance. Rather, one needs to explore the many aspects of financial performance that could possibly be signalled when firms change their dividend (Vieira and Raposo, 2007). This study, therefore, investigates three different aspects of financial performance that managers could possibly signal when they change dividends in post–apartheid South Africa. These various measures of financial performance are changes in a firm's profitability, liquidity, and gearing. By doing so, the researcher will be able to gain a better understanding of the concept of dividend signalling.

1.2 BACKGROUND INFORMATION

Mutie (2011) observed that shareholders invest money so that they can be rewarded with a return, which is known as a dividend. Moreover, only a firm that is performing well can afford to pay dividends (Mutie, 2011). It is indeed this link between dividends and performance that birthed the dividend signalling hypothesis, as indicated in the early works of Lintner (1956).

In a world of information asymmetry, where managers have access to information regarding the current performance and expected plans of a firm, dividends can be management's means of communicating this information to less informed outsiders (Gitman and Zutter, 2011). In this regard, investors, analysts, and scholars have tried to decipher dividends for the smallest possible amount of information that they [dividends] could contain.

However, judging from the different conclusions that have been reached, it seems that the puzzle is yet to be solved. The question that one has to ask is the following: if dividends do indeed carry signals, what signals could they be sending regarding the future performance of a firm? This leads to another important aspect of the signalling puzzle, namely that of performance.

1.2.1 Performance

According to Bhat (2009), performance is the accomplishment of all given tasks, as measured against set standards of effectiveness and efficiency. In addition, Trivedi (2010) explained that performance can be measured or explained from a financial or non-financial perspective. Financial performance measurement normally looks at aspects such as trends, ratios and fund flow analysis calculated using figures from financial statements, and is therefore considered to be objective (Ismaila, 2011). On the other hand, non-financial performance measurement is more subjective, as it looks at subjective issues such as customer service, employee satisfaction, and expected growth in market share (Ismaila, 2011). For the purposes of this study, the only aspect of performance linked to the dividend signalling concept is financial performance due to the associated merit of objectivity.

1.2.2 Financial Performance

As mentioned above, financial performance can be measured using various tools (Trivedi, 2010). However, the most common measure of financial performance used by firms, and adopted in this study, is ratio analysis (Gitman and Zutter, 2011). Poznansk, Sadownik and Gannitsos (2013) defined ratio analysis as a comparison between the actual versus expected outcome. In this study, profitability, liquidity, and gearing ratios were analysed to determine whether the financial performance of firms improved or deteriorated. As already discussed, it has been interesting to note how all the above mentioned aspects of financial performance have been linked to the dividend signalling concept.

1.2.3 South Africa and the dividend puzzle in the apartheid era

Just like the rest of the world, South African scholars and analysts joined the quest to solve the dividend puzzle, as shown by studies on dividends from as early as the 30s (Firer, 2008). However, unlike the rest of the world, the circumstances in which South African companies operated could have complicated the comparability of their outcomes with those of other countries (Tyagi, 2010). For example, during the apartheid era, while countries like Germany, Singapore, Italy, Finland, France, Norway, and Malaysia taxed dividends using the full imputation tax system, whereby shareholders were given a full tax rebate on dividend tax to avoid the double taxation of dividends, South Africa was using a partial imputation taxation system (Ainsworth, 2016).

In this system, companies would pay normal tax on corporate profits and then declare dividends from residual profits (Ainsworth, 2016). As Tsoai (2012) further elaborated, companies that distributed dividends also had the responsibility of withholding tax on the dividends distributed to shareholders. This meant that shareholders did not receive the full amount of the dividend distributed by the company, but only the declared dividend less the tax withheld by the company. This dividend was then subject to individual tax in the hands of the shareholder, as well as a tax rebate, which was a portion of the corporate tax paid by the company on the distributed dividend (Tsoai, 2012).

Interestingly, since South Africa only used the partial imputation system, Lombard (1996) observed that although shareholders received a tax rebate, full relief from the double taxation of dividends was not achieved. As a way of easing this tax burden on shareholders, firms would avoid declaring and distributing dividends, a fact confirmed by Tsoai (2012) in her work entitled '*Taxing of dividends: a transition from secondary tax on companies (STC) to dividends tax'*.

Based on the discussion above, whereas countries like Germany, Singapore, Italy, Finland, France, Norway, and Malaysia offered full relief in instances of double taxation, South African based firms resorted to retaining profits as a way of easing the dividend tax burden on shareholders, hence creating the illusion of higher profits (Lombard, 1996). There is compelling evidence to argue that if the signalling hypothesis was applied to the then South African context, it would have been incorrect to conclude that these low or no dividends were signals of poor future financial performance.

In order to alleviate the problems associated with the partial imputation system and achieve alignment with international norms, the partial imputation system was abolished in 1941 and replaced with the classical taxation system (Williams, 1997). Based on the new system, company profits were taxed without a deduction for dividends distributed (Williams, 1997). Furthermore, dividends received were taxed in the hands of the shareholders (Williams, 1997). As a result, dividends were subject to taxation at both corporate and individual levels, thereby causing the unfavourable double taxation of dividends (Venter, 2014). To discourage firms from retaining dividends, firms that paid fewer or no dividends were charged Undistributed Profit Tax (UPT) at a rate of 33.3% (Lombard, 1996). However, firms

still avoided paying UPT by making huge advances and loans that they deemed to be dividends, thereby giving the impression of the payment of high dividends (Lombard, 1996).

Based on the foregoing discussion, if one was to look at these artificially 'high' dividends paid by firms in the form of loans or advances to shareholders, would one conclude that they [the high dividends] were a signal that earnings had permanently increased, or would one see them as a mere act of tax avoidance?

1.2.4 South Africa and the dividend puzzle in the post-apartheid era

Finally, towards the end of apartheid [1990], the classical taxation system was abolished and replaced with a corporate level taxation system that came into effect on the 17th of March 1993 in the form of a Secondary Tax on Companies (STC) (Tsoai, 2012). Under this system, only resident companies would pay tax on the dividends distributed from after-tax profits, and shareholders would receive their dividends free of tax (Tsoai, 2012). Although this may have caused foreign countries to be subject to double taxation, as STC was not given as relief for double taxation, it was during the STC era that South African tax rates decreased from as high as 48% to as low as 28%. This meant that South African taxes were becoming competitive in the international market (Venter, 2014).

In a bid to continue ensuring consistency with the rest of the world, the STC was replaced by dividend taxation at 15% in 2012 (Venter, 2014). Instead of having companies pay STC for distributed dividends, individuals became liable for taxation on dividends received, which was usually withheld by companies on behalf of SARS (Venter, 2014). At the same time, companies would still pay 28% corporate tax on profits for the year.

From this discussion, it is clear that by using this classical tax system, the South African corporate tax rate is still internationally attractive and competitive enough to attract investors (Tsoai, 2012). Moreover, dividends are now taxed in the hands of the shareholder, who are the beneficial owners of dividends (Tsoai, 2012).

Based on the discussion above, if one examines the dividend signalling theory in the South African context, one needs to look at the post-apartheid era, as it is more aligned and consistent with international norms. Indeed, this would make the findings of the study more

comparable with the rest of the world.

1.3 PROBLEM STATEMENT

As illustrated in the sections above, the link between dividends and financial performance birthed the dividend signalling hypothesis. In a study conducted by Vieira (2005), it was proposed that if one is to determine the exact information signalled via dividend changes, one has to look at the dividend signalling concept from all angles of financial performance. This is because a firm's dividend policy reflects its overall financial performance (Brigham and Houghton, 2007). This is the subordinate problem of this study.

With Vieira's (2005) proposal in mind, it seems that in order to uncover the dividend signalling mystery, one must examine relationships between dividends and different aspects of performance. Despite this recommendation, well-known scholars from developed countries, such as De Angelo and De Angelo and Skinner (1996), Nissim and Ziv (2001), Grullon *et al.* (2003, 2005), Zhou and Ruland (2006), and Guo (2014) only examined the dividend signalling concept using changes in earnings. Similarly, in developing countries, Al-Twaijry (2007), Huang, You and Lin (2009), Lee (2010), Mutie (2011), Malombe (2011), and Murekefu and Ouma (2012) explored the same relationship.

Studies conducted in South Africa, like those in the rest of the world, also limited the dividend signalling hypothesis to one specific measure of performance. For instance, Botha, Bosch and Van Zyl (1987), Nortje (1997), Nell, Hamman and Smit (2001), Clarke (2007), Wolff and Auret (2009), Firer (2008), Vermeulen (2011), Vermeulen and Smit (2013), and Montgomery (2015) determined whether dividend changes were associated with future changes in earnings.

As evidenced by the above studies, it becomes apparent that the dividend signalling theory has been limited to one measure of financial performance, thereby giving the impression that dividend changes can only send a signal about one aspect of performance. However, Vieira (2005) challenged this view.

It has also been interesting to note how most of the empirical literature on dividend signalling of future financial performance in both emerged and emerging markets is based on share price reactions to changes in dividends (Gupta *et al.*, 2012). However, a thorough review of

the literature revealed that while share prices may react to changes in dividend announcements, they are mere reactions and only show evidence of signalling (Gupta *et al.*, 2012). In fact, according to the authors, in order for one to determine the exact information embedded in dividend changes regarding future performance, one needs to use various historical financial performance data as dependant variables. On the other hand, if one only needs to get evidence of dividend signalling, then the use of share prices is justified (Gupta *et al.*, 2012).

A study by Laabs and Bacon (2013) seems to validate Gupta *et al.*'s (2012) view. The authors examined the effect of dividend increases on share prices. Although they found that increases in dividends caused share price increases, the authors observed that the relationship between the two variables was only evidence of signalling. In fact, the authors noted that dividend-increment announcements sent a positive signal about the firm's future performance, thereby causing a significant increase in the firm's share price. This prompted them to argue that despite evidence of signalling, as shown by increases in share prices, the authors were still not sure what was conveyed in the dividends paid, until they examined the link between dividends and earnings. In conclusion, the authors asserted that the test between dividends and share price reactions is a test to prove the dividend signalling theory, and should not be used if one needs to determine what information is conveyed via dividends.

The foregoing discussion highlights two main points: firstly, if one needs to determine the exact information contained in dividend changes regarding a firm's future financial performance, it is ideal to use measures of financial performance such as profitability, liquidity and gearing ratios, rather than market efficiency measures such as share price reactions. This is because they [market reactions] are mere reactions to dividend signalling. Secondly, in order to determine the exact signals sent via dividend changes, one needs to compare changes in dividends with changes in various measures of financial performance (Vieira, 2005).

Interestingly, in recent years, a number of authors have embraced Vieira's (2005) proposition, as there has been a notable shift towards the analysis of the dividend signalling hypothesis taking into account various aspects of financial performance. Authors such as

Ahmed (2015) and Gwaya and Ishmail (2016) incorporated the effects of dividends on a firm's overall performance using various measures of performance, thereby endorsing Brigham and Houston's (2007) assertion that a firm's dividend policy is related to its overall financial performance.

The aim of this study is to identify the various aspects of financial performance that managers signal when they pay dividends in the South African context. This is done by investigating relationships between changes in dividends and changes in several measures of financial performance, such as profitability, as measured by earnings and ROA; liquidity, as measured by the current ratio; and gearing, as reflected by movements in the debt to equity ratio. Moreover, this study will not use the reaction of share prices to test the dividend signalling hypothesis since it is not testing for the evidence of signalling, but rather for the exact information signalled via dividends. By doing so, gaps in the finance literature, especially in the South African context, will be filled.

1.4 RESEARCH OBJECTIVES

The overall objective of the study is to establish whether changes in the current level of dividends are associated with changes in future financial performance. Since it has been determined that there is ample support for the notion that dividend signalling should be investigated using various aspects of financial performance, objectives a) to d) below were set. This study aims to investigate:

a) the relationship between changes in dividends and changes in a firm's future earnings;
b) the relationship between changes in dividends and changes in a firm's future ROA;
c) the relationship between changes in dividends and changes in a firm's future Current Ratio (CR); and
d) the relationship between changes in dividends and changes in a firm's future debt to equity ratio (DER).

The researcher differentiated between the signalling of earnings and ROA, as is shown by objectives a) and b) above, following the argument made by Lintner (1956) that managers would only increase dividends when they were certain that earnings had permanently

increased. Furthermore, ROA was used as another profitability measure based on Hagel *et al.*'s (2013) assertion that although earnings are a measure of how profitable the whole business unit is, they do not necessarily reflect the operational efficiency of a firm, as reflected by ROA. As a result, both earnings and ROA were used as measures of profitability, in order to ensure that both profitability angles were covered in the study.

To achieve these objectives, hypotheses (a) to (d) were formulated accordingly, as discussed below.

1.5 RESEARCH HYPOTHESES

Helmenstine (2017) defined a hypothesis as a research statement that is yet to be accepted or refuted. Farrugia *et al.* (2010) further elaborated that it is a possible outcome of a study, and is strongly related to the aims and objectives of the study.

In order to test whether a relationship exists between dividends and future financial performance, different sets of hypotheses were formulated for each of the objectives of this study.

To investigate the relationship between changes in dividends and changes in a firm's future earnings, hypothesis (a) was formulated as follows:

H0 (a): Increases or decreases in the current level of dividends are not associated with increases or decreases in future earnings.
H1 (a): Increases or decreases in the current level of dividends are associated with increases in future earnings.

The second hypothesis (b) was formulated as follows:

H0 (b): Increases or decreases in the current level of dividends are not associated with increases or decreases in a firm's future ROA.
H1 (b): Increases or decreases in the current level of dividends are associated with increases or decreases in a firm's future ROA.

Furthermore, hypothesis (c), which tests the relationship between changes in the dividend level and future changes in a firm's liquidity, as measured by CR was formulated as shown

below.

H0(c): Increases or decreases in the current level of dividends are not associated with increases or decreases in a firm's future CR.
H1(c): Increases or decreases in the current level of dividends are associated with increases or decreases in a firm's future CR.

The above hypotheses (a) to (c) were formulated in order to indicate a positive relationship between changes in dividends and changes in earnings, ROA and the current ratio, based on theories developed by Linter (1956) and Bhattacharya (1979).

Finally, hypothesis (d) was formulated in order to examine the inverse signalling relationship that exists between dividends and gearing, whereby firms can only commit to a dividend increment if they believe that there will be a lower gearing level (Grullon *et al.*, 2002).

H0 (d): Increases or decreases in the current level of dividends are not associated with decreases or increases in a firm's future DER.
H1 (d): Increases or decreases in the current level of dividends are associated with decreases or increases in a firm's future DER.

Providing answers to all the above stated hypotheses is important, as it enables the researcher to determine whether dividends carry signals regarding various aspects of a firm's future performance. Indeed, if Brigham and Houston (2007) and Vieira's (2005) proposition holds, dividend changes will be associated with different aspects of financial performance, as highlighted above.

1.6 RESEARCH METHODOLOGY

According to Olsen, Lodwick, and Dunlap (1992), every study is based on a certain pattern, structure, framework and assumptions, which is known as a research paradigm. In addition, Thomas (2010) elaborated that the main paradigms in research are positivism, post-positivism, and interpretivism.

Henning, Van Rensburg and Smit (2004) defined positivistic researchers as those who assume that a certain of realism exists and is perceived with total accuracy. Studies which adopt this line of reasoning use scientific methods and hypothesis testing to enhance

precision in understanding relationships among variables (Henning *et al.*, 2004). The authors went on to define researchers who follow post-positivism as researchers who still believe in the existence of a set reality when carrying out research. However, unlike positivists, post-positivists do not believe that reality can be perceived with complete accuracy (Vosloo, 2014). Finally, scholars who follow interpretivism assume that there is no common reality and that each individual must create his own reality (Vosloo, 2014).

Following the work of Thomas (2010) and Vosloo (2014), this study fits into the positivism paradigm, since it uses hypothesis testing to investigate relationships between dividends and measures of financial performance. Moreover, this study is testing variables in post-apartheid South Africa to prove or disprove an already existing reality, namely that dividends carry signals about a firm's financial performance. All this makes this study synonymous with positivism.

The research design for this study is correlational, and is analysed using quantitative methods. Furthermore, the study uses secondary data sources to achieve the set objectives. The target population of the study consists of South African, non-financial firms listed on the Johannesburg Stock Exchange (JSE), operating in the post-apartheid period [1995-2015], and whose financial information is available on the INET-BFA database. Financial firms were excluded from the target population, as they are subject to different categorisation, tax and regulation rules than non-financial firms (Shahwan, 2015). In order to be consistent with other signalling studies, only firms which declared and/or paid cash dividends each year since 1995 were included in the target population. This means that firms with dividend initiations and omissions were excluded from the population of the study, as these extreme and sudden changes in dividend payment policies have different effects on future financial performance, in comparison to consistent dividend payments (Shahwan, 2015). Finally, in order to ensure industrial representativeness, firms in the target population were stratified per industry and then randomly selected into the final sample.

In this study, dynamic panel data models were used to determine the relationship between changes in dividends and changes in future profitability, liquidity and gearing. Specifically, the dividend payout ratio was used as a proxy for dividend policy, as it reflects the lifecycle of a firm, being extremely low when firms are in the high growth phase, and gradually

declining when firms mature (Thomas, 2010). Furthermore, headline earnings were used, since they account for earnings generated from a company's core business and not from non-recurring activities (Steenkamp, 2013). As Carte (2007) indicates, headline earnings honestly capture the true profits generated by a company in a trading period. Using headline earnings for this study seemed relevant, as it a prerequisite for all companies listed on the JSE to calculate headline earnings for every financial year. Furthermore, as Nissim and Ziv (2001), Grullon *et al.* (2005), and Vieira (2005) recommended, ROA was used as an additional measure of profitability, apart from headline earnings. Finally, the current ratio was used as a measure of firm liquidity, while DER was used as a gearing measure.

The study based its methodology on Fama and French's (2000) theory that the financial performance of any firm in any industry is mean reverting. According to the authors, firms that generate high profits tend to attract competition from existing competitors and new entrants, which will in turn cause their performance to revert to the mean. Moreover, the authors argued that financial performance is autocorrelated; a firm's past financial performance is a major determinant of its future performance.

Based on studies by Fama and French (2000), Nissim and Ziv (2001), Grullon *et al.* (2005), and Vieira (2005), the modified partial adjustment model, which controls for mean reversion and autocorrelation of financial performance was incorporated into the dynamic model used to determine the relationship between changes in dividends and changes in future profitability, liquidity and gearing. Using this model enabled the author to capture the true essence of financial performance in the real world, hence making this study relevant for all firms.

The study used panel data and panel data models. This enabled the researcher to make more accurate inferences regarding model parameters, since panel data gives more degrees of freedom and sample variability than either cross-sectional or time-series data, a fact supported and fully substantiated by Gujarati and Porter (2008).

1.7 DEFINITION OF TERMS

To enhance the reader's understanding of complex concepts discussed in this chapter, some key terms are defined below, followed by a table of abbreviations.

Dividend: This is the distribution of a firm's after-tax profit to shareholders (Mutie, 2011).

Dividend policy: Baker and Kapoor (2015:182) defined a firm's dividend policy as its decisions regarding the nature, frequency and size of dividends.

Dividend payout ratio: According to Gitman and Zutter (2011), a firm's dividend payout ratio is the amount or percentage of dividends paid out to shareholders relative to a firm's net profit for the year. In this study, the dividend payout ratio was calculated as dividend per share, scaled by earnings per share, following the methodology proposed by Anton (2016).

Dividend signalling hypothesis: Tsuji (2012) defined the dividend signalling hypothesis as the ability of dividends to convey information regarding a firm's future prospects.

Profitability: This is a measure of financial performance, usually showing a firm's ability to pay dividends, service loans and invest in new assets usually measured by earnings, ROA, ROE, gross profit margin, and net profit margin (Ismaila, 2011).

Earnings: According to Hagel *et al.* (2013), earnings can be defined as a measure of profitability reflecting the remaining revenue of a firm, after deducting operating expenses, finance costs and taxes.

Headline Earnings: These are basic earnings attributable to shareholders, excluding items such as goodwill impairments and capital profits net of any related tax, both current and deferred (Steenkamp, 2013).

Return on Assets (ROA): This a ratio that looks at the ability of a company to utilise its assets to generate profits calculated as operating profit before interest and tax, divided by the book value of total assets (Gitman and Zutter, 2011). Throughout this study, the abbreviation ROA was used for Return on Assets.

Return on Equity (ROE): Gitman and Zutter (2011) defined ROE as a ratio that evaluates the profits generated from the use of owners' equity.

Gross Profit: According to Gitman, Juchau and Flanagan (2015), the gross profit ratio is the profit derived from a firm's core activities before deducting operating expenses.

Net Profit: This is the profit generated for the overall activities of a firm (Pandey, 2015).

Mean reversion: Monoyios and Sarno (2002) defined mean reversion as the tendency of economic and performance indicators to revert to the mean.

Autocorrelation of financial performance: The effect which past performance has on future performance (Fama and French, 2000).

Collinearity: According to Asteriou and Hall (2007), collinearity, also known as multicollinearity, occurs when the independent variables are highly correlated, resulting in biased regression results.

Liquidity: Poznansk, Sadownik and Gannitsos (2013) defined liquidity as the ability to have the cash or cash equivalents to pay for operational obligations as they fall due.

Current ratio: This ratio shows the ability of a firm to pay its short-term obligations as they come due. It is calculated as total current assets divided by total current liabilities (Ismaila, 2011). The abbreviation CR is used throughout the study.

Gearing: Ismaila (2011) defined gearing as the degree to which a company relies on borrowed money. Poznansk *et al.* (2013) further defined gearing as a means to determine if a firm should or should not be granted more debt.

Debt to Equity ratio: This a financial ratio that indicates the proportion of shareholders' equity and debt used to finance a company's assets, calculated as the ratio between the book value of total liabilities and owners' equity (Vieira, 2005). In this study, the abbreviation DER was consistently used for the debt to equity ratio.

Dividend observations: Dividend observations refers to the yearly dividend changes made for each firm from 1995 to 2016.

Table 1 below lists the abbreviations used in this chapter with regard to variables, descriptive statistics, specification tests and regression results.

Table 1: Abbreviations used in the study

Abbreviation	Description of variable
E	Earnings
DPR	Dividend Payout Ratio
ROA	Return of Assets
CR	Current Ratio
SIZE	The natural logarithm of assets
GROWTH	Market to book value of equity
DER	Debt to Equity Ratio
FEM	Fixed Effects Model
REM	Random Effects Model
LM	Langrage Multiplier
OLS	Ordinary Least Squares
PDFED	A dummy variable which takes the value of 1 when earnings revert from a positive position

1.8 ETHICAL CONSIDERATIONS

Bryman and Bell (2007) outlined some principles of ethical conduct that one must adhere to when conducting academic research. These are the following:

- honesty in the collection, analysis and presentation of data in research;
- objectivity in all aspects of carrying out research;
- due diligence, especially when dealing with and reporting sensitive information;
- avoidance of recklessness and negligence when dealing with sensitive information; and
- avoidance of plagiarism.

All these aspects were considered during the course of this study. Furthermore, this study was conducted in line with the UNISA ethical guidelines, after the researcher obtained

ethical clearance from the UNISA ethics committee.

The study used archival secondary data, which was obtained from INET-BFA. This information was obtained through the researcher's free online access to the database as a UNISA student. The researcher did not need to purchase or request the data from any organisation or person. Moreover, data obtained was only used for the purposes of this study, without any misrepresentation, recreation or manipulation for the researcher's own use. In summary, the study was conducted in line with not only the UNISA code of ethics, but also with international research ethics.

1.9 CHAPTER OVERVIEW

The structure of the study takes the form of six detailed chapters, including this introductory chapter. The introductory chapter, which is chapter one, provides a thorough orientation and background to the study. The chapter also details the problem statement, research objectives and hypotheses, as well as providing a brief description of the methodology used to achieve the objectives. The significance, limitations and delineation of the study are also discussed in this chapter, with particular attention being paid to the ethical issues surrounding the study.

Chapter two provides an outline of the theoretical framework of the study, and looks at how firms declare dividends and what influences such decisions. The chapter also discusses fundamental issues regarding the measurement of financial performance, as well as the link between dividends and financial performance. Dividend theories are also explained in detail in order to illustrate how the dividend signalling hypothesis has developed over time. In summary, this chapter drives and substantiates the arguments raised in this study.

In Chapter three, empirical evidence on the dividend signalling hypothesis is discussed. The chapter consists of five sections, with the first section exploring evidence of the ability of dividends to carry information regarding subsequent earnings. The second section looks at empirical evidence of the signalling of ROA, while the third and fourth sections investigate the ability of dividends to carry information regarding future liquidity and gearing respectively. The final part of this chapter looks at studies that have used the various aspects of financial performance to investigate the dividend signalling hypothesis. In all the

five sections, the researcher explores the literature from both developed and developing countries, with a special emphasis on the South African market. Based on all the chapter discussions, appropriate conclusions are then drawn.

Chapter four focuses on the methodology used in the study. In this chapter, the research paradigm, approach and method adopted in the study are discussed in detail. In this chapter, the target population and sampling criteria are also explained in detail. In addition, all appropriate tests associated with panel data modelling and regression analysis are explained and justified. Finally, methods of measuring, collecting, analysing, and ensuring the validity of data are discussed.

The fifth chapter presents the findings of the study, focusing on the key objectives of the study in order to determine whether dividend changes carry signals regarding a firm's future profitability, liquidity and gearing. The findings of the study are then analysed and interpreted.

The sixth and final chapter of the study presents the conclusions of the study based on the findings presented in the previous chapter, as well as making recommendations for further research.

1.10 CHAPTER CONCLUSION

The overall objective of this chapter was to provide a thorough orientation to the study. In this regard, issues surrounding the payment of dividends were discussed. Moreover, the link between dividends and financial performance and issues surrounding the measurement of performance were explored in this chapter.

As the setting of the study is post-apartheid South Africa, detailed background information was provided in order to draw a distinction between apartheid and post-apartheid South Africa. This distinction enabled the researcher to justify the need for the study to be carried out in the post-apartheid South African context.

To provide insight into the dividend signalling hypothesis, several studies were reviewed. The common debate in this study has been the need to use different measures of financial performance when one needs to investigates the information content of dividends. Moreover, in this chapter, it was concluded that the relationship between dividends and

share price reactions would not be explored since it would not solve the dividend signalling puzzle. In fact, Laabs and Bacon (2013) argued that share do not elaborate on the exact information contained in dividends. However, a more detailed understanding of the dividend signalling concept can be obtained in the following chapter, where several dividend theories are discussed.

CHAPTER 2

2 THEORETICAL FRAMEWORK

2.1 INTRODUCTION

As discussed in the previous chapter, the dividend decision is one of the most significant decisions that a financial manager is required to make, as acknowledged by Ahuja, Dawar and Arrawtia (2016). It is, however, important to note that managers and directors have to carefully consider various factors such as financing future growth, maintaining adequate liquidity, meeting interest commitments, and the need to satisfy the expectations of investors before they can approve any proposed dividends (Gitman *et al.*, 2015). Accordingly, decisions pertaining to the nature of the dividend, the timing of the dividend announcement, and payment have to be made (Gitman *et al.*, 2015). According to Brigham and Houston (2015), it is imperative for financial managers to consider all these factors in order to make sound dividend decisions.

Indeed, this careful consideration has prompted many theorists to pay particular attention to dividends. This chapter discusses the important aspects pertaining to dividends, such as factors considered before declaring dividends, types of dividends, and the vital issue of dividend taxation. Dividend theories are also discussed in detail. Since the hypothesis being tested is the signalling ability of dividends, much of the literature reviewed is in line with this hypothesis. This chapter also reviews aspects of financial performance that are related to dividend signalling in detail.

2.2 DIVIDEND FUNDAMENTALS

Gitman *et al.* (2015) defined dividends as distributions to investors. According to Kapoor (2009), dividends are not a mere key variable through which investors can gauge how well a firm has been doing, but can also be a measure of expected performance. In fact, the author noted that investors can use dividends as a measure to help determine whether or not to continue investing in the same firm. This means that dividends are not only a mere return to investors, but can say more, at least as far as the shareholders are concerned, about the future performance of a firm (Sharma, 2015).

In addition to being a firm performance indicator for investors, dividends can also be a source of finance to them (Wilson, 2015). However, as Gitman and Zutter (2011)

acknowledged, if the firm retains the same dividends, they can become a source of internal finance for them. This scenario seems to lead to a dividend dilemma, as paying high dividends could be interpreted by shareholders as an improvement in performance, while retaining dividends could provide more internal funds for the firm (Gitman *et al.*, 2015). In light of this discussion, it can be concluded that declared dividends can impact a firm's capital structure. To substantiate this claim, Mwangi, Makau and Kasimbei (2014), Abuhommous (2013), Du Toit (2013), Pernsteiner and Dick (2013), and Sanvicente (2011) found compelling evidence suggesting that dividend decisions interfere with capital structure decisions. In fact, Abuhommous (2013) concluded that the mere decision not to pay dividends and retain earnings is in itself a finance decision. On these grounds, it can be concluded that one cannot really discuss the dividend concept without looking at its interference with capital structure decisions.

Gitman *et al.* (2015) pointed out that although dividends are declared from retained earnings, they are actually paid from a firm's cash reserves. In fact, according to the authors, when firms declare and pay dividends, they have to not only consider the ability of cash reserves to meet the declared dividend, but also factors such as interest commitments, legal or contractual constraints, as well as the preferences of their investors. It therefore seems apparent that before one analyses dividends in detail, one has to look at the aspects considered by financial managers when determining the level of dividend to declare and pay to investors.

2.3 DIVIDEND DETERMINANTS

There are many studies in the literature on gearing as an important factor in the decision-making process regarding a firm's dividend policy (Khan *et al.*, 2016). In their recent study, Mui and Mustapha (2016) acknowledged that every investment opportunity that a firm gets is a chance to earn some positive returns. However, as the authors emphasised, in order to make an investment, a firm has to have the money to finance it. In this regard, investments can be financed by various methods, such as issuing shares to shareholders, acquiring debt or retaining earnings by paying lower dividends (Rigby, 2011). Should a firm choose the latter to finance an investment, there may be unfavourable repercussions, as dividends can be used as a way to gauge expected performance and to make decisions to

buy or sell shares (Gitman and Zutter, 2011). If firms choose to finance investments from debt finance, they would have to bear the interest payments associated with debt financing (Pandey, 2015).

Pratt (2010) defined interest payments as financial obligations which firms are supposed to honour without default, even during years of poor financial performance. Firms that use debt financing have to first pay interest before they have residual profits from which to declare dividends (Pandey, 2015). This reinforces Rozeff's (1982) argument that the higher the debt, hence the gearing of a firm, the lower the dividends declared and distributed to investors. Based on the above discussion, it can be convincingly concluded that a firm's investment opportunities, financing needs, and especially debt levels are major determinants of its dividend decision.

According to Khan and Jain (2010), the liquidity condition of a firm plays a pivotal role in the dividend decision. As the authors further elaborated, firms with enough cash reserves pay higher dividends compared to their counterparts with lower cash reserves. This echoes an earlier argument by Burns and Hendrickson (1972) that since dividends are paid out of cash reserves, managers must first consider a firm's cash position before distributing dividends. This means that if a firm has to pay out dividends in the form of cash, there has to be some cash available to do so (Ahmed, 2015). Despite this, Pandey (2015) still cautioned that although it is easier to conclude that firms with enough cash reserves pay liberal dividends, one needs to make a distinction between relatively new and more mature firms. According to the author, new firms may have cash reserves, but they may still opt to use them to invest, thereby giving the impression of a lack of cash. Meanwhile, mature firms may or may not necessarily have a lot of cash reserves, but because they would have exhausted most of their profitable investment opportunities, they tend to pay higher dividends (Pandey, 2015). Nevertheless, the author maintained that the liquidity position of a firm is still an important determinant in paying dividends.

The South African Companies Act (2008) emphasises that firms are only allowed to distribute dividends if the solvency and liquidity tests are satisfied immediately after a dividend is declared. In fact, according to the Act, any firm operating within the South African context can only pay dividends if its assets, as fairly valued, equal or exceed its total

liabilities, as fairly valued, hence meeting the solvency test. Furthermore, the firm must be able to pay its debts as they become due in the normal course of the business, or for a period of 12 months after the date of the test. Moreover, the Act restricts all firms to pay dividends from retained earnings, rather than from their yearly profits. The above discussion seems to validate the view that legal restrictions are a major determinant of a firm's dividend decisions (Goel, 2016).

In addition to the legal restrictions imposed by the Companies Act, certain contractual obligations may also restrict the payment of dividends (Gitman and Zutter, 2011). For instance, when a firm obtains external funds, it may be restricted from paying cash dividends until a certain level of earnings has been achieved. Alternatively, the firm may be mandated to only pay dividends up to a specified ceiling (Nandago, 2015). As Gitman *et al.* (2015) reinforced, these contractual constraints could be a means to protect creditors from losing out due to a firm’s insolvency. Furthermore, they could be there to ensure that firms do not overcommit to dividends and forego profitable investments (Gitman *et al.*, 2015). In this regard, before managers determine the level of dividends to distribute to investors, they may have to carefully consider contractual clauses which could potentially implicate dividends (Pandey, 2015).

Different investors will always have different preferences when it comes to the payment of dividend taxes, a fact supported by Mui and Mustapha (2016). For instance, in a country like South Africa, where dividends are taxed at 15% and capital gains at 10%, investors with huge investments may prefer to defer taxes to a later stage and pay lesser taxes in the form of capital gains. On the other hand, investors who rely on dividends as their main source of income would prefer firms to pay them high dividends and be indifferent to the higher dividend tax (Gitman and Zutter, 2011). Based on this argument, before firms establish the current level of dividends to pay, they may need to first determine the needs of the majority of their clientele as far as tax preference is concerned (Pandey, 2015). In conclusion, investors’ tax preferences play a major role in the determination of any firm’s dividend-paying behaviour.

Pandey (2015) also discussed the role of inflation in the dividend decision making process. According to the author, some managers tend to pay lower dividends during high-inflation

periods, in an attempt to use the money to replace assets recorded at historical cost. On the contrary, some managers may adopt a liberal dividend policy in order to protect investors from losing out due to the erosion of the real value of dividends (Pandey, 2015). In their article entitled '*Inflation and the dividend policy of US firms*', Basse and Reddemann (2011) proved that inflation does have an effect on dividend decisions, and is one of the factors which managers consider when declaring dividends.

As has been shown in the above discussion, managers must look at various issues such as a firm's financing needs, liquidity, contractual restrictions, as well as the preferences of the majority of their investors, before making the dividend decision. Sometimes, managers may also have to consider external factors beyond their control, such as legal restrictions and inflation. In summary, making decisions regarding the payment of dividends seems to be a complex process, as it involves looking at different, and in some cases, overlapping factors (Uwuigbe, Jafaru and Ajayi, 2012).

2.4 DIVIDEND POLICY

Most South African dividends are declared and paid on an annual basis, with a few exceptional firms paying out interim dividends (Van der Merwe and Du Plessis, 2004). It can be assumed that after a few years of declaring and paying dividends, a firm may end up having an established dividend pattern (Albrecht, Stice and Stice, 2007). For example, most managers may have a pattern of how much debt they would expect in the coming year, the associated contractual constraints, as well as expected interest payments. They may also have established a pattern in terms of how much of their liquid assets cover the payment of dividends. Most importantly, they may have figured out the dominant clientele amongst their investors and their tax preference. The foregoing discussion implies that with time, making the decision regarding the payment of dividends, although still not easy, may follow a certain predictable pattern, as Albrecht *et al.* (2007) already confirmed. This pattern regarding the size, frequency, type and timing of distributions to investors over time is called the dividend policy (Baker, Singleton and Veit, 2011).

Shim, Siegel and Shim (2012) pointed out that there are different types of dividend policies from which firms can choose. The authors went on to cite the constant-payout ratio as the most common type of dividend policy. According to Gitman and Zutter (2011), firms that

follow this policy have a fixed or constant percentage paid out of their earnings each year. Although these firms' investors may enjoy uniformity and a certain level of predictability, the major downside of following this policy is the fact that yearly earnings fluctuate, and firms sometimes have losses (Gitman and Zutter, 2011). In fact, during these low-earnings or loss-making years, firms may end up paying low or no dividends at all (Gitman et al, 2015). In this case, the firm's value may end up being negatively affected, since investors use dividends as a proxy for future performance and status, a fact that was also supported by Shim *et al.* (2012). In this regard, adopting the constant-payout dividend policy may not be the best of decisions for firms whose earnings fluctuate unpredictably. Pandey (2015) added that the constant-payout ratio may not be a good policy to follow for firms operating in inflationary economies, as earnings tend to fluctuate rapidly, causing dividend uncertainty and low firm value.

Instead, these firms may adopt a regular dividend policy, whereby a fixed rand dividend per share is paid out during each period (Gitman and Zutter, 2011). As Aduda and Kimathi (2011) highlighted, firms that adopt this policy have the flexibility to make periodical changes to the rate once they are confident that earnings have permanently increased. In fact, there seems to be a claim that due to its predictability, this type of policy could make it easy for managers to send information about a firm's future (Sharma, 2015). According to Sharma (2015), when managers increase the dividend rate, investors usually take this as a signal that the future prospects of the firm have improved.

Since the regular dividend is usually followed when there is a level of certainty regarding earnings, managers who are perhaps a bit unsure about their earnings may be reluctant to adopt this policy. Furthermore, they may not want to follow the constant-payout ratio policy because of its effect on share value in low-earnings or loss-making years. In this case, these managers may end up following the low-regular-and-extra dividend policy (Aduda and Kimathi, 2011). As the authors observed, firms which follow this policy make conservatively low payments in each period and supplement them with a higher than usual dividend when earnings are higher than usual. Though firms that use this policy may be viewed as playing it too safe, there is usually a level of guarantee that investors get their dividend, just as there is a guarantee that the firm will have a considerably higher level of internal funds for

investment (Aduda and Kimathi, 2011).

As previously discussed, some firms may prefer using retained earnings as a source of finance, as it does not result in associated contractual restrictions (Rigby, 2011). In addition, using internally generated funds to fund investment opportunities eliminates the payment of obligatory interest (Pandey, 2015). Due to these merits, most firms find it an attractive way of raising funds for projects (Aduda and Kimathi, 2011). According to Manneh (2014), firms that rely on internally generated finance tend to adopt a residual dividend policy. Aduda and Kimathi (2011) defined residual dividends as an amount paid after a firm has considered the amount of retained earnings necessary to fund the firm's optimum capital projects. When using such a policy, dividends will only be paid if there are some residual earnings (Myers and Majluf, 1984). According to Manneh (2014), this policy is specifically adopted by firms with enormous profitable investment opportunities. In addition, managers of firms that adopt the residual policy usually prefer to retain and reinvest earnings, rather than paying them out as dividends.

On these grounds, it seems that firms that actually choose this policy tend to have investors who have a preference for investment and growth, rather than dividends (Mui and Mustapha, 2016).

In summary, managers choose a policy after considering many factors peculiar to their specific firm needs (Pandey, 2015). On these grounds, there seem to be no right or wrong policy to follow, a supposition also noted by Manneh (2014), who indicated that different policies work for different firms under different circumstances.

2.5 TYPES OF DIVIDENDS

In the discussion above, it was established that a firm's dividend policy is a pattern followed when establishing when to declare dividends, the amount to declare and, most importantly, the type of dividend to pay to investors (Baker *et al.*, 2011). Therefore, this brings forth the idea that there are various types of dividends that firms can distribute to their investors.

As Gitman and Zutter (2011) explained, the main type of dividend paid out by many firms is a cash dividend. As the Companies Act (2008) stipulates, firms which pay cash dividends should always have enough cash reserves when and after cash dividends are declared and

distributed. If this is not the case, the firm has to have at least cash equivalents that are able to meet the payment of the dividends. In other words, the firm must satisfy the liquidity test, as required by the Act.

It has already been established that a firm's clientele can heavily influence the dividend policy of a firm. According to Mui and Mustapha (2016), if it so happens that the majority of the shareholders prefer lower capital gains to dividends tax, managers may end up substituting the payment of a cash dividend with the issue of bonus shares, in order to increase the shares held by each investor. This not only helps shareholders to defer the payment of dividend taxes, but also frees some cash for investment, which could otherwise have been paid as dividends (Pandey, 2015).

According to Pandey (2015), it is normal for firms to have contractual obligations that may prohibit them from paying cash dividends (Pandey, 2015). In this case, most firms end up resorting to offering scrip dividends to investors (Gitman and Zutter, 2011). By doing so, each investor will be given a promissory note, whereby the firm undertakes to pay dividends later (Gitman *et al.*, 2015). This may also be the case for firms that may need to use their funds for investment, while still needing to offer returns to their investors (Aduda and Kimathi, 2011). In fact, as Shim *et al.* (2012) point out, scrip dividends are a good way of striking a balance when faced with a decision to either invest or pay dividends.

In rare cases, a firm may find itself without enough cash to issue cash dividends, yet with too many liabilities to issue scrip dividends (Manneh, 2014). This may prompt the issuing of inventory or part of the firm's non-current assets in lieu of cash dividends (Gitman and Zutter, 2011). Similarly, firms on the verge of closing up business may also issue liquidating dividends in the form of assets. Although these will still be deemed as normal dividend distributions, the associated tax implications may differ from those of normal dividend distributions, since these will be distributions of capital and not earnings (Gitman *et al.*, 2015). This leads to the interesting issue of the taxation of dividends, especially in the South African context.

2.6 TAXATION OF DIVIDENDS IN SOUTH AFRICA

Every country needs taxes to survive (Awasthi and Bayrakta, 2014). According to an article

entitled '*How we collect tax'*, the main sources of government revenue in South Africa are individual tax, value added tax, capital gains tax, customs duty and dividends tax, with individual tax generating the highest revenue level (SARS, 2016). For the purposes of this study, the taxation of dividends is discussed in detail.

Over the years, the way in which South African dividends are taxed has changed (Venter, 2014). However, as the author went on to acknowledge, the intention has always been to ensure that the South African taxation system is in line with international norms.

There are three main types of dividend taxation systems adopted worldwide, namely imputation, classical, and corporate tax systems (Tsoai, 2012). Erero and Gavin (2015) defined imputation tax as a system that integrates the taxation of firms and their owners. As the authors elaborated, any distribution of profits from firms to owners would have to be taxed either at the instance of the firm or owners, but not both. To achieve uniformity and consistency, firms in markets which use the imputation tax system are charged normal company tax and then withhold a certain percentage of tax for the distributed dividends, and give investors their dividend share net of the tax withheld (Venter, 2014). As Ainsworth (2016) observed, although this gives the impression of double taxation, it is important to note that when investors calculate their individual tax liability, they are then granted either a full or partial rebate called a shareholder's credit, thereby eliminating the effect of double taxation.

During the apartheid era, the South African government used a partial imputation system to collect taxes (Ainsworth, 2016). Firms were liable for corporate taxes at a rate of 50%, and collected dividend taxes on behalf of SARS, levied at 15% (Williams, 1997). To ensure that the investors' share of dividends was not taxed again, a rebate was granted to investors to reduce the tax liability (Lombard, 1996). As Tsoai (2012) noted, different tax authorities vary in the manner in which they award this rebate. For example, while South Africa was using the partial imputation system, where the shareholders were only awarded a partial tax rebate, countries such as Germany, Australia, Singapore, Italy, Finland, France, Norway and Malaysia were using the full imputation system, awarding shareholders a full tax rebate (Kari and Yla-Liedenpohja, 2002). On these grounds, even though South Africa was using the same taxation system as most of its international counterparts, South African investors

were still not given full relief from double taxation, since a partial tax credit was allowed (Tsoai, 2012). In fact, as Lombard (1996) observed, only a third of dividends were exempt in the hands of the shareholder, yet they were subject to 50% corporate tax in the hands of the firm. This meant that the same amount was, in most cases, subject to up to an approximate effective tax rate of 57.5%, hence making South African equity financing expensive and undesirable for most firms (Margo Commission, 1986). Indeed, it was the complication brought about by a partial tax credit, together with the need to attract investments that prompted a change from the partial imputation system to a classical tax system (Lombard, 1996).

Kari and Yla-Liedenpohja (2002) defined the classical tax system as a system that makes a distinction between corporations and their owners, hence taxing them separately. According to Venter (2014), governments that use the classical tax system receive a double dose of tax, since firms pay tax on their reported profits, whilst investors are still liable for tax on dividends received. Since dividends are not a normal expense, they will be included in a firm's profits, and are therefore taxed in the hands of the firm (Erero and Gavin, 2015). On the other hand, when these dividends are received by investors, they are taxed as income through individual tax, with no tax credit, as is the case under the imputation system (Venter, 2014). It is therefore clear that under the classical system, the same dividend amount is taxed both in the hands of the firm, and the investor, resulting in double taxation (Lombard, 1996).

After the abolishment of the partial imputation tax system in 1941, South Africa adopted a classic tax system (Tsoai, 2012). While firms were still liable for normal corporate tax, without a dividend deduction, shareholders were still liable for dividend taxes on the same amount (Tsoai, 2012). The author further pointed out that many firms would try to ease the tax burden on investors by not distributing dividends. As explained by SARS (2016), the government relies on taxes, including dividend taxes, to survive. To encourage firms to distribute dividends, firms were charged undistributed profits tax (UPT) at a rate of 33.3% for every distributable amount that the firm did not distribute (Lombard, 1996). Although the government may have managed to collect revenue through the double taxation of dividends, this classical tax system discouraged both foreign investments and equity financing. In fact,

a commission assigned to determine the effectiveness of the system recommended a shift from the classical system (Margo Commission, 1986).

The problem of double taxation prompted authors such as Harberger (1962), Lombard (1996), Williams (1997) Kari and Yla-Liedenpohja (2002), and Tsoai (2012) to criticise the system, and label it a stumbling block to economic efficiency. The desire for alignment with international norms, the promotion of economic efficiency, and the encouragement of investment, both local and international, prompted a shift from the classical system to a corporate level taxation system (Tsoai, 2012).

In a bid to encourage economic efficiency, and promote investment, in 1993, the then Minister of Finance, Derek Keys, announced the introduction of the Secondary Tax on Companies (STC) (Coetzee and de Wet, 2014). According to a tax guide published by SARS (2016), STC is a corporate tax system, whereby a firm is required to pay its normal tax liability, and a secondary tax on the net of dividends distributed and received. When South Africa first introduced STC, company tax was levied at 48%, while STC was levied at 15% (Tsoai, 2012). This effectively meant that companies that paid liberal dividends effectively paid up to 63% tax on dividends distributed (Venter, 2014). Therefore, South African company tax rates were too high compared to world standards (Tsoai, 2012). Although this prompted a decrease in the company tax rate from 48% to 40%, there was a compensatory increase in STC from 15% to 25%, a rate that was still considered high by many investors (Tsoai, 2012). In a bid to make South African taxes competitive, in June 1994, the company tax rate was further reduced to 35%, followed by a decrease in STC from 25% to 12.5% and later to 10% (Coetzee and de Wet, 2014).

Despite attempts to lower both the company tax rate, and the STC rate, South African company taxes were still considered high by foreign investors (Venter, 2014). Manyama (2007) concluded that the noticeable decline in foreign direct investment experienced by South Africa during the STC era was due to the high company tax rate. In fact, in 2011, the Financial Times concluded that the South African corporate tax system was complicated, and was the major reason why foreign investors moved their investments to countries like Mauritius, Botswana, Kenya, Dubai and Seychelles. In a bid to align themselves with international tax norms, and to improve investments, the South African government

introduced Dividends Tax (DT) in April 2012 (SARS, 2016).

Although DT was levied at 15%, 2.5% slightly higher than STC, the shift from STC aligned the South African tax system with international standards (Lund, 2012). This is especially true, since STC was unique to South Africa, as acknowledged by Visser (2012). Consequently, foreign companies based in South Africa could not claim a refund in their own countries based on the Double Taxation Agreement (DTA), as STC was not acknowledged as a withholding tax (Tsoai, 2012). This was established in the case of Volkswagen SA (Pty) Ltd vs. SARS. In this case, when Volkswagen South Africa, a subsidiary of Volkswagen Germany, claimed an STC refund on dividends paid to its holding company based on DTA, it was ruled that STC was not a tax on dividends, but a business tax (Volkswagen SA (Pty) Ltd v SARS 70 SATC 195). It seems that the incompatibility of STC with other countries' dividend tax systems needed to be addressed in order for South Africa to be on par with other countries. Indeed, as Visser (2012) appropriately concluded, the implementation of the new DT gave South Africa a new competitive edge in the international community.

The preceding discussion outlines just how complex dividends are, as one has to consider issues such as clientele, investment opportunities, and funding options before declaring dividends. Moreover, decisions regarding the type of dividend policy to adopt, the dividend type to distribute, and the consequential tax effects of such a distribution have to be considered Therefore, it becomes clear that dividend decisions may actually be important, despite Miller and Modigliani's claim to the contrary. A review of the dividend theories below further sheds some light on the importance of dividends.

2.7 DIVIDEND THEORIES

According to Pandey (2015), there are several schools of thought regarding dividends. These different perspectives on dividends are what researchers famously refer to as dividend theories (Manneh, 2014). Bryman (2001) defined a theory as an explanation of observed regularities about variables. According to Montgomery (2015), there are three main theories regarding dividends, namely the dividend irrelevance theory, dividend relevance theory, and the dividend signalling theories. These main theories have been a basis for constant research debates and arguments amongst finance scholars. However,

no matter the amount of research done on dividends, it seems that the puzzle pieces are yet to fit (Black, 1976).

2.7.1 Dividend Irrelevance theories

A group of scholars have argued and tried to prove that despite the attention they get, dividends are actually irrelevant in determining a firm's value (Pandey, 2015). These scholars modelled what have come to be popularly known as dividend irrelevance theories.

2.7.1.1 Miller and Modigliani's irrelevance theory

In 1961, Franco Modigliani and Nobel Prize winner in Economics, Morton Miller, came up with the dividend irrelevance theory, as explained in their paper entitled '*Dividend Policy, Growth, and the Valuation of Shares'*. The authors argued that the value of a firm is unaffected by how that firm is financed, and ultimately, by the dividend policy it adopts. In other words, issuing shares, obtaining debt, or paying extravagant or conservative dividends has no effect on the value of a firm. In fact, according to the authors, investors are only interested in the growth and profits of a firm, and are indifferent to whether dividends are paid or used to finance other business projects. Furthermore, the authors argued that the dividend decision is passive and residual, and has no impact on the value of a firm. The authors further pointed out that investors can always 'create' their own dividend if need be, by selling some of their shares, hence making dividend policy an irrelevant determinant of value.

In spite of the popularity of Miller and Modigliani's theory, Kibet, Jagongo and Ndede (2016) argued against the theory, pointing out that its assumptions that there are no transactional costs, floatation costs, and taxes associated with dividend and finance decisions render the theory unrealistic in real life. In fact, Kibet *et al.* (2016) argued that if one applies this theory, if investors need cash, they are able to sell their shares without suffering any transactional costs. Moreover, any dividend distributions will not result in any taxes or costs to either the firm or the shareholder (Kibet *et al.*, 2016). However, as is evidenced worldwide, dividend distributions are taxed globally, creating revenue for governments, and resulting in losses to either firms, investors or both (Kibet *et al.*, 2016). Thus, it is clear that in the real world, the assumption of the absence of taxes or transactional costs does not hold, thereby rendering Miller and Modigliani's theory of dividend irrelevancy irrelevant.

Another key assumption of the above theory has been the assertion that financial markets are not only perfect, but also competitive and free of any informational asymmetry (Kibet *et al.*, 2016). According to Manneh (2014), this gives the illusionary picture of firms that can pay as much dividends as possible, or as low dividends as they want, and still have the same value of shares as their counterparts. Indeed, it has been this illusion of a perfect world that has been a basis for criticism of this theory by many scholars (Pandey, 2015). Authors such as Leland and Pyle (1977), Campello (2006), Ahmad, Abdullah and Roslan (2012), and Ahmeti and Prenaj (2015) carried out studies and concluded that the information gap between managers and shareholders makes it impossible for Miller and Modigliani's second assumption to hold in real markets. In fact, the authors found that dividend decisions convey a lot of information regarding the performance of firms, past or expected, and influence firm value.

2.7.1.2 The residual theory of dividends

Following the work of Miller and Modigliani, there emerged another school of thought that almost mirrored their theory and deemed the payment of dividends as a residual and passive, rather than active, decision (Gitman *et al.*, 2015). According to Gitman *et al.* (2015), firms that follow this policy only pay dividends if they have some leftover earnings after all profitable investment opportunities have been exhausted. This renders the dividend decision passive, and irrelevant (Gitman *et al.*, 2015).

Indeed, if one looks at the residual policy, it seems logical that dividends are a passive decision, and therefore do not matter. However, the question that remains is why firms still go through the costly administrative exercise of issuing dividends, even when it sometimes seems unreasonable to do so, if they do not matter. It is this lingering question that prompted scholars such as Blume (1980), Litzenberger and Ramaswamy (1982), Ang and Peterson (1985), De Angelo and De Angelo and Skinner (2000), Ang and Ciccone (2009), Akbar and Baig (2010), and Kibet *et al.* (2016) to discount the dividend irrelevance theories and conclude that dividends do matter.

In a bid to discount the dividend irrelevance theories, a new school of thought was birthed - that which supports the importance and relevance of dividends in determining the value of a firm.

2.7.2 Dividend relevance theories

According to Laiboni (2013), in his most cited article, “Dividend policy theories”, scholars who support the relevance of dividends strongly criticise the dividend irrelevance theories because of their unrealistic assumptions, such as the absence of transactional costs and the information gap. The author cited the work of Chowdhury and Chowdhury (2010), who discounted the dividend irrelevance theories and found dividend policy to have an impact on, not only the share price and market value of firms, but also on a firms’ weighted average cost of capital. According to Laiboni (2013), Chowdhury and Chowdhury’s work (2010) summarises the nature of key dividend decisions, as it outlines its impact in different key firm-performance areas.

Dividend relevance theories can be traced as far back as the work of Lintner (1962), Gordon (1963) and Walter (1963), with additions by authors such as Barsky and De Long (1993), Foerster and Sapp (2005), and Lambrecht and Myers (2012). According to these authors, the dividend policy adopted by any firm has a profound effect on the value of a firm. The authors attributed this effect to the information gap between managers and shareholders, as is shown in the discussion below.

2.7.2.1 The bird-in-hand argument

As mentioned above, the key argument in support of the relevance of dividends is attributed to Lintner (1962), Gordon (1963) and Walter (1963), among other authors. In response to Miller and Modigliani’s theory, the authors argued that a direct relationship exists between a firm’s dividend policy and its market value. In fact, according to the authors’ bird-in-hand argument, most investors prefer the certainty of dividends to uncertain future capital gains. To augment the argument, Lintner (1962) highlighted that it is in the nature of investors to prefer dividends, because of the time value of money. Similarly, Gordon (1963) argued that investors are risk-averse, hence they prefer the certainty of dividends.

In a study that set out to reinforce the relevance of dividends, Walter (1963) developed an approach that links dividends with firm value. According to the author, there is a balancing relationship between a firm’s internal rate of return (r) and its cost of capital (k). In fact, this relationship determines the value of a firm (Walter, 1963). As the author further elaborated, in years when returns are greater than the cost of capital (r>k), a firm has to retain its

earnings and invest them to get lucrative returns, rather than distribute them, thereby boosting the value of the firm. On the other hand, if investment opportunities have a lower return (r<k), managers would rather distribute the earnings to shareholders who may choose to reinvest the dividends elsewhere. It can be noted from the preceding argument that a firm's value is affected by either its investment, or dividend decisions (Walter, 1963).

Gordon (1963) developed the dividend capitalisation model to complement Walter's (1963) work. In the same vein, Gordon (1963) concluded that firms with a high rate of return (r) and a lower cost of capital (k) tend to have a higher earnings retention rate. Likewise, firms with a rate of return lower than their cost of capital (r<k) end up adopting a liberal dividend policy (Gordon, 1963).

Fuller and Hsia (1984) joined the quest to determine the relevance of dividends. The authors modified Gordon's (1963) model and developed an H-model which shows the effect of dividends on shares which grow in a linear manner. The authors reiterated Gordon's (1963) concluding remarks that dividend policy is linked to dividend growth and the cost of capital. Based on the work of Walter (1963), Gordon (1963), and Fuller and Hsia (1984), it can be noted that dividend decisions are not mere residual and irrelevant decisions, but have an effect on the value of a firm (Periasamy, 2009).

Authors such as Hurley and Johnson (1994), and Hurley (2013) also contributed to the growth models, by introducing slight variations to Walter (1963) and Gordon's (1963) models. Hurley and Johnson (1994) adjusted the model for uncertain dividends, while Hurley (2013) catered for instances when dividends are either geometric, or additive. Despite their variations, the authors' conclusions were still consistent with the findings of Water (1963) and Gordon (1963).

Although the dividend relevance theories gained popularity amongst those who found folly in the irrelevance theories, empirical studies have not yet provided conclusive evidence in support of Lintner (1962), Gordon (1963) and Walter's (1963) models, as Laiboni (2013) observed.

2.8 DIVIDEND SIGNALLING THEORIES

To better understand the dividend puzzle (Black, 1976), another group of scholars emerged

who discredited Miller and Modigliani's theory, by citing the importance of asymmetric information between managers and investors and the role it plays in dividend decisions (Haddon, 2014). The latter's theory was built on the assumption that managers and outside investors have access to the same information regarding a firm's performance. On the contrary, managers usually possess information about the firm's current, and future prospects that is not usually available to investors (Manneh, 2014). This information gap between managers and investors may cause the correct intrinsic value of a firm to be unavailable to the market, or to be available in a distorted manner (Aduda and Kimathi, 2011). In the case of the latter, the share price of the firm may end up being an inaccurate measure of the firm's value (Aduda and Kimathi, 2011). In a bid to close this information gap, managers may need to share the information they possess with outsiders via the dividend level they approve and distribute (Pandey, 2015). In this regard, dividends become a useful tool for managers to convey private information regarding a firm's prospects to investors (Haddon, 2014). This proposition has become known as the information content of dividends, or dividend signalling hypothesis (Gitman and Zutter, 2011).

2.8.1 Classical signalling theories

In 1956, Lintner reviewed information for 28 well-established companies to investigate the information content of dividends. The author made an analysis based on all published sources available, in an attempt to identify all instances when a change in dividends was made. Moreover, the author conducted interviews to determine factors which managers actively considered the most when making dividend decisions. It was found that in almost all instances, the question of how much should be paid in a given period was considered after taking the existing dividend level into account. In fact, as the author further observed, the important factors which were considered before a dividend was approved was the current level of earnings, expected earnings, and the existing dividend level. Moreover, most managers agreed that there was a general reluctance to increase dividends in cases where earnings had not permanently increased (Lintner, 1956). Similarly, dividend reductions were also well considered and less frequent (Lintner, 1956).

Based on his observations, the author concluded that the mere reluctance by managers to change dividend rates mainly emanated from the belief that dividends conveyed a lot of

information regarding the prospects of a firm, and therefore needed to be changed with caution.

In his paper entitled 'I*mperfect Information, Dividend Policy, and 'The Bird in the Hand' Fallacy*', Bhattacharya (1979) developed a model in which a firm can use cash dividends as a tool to signal a firm's future cash flows. The author argued that in instances when a firm's productive assets are projected to generate high cash flows, managers increase dividend levels. On the contrary, if projected cash flows are low, managers reduce dividends as a way of signalling the expected decline in cash flows (Bhattacharya, 1979). The author also echoed the work of Lintner (1956), and concluded that managers tend to use dividend payments as a signalling tool regarding the expected cash flows and profitability of assets throughout their useful lives.

With regard to the dividend signalling hypothesis, John and Williams (1985) also made a simple observation about the behaviour of managers of firms and investors. According to them, when investors need cash, they have an option to sell their shares to other investors. However, they added that some shareholders might sell their shares for a price lower than the true value of the shares (John and Williams, 1985). To avoid such a loss, if managers have favourable information regarding firm value, they may try to warn their investors to avoid a loss by issuing higher dividends, thereby bidding the share price up. This increase in share prices prompts outside investors to pay the correct price for the firm's share (John and Williams, 1985). Nonetheless, one could still argue that the higher dividend paid to investors still does them no good, as it attracts higher taxes. However, the authors pointed out that the higher taxes endured by investors are almost always offset by the premium received due to the increase in share prices, hence making the signalling process worthwhile.

After the contemporary dividend signalling models by Lintner (1956), Bhattacharya (1979), and John and Williams (1985), as discussed above, a number of studies emerged with variations to these models. Kumar (1988) developed a model that emphasised the importance of the sequence of events in dividend signalling. According to the author, managers have to understand a firm's productivity pattern and then try to mirror that pattern by the dividend declared. Similarly, Constantinides and Grundy (1989) developed a

signalling model that almost mirrored Kumar's (1988) model. These authors, however, adopted a different approach by designing a model that evaluated the role of, and interaction between dividend, financing and investment decisions at signalling equilibrium. According to Constantinides and Grundy (1989), it is not sufficient to acknowledge the sequence of events in signalling models. Instead, one needs to evaluate the role of that sequence at the signalling equilibrium.

In a similar vein, Guttman and Kadan (2008) developed a model that looks at the role of dividend equilibrium in the dividend signalling process. The authors pointed out that maintaining a focal dividend point was central to making signalling effective, as investors would have a dividend reference point to gauge whether expected performance deteriorated or improved (Guttman and Kadan, 2008).

As can be seen from the above discussion, managers of firms change dividends and use this as a significant tool to indicate the expected earnings level (Lintner, 1956), liquidity level (Bhattacharya, 1979) or improved performance level (John & Williams, 1985).

2.8.2 Modern signalling theories

As Allen, Bernardo and Welch (2000) explained, an economy consists of two types of firms: low-performance firms, or high-performance firms. However, the true value of a firm is usually only known by insiders. Based on this, managers need to choose a dividend policy that correctly reflects the true value of the firm, so that outsiders are able to distinguish between high-performers from low-performers (Allen *et al.*, 2000). As the authors further explained, one way of distinguishing between the two firms would be through the payment of dividends. Managers of high-performance firms may choose to pay higher dividends, which they view as a reflection of the value of the firm (Vojtech, 2012). Nevertheless, there may be instances when low-performing firms imitate high-performers by paying high dividends, in order to send incorrect signals regarding their true value (Vojtech, 2012). However, as Pandey (2015) noted, using dividends is a costly signal, since shareholders have to pay tax on the dividends received. In this regard, only firms that are consistently able to dissipate these associated costs can maintain the same level of dividends, hence enabling outsiders to distinguish between high and low-performing firms (Allen *et al.*, 2000).

Of late, there has been a shift from the more traditional explanations of dividend signalling

to a more modern, behavioural explanation of the dividend signalling hypothesis (Baker and Wurgler, 2012). Behavioural dividend models assume that changes in dividends are governed by the reaction of investors to deviations from previous dividends (Kinkki, 2001). As Kinkki (2001) further commented, it seems that these modern models are based on Lintner's (1956) model, whereby current dividend decisions revolve around previous dividend levels.

Indeed, in 2000, Stiglitz used the foundation of behavioural sciences to highlight two main objectives of behavioural signalling models. The author explained that the first objective of behavioural signalling occurs in a situation where information is meant to carry signals pertaining to quality, while the second looks at the reaction of outsiders. Drawing on Stiglitz's (2000) concept, Sirait and Siregar (2014) showed that managers may send information regarding the quality of forecast earnings by using behavioural models. In particular, the authors found that the factors that signal earnings quality the most are dividend-paying status, dividend frequency, and increases in dividends. Deng, Li and Liao (2017) confirmed these findings, but cautioned against the use of equity refinancing, as it reduces the signalling ability of dividends.

Using a reference-point model, Baker and Wurgler (2012) illustrated how the reaction of shareholders is pivotal in the dividend signalling process. The authors echoed the work of Stiglitz (2000) and referred to dividend signalling as a behavioural concept since it involves perceptions and reactions of the human mind. Baker and Wurgler (2012) argued that investors can establish a dividend reference point that they will use as a standard against all future dividends. In instances where subsequent dividends are more than reference-point dividends, investors will conclude that managers are sending positive signals about the future prospects of an organisation. On the other hand, lower than reference-point dividends will send negative signals. Indeed, using Lintner's (1956) partial adjustment model, the authors observed that a lot of companies preferred to cluster dividends at the reference point in order not to deviate from reference points established by investors (Baker and Wurgler, 2012). Importantly, the authors stressed that for this model to work, managers must ensure that dividend announcements are discrete, payment regular, and is accompanied by some ceremony and fanfare. This encourages the establishment of

memory and makes behavioural dividend signalling effective (Baker and Wurgler 2012).

In a follow-up paper, Baker and Wurgler teamed up with Mendel and emphasised that in the behavioural signalling context, investors are averse to dividend reductions (Baker, Mendel and Wurgler, 2016). According to the authors, since investors are risk-averse, managers pay dividends clustered around the reference point and retain some cash to cater for future periods. Importantly, firms must avoid dividend cuts at all cost (Baker *et al.*, 2016).

In conclusion, in as much as behavioural models analyse the relation between dividend patterns and human behaviour, they are still consistent with Lintner's (1956) concept of partial dividend adjustments. Better still, though there may be different dividend signalling theories and models, there is still one common concluding remark amongst the authors: dividends have an ability to carry information regarding expected financial performance to less informed stakeholders.

2.9 FINANCIAL PERFORMANCE

According to Trivedi (2010), performance is the ability to carry out a certain task. While performance is a broad term, financial performance refers specifically to the act of performing a given financial activity, and the extent to which an organisation's financial goals and objectives are achieved (Chadha, 2016). In order for one to determine whether a firm is meeting its financial goals or not, one may have to perform a financial analysis by looking at a firm's financial statements. These include the Statement of Profit and Loss and Other Comprehensive Income (SOPLOCI), Statement of Financial Position (SOFP), cash flow statement, and notes to the financial statements (Trivedi, 2010).

The above-mentioned financial statements can be used to check different aspects of financial performance (Luca, 2008). For instance, if one is interested in the profitability aspect of a firm's financial performance, the SOPLOCI would be the most relevant statement to consider (Trivedi, 2010). Simply defined, profitability is the ability of a business to earn a profit from its business activities (Pandey, 2015). Moreover, Gitman and Zutter (2011) argued that profitability reveals the efficiency of management in using all resources within their means to make a profit (Gitman and Zutter, 2011). In a follow up comment, Trivedi (2010) emphasised that the profitability of a firm is not determined by looking at one absolute measure, but by exploring various aspects of financial performance. Therefore, if

one takes Trivedi's (2010) comment into account, the profitability of a firm will have to be determined after analysing various profitability metrics. Indeed, as is outlined by Gitman and Zutter (2011), firms may measure their profitability by using common traditional ratios such as the gross profit ratio, net profit ratio, ROA, and ROE.

According to Gitman *et al.* (2015), the gross profit ratio expresses the relationship between a firm's gross profit and net sales. Firms that compute this ratio will be interested in determining the efficiency with which main operations are performed (Pandey, 2015). In this regard, the higher this ratio is, the more efficient a firm's main operations are (Manneh, 2014).

In order to determine whether a firm is profitable in other operating aspects, the net profit ratio may also be computed (Trivedi, 2010). This ratio shows the relationship between a firm's net profit and its net sales (Gitman *et al.*, 2015). As Pandey (2015) explained, this ratio helps to determine profits generated from the day-to-day core activities of a firm. In other words, this ratio is a measure of the efficiency with which all business affairs, apart from trading activities, are being managed (Pandey, 2015). While a high ratio may indicate an improvement in the operational efficiency of a business, a low ratio may be a signal of mismanagement in some of the business aspects (Trivedi, 2010).

Drawing from the discussion above, in as much as both the gross profit and net profit ratios show how efficient a firm is in their business operations, they are still considered by many analysts to be too general (Trivedi, 2010). In order to establish how much profits a firm is generating from using its assets or employing its equity, more specific ratios such as ROA and ROE may be used (Brigham and Houston, 2015).

According to Brigham and Houston (2015), ROA measures how well a firm uses its assets. Specifically, it measures the profitability of a firm relative to its total assets (Brigham and Houston, 2015). In this regard, if the managers of a certain firm use their assets effectively and efficiently, it will translate into a higher ROA. Conversely, inefficient and ineffective use of assets may end up translating to a lower ROA. As Trivedi (2010) illustrated, if the management of a firm needs to make a decision to sell existing assets, they may end up referring to the firm's ROA in order to determine whether the assets are profitable enough

to warrant keeping them. Therefore, ROA becomes a very important indicator of profitability.

Furthermore, managers can also determine the profitability of their operations by calculating ROE (Brigham and Houston, 2015). According to Broeckling (2010), when shareholders provide capital to the business, they do so with an expectation that the firm will use that capital and generate profits. As a result, the profitability of a firm, from the owner's point of view, is measured in terms of the profit generated by the capital contributed (Simmons and Hardy, 2012). This means that from the shareholders' perspective, profitability is reflected by ROE, which measures the amount of profit earned by the firm on funds invested by shareholders (Simmons and Hardy, 2012). Thus, in the eyes of the shareholder, a high ROE is a sign of a worthwhile and profitable investment (Pandey, 2015).

As mentioned at the beginning of section 2.4, there are a number of financial statements that organisations prepare to portray various aspects of financial performance. Likewise, different stakeholders may be interested in particular financial statements for various reasons (Gitman and Zutter, 2011). For instance, while management and investors may be interested in knowing whether the business was profitable or not, stakeholders such as credit providers may be interested in knowing the cash position of a firm (Gitman *et al.*, 2015). In the same manner, potential credit providers may also need to gauge if a firm that is requesting debt financing can pay off its current debts. By analysing ratios such as liquidity ratios, credit providers may be able to tell if the firm is able to meet its short-term cash obligations as they fall due (Pandey, 2015).

According to Saleem and Rehman (2011), a firm's liquidity ratios measure its ability to meet the payment of its short-term obligations by making a comparison between cash reserves and short-term obligations. If cash reserves are lower than obligations, the business might face difficulties in meeting its short-term financial obligations (Gitman and Zutter, 2011). On the other hand, higher than normal cash reserves may be an indication that the firm is foregoing lucrative short-term investments by keeping high cash reserves (Trivedi, 2010).

There are two main traditional ratios used to determine the liquidity position of a firm (Kirkham, 2012). As the author pointed out, a firm's current and quick ratio are the main measures of a firm's cash position. The current ratio is simply determined by dividing a

firm's total current assets by total current liabilities (Saleem and Rehman, 2011). Gitman *et al.* (2015) observed that while the current ratio provides an idea of the cash position of a firm, the quick ratio provides a narrower focus, as it only considers more liquid current assets such as cash, prepayments, and accounts receivable. In conclusion, Saleem and Rehman (2011) pointed out that if one needs to determine whether a firm has enough cash reserves to settle its current liabilities, the current and quick ratios are good measures.

The other aspect of interest to various stakeholders is the firm's gearing position (Sivakumar, 2016). The author defined gearing as the use of debt to finance a firm's activities. On the same note, Sofat and Hiro (2016) pointed out that a firm's gearing position is strongly related to its capital structure decisions. Pandey (2015) defined capital structure as the mix of a firm's long-term sources of funds, such as borrowed capital and equity share capital. In cases where a firm's equity share capital is lower than borrowed capital, the capital structure is said to be highly geared (Gitman and Zutter, 2011). On the other hand, if equity share capital is higher than borrowed capital, the capital structure is said to be lowly geared (Gitman and Zutter, 2011). Interestingly, firms that are highly geared may end up suffering from financial distress due to the high mandatory interest payments associated with high debt (Sofat and Hiro, 2016). Moreover, the financial distress may also make it impossible for firms to service current debt, and jeopardise their chances of getting more debt (Sofat and Hiro, 2016). On these grounds, it can be argued that a firm's capital gearing is important, not only to a firm's investors, but also to its current and prospective credit providers. In fact, according to Atrill, McLaney and Harvey (2014), banks and other prospective financial providers always consider the level of gearing before giving loans to firms, which makes the ratio of utmost importance to a firm.

It is apparent from the above discussion that different stakeholders consider the financial information available to them from different perspectives. In this regard, managers of successful firms focus on improving overall financial performance from each stakeholder's perspective (Harrison and Wicks, 2013).

2.10 DIVIDEND SIGNALLING AND FINANCIAL PERFORMANCE

According to Uwuigbe *et al.* (2012), the link between dividends and performance has been investigated for decades, with the main proponents being Lintner (1956), Bhattacharya

(1979), and John and Williams (1985). Interestingly, all of the authors have linked dividends with specific, yet different aspects of financial performance (Vieira, 2005). For instance, while Lintner (1956) indicated that dividend increases are a signal of permanent increases in earnings, Bhattacharya (1979) and John and Williams (1985) associated dividend changes with changes in future cash flows. Furthermore, authors such as Grullon *et al.* (2003), Vieira (2005), and Galai and Wiener (2013) hypothesised that when firms change dividends, they will be communicating an expected change in gearing. Looking at all these various studies, one can conclude that dividends could be used as a tool to send signals regarding earnings, cash flows, or gearing. However, the question that remains is the following: if dividends indeed do carry signals regarding financial performance, what exactly do they signal?

Indeed, in a bid to answer the above question, there is ample support for the idea that dividend signalling tests must not be limited to profitability, earnings or gearing, but need to include all these aspects of financial performance (Vieira, 2005). This view validates Brigham's (1995) assertion that a firm's dividend policy is seen as a major determinant of its overall financial performance. On these grounds, it can be argued that in order to understand the exact information conveyed by dividends, one needs to test the ability of dividends to signal expected earnings, liquidity and gearing. Thereafter, appropriate conclusions can be drawn.

2.11 CHAPTER CONCLUSION

This chapter has clearly shown that there are as many dividend theories as there are dividend policies. Up to this point, this chapter focused on the fundamental issues surrounding dividends, such as dividend determinants, as well as the different types of dividends. Furthermore, the evolution of dividend taxation in South Africa since the apartheid era was also outlined in this chapter.

In order to provide a detailed explanation of the signalling power of dividends, aspects of financial performance and their relationship with dividends were discussed. This study now turns to a review of relevant empirical literature in the next chapter. By doing so, the researcher will be able to corroborate the main findings from related studies, in order to gain a better understanding of the dividend signalling hypothesis.

CHAPTER 3

3 LITERATURE REVIEW

3.1. INTRODUCTION

Manneh (2014) once argued that as long as managers possess more information about the prospects of a firm, dividends will always be used as a means to convey information to investors. In fact, many scholars have conducted a lot of empirical studies to prove the information content of dividends, popularly known as the dividend signalling hypothesis (Aduda and Kimathi, 2011).Yet, despite the number of studies conducted on this topic, there seems to be no common ground pertaining to the exact signals embedded in a dividend (Vieira, 2005).

Uwuigbe *et al.* (2012) observed that studies on the dividend signalling concept have produced a large body of empirical research, particularly falling into four major categories. According to the authors, the first category tests how changes in dividends signal future profitability, measured by ROA, or alternatively, ROE. The second category looks at the dividend-earnings relationship, whereby changes in dividends signal future earnings. This group of authors differentiates their studies from those in the first category by arguing that dividends are not a signal of profitability as a general measure of performance, but reflect the expected level of earnings growth (Pandey, 2015). The third category is made up of authors who investigated the reaction of share prices to dividend announcements in order to find evidence of dividend signalling. The final category is made of authors who believe that dividends can be used to send signals regarding a firm's expected cash flows as per Bhattacharya (1979) and John and Williams' (1985) theory.

Despite an overwhelming number of empirical studies falling into the four categories discussed above, there is a growing body of literature that links the dividend signalling theory to gearing. Authors such as Aivazian, Booth and Cleary (2003), Vieira (2005), Vieira and Raposo (2007), and Galai and Wiener (2013) stressed how excessive debt can lead to financial distress. Therefore, managers use dividends to send positive signals when there is an expected decline in the debt.

It, therefore, seems apparent that there are many aspects of financial performance associated with dividend signalling as there are studies. Still, results from these tests are,

more often than not, contradictory and unable to provide a satisfactory resolution to the dividend puzzle.

This chapter is a discussion of the empirical studies carried out on the dividend signalling hypothesis in both developed and developing countries. However, special emphasis is paid to the South African context. For clarity, studies are grouped according to objectives set in chapter 1 of this study.

3.1 SIGNALLING OF EARNINGS

Most of the financial literature supports the theory that higher dividend payout ratios lead to lower subsequent earnings (Montgomery, 2015). Huang *et al.* (2009) substantiated this claim and concluded that in practice, firms that pay high cash dividends tend to have reduced retained earnings. According to M'rabet and Boujjat (2016), dividends reduce the funds available for investment causing investors to associate high dividends with low future earnings. Based on the foregoing discussion, the consensus view seems to be that firms with higher dividends payout ratios send signals regarding lower future earnings. Yet, empirical studies seem to challenge this supposition, as discussed below.

3.1.1 Studies in developed countries

Watts (1973) was one of the pioneers of the hypothesis that dividends are informative about future earnings. The author regressed future earnings on both historical earnings and dividends, to test if future earnings were determined by historic dividends. The results showed that a positive, but weak relationship exists between past dividends and subsequent earnings.

In 2001, Nissim and Ziv investigated the relationship between changes in dividends and earnings using firms in the USA market. The authors used dividend events between 1963 and 1998. Dividends per share and earnings per share were used as dependent and independent variables respectively. Their sample had a total of 100 666 dividend observations, consisting of 811 dividend decreases, 13221 dividend increases, and 86 634 no-change dividend observations. The authors argued that studies which do not corroborate the dividend signalling hypothesis omitted some important variables in their regression models. As a result, the authors included ROE into their model, asserting that it

[ROE] is an important predictor of earnings. They assumed ROE to be mean reverting: a high ROE would result in a decrease in earnings due to factors such as competition from existing competitors and new entrants. Moreover, the authors regressed changes in earnings against dividends, using a model that controlled for the mean reversion of earnings. The authors concluded that dividend increases are associated with increases in future profitability for at least 4 years. However, the authors could not find enough evidence to support the signalling effect of dividend decreases on earnings.

Grullon *et al.* (2005) challenged the findings and methodology by Nissim and Ziv (2001), in a paper entitled '*Dividend changes do not signal changes in future profitability*.' The authors used a sample that had 14 235 dividend increases, 974 dividend decreases, and 23 334 no-change observations. Firstly, the authors replicated Nissim and Ziv's (2001) study, assuming the mean reversion of earnings to be linear. The authors found that dividend changes had a positive correlation of 0.027 with changes in earnings. Afterwards, the authors followed recommendations by Brooks and Buckmaster (1976), and Fama and French (2000), and assumed the rate of mean reversion and autocorrelation of earnings to be non-linear; an assumption which seems realistic considering that earnings fluctuate in a non-linear manner. This time, the authors found no evidence to support of dividend signalling. Based on findings from both the linear-reversion and non-linear reversion models, the authors concluded that when the mean reversion and autocorrelation of earnings is assumed to be non-linear, dividends and future earnings are not correlated. This conclusion disproved Nissim and Ziv's (2001) argument regarding the mean reversion of earnings and the dividend signalling hypothesis.

Using the same US market, Arnott and Asness (2003) validated findings by Nissim and Ziv (2001). They revealed that a liberal dividend payout translates to higher expected earnings. Interestingly, this fuelled controversy in the finance literature. Commenting on these findings, M'rabet and Boujjat (2016) said that Arnott and Assess' (2003) results contradicted the common view that a liberal reinvestment policy of retained earnings fuels faster future earnings growth and vice versa.

Drawing on the research by Arnott and Asness (2003), and adopting the same methodology, Gwilym, Seaton, Suddason and Thomas (2010) used a sample of firms from

Germany, France, Italy, Greece, Spain, Netherlands, Switzerland Portugal, Japan, and the United Kingdom. The authors' findings echoed Arnott and Asness' (2003) findings. In fact, according to Gwilym *et al.* (2010), regardless of operating within different economic environments, there is overwhelming evidence in the international market confirming a positive relationship between substantial dividend payout ratios and future earnings.

In 2005, Vieira used panel data methodology, and a linear model of earnings expectation to investigate whether dividends affected future earnings and performance. The sample used consisted of companies from the Portuguese and United Kingdom (UK) markets. The author did not find evidence in support of signalling. The author replicated the same study using Fama and French's (2000) non-linear model of earnings expectation. Interestingly, this time, the author found that dividends ceased to be informative about earnings. The author concluded that models which account for mean reversion in a linear manner miss some important information regarding the behaviour of earnings in relation to dividends.

Along similar lines, Zhou and Ruland (2006) conducted an investigation on a sample of Australian firms and concluded that there is a strong positive relationship between a firm's current dividend payout and its future earnings. These results were in support of Linter's (1956) argument that dividend increases are associated with increases in earnings. The authors further observed that the positive relationship was more prominent for firms with a limited number of growth opportunities.

In their paper entitled '*Do liquidity induced changes in aggregate dividends signal aggregate future earnings growth*', Wann and Long (2009) found a strong relationship between aggregate dividends and earnings. Precisely, the authors found that dividends influence earnings for up to 3 years.

Flint *et al.* (2010) also conducted a similar study in the Australian market. The authors examined the relationship between the dividend payout ratio and a firm's future earnings growth. Using both listed and delisted firms on the Australian stock exchange from 1989 to 2008, the authors provided further evidence that there is a positive link between the dividend payout ratio and a firm's future earnings growth, reinforcing the earlier work of Zhou and Ruland (2006) in that same market.

Gou, Maung and Wilson (2015) extended the dividend signalling concept to non-financial firms trading on the New York Stock Exchange, American Stock Exchange, and the NASDAQ Stock Exchange from 1975 to 2005. The authors investigated whether dividend changes can carry signals regarding future earnings. They concluded that a positive relationship exists between dividend increases and future earnings. However, the authors cautioned that this positive relationship tends to be strongly influenced by a firm's earnings volatility.

Despite the overwhelming evidence from empirical tests conducted in developed countries, there are a number of authors whose empirical tests failed to support the dividend signalling (Farsio, Geary, and Moser, 2004).

Benartzi, Michaely and Thaler (1997) tested the ability of dividends to signal changes in earnings by observing the mean and median of changes in earnings and dividends over a 4-year period. The authors used simple regression and found that dividend changes signal past rather than future earnings of a firm.

In their paper entitled '*The Relationship between Dividends and Earnings*', Farsio, *et al.* (2004) provided a critique of studies supporting the dividend signalling hypothesis. The authors hypothesised that no significant relationship exists between earnings and dividend in the long run. Quarterly data was used for 500 firms listed on the S&P index from 1988 to 2002. The authors also employed the Dickey-Fuller test, a simple regression test, and the Granger causality test. They concluded that, in the long run, no causal relationship exists between dividends and future earnings. In fact, the authors cautioned investors to be wary of the potential to be misled by the fleeting short-term relationship between dividends and earnings

Asem and Kaul (2014) further reinforced the work of Farsio *et al.* (2004) by conducting a study on firms listed on the New York Stock Exchange, American Stock Exchange, and the NASDAQ exchange. The authors found that dividend-reducing firms, with high current earnings, experienced large earnings growth. The authors' findings are in line with Huang *et al.* (2009)'s claim that in practice, firms paying high cash dividends will experience low earnings growth.

Eniola and Akinselure (2016) examined the impact of the dividends on earnings in Nigeria, using secondary data from 2004 to 2013. Using multiple regression, the authors could not find significant evidence to conclude that changes in dividends were accountable for changes in earnings.

Feragen (2014) examined the link between dividends and earnings for 76 public listed firms operating within the Norwegian market. The authors compared lagged dividends with current earnings and could not find enough evidence in support of the dividend signalling hypothesis.

Using evidence from Nordic countries, Jaber and Krisciunas (2016) analysed the effects of dividends on earnings. They conducted a quantitative study on firms listed on the OMX Nordic all-share index over the period between 2000 and 2015. Using a sample of 586 companies, and 7021 instances of dividend changes, the authors found that changes in dividends are not reliable predictors of earnings.

3.1.2 Studies in developing countries

Using data from the Taiwanese market, Huang et al (2009) examined whether dividend payout ratios are associated with subsequent earnings. Contrary to expectations that higher dividends may lead to reduced earnings, the authors found that high payout ratios are positively correlated with earnings. Drawing on recommendations by Grullon *et al.* (2005), the authors accounted for the mean reversion of earnings and still obtained similar results. In 2010, Lee conducted a study in the Singaporean stock market to investigate whether dividends signal a firm's future earnings. The author used the financial statements of firms listed on the Singaporean stock exchange from 1990 to 2007. Employing the Johansen's vector error-correction model (VECM), the author concluded that the current dividend payout ratio does convey information regarding a firm's subsequent earnings. Specifically, the author found that firms that increased their dividend payout ratios enjoyed sustained increases in subsequent earnings.

Choi, Joo and Park (2011) tested whether the issue of linearity or non-linearity of mean reversion matter when examining the dividend signalling hypothesis. Using data from the Korean market, the authors found that when mean reversion is assumed to be linear, as

was the case with Nissim and Ziv (2001), earnings are positively and significantly related to dividend changes. Yet, when mean reversion is assumed to be non-linear, as was suggested by Grullon *et al.* (2005), dividends significantly lose their signalling power. The work of Choi *et al.* (2011) reinforces the argument consistently presented by Grullon *et al.*, (2005), Vieira (2005), and Vieira and Raposo (2007) that methodological issues could be the missing piece to the dividend signalling puzzle. If one correctly accounts for the mean reversion of earnings, dividends cease to have the signalling power to predict subsequent earnings.

Looking at the findings from Choi *et al.*'s (2011) study, one could argue that indeed models which test for the ability of dividends to signal earnings must account for the mean reversion process in a non-linear pattern. This situation could mean that controversy regarding dividend signalling is far from over as it is not only a matter of what is exactly signalled by changes in dividends but also a matter of using models which mirror the true nature of earnings.

Mbithi (2014) used data from 25 Kenyan-based firms, and fixed effect regression analysis to investigate whether dividend changes are related to future earnings growth. The author used interim financial reports from 1999 to 2012. The evidence found failed to support dividend signalling of future earnings at 5% significance level. To validate the findings, the author used questionnaires to evaluate managers' experience and views on the topic and still could not find enough evidence to support the signalling of earnings via dividends.

Abidin, Wellalage and Chowdhury (2015) explored the link between dividend policies and expected earnings in the South Korean market in comparison with the Australian, Chinese, Japanese and Singaporean markets. The authors used a fixed effect model of regression on data from 2003 to 2012. The authors found that South Korea had lower payout mean values compared to the other markets. However, across the board, the authors found that the large firms experienced lower future earnings growth. More importantly, they found that a significant positive relationship exists between dividend payout ratios and future earnings in, not only the South Korean market, but also in Australia, China, Japan, and Singapore.

3.1.3 Studies in South Africa

In 1997, Nortje examined the dividend signalling concept using South African listed firms. The author used the dividend payout ratio as the independent ratio and determined whether it was related to future changes in earnings per share. After making a comparison between dividend payout ratios in previous years and earnings per share in preceding years, Nortje (1997) concluded that changes in the dividend payout ratio are not associated with changes in earnings per share.

Nel, Hamman and Smit (2001) investigated whether changes in dividends carry signals regarding a firm's future earnings. The authors studied 278 JSE-listed firms and found no evidence to support the hypothesis that future increases in earnings are predicted by dividend changes. The authors rather found that earnings change in response to past earnings, confirming Fama and French's (2000) autocorrelation concept. Moreover, the authors found that most managers are reluctant to reduce dividends since a decrease may send negative signals regarding the future prospects of a firm.

Vermeulen (2011) extended the work of Zhou and Ruland (2006) to the South African context and found that a significant positive relationship exists between current dividend payout ratios and future earnings for South African companies as was the case for Australia and USA. Precisely, firms that increased their dividend payout ratios also recorded an increase future earnings.

Haddon (2014) examined the relationship between dividend reductions and earnings for JSE-listed companies operating from 1990 to 2012. The study used 95 dividend observations from both a dividend-decreasing and a peer sample. Using event study methodology, the author found compelling evidence to conclude that firms which decrease dividends experience a decline in subsequent earnings.

Following the methodology employed by Arnott and Asness (2003), Montgomery (2015) used South African listed firms operating from 1960 to 2014 to analyse the relationship between dividend payout and earnings. The results showed a negative relationship between dividend payout and subsequent earnings. However, when the author tested for the same relationship in the apartheid period [pre-1994] and post-apartheid period [1995-2014], a positive relationship was found in the apartheid era, while a negative relationship

was found in post-apartheid South Africa. This split between the apartheid and post-apartheid period was vital since the conditions in both periods were different. Although the split between the apartheid and the post-apartheid era is commendable, the results could have been improved if the author tested for other aspects of financial performance which could have been signalled by changes in dividends, which is the subordinate aim of this study.

3.2 SIGNALLING OF ROA

Studies on the hypothesis that dividends can carry information regarding ROA and/or ROE have consistently yielded inconclusive results. Like the dividends-earnings test discussed above, some authors have insisted on the existence of a relationship between dividend changes and ROA while some do not. To add to the controversy, it is inconclusive whether such a relationship is negative or positive. The studies discussed below highlight this lack of unanimity in the empirical literature.

3.2.1 Studies in developed countries

In 2003, famous dividend signalling gurus, Grullon, Michaely, Benartzi and Thaler (2003) teamed up and made their contribution to the dividend signalling puzzle. In their well-known paper entitled '*Dividend Changes Do Not Signal Changes in Future Profitability*', the authors found that, after controlling for the non-linear behaviour of profitability, current year dividends were negatively correlated with future ROA.

Joos and Plesko (2004) tested the dividend signalling hypothesis by investigating the predictive power of dividend increases for loss-making firms. Using data from 1970 to 2001, the authors found evidence significant enough to support the signalling power of dividend increases. In fact, every time the firms increased their dividends, there was a subsequent improvement on the losses.

Using the UK, French and Portuguese markets, Vieira and Raposo (2007) investigated whether a relationship exists between current year dividends and ROA. The authors found that dividend increases are used as a signalling tool in the UK market but not in the Portuguese and French markets.

Abrahamsen and Balchen (2010) used data from the Norwegian market to investigate

whether changes in dividends affect a firm's ROA in subsequent years. The authors used multivariate regression and tested the relationship using dividend increases, decreases, initiations and omission. Interestingly, the author found that firms with dividend initiations, and increases experienced an increase in future ROA while those with dividend cuts suffered a decline in profitability.

3.2.2 Studies in developing countries

Amidu (2007) investigated the dividend signalling hypothesis using firms listed on the Ghana Stock Exchange. After collecting data from 1997 to 2004, the author found that there is an inverse relationship between profitability and dividend payout.

Unlike most dividend signalling studies that exclude banks from their sample, Agyei and Marfo-Yiadom (2011) examined the dividend signalling hypothesis using a sample of 16 Ghanaian banks and dividend events from 1999 to 2003 The authors' primary objective was to determine whether dividends paid by banks translate into an improvement in future profitability. With the use of panel methodology, and ROE as a measure of profitability, they concluded that banks that pay dividends enjoy an increase in profitability.

Lee *et al.* (2012) used 2,396 dividend events to investigate the dividend signalling hypothesis in Malaysia using data from 1998 to 2007. The authors found that there is a poor correlation between dividend changes and future profitability, especially in the long run.

In a bid to unravel the dividend signalling puzzle in Kenya, Timothy and Peter (2012) collected data from 2002 to 2010 for firms listed on the Nairobi Securities Exchange. The authors used regression analysis to establish the relationship between dividend payout in year 0 and net profit in subsequent years. Their findings endorsed the dividend signalling hypothesis.

Ajanthan (2013) analysed the relationship between a firm's current dividend payout ratio and its subsequent net profit margin in Sri Lanka. The study focused on hotels and restaurants listed on the Colombo Stock Exchange (CSE). Using correlation analysis, the authors found that 52.6% changes in future profitability were explained by changes in dividend payout.

In the same vein, Priya and Nimalathasan (2013) studied whether a relationship exists between dividends and future ROA, ROE, and ROI. The study used data collected from selected hotels and restaurants operating in Sri Lanka. Data was collected from 2008 to 2012. The authors concluded that dividend policy ratios have a significant impact on all firm performance ratios with the exception of ROI.

Contrary to the studies which found conclusive evidence in support of the information content of dividends, Demontis (2013) used 812 dividend events from 2005 to 2012 in the Scandinavian market and found no relationship between dividend changes and future profitability. Al-Amarneh and Yaseen (2014) extended the same study to Jordan using 47 industrial companies trading on the Amman Stock Exchange (ASE) from 2005 to 2011. Unlike the case with Demontis (2013), the results were supportive of the dividend signalling on profitability.

Thafani and Abdullah (2014) investigated whether a firm's dividend policy has an effect on its subsequent ROE, ROA, and Earnings per share (EPS). The authors used a sample of 21 manufacturing companies listed on the Colombo Stock Exchange from 2007 to 2011. The results showed a positive significant relationship between dividends and future profitability.

Using capitalised dividends, and data from the Nigerian market, Ebiringa, Okoroegbe and Obi (2014) conducted an investigation to determine whether dividend policy determines future profitability. The authors used the vector autoregressive (VAR) model to analyse short and long-term relationships between the dividends and profit. The findings showed that capitalised dividends are significantly and positively related to profitability. These results were consistent for both the short and long-run.

Moscu, Grigorescu and Prodan (2014) investigated the effect of dividend changes on future profitability measured by ROA and ROE. The authors used data from the financial statements of 55 firms listed on the Bucharest Stock Exchange. The authors found enough evidence to support the information content of dividends.

Velnampy, Nimalthasan and Kalaiarasi (2014) used data from manufacturing firms listed on the Colombo Stock Exchange for the period 2008 to 2012. The authors used ROA and

ROE as determinants of future profitability while dividend payout was used as a proxy for dividend policy. Using regression analysis, the authors could not find enough evidence in support of dividend signalling.

More recent evidence from Enekwe, Nweze and Agu (2015) seems to endorse the common view that dividends are positively and significantly related to profitability. The authors used data from the Nigerian Stock Exchange and regression analysis to investigate the effect of dividend policy on Return on Capital Employed (ROCE), ROA, and ROE. Enekwe *et al.*'s (2015) use of various measures of profitability is commendable as it showcases the influence of dividend policy on various profitability measures.

In Turkey, Kadioglu and Ocal (2016) investigated the relationship between changes in dividends and future profitability. The authors used panel data regression on a data set comprising 1,239 dividend observations from 123 companies listed on the Istanbul Stock Exchange during the period 2004-2014. Unlike most authors, the authors were unable to demonstrate that changes in dividends are related to changes in profitability.

3.2.3 Studies in South Africa

Most of the South African studies that examined the relationship between dividends and profitability failed to make the distinction between the dividends-earnings and the dividend-ROA and/or ROE tests, as Pandey (2015) suggested. Instead, the authors interchangeably used both earnings and ROA as profitability measures. This includes authors such as Wolff and Auret (2009), Vermeulen (2011), Vermeulen and Smit (2013), and Montgomery (2015). However, this study differentiates between earnings and ROA, following Pandey's (2015) suggestion that earnings and ROA do not necessarily measure the same aspect of firm performance.

3.3 SIGNALLING OF LIQUIDITY

John and Williams' (1985) most important contribution to the dividend signalling literature has been the assertion that in a signalling equilibrium, firms expecting large cash flows tend to pay high dividends. Despite being theoretically sound, this hypothesis has not been as extensively tested as the dividend-profitability tests discussed in the earlier sections of this chapter.

In 1990, Kale and Noe reinforced the work of John and Williams (1985) by suggesting that dividends are a signal of the stability of a firm's future cash flows. According to the authors, it is only firms that are confident about their cash flows that can use dividends as a signalling tool. To test this hypothesis, Thanatawee (2011) investigated whether a relationship exists between dividend policy and future cash reserves in Thailand. Using data from 2000 to 2008, and employing the Pearson correlation matrix, the author found that firms increased dividends when there was an expected increase in liquidity.

Bijia (2013) examined the relationship between dividends and current assets in Hong Kong. The author's objective was to determine whether dividends convey information about future liquidity in Hong Kong. It was found that firms which increased dividends reported a notable increase in the volume of current assets. The conclusion was that dividends are positively correlated with future liquidity.

Kauko (2012) developed a model which showed that dividends are an important source of information regarding future liquidity in the banking sector. The author found that depositors are very sensitive to changes in liquidity. This sensitivity is almost offset by the managers' need to calm the information-sensitive investors. During periods of uncertainty, managers end up using dividends to inform the investors about the bank's positive prospects.

Forti and Schiozer (2015) argued that dividends can be used for more than just signalling, especially in the banking sector. Using data obtained from Brazilian banks, the authors proposed extending the dividend signalling concept to the signalling of asset quality. According to the authors, dividends can be used to send information regarding the bank's asset quality. Their major observation was that during the periods of financial distress, many Brazilian banks increased dividends. The authors alluded this to the signalling of asset quality. The overall finding was that banks increase dividends to signal an improvement in liquidity to information-sensitive depositors.

To date, studies exploring the information content of dividends have been limited to the ability of dividends to signal changes in either earnings or ROA. In fact, very little is known about the dividend signalling of liquidity, especially in developing markets like South Africa. By extending the dividend signalling hypothesis to liquidity, this study makes a vital

contribution to finance literature.

3.4 SIGNALLING OF GEARING

A handful of researchers in developed markets suggested extending the dividend signalling hypothesis to gearing. Precisely, the researchers put forth a claim that dividends can be used to carry signals regarding expected debt and equity (Galai and Wiener, 2013). In a bid to test if this notion, Geske and Delianedi (2001) used a sample of firms in the US from 1991 to 1998. The authors found that dividends had little or no significant impact on future debt levels.

Aivazian *et al.* (2003) examined the relationship between dividend policy and the debt to equity ratio. The authors used two comparative samples. The first sample consisted of firms from eight emerging bank-oriented markets. The second sample was made of American-based banks. The authors concluded that a negative relationship exists between dividends and debt.

Vieira (2005) used five different dependent variables, including the debt to equity ratio to test the dividend signalling hypothesis in the UK, Portuguese and French markets. Using lagged dividend payout ratios, panel data, and the Fixed Effects model (FEM), the author found conflicting results in the three markets. Results from the Portuguese sample showed a negative relationship between dividends and debt. On the other hand, the French market showed a positive relationship, statistically significant at 10%. The UK sample showed results similar to the Portuguese market with the Dividend Increase-Earnings Increase (DIEI) panel showing a negative coefficient statistically significant at 1%. However, the Dividend Increase-Earnings Decrease (DIED) and Dividend Decrease-Earnings Increase (DDEI) panels showed a positive coefficient statistically significant at 1%, which indicates a strong correlation between dividend increases and increases in debt. The above results are conflicting, which is an indication that more research needs to be carried out on the topic.

Using the Merton's model, Galai and Wiener (2013) showed that a firm's dividend policy impacts the values of debt and equity. During that same year, Bijia (2013) used data from Hong Kong to evaluate whether dividend increases led to changes in financial leverage. The author found that instead of causing decreases in leverage, firms which increased

dividends experienced an increase in financial leverage from 37% to 45%.

A closer look at the small number of studies carried out on dividend signalling of future gearing indicates how there still is work to be done to solve the dividend puzzle. This is especially true in the South African context, considering the glaring absence of empirical evidence that test whether dividend changes could possible carry information regarding the gearing of a firm.

3.5 SIGNALLING OF VARIOUS ASPECTS OF FINANCIAL PERFORMANCE

Recently, the question of whether the dividend signalling hypothesis should be limited to one measure of financial performance or not has become a subject for debate in finance circles (Vieira, 2005). This emanates from Brigham and Houston's (1995) assertive remark that the dividend policy adopted by a firm is a crucial determinant of its overall financial performance. Indeed, it the link between dividend policy and overall financial performance that prompted authors such as Vieira (2005), Vieira and Raposo (2007), Bijia (2013), and Enekwe *et al.* (2015) to investigate the dividend signalling hypothesis using different measures of financial performance. The intention of these authors was to determine the exact financial performance measure signalled when managers change the dividend policy.

Vieira (2005) and Vieira and Raposo (2007) examined the relationship between dividend and profitability measures such as ROA and ROE. The authors extended the same signalling hypothesis to earnings growth, gearing, measured by the debt-to-equity ratio, liquidity, measured by the current ratio, and net cash flow movements. By incorporating these various measures of financial performance, the authors were able to extensively prove that even though dividends do not carry signals regarding earnings and ROA, they do reveal some information regarding liquidity and debt. Based on these results, it seems if one extends the dividend signalling hypothesis to various measures of financial performance, the dividend puzzle might eventually be solved.

Moscu *et al.* (2014) extended Vieira's (2005) study to the Bucharest market with slight variations in the variables of financial performance. The author sought to determine whether there is a correlation between the dividend policy of a firm and its future corporate performance. Data such as ROA, ROE, Tobin Q, market to book ratio, free cash flow (FCF) was collected for 55 firms listed on the Bucharest Stock Exchange from 2010 to 2013. The

author found that dividends carried positive signals regarding a firm's profitability and liquidity.

Similarly, Bijia (2013) examined whether managers could use dividends to signal changes in future profitability, gearing, and liquidity. The author used ROA as a measure of profitability while the debt to equity and the current ratio were used as measures of gearing and liquidity respectively. The author found that lower dividend payout ratios were associated with lower cash levels, evidenced by lower current ratios in the years preceding dividend announcements. Moreover, decreases in dividend payout ratios were associated with high gearing levels, reflected by an increase in the debt to equity ratio. Furthermore, firms that increased their dividend levels experienced there a decline in ROA.

Based on the different results obtained from the above key studies, it becomes clear that using one measure of financial performance is not a complete reflection of the information content of dividends. It seems the only way to resolve this is to ensure that various ratios are examined in relation to dividend signalling. From there, appropriate conclusions can be drawn.

3.6 CONCLUSION

The discussion in earlier sections of this chapter showed studies undertaken to explore the information content of dividends in developed and developing countries like South Africa. The studies were grouped according to the financial performance measure associated with dividends as per the set objectives of this study. Interestingly, there was no solid consensus on the aspect of financial performance that managers try to send to the market when they change their dividend policy.

Although all the reviewed studies are relevant to this study and form a good basis in support of the signalling hypothesis, attention is paid to the ground breaking work of Vieira (2005). The author is one of the most cited authors who successfully examined the dividend signalling hypothesis using a hybrid measure of financial performance including profitability, liquidity, and gearing measures. This study draws on the work of Vieira (2005), and incorporates various aspects of financial performance to investigate the dividend signalling hypothesis. Moreover, this study makes use of a combination of panel methodology

recommended by Gujarati (2008) and the non-linear model of earnings expectation proposed by Fama and French (2002) and endorsed by Grullon *et al.* (2005), Vieira (2005), Vieira and Raposo (2007), and Guo (2014). This study seeks to employ such methodology as it extends the dividend signalling hypothesis to the South African context in the post-apartheid period. A detailed discussion of methodological issues is given in the next chapter.

CHAPTER 4
4 RESEARCH METHODOLOGY

4.1 INTRODUCTION

The first chapter of this study provided a background to the study. This enabled the mapping of the statement of the problem, objectives, and hypotheses of the study. This chapter outlines the steps and procedure which the researcher took to achieve the objectives of the study. These steps and procedures are referred to as the research methodology.

According to Leedy and Ormrod (2010), research methodology is the overall approach adopted by a researcher in conducting a research project. Babbie and Mouton (2010) emphasised that the aim of research methodology is to explain the individual steps taken in the research process in order to achieve the set research objectives. In this regard, this chapter starts by providing a comprehensive description of the research paradigm and research design this research fits into. The rest of the chapter looks at the research approach, population and sampling techniques, and the methods used to collect, analyse, and present data.

4.2 RESEARCH PARADIGM

Thomas (2010) defined research paradigm as a set of beliefs, values, and assumptions that researchers abide by when carrying out research. According to Scotland (2012), there are four main types of research paradigms, namely positivism, interpretivism, post-positivism, and critical theory. Guba and Lincoln (1994) defined positivists as researchers who believe in the existence of a certain reality. In addition, Vosloo (2014) observed that positivists rely on gathering factual knowledge through observations and measurement, and not through subjective understandings and deductions. Moreover, they [positivists] follow the notion that research is a cumulative process, where new knowledge is gathered via experiments leading to the elimination of incorrect hypothesis (Burrell and Morgan, 2017).

On the contrary, interpretivists accept that there are many different ways of interpreting the world and undertaking research. Furthermore, they assume that no single point of view can ever give the entire picture as there may be multiple realities (Williamson and Whittaker,

2014).

Adam (2014:5) defined post-positivism as a “cautious” extension of positivism. In an attempt to differentiate post-positivism from positivism, Adam (2014) highlighted that post-positivists conduct research under the assumption that although a certain reality exists, it cannot be determined with utmost precision.

In a paper entitled ‘*Critical Theory’*, Fuchs (2015) gave an elaborate explanation of critical based research. According to the author, research based on critical theory is a more subjective type of research, conducted under the assumption that a relationship exists between the researcher and the researched variable, thus making the outcome of the research subjective to this relationship (Fuchs, 2015).

Johnson and Duberley (2000) made a perfect summative remark regarding research paradigms. According to the authors, while the aim of positivist and post-positivist research is to predict or explain relationships between variables, interpretivism and critical theory research aims to understand the surrounding world of individuals.

4.2.1 Positivism

According to Keat (2013), positivism is a deductive research culture, where the role of the researcher is restricted to the collection, analysis, and interpretation of data in order to get quantifiable results (Henning *et al.*, 2004). Commenting on the work of Henning *et al.* (2004), Thomas (2010) wrote that for positivist researchers maintain a certain level of independence when carrying out their research. In this regard, a study which uses scientific methods, is quantifiable, objective, and relies on empirical means to understand relationships is positivistic in nature.

The issue at the core of this study is to test whether dividend can be used to send important information to different users of financial information. To test this theory, the author objectively collected data and used scientific methods to get quantifiable results. In this regard, this study falls into the category of positivist research.

4.3 RESEARCH DESIGN

Creswell (2014) defined research design as a framework which outlines the setting,

approach, sampling criteria, data collection procedures, and data analysis of a study. Commenting on the selection of an appropriate research design, Vosloo (2014) emphasised that the design of a study is determined by its problem statement and objectives. Yin (1989) elaborated that one cannot determine the design of a study without a clear understanding of the problem and questions that the study intends to answer. In fact, according to Yin (1989), the research design of a study is not a mere outline of the research methods adopted, as commonly assumed. Instead, it is the logical structure of a study. Moreover, Yin (1989) argued that it is folly to equate research design to quantitative or qualitative research. This is because the classification of research into quantitative or qualitative groups merely refers to decisions regarding the nature of data collected, the means with which that data is analysed, and the manner in which the data is presented (Yin, 1989). On the contrary, research design determines and informs the decision whether the research is quantitative or qualitative in nature (Yin, 1989).

According to Picardi and Masick (2013), a study can fall into two main research designs, namely experimental and non-experimental. Experimental research looks at issues of causality (Imai, Tingley and Yamamoto, 2012). On the other hand, non-experimental research seeks to establish relationships between variables. Imai *et al.* (2012) elaborated further that in non-experimental research, the researcher cannot manipulate the data used or the research process (Yin, 1989). Non-experimental designs can be further categorised into descriptive designs, surveys, correlational designs, and case studies.

Royse (2011) defined descriptive studies as studies carried out to acquire information about an existing phenomenon. An example of a descriptive study is a study whose objective is to obtain information about the spending habits of low-income South Africans (Royse, 2011).

Commenting further on non-experimental research designs, Babbie (1990) defined surveys as studies carried out to acquire information from certain reports. Babbie (1990) cautioned that researchers who carry out a survey need to develop sound data collection habit. This is because the extent and quality of information received from surveys depend on the questions asked by the researcher (Babbie, 1990).

Salkind (2012) defined correlational research as research which looks at relationships between variables. The author, however, made a distinction between correlational and causal studies. While correlational studies merely investigate associations between two or more variables, causal studies investigate cause-and-effect associations between the variables. The author further made a distinction between retrospective and prospective correlational studies. He defined retrospective correlational studies as studies that look at how the present dependent variable relates to a past independent variable. On the other hand, prospective correlational research looks at how a current independent variable relates to a future dependent variable.

Johnson and Christensen (2016) reinforced the work of Salkind (2012) and argued that it is vital to differentiate between correlational and cause and effect studies. According to the authors, a mere positive relationship between variables A and B variables is not indicative of a causal relationship between them. Johnson and Christensen (2016) further pointed out that it would be folly to assume that if A is related to B, there is a presumed cause and effect relationship. This is especially true since correlational studies fall under non-experimental designs while cause and effect studies are experimental in nature (Johnson and Christensen, 2016).

Lastly, Yin (1984) defined case studies as studies which describe, explain, or explore associations between phenomena using thorough contextual analysis. According to the author, case studies are usually carried out on a small sample or confined to a smaller geographic setting. However, Zainal (2007), cautioned that although case studies may explore and explain relationships just like correlational studies, their findings cannot be generalised due to their smaller sample sizes.

This study falls into the broad category of non-experimental designs since the objective of the study is to determine relationships between variables without manipulating the circumstances in post-apartheid South Africa, the sample, variables or the outcome. Moreover, this is a prospective correlational and longitudinal study examining the relationship between dividends and measures of future financial performance for different firms operating in post-apartheid South Africa from 1995 to 2016.

4.4 RESEARCH APPROACH

The research approach of a study is the manner in which a researcher answers the research question (Creswell, 2014). According to Saunders, Lewis and Thornhill (2012), there are two main types of research approaches, namely deductive and inductive approaches. Precisely, a study is deductive when there is a formulated hypothesis which needs to either be confirmed or rejected during the research process (Saunders *et al.*, 2012). On the other hand, a study is inductive if the research problem is answered by some formulated research questions, leading to the development of new theories and generalisations (Saunders *et al.*, 2012). Mbala (2016) noted that positivist studies usually adopt a deductive research approach. Following this discussion, it is apparent that the methodological approach taken in this study is deductive since the study tests an existing dividend signalling hypothesis.

4.5 RESEARCH METHOD

According to MacDonald and Headlam (2011), the research methods of a study are the techniques used to conduct the research such as data collection techniques, data measurement techniques, data analysis techniques, and the scope of the study. There are two main types of research methods, namely quantitative methods and qualitative methods. The third type is a hybrid of both quantitative and qualitative methods (Bryman and Bell, 2015). Studies which use quantitative methods gather data which is numerical in nature while qualitative driven studies gather data in narrative form (Bryman and Bell, 2015). Creswell (2014) made a compelling argument that the selection of either the quantitative or qualitative method is not a choice that a researcher has to make. However, this decision is predetermined by the paradigm and research design that the research fits into (Creswell, 2014).

This study used quantitative methods to gather and compile pre-existing, secondary data from 1995 to 2016 for firms listed on the JSE. The type of the data gathered was determined by the research hypotheses set for this question. Moreover, quantitative data analysis tools, discussed in detail later in this chapter, were employed to analyse the data in order to make conclusions about the dividend signalling hypothesis.

4.6 RESEARCH POPULATION AND SAMPLE

4.6.1 Target Population

Burns and Grove (1993) defined a population as a list of all elements, individuals, objects, and events that meet the criteria for inclusion in a study. In this study, the population consisted of all non-financial, South African listed firms, whose financial information was available on INET-BFA from 1995 to 2016, and consistently paid dividends since 1995. The study excluded financial firms from the population because of the different categorisation rules that govern financial firms. This decision is consistent with other studies carried out in both developed and developing markets. This resulted in a target population of 39 firms and 819 dividend observations. Appendices A and B show the population before after applying the criteria discussed above.

4.6.2 Sample Selection

According to Bryman and Bell (2015), the primary objective of sampling is to get a sample as close to the population as possible. This improves results and makes inferences to the population valid (Bryman and Bell, 2015). The authors emphasised that it is important for researchers to focus on the specific techniques which result in representative samples (Bryman and Bell, 2015). In fact, Etikan and Bala (2017) observed that most quantitative studies tend to use probability sampling techniques to improve the quality of their samples.

Probability sampling is a technique in which each element in a population has a specifiable chance of being selected (Etikan and Bala, 2017). The motivation behind using probability sampling is to create a sample that represents the population as close as possible (Barreiro and Albandoz, 2001)

Johnson and Christensen (2016) identified four main types of probability sampling techniques, namely random sampling, systematic sampling stratified sampling, and cluster sampling. They defined random sampling techniques as a process through which a sample is selected with all elements having the same probability of being selected However, Agarwal (2006), differentiated between random sampling with replacement and random sampling without replacement. According to the author, when a certain element has got several chances of being selected, it can be said that the element was selected using random sampling with replacement (Agarwal, 2006). In the event that the element can only be selected once, it can be said that the element was selected through random sampling without replacement (Thompson, 2012).

Barreiro and Albandoz (2001) defined systematic sampling as an extension of random sampling, where elements are randomly selected based on a pre-set interval. In a follow-up comment, Agarwal (2006) stressed the importance of the sampling interval as it has an effect on the size of a sample. In fact, for systematic sampling to be effective, elements in the sampling frame must be randomly ordered and the first element must be determined randomly (Agarwal, 2006)

Thompson (2012) defined stratified sampling as a sampling technique that ensures the representativeness of all the elements of a population. Johnson and Christensen (2016) recommended the use of stratified sampling in cases where one needs to infer to the general population since it [stratified sampling] tends to produce samples which are more representative of the population than simple random sampling. This is because stratified sampling techniques give each element an equal chance of being selected (Johnson and Christensen, 2016).

The final form of probability sampling techniques is cluster sampling (Thompson, 2012). Thompson (2012) defined cluster sampling as a technique where clusters of participants that represent the population are identified and included in the sample based on aspects such as geographic location, size or industry type.

In a commentary regarding population, sample size, and inference, Agarwal (2006) noted that sample size matter, especially if ones needs to make the correct inferences to the general population. Precisely, studies with a small population require larger samples while small samples can work for large populations (Agarwal, 2006). In the same vein, Tabachnick and Fidell (2001) noted that a researcher using regression analysis needs to determine an adequate sample size as it [size] tends to have an effect on the goodness of the model. To avoid having misleading results, the author included all 44 firms in the sample as the population had a small number of firms.

4.7 DATA COLLECTION

To answer a research question, a researcher can either collect primary or secondary data (Agarwal, 2006). According to Brief (2012), primary data is data that is collected from the main source of information by means such as interviews or discussions. In most cases,

such data is collected for a specific purpose (Brief, 2012). In contrast, secondary data is data that collected from sources such as financial reports and statements. Unlike primary data, this type of data is used by different stakeholders for various purposes such as publication, academic research, and reporting purposes (Goodwin, 2012).

According to Thompson (2012), data collected for research purposes can be further grouped into two main groups, namely qualitative or quantitative data. The author emphasised that the distinction between quantitative and qualitative data is in the type of information collected, the questions that the data is meant to answer, and the methods used to analyse it. Precisely, quantitative data is data which can be analysed numerically and yields results which are normally presented using statistics, tables and graphs. On the contrary, qualitative data often comprises recorded observations and explanations which reveal attitudes, perceptions, and intentions (Thompson, 2012).

4.7.1 Sources of data

Secondary data was collected through the INET-BFA database and downloaded as an excel file. This data was in the form of quantitative financial ratios from financial statements published for different stakeholders. Data collected ranged from 1995 to 2016.

4.7.2 Data collected

The data collected was in line with the objectives and hypotheses set for this study. As discussed in chapter 1, this study sought to answer 4 specific objectives translated into 4 different hypotheses. Firstly, the relationship between changes in dividends and changes in expected earnings was investigated based on the hypothesis below:

H0 (a): Increases or decreases in the current level of dividends are not associated with increases or decreases in future earnings.
H1 (a): Increases or decreases in the current level of dividends are associated with increases in future earnings.

The study also sought to determine if dividends can send information regarding expected changes in ROA, as shown by the hypothesis below:

H0 (b): Increases or decreases in the current level of dividends are not associated with

increases or decreases in a firm's future ROA.
H1 (b): Increases or decreases in the current level of dividends are associated with increases or decreases in a firm's future ROA.

This study extended the dividend signalling hypothesis to the signalling of liquidity as follows:

H0 (c): Increases or decreases in the current level of dividends are not associated with increases or decreases in a firm's future CR.
H1 (c): Increases or decreases in the current level of dividends are associated with increases or decreases in a firm's future CR.

This hypothesis was set based on Bhattacharya (1979) and John and Williams' (1985) theory that firms increase dividends when there is an expected increase in cash levels. The results of this study are expected to be in line with this theory.

Finally, based on arguments and empirical evidence from authors such as Grullon *et al.* (2002), Aivazian *et al.* (2003), Galai and Wiener (2013) and Bijia (2013), the dividend signalling concept was extended to the possible signalling of gearing as follows:

H0 (d): Increases or decreases in the current level of dividends are not associated with decreases or increases in a firm's future DER.

H1 (d): Increases or decreases in the current level of dividends are associated with decreases or increases in a firm's future DER.

The hypothesis was modelled to show an inverse relationship between changes in dividends and subsequent gearing levels.

4.7.2.1 Dividends

The overall objective of this study is to determine whether a relationship exists between dividends and future financial performance. To achieve this objective, the main independent variable which was collected was the proxy for dividend policy. According to Maio and Santa-Clara (2015), dividends paid by a firm are generally measured using two measures, namely the dividend yield and the dividend payout ratio. Dividend yield relates the dividend

paid by a firm to its share price, calculated as annual dividends per each share, scaled by the share price (Maio and Santa-Clara, 2015). Maio and Santa-Clara (2015) pointed out that a firm's dividend yield is important to shareholders since it indicates the dividends paid relative to the share price.

There is also prominent literature on the use of the dividend payout ratio as an alternative measure of dividend policy. While the dividend yield relates dividends paid to the share, the payout ratio relates dividends paid to the earnings of a firm (Hellstrom and Inagambaev, 2012). In support of using the payout ratio, Hasan *et al.*, (2015) argued that the dividend payout ratio of a firm is the most important dividend measure as it can be adapted in a number of various settings. According to the authors, the payout ratio is used by many firms as a way of estimating and valuing dividends in future periods. Moreover, it enables firms to determine their retention ratio, which is useful in estimating future growth in earnings (Moyer, McGuigan and Rao, 2014). M'rabet and Boujjat (2016) validated this with the argument that firms with high retention ratios, hence low payout ratios, generally have higher growth rates in earnings than firms with lower retention ratios. Finally, the authors argued that the dividend payout ratio tends to follow the life cycle of a firm, starting extremely low when the firm is in a high growth phase, gradually increasing as the firm reaches its maturity phase and its growth prospects decrease (M'rabet and Boujjat, 2016).

Based on the merits of the dividend payout ratio discussed above, this study used dividend payout ratios to determine whether changes in the variable are related to changes in future financial performance. Specifically, the dividend payout ratio was calculated for all firms as dividends per share scaled by earnings per share (Baker and Kapoor, 2015). Using the payout ratio enabled this study to be comparable in methodology with studies by authors like Arnott and Asness (2003), Murekefu and Ouma (2012), Njonge (2014), and Montgomery (2015).

4.7.2.2 Earnings

Following an argument by Lintner (1956) that managers increase dividends when they are convinced of a permanent increase in earnings, this study examined the relationship between changes in a firm's dividend payout ratio and changes in earnings. The study followed the methodology by Nissim and Ziv (2001) and Grullon et al (2005) and used raw

earnings for the year as a dependent variable. However, since this study was set in the South African context whereby listed companies are required to calculate headline earnings, headline earnings were collected for each firm in the sample.

4.7.2.3 ROA

The researcher also considered alternative measures of profitability following arguments by Lee (2010a), Lee (2010b), Lukose and Rao (2010), and Lee *et al.* (2012) that the dividend signalling hypothesis should not be limited to earnings only, but must be extended to other aspects of profitability such as ROA or ROE. In fact, according to Grullon *et al.* (2005), since the dividend signalling theory does not precisely indicate the performance metric which should be used when testing the theory, an alternative measure of profitability extensively used by many authors is ROA (Grullon *et al.*, 2005). Indeed, simulations by Petersen, Schoeman and Tau (2008) validated the preference of ROA and ROE as profitability measures in dividend signalling tests.

On the basis of the preceding evidence, this study used ROA as an additional measure of profitability. For the purpose of this study, ROA was consistently calculated for all firms in the sample as earnings for the year scaled by the book value of total assets (Gitman and Zutter, 2011).

4.7.2.4 Liquidity

Viswanath, Kim and Pandit (2002) used a commitment model and put forward a claim that since dividends are paid from cash reserves, a mere commitment to pay dividends constitutes a positive signal regarding the expected liquidity levels of the firm. The authors' reinforced Bhattacharya's (1979) argument that cash dividends signal a firm's future cash flow. In order to determine whether firms use dividends to signal future liquidity, the author collected the current ratio as a measure of liquidity for all firms in the sample, a methodology also adopted by authors such as Thanatawee (2011), Bijia (2013), and Kauko (2012). The current ratio was consistently calculated as the ratio between current assets and current liabilities for all firms (Gitman and Zutter, 2011).

4.7.2.5 Gearing

Dividends have been linked with gearing by authors like Aivazian *et al.* (2003), Vieira (2005),

and Bijia (2013). According to these authors, firms only pay liberal dividends once there is absolute certainty that their debts will decrease. Bijia (2013) attributes this to the fact that low debts translate to low interest payments, which frees funds for the payment of dividends. The debt to equity ratio was calculated according to the procedure used by Vieira (2005). The variable was uniformly determined as total debt scaled by the total book value of equity.

4.7.2.6 Control Variables

According to Manneh (2014), one of the major factors that influence the financial performance of a firm is its size. Large companies tend to perform better than their smaller counterparts (Al-Shubiri, 2011). In fact, research by Papadognas (2007) and Lee (2009) corroborated this argument. Based on this argument, the author included corporate size as one of the control variables of the study.

Commenting on the determination of an appropriate proxy for size, Chipeta (2012) noted that empirical work on dividend signalling has used numerous reliable proxies for size. These include variables like the natural logarithm of sales, net fixed assets, and total assets. In a bid to determine the most appropriate proxy for size, Al-Khazali and Zoubi (2005) conducted a study to using the natural logarithm of capital employed, total assets and market capitalisation. The authors found that there were no major differences in the three proxies as they all generated similar results.

Based on findings by Al-Khazali and Zoubi (2005), and methodology by Manneh (2014), the natural logarithm of total assets was used as a proxy for firm size. Commenting on logarithms, Osborne (2002) argued that logarithm transformation is one of the most important transformations in quantitative studies. According to the author, logarithm transformation stabilises data by removing extreme values that tend to regress to the mean and affect the outcome of a study.

A number of empirical studies carried out to investigate the relationship between firm size and profitability have shown a positive relationship. For instance, studies by authors such as Vijayakumar and Tamizhselvan (2010) and Akbas and Karaduman (2012) showed a significant and positive relationship between profits and size. However, studies by Yi and Tzu (2005), Velnampy and Nimalathasan (2010), and Velnampy (2013) showed no

relationship at all. To add to the puzzle, Becker-Blease *et al.* (2010) and Banchuenvijit (2012) found negative, yet significant results while Burson (2007) found negative, yet insignificant results. Based on these empirical results, it seems there is a need for further research on the size-profitability test. Taking into consideration the number of studies that found size and profitability to be positively related, there is an expectation that size could relate to profitability positively in the South African market.

A number of tests have also been carried out to determine if size affects liquidity. Unlike the size-profitability test discussed above, the link between size and liquidity has provided consistent results. Most studies showing a positive association between the two variables. Studies by Audretsch and Elston (2002), Soumaya (2012), Dogan (2013), and Jafari, Gord and Beerhouse (2014) have positively linked firm size and liquidity. This forms the basis of the expectation from this study.

Moreover, most empirical studies have demonstrated that there is a positive relationship between firm size and gearing. For instance, authors like Abdussalam (2006), Li (2011), Mahfoudh (2013), Mwangi (2014), and Njoroge (2014) found that large firms tend to be highly geared. However, Marete, (2015) found the relationship to be negative and significant. Marete (2015) based her argument on the fact that large firms tend to get high equity capital which reduces the need to borrow. Moreover, large firms tend to have lower risk profiles than smaller firms, especially in South Africa (Mgudlwa, 2009). This results in smaller firms relying heavily on debt funding than larger firms (Mgudlwa, 2009). Based on this argument, the general expectation throughout this study is that size is negatively correlated with debt.

Another variable that was included in the study based on recommendations by Uwuigbe et al. (2012), Vermeulen and Smit (2013), Manneh (2014), Abidin et al. (2015), and Anton (2016) is growth. According to Chipeta (2012), the most common and reliable proxy for a firm's growth prospects is the market to book value of equity. Following this recommendation, this study used the market to book value of equity as a proxy for firm growth.

There is still some considerable ambiguity regarding the exact nature of the relationship between growth and financial performance (Yoo and Kim, 2015). According to Vermeulen

(2011), a firm's level of growth can influence its financial performance. For instance, firms with the prospect of future growth tend to invest more and outperform their counterparts financially (Manneh, 2014). Yet, Yoo and Kim (2015) who argued that performance-driven firms tend to experience low growth prospects refuted this theory. Yoo and Kim's (2015) results are based on a theory by Marris (1964) and Penrose (1995) who argued that financing growth tends to compromise profitability. This theory was empirically supported by Lee (2014), Jang and Park (2011), and Nakano and Kim (2011) who found a negative relationship between growth and profitability. In as much as there are conflicting viewpoints, empirical evidence seems to support an inverse relationship. This informs the expectation of this study.

Moreover, growth is expected to be negatively related to the current ratio, which is a measure of liquidity. This is based on evidence from Li (2002), Behr (2003), Batten and MacKay (2013), and Pandey (2015).

There is a general lack of consensus in the empirical literature regarding the relationship between growth opportunities and debt levels. Jafari (2004) found a negative relationship between growth and debt. However, Mahmodi and Khaneghah (2013) established that growth and gearing are positively and significantly linked. Fama and French (2002) who argued that when firms have low growth opportunities, they tend to have low debt levels corroborated this. However, when they have high growth prospects, they borrow more. However, Fama and French (2002) strongly argued that even though the relationship is positive, its nature is non-linear. This study expects growth to be positively related to gearing levels. The issues of non-linearity are beyond the scope of this study.

Based on the discussion above, Table 2 below summarises the expected findings from this study.

Table 2: Variables and their expected effect on Earnings, ROA, CR and DER

Test	Dependent Variable	Independent/Control Variable	Expected Outcome

Dividend signalling of Earnings	E_{it} (Headline Earnings per share)	E_{it-1} (lagged earnings)	Negative relationship
		PDFED (dummy for mean reversion)	Negative relationship
		SIZE (log of assets)	Positive
		GROWTH (market-to-book-value of Equity)	Negative
Dividend signalling of ROA	ROA (Return on Assets	DPR	No significant relationship
		ROA_{it-1} (lagged ROA)	Negative relationship
		PDFED (dummy for mean reversion)	Negative relationship
		SIZE (log of assets)	Positive
		GROWTH (market-to-book-value of Equity)	Negative
Dividend signalling of CR	CR (Current Ratio)	DPR	Positive significant relationship
		CR_{it-1} (lagged CR)	Negative relationship
		SIZE (log of assets)	Positive
		GROWTH (market-to-book-value of Equity)	Negative
Dividend signalling of DER	DER (Debt to Equity Ratio)	DPR	Negative significant relationship
		CR_{it-1} (lagged CR)	Negative relationship
		SIZE (log of assets)	Negative
		GROWTH (market-to-book-value of Equity)	Positive

4.8 DATA COLLECTION PROCEDURES

As discussed in section 4.7.1, the INET-BFA database was used to collect the data required for this study. The database has published financial statements and ratios for all firms listed on the JSE.

According to Gadoiu (2014), one of the major shortfalls of financial ratios is the lack of uniformity in calculating them. Although the ratios such as the current ratio, debt to equity ratio, and ROA were readily calculated, the researcher confirmed if they were calculated uniformly. To do so, the researcher recalculated all financial ratios using the methods discussed earlier in this chapter. The relevant data was downloaded from INET-BFA into an excel file. Once the data was collected, the researcher conducted checks for data reliability and validity.

4.9 DATA RELIABILITY

Polit and Hungler (1993) defined reliability as the degree of consistency with which an instrument measures the attribute it is designed to measure. In addition, the authors noted that data collector bias and inconsistent measuring instruments mainly affect reliability in research.

Data collector bias occurs when the data used in the study either is preferred by different data collectors or is manipulated in one way or the other (Polit and Hungler, 1993). To eliminate the threat of data collector bias, the researcher was the only person who collected the data. Data integrity and consistency was maintained by ensuring that the data used was from standardised and published financial statements. The researcher also made sure that all ratios were calculated using the same conventional formulas explained in section 4.7.2.

4.10 DATA VALIDITY

According to Cook and Campbell (1979), the main issue affecting quantitative research is the issue of validity. Validity is the strength of the findings, inferences and conclusions of a study (Cook and Campbell, 1979). Although validity issues can be internal or external, the overall validity of a study is influenced by different factors, hence, it needs to be evaluated from various perspectives (Cook and Campbell, 1979).

4.10.1 Internal validity

Polit and Hungler (1993) defined internal validity as the extent to which the observed effects of a dependent variable are caused by the independent variable and not by peripheral variables. Campbell and Stanley (1963) identified extraneous variables, history effects, selection bias, and regression analysis as the four main threats to internal validity in a

correlational study.

4.10.1.1 Extraneous variables

Peck, Olsen and Devore (2012) defined extraneous variables as variables that contest with the independent variable(s) in explaining the result of a study. To curb the threat of extraneous variables, the researcher reviewed other studies on dividend signalling to determine if there were any variables, other than dividends, which influence financial performance. In the event that there were extraneous variables, Bevins (1999) recommended controlling for these variables in the estimation equation. A review of studies by Uwuigbe *et al.* (2012), Vermeulen and Smit (2013), Manneh (2014), Abidin *et al.* (2015), and Anton (2016) showed that size and growth are the major extraneous variables of financial performance. As a result, these variables were included as control variables.

The issue of extraneous variables was further curbed by randomisation. Bevins (1999) defined randomisation as an unbiased sampling process where firms are selected without considering factors such as firm size, growth prospects, or any other firm-specific aspects. By using randomisation, a study can even manage to control for more extraneous variables not previously considered (Bevins, 1999). As was explained earlier, all firms which met the sampling criteria were included in the final sample, thus completely removing bias introduced by size and growth. Furthermore, using panel data models enabled the researcher to control for time-invariant effects peculiar to firms and industries (Gujarati and Porter, 2008)

After identifying the extraneous variables discussed above, the author conducted a pilot study with a small sample of 14 firms in order to determine the effect of the extraneous variables on financial performance. Polit, Hungler and Beck (2001) defined pilot studies as a small-scale version of the main study, conducted to develop and test the adequacy of research instruments, sampling frame, and technique. The researcher specifically conducted a pilot study to determine whether size and growth had an effect on financial performance. The regression results showed that size and growth significantly affected financial performance.

4.10.1.2 History effect

According to Yu (2017), the threat of history effects occurs when there are changes to variables from the time they are collected to the time the study is completed. These changes can affect the variables in a way that influences the findings of the study (Yu, 2017). History effects did not affect this study because the data used was historical in nature, it was not subject to change after being published

4.1.1.1 Selection bias

According to Certo *et al.* (2016), selection bias occurs during the sampling stage when the author prefers one element to the other, thereby introducing systematic error into the study. In this study, no firm was preferred over another since all firms in the population were included in the final sample.

4.1.1.2 Regression analysis

Threats to internal validity caused by regression analysis occur when variables that have extreme scores are included in the study, thus affecting the distribution of the data (Yu, 2017). According to Osborne and Overbay (2004), a dataset can have outliers due to sampling and data entry errors. However, the authors pointed out that in some cases, the outliers could legitimately be part of the data. In such cases, one could use transformations such as trimming and winsorising (Osborne and Overbay, 2004). Unfortunately, these transformations are not always be suitable for most models, and may affect data interpretation in undesirable ways (Osborne and Overbay, 2004). As an alternative, the author proposes the use of truncation whereby extreme variables are recorded to the highest or lowest reasonable value in the dataset.

Following recommendations by Osborne and Overbay (2004) and Chipeta (2012), the researcher considered using truncation. However, since the researcher used panel data models which account for such differences in firms, the data collected was not changed.

4.1.2 External validity

External validity can be defined as the extent to which research findings can be generalised beyond the sample used and the geographical setting of the study (Zohrabi, 2013). To ensure external validity, the researcher used ratios uniformly calculated using the same formulas across all firms. Moreover, the study used methodology adopted by other

researchers in South Africa and abroad.

4.11 MODELS OF ESTIMATION

4.1.3 Models that account for the mean reversion process

In their paper entitled '*Forecasting Profitability and Earnings'*, Fama and French (2000) pointed out that profitability tends to be mean reverting; firms performing well tend to attract competition which drives profits down. On the contrary, poorly performing firms tend to redirect resources to more productive use, causing an improvement in profitability (Fama and French, 2000). In this regard, it can be concluded that a portion of changes in profitability is attributed to the mean reversion process.

The mean reversion theory is based on the empirical foundation laid by Brooks and Buckmaster (1976), and Freeman, Ohlson and Penman (1982) that earnings have a tendency to reverse from one year to another. Moreover, the speed with which the reversal process occurs tends to differ based on the size of earnings; large profits are quickly diluted by new entrants and competition while highly negative profits are reduced by repositioning and fear of takeovers (Brooks and Buckmaster, 1976). Elgers and Lo (1994) corroborated these findings and further proved that negative earnings revert back to the mean at a faster rate than positive earnings, thus highlighting the non-linearity in the reversion process.

To augment their theoretical contribution, Fama and French (2000) developed an earnings adjustment model that accounts for the mean reversion of earnings. Moreover, the authors controlled for the autocorrelative nature of performance. Commenting on the work of Fama and French (2000), Grullon *et al.* (2005) argued that when one is investigating the dividend signalling of profitability, Fama and French's (2000) earnings adjustment model must be used as it captures the true nature of profits. Grullon *et al.* (2005) tested the model in a pure dividend signalling context and found strong evidence of mean reversion and autocorrelation of earnings. In conclusion, the authors echoed Fama and French's (2000) sentiments that dividend signalling models must always account for mean reversion and autocorrelation of financial performance.

In this regard, when one analyses whether dividend changes lead to changes in subsequent financial performance, one needs to control for the relationship between past and future

profitability by including a lagged profitability variable in the estimation equation (Grullon *et. al*., 2005). In addition, one has to account for the mean reversion process by adding dummy variables that capture the mean reversion process as illustrated by Fama and French (2000). Authors like Nissim and Ziv (2001), Vieira (2005), and Vieira and Raposo (2007) commented positively about dividend signalling models which take into account the propositions of Fama and French (2000). Precisely, these authors consider the model an effective tool in deciphering the dividend signalling puzzle.

Following methodology by Nissim and Ziv (2001), Grullon *et al.* (2005), and Viera (2005), the study used Fama and French's (2000) earnings adjustment model. This model was extended to all measures of financial performance.

4.1.4 Panel Data models

According to Chipeta (2012), numerous econometric procedures have been used to test the dividend signalling model. However, panel data estimation techniques have arguably been the most effective due to their ability to combine the cross-sectional and time-series nature of data. In fact, according to Vieira (2005), using panel data models enhances the quality of the data being analysed since it [panel data analysis] accounts for the heterogeneity found in panel data. Gujarati and Porter (2009) validated this view by commenting that using panel data provides more degrees of freedom and reduces collinearity between variables. Commenting in support of panel data models, Chipeta (2012) argued that they are particularly suited to detect dynamics of change. Since this study looked at the relationship between changes in current dividends and changes in financial performance, panel data models were deemed most suitable. Precisely, the study employed dynamic panel models throughout all tests conducted.

Baltagi (2014) defined a dynamic panel model as a model that contains lagged dependent variables as independent variables. Since it was previously explained that there is a relationship between past and future financial performance, all models had to include a lagged dependent variable that accounts for past financial performance, thus creating dynamic panel models.

According to Williams, Allison and Benito (2015), panel data can be estimated using fixed

effects models, random effects models, and pooled ordinary least squares. However, the authors cautioned that it is important to ensure that the correct model is used since it has a bearing on the outcome of the study.

4.1.4.1 Fixed Effects

Asteriou and Hall (2007) defined fixed effects as factors such as the geographic location of firms, management style, and work ethos, which may vary from firm to firm but remain constant over time. Moreover, fixed effects result from omitted variables that have an influence on other variables in the model (Asteriou and Hall, 2007). According to Williams *et al.* (2015), the principle behind fixed effects is simple: their effect on the other variables may vary per firm but are time-invariant. According to Chipeta (2012), in cases when a model has omitted, firm-specific, yet time-invariant variables that are correlated with other variables in the model, the fixed effects model is the best estimation tool. This is because it is able to provide a means to control for these omitted variables.

The first method used to control for fixed effects is the allocation of a unique intercept to each firm under study (Gujarati and Porter, 2009). This is based on the assumption that differences in firms or elements under study can be captured by differences in the constant term (Gujarati and Porter, 2009). To cater for the different intercepts, one needs to create dummy variables are for n-1 firms (Williams *et al.*, 2015). Vo et al (2017) explained that since the first firm's intercept will be represented by the constant value α, one needs to create n-1 dummy variables. For instance, if a study has 2 000 firms, the first firm will have a normal intercept, α. However, the other 1 999 firms' intercepts will be represented by 1 999 dummy variables in the model. Although this controls for fixed effects, this process tends to be tedious and can produce many coefficients that the researcher is not interested in (Chipeta, 2012). Furthermore, having many dummy variables in a model could lead to unnecessary and meaningless coefficients, thus diluting the statistical power of the model (Gujarati and Porter, 2009). Alternatively, one can account for fixed effects using a within-fixed effects estimator whereby demeaned independent and dependent variables are determined and are estimated by OLS (Gujarati and Porter, 2009). According to Chipeta (2012), in order to demean variables, one must first compute the averages of all the variables. From there, the average values are then subtracted from the actual values of the

variables, thus eliminating the between-firm variability (Chipeta, 2012). This only leaves the within-firm variability, which is then easily analysed using ordinary least regression.

Owing to the drawbacks of including too many dummy variables in a regression model, the researcher considered the use of demeaned variables when dealing with fixed effects. However, for the researcher to use the within-estimator, the following assumptions had to hold:

- the presence of strict exogeneity;
- homoskedasticity whereby $var\ (u_{i,t}\ |x, a)0$ is constant for all t; and;
- the absence of auto-correlation.

4.1.4.2 Random Effects

According to Gujarati and Porter (2009), a random effects model can be used in the absence of omitted variables in a model. Alternatively, one can use a random effects model in instances where there are omitted variables that are uncorrelated with the explanatory variables in the model (Williams *et al.* 2015). In such a case, using a fixed effects model yields inconsistent results.

According to Baltagi (2014), in order for random effects models to yield correct results, one has to ensure that there is strict exogeneity, cross-sectional independence, and homoskedasticity.

4.1.4.3 Pooled Ordinary Least Squares

According to Asteriou and Hall (2007), the easiest way to deal with panel data is to pool the data for all firms. Though easy, this method has several limitations with the major limitation being the assumption that all firms in all industries are the same (Asteriou and Hall, 2007). Despite this, Chipeta (2012) recommended the use of pooled OLS when there are no distinctions between firms. However, this is highly unlikely since South African firms are different in size, have different organisational cultures and backgrounds, and operate under different management styles.

4.12 MODEL SPECIFICATION TECHNIQUES

4.1.5 Estimation technique for the signalling of earnings

Following the methodology by Grullon *et al.* (2005) and Vieira (2005), Fama and French's (2000) earnings adjustment model was used to test the dividend signalling of earnings. As previously discussed, headline earnings were collected for all firms since they are calculated using the same standard formula for all firms listed on the JSE.

Although some firms declare and pay dividends bi-annually, for the purpose of this study, annualised dividends were used. This was done to match dividends with earnings since earnings are generally reported annually. Dividends were annualised by adding interim and final dividends for each financial year.

In order to determine whether changes in the dividend payout ratio are related to changes in future earnings for each firm i, dividend changes were first determined for the prior period denoted by t-1. These changes in dividends for year t-1 were then compared to changes in earnings in the preceding year t. Using changes in earnings in year t enabled the researcher to determine whether future changes in earnings are a result of changes in dividends in the previous year t-1. Dividend changes for firm i in year t-1 were determined as follows:

$$\Delta \boldsymbol{DPR_{i,t-1}} = \frac{\boldsymbol{DPR_{i,t-1}} - \boldsymbol{DPR_{i_{t-2}}}}{\boldsymbol{DPR_{i_{t-2}}}} \ , \qquad (\mathbf{1})$$

Where $\boldsymbol{DPR_{i,t-1}}$ and $\boldsymbol{DPR_{i_{t-2}}}$ are dividend payout ratios for firm i in years t-1 and t-2 respectively.

Furthermore, changes in future earnings were determined as follows:

$$\Delta \boldsymbol{E_{i,t}} = \frac{\boldsymbol{E_{i,t}} - \boldsymbol{E_{i,t-1}}}{\boldsymbol{E_{i_{,t-1}}}}, \qquad (\mathbf{2})$$

Where $\boldsymbol{E_{i,t}}$ represents earnings for firm i in year t while $\boldsymbol{E_{i,t-1}}$ represents earnings for firm i in year t-1.

Following the methodology by Benartzi *et al.* (1997), Nissim and Ziv (2001), Grullon et al (2005), and Vieira (2005), a lagged variable $\boldsymbol{E_{i,t-1}}$ was added to the model as shown in equation **(3a)**. This was done to control for the relationship between past and future

earnings. The researcher controlled for the mean reversion of earnings by adding a dummy variable, $PDFED_{i,t}$ which takes the value of 1 when earnings revert from positive values to the mean. In addition, a dummy variable $NDFED_{i,t}$ was added in instances where earnings were reverting from negative values. This study made a slight variation to Fama and French's (2000) model and only included 2 dummy variables for mean reversion. This was done to minimise dummy variables whose value was the same with the variables under study since this created a problem of perfect multicollinearity.

Since it was established that a firm's size and growth opportunities influence its future financial performance, control variables were added to the estimation equation accordingly. To control for size, the researcher used the natural logarithm of total assets, a method validated by Manneh (2014). Growth prospects were controlled for using the market to book value of equity as recommended by Barclay and Smith (1999).

Based on the preceding discussion, equation **(3a)** below accounts for the dividend signalling of future earnings, taking into consideration the fact that earnings revert to the mean. Furthermore, it also accounts for the possibility that changes in future earnings are influenced by past earnings, size and the growth prospects of a firm.

$$\Delta \boldsymbol{E_{i,t}} = \boldsymbol{\alpha} + \boldsymbol{\beta_1}\,\Delta \boldsymbol{DPR_{i,t-1}} + \boldsymbol{\beta_2}\,\boldsymbol{E_{i,t-1}} + \boldsymbol{\beta_3}\,\boldsymbol{NDFED_{i,t-1}} + \boldsymbol{\beta_4}\,\boldsymbol{PDFED_{i,t-1}} + \boldsymbol{\beta_5}\,\boldsymbol{SIZE_{i,t-1}} + \boldsymbol{\beta_6}\,\boldsymbol{GROWTH_{i,t-1}} + \boldsymbol{u_{i,t-1}} \quad \textbf{(3a)}$$

$\Delta \boldsymbol{E_{i,t}}$ shows changes in earnings for firm i in year t while $\Delta \boldsymbol{DPR_{i,t-1}}$ shows changes in the dividend payout ratio for firm i in year t-1. $\mathrm{SIZE_{i,t-1}}$ and $\mathrm{GROWTH_{i,t-1}}$ are control variables which cater for effect of size and growth prospects on earnings. Moreover, $N\mathrm{DFED_{i,t-1}}$ and $\mathrm{PDFED_{i,t-1}}$ are dummy variables for when earnings are reverting from negative or positive values respectively. Finally, $u_{i,t-1}$ is the composite error term made up of $u_i + v_{i,t-1}$ with u_i representing unobserved, time invariant and firm specific effects while $v_{i,t-1}$ is the stochastic term. The inclusion of u_i caters for all unobserved time-invariant firm effects such as the effect of geography, organisation culture or management style on financial performance (Gujarati and Porter, 2008).

Equation **(3b)** was modelled to cater for fixed effects by calculating the average of all

variables over time for each i and then subtracting those variables from equation **(3a)** as follows:

$$(\Delta \boldsymbol{E_{i,t}} - \Delta \overline{\boldsymbol{E}}_{\boldsymbol{i,t}}) = \boldsymbol{\alpha} + \boldsymbol{\beta_1}(\Delta \boldsymbol{DPR_{i,t-1}} - \Delta\, \overline{\boldsymbol{DPR}}_{\boldsymbol{i \cdot t-1}}) + \boldsymbol{\beta_2}(\boldsymbol{E_{i,t-1}} - \overline{\boldsymbol{E}}_{\boldsymbol{,t}}) + \boldsymbol{\beta_3}(\boldsymbol{NDFED_{i,t-1}} - \overline{\boldsymbol{NDFED}}_{\boldsymbol{i,t-1}}) + \boldsymbol{\beta_4}(\boldsymbol{PDFED_{i,t-1}} - \overline{\boldsymbol{PDFED_{i,t-1}}} + \boldsymbol{\beta_5}(\boldsymbol{SIZE_{i,t-1}} - \overline{\boldsymbol{SIZE}}_{\boldsymbol{i,t-1}}) + \boldsymbol{\beta_6}(\boldsymbol{GROWTH_{i,t-1}} - \overline{\boldsymbol{GROWTH}}_{\boldsymbol{i,t-1}}) + \boldsymbol{u_{i,t-1}} - \overline{\boldsymbol{u}}_{\boldsymbol{it-1}} \quad \textbf{(3b)}$$

$(\Delta \boldsymbol{E_{i,t}} - \Delta \overline{\boldsymbol{E}}_{\boldsymbol{i,t}})$ shows the difference between changes in earnings and the demeaned earnings value, $(\Delta DPR_{i,t-1} - \Delta\, \overline{DPR}_{i \cdot t-1})$ shows the difference between changes in the dividend payout ratio in year t-1 and the demeaned value of the same variable. Similarly, $(SIZE_{i,t-1} - \overline{SIZE}_{i,t-1})$ and $(GROWTH_{i,t-1} - \overline{GROWTH}_{i,t-1})$ show demeaned size and growth variables while $(NDFED_{i,t-1} - \overline{NDFED}_{i,t-1}$ and $(PDFED_{i,t-1} - \overline{PDFED_{i,t-1}}$ show demeaned dummy variables for mean reversion. $(E_{i,t-1} - \bar{E}_{,t})$ is the demeaned variable for autocorrelation between past and future earnings.

The random effects model was estimated as shown in equation **(3c)** below.

$$\Delta \boldsymbol{E_{i,t}} = \boldsymbol{\alpha} + \boldsymbol{\beta_1}\, \Delta \boldsymbol{DPR_{i,t-1}} + \boldsymbol{\beta_2}\, \boldsymbol{E_{i,t-1}} + \boldsymbol{\beta_3}\, \boldsymbol{NDFED_{i,t-1}} + \boldsymbol{\beta_4}\, \boldsymbol{PDFED} + \boldsymbol{\beta_5}\, \boldsymbol{SIZE_{i,t-1}} + \boldsymbol{\beta_6}\, \boldsymbol{GROWTH_{i,t-1}} + \boldsymbol{u_i} + \boldsymbol{v_{i,t-1}} \quad \textbf{(3c)}$$

The variables are similar to those modelled in equation **(3a)**. However, the only difference occurs with $\boldsymbol{u_i}$ which represents the between-entity error while $\boldsymbol{v_{i,t-1}}$ represents the within-entity error.

4.1.6 Estimation technique for signalling of ROA

Using estimation equations similar to equations **(3a)**, **(3b)** and **(3c)**, equations **(4a)**, **(4b)** and **(4c)** were constructed as follows:

$$\Delta \boldsymbol{ROA_{i,t}} = \boldsymbol{\alpha} + \boldsymbol{\beta_1}\, \Delta \boldsymbol{DPR_{i,t-1}} + \boldsymbol{\beta_2}\, \boldsymbol{ROA_{i,t-1}} + \boldsymbol{\beta_3}\, \boldsymbol{NDFED_{i,t-1}} + \boldsymbol{\beta_4}\, \boldsymbol{PDFED_{i,t-1}} + \boldsymbol{\beta_5}\, \boldsymbol{SIZE_{i,t-1}} + \boldsymbol{\beta_6}\, \boldsymbol{GROWTH_{i,t-1}} + \boldsymbol{u_{i,t-1}} \quad \textbf{(4a)}$$

$$\left(\Delta \boldsymbol{ROA_{i,t_{+1}}} - \Delta \overline{\boldsymbol{ROA}}_{\boldsymbol{i,t_{+1}}}\right) = \boldsymbol{\alpha} + \boldsymbol{\beta_1}(\Delta \boldsymbol{DPR_{i,t}} - \Delta\, \overline{\boldsymbol{DPR}}_{\boldsymbol{i \cdot t}}) + \boldsymbol{\beta_2}(\boldsymbol{ROA_{i,t}} - \overline{\boldsymbol{ROA}}_{\boldsymbol{,t}}) + \boldsymbol{\beta_3}(\boldsymbol{NDFED_{i,t}} - \overline{\boldsymbol{NDFED}}_{\boldsymbol{i,t}}) + \boldsymbol{\beta_4}(\boldsymbol{PDFED_{i,t}} - \overline{\boldsymbol{PDFED_{i,t}}} + \boldsymbol{\beta_5}(\boldsymbol{SIZE_{i,t}} - \overline{\boldsymbol{SIZE}}_{\boldsymbol{i,t}}) +$$

$$\boldsymbol{\beta_6}\,(\boldsymbol{GROWTH_{i,t}} - \overline{\boldsymbol{GROWTH}}_{i,t}) + \boldsymbol{u_{i,t}} - \bar{\boldsymbol{u}}_i \qquad \textbf{(4b)}$$

$$\Delta\boldsymbol{ROA_{i,t}} = \boldsymbol{\alpha} + \boldsymbol{\beta_1}\,\Delta\boldsymbol{DPR_{i,t-1}} + \boldsymbol{\beta_2}\,\boldsymbol{ROA_{i,t-1}} + \boldsymbol{\beta_3}\,\boldsymbol{NDFED_{i,t-1}} + \boldsymbol{\beta_4}\,\boldsymbol{PDFED_{i,t-1}} + \boldsymbol{\beta_5}\,\boldsymbol{SIZE_{i,t-1}} + \boldsymbol{\beta_6}\,\boldsymbol{GROWTH_{i,t-1}} + \boldsymbol{u_i} + \boldsymbol{v_{i,t-1}}. \qquad \textbf{(4c)}$$

Equation **(4a)** was estimated using OLS while equations **(4b)** and **(4c)** were estimated using fixed effects and random effects models respectively. The variable $\Delta\boldsymbol{ROA_{i,t}}$ is determined as $\Delta\boldsymbol{ROA_{i,t}} = \frac{\boldsymbol{ROA_{i,t}} - \boldsymbol{ROA_{i,t-1}}}{\boldsymbol{ROA_{i_{t-1}}}}$, with $\boldsymbol{ROA_{i,t}}$ representing ROA for firm i in year t while $\boldsymbol{ROA_{i,t-1}}$ shows ROA for firm i in year t-1. $\Delta\boldsymbol{DPR_{i,t-1}}$ is still calculated using equation 1 outlined in section 4.9.2 above. As the case in equations (3a) to (3c), $NDFED_{i,t-1}$ and $PDFED_{i,t-1}$ are still dummy variables for the mean reversion process. Similarly, $SIZE_{i,t-1}$ and $GROWTH_{i,t-1}$ are control variables for the effect of size and growth on ROA.

Equation **(4b)** above was modelled using demeaned variables to account for fixed effects. Finally, equation **(4c)** was modelled to in the event that there were some random effects in the data.

4.1.7 Estimation technique for the signalling of liquidity

According to Bijia (2013), firms with excess cash may pay substantial amounts of cash dividends to alleviate the conflict of interest between management and shareholders. In most cases, firms that expect to have excess cash reserves use dividends as an information tool to communicate their positive prospects to outsiders (Bijia, 2013). This forms the basis of the argument presented in this study that dividends can be used to carry signals about a firm's liquidity position.

Following the methodology by Vieira (2005), the current ratio was used as a measure of liquidity. The changes in future liquidity were measured as follows:

$$\Delta\boldsymbol{CR_{it}} = \frac{\boldsymbol{CR_{i,t}} - \boldsymbol{CR_{i,t-1}}}{\boldsymbol{CR_{i_{t-1}}}} \qquad \textbf{(5)}$$

The variable $\Delta\boldsymbol{CR_{it}}$ shows changes in the current ratio for firm i in year t while $CR_{i,t-1}$ shows the current ratio for the previous year t-1.

Following the methodology by Vieira (2005), equation **(5a)** below was used to estimate the relationship between changes in dividend and changes in liquidity:

$$\Delta CR_{i,t} = \alpha + \beta_1 \Delta DPR_{i,t-1} + \beta_2\ CR_{i,t-1} + \beta_3\, NCR_{i,t-1} + +\beta_4\, PCR_{it-1} + \beta_5\, SIZE_{it-1} + \beta_6 GROWTH_{it-1} + u_{i,t-1} \quad \textbf{(5a)}$$

$CR_{i,t-1}$ is a lagged liquidity variable which captures the relationship between past and future liquidity. $NCR_{i,t}$ and $PCR_{i,}t$ are dummy variables which capture the reversion of financial performance from negative and positive performance respectively. Just like in previous equations, the model also controlled for the effect of size and growth opportunities by adding the variables $SIZE_{it-1}$and $GROWTH_{it-1}$ respectively.

Moreover, to cater for fixed effects, equation (5b) was modelled as follows:

$$(\Delta CR_{i,t} - \Delta\overline{CR}_{i,t}) = \alpha + \beta_1 (\Delta DPR_{i,t-1} - \Delta\, \overline{DPR}_{i\cdot t-1}) + \beta_2 (CR_{i,t-1} - \overline{CR}_{,t-1}) + \beta_3 (NCR_{i,t-1} - \overline{NCR}_{i,t-1}) + \beta_4 (PCR_{i,t-1} - \overline{PCR_{\iota,t-1)}} + \beta_5 (SIZE_{i,t-1} - \overline{SIZE}_{i,t-1}) + \beta_6 (GROWTH_{i,t-1} - \overline{GROWTH}_{i,t-1}) + u_{i,t-1} - \overline{u}_i \quad \textbf{(5b)}$$

Model **(5c)** below was developed to cater to random effects.

$$\Delta CR_{i,t} = \alpha + \beta_1 \Delta DPR_{i,t-1} + \beta_2\, CR_{i,t-1} + \beta_3\, NCR_{,t-1} + \beta_4\, PCR_{,t-1} + \beta_5\, SIZE_{i,t-1} + \beta_6\, GROWTH_{i,t-1} + u_i + v_{i,t-1} \quad \textbf{(5c)}$$

The variables in **(5c)** are still similar to those in equations **(3c)** and **(4c)** in sections above.

4.1.8 Estimation technique for the signalling of gearing

To investigate whether current dividends are related to future debt levels, equation **(6a)** was modelled in a manner similar to equations **(3a)**, **(4a)**, and **(5a)**.

$$\Delta DER_{i,t} = \alpha + \beta_1 \Delta DPR_{i,t-1} + \beta_2\ DER_{I,t-1} + \beta_3\, NDER_{i,t-1} + \beta_4\, PDER_{i,t-1} + \beta_5\, SIZE_{i,t-1} + \beta_6\, GROWTH_{i,t-1} + u_{i,t} \quad \textbf{(6a)}$$

Changes in the debt to equity ratio for firm i in year t were determined in a manner similar to changes in earnings, ROA, and the current ratio. The variable $\Delta DER_{i,t}$ shows changes

in the debt to equity ratio while $\boldsymbol{DER_{I,t-1}}$ is a variable which caters for the autocorrelation between past and future debt levels. On the other hand, $\boldsymbol{NDER_{i,t-1}}$ and $\boldsymbol{PDER_{i,t-1}}$ are dummy variables for negative and positive mean reversion of debt levels respectively.

Similarly, following the methodology used to model estimation equations **(3b)**, **(4b)** and **(5b)**, equation **(6b)** below was modelled to eliminate unobserved time-invariant effects.

$$(\Delta \boldsymbol{DER_{i,t}} - \Delta \overline{\boldsymbol{DER}}_{i,t}) = \boldsymbol{\alpha} + \boldsymbol{\beta_1}(\Delta \boldsymbol{DPR_{i,t-1}} - \Delta \overline{\boldsymbol{DPR}}_{i,t-1}) + \boldsymbol{\beta_2}(\boldsymbol{DER_{i,t-1}} - \overline{\boldsymbol{DER}}_{i,t-1}) + \boldsymbol{\beta_3}(\boldsymbol{NDER_{i,t-1}} - \overline{\boldsymbol{NDER}}_{i,t-1}) + \boldsymbol{\beta_4}(\boldsymbol{PDER_{,t-1}} - \overline{\boldsymbol{PDER}_{i,t-1}} + \boldsymbol{\beta_5}(\boldsymbol{SIZE_{i,t-1}} - \overline{\boldsymbol{SIZE}}_{i,t-1}) + \boldsymbol{\beta_6}(\boldsymbol{GROWTH_{i,t-1}} - \overline{\boldsymbol{GROWTH}}_{i,t-1}) + \boldsymbol{u_{i,t-1}} - \bar{\boldsymbol{u}}_i \quad \textbf{(6b)}$$

Equation (6c) below was modelled to account for random effects as follows:

$$\Delta \boldsymbol{DER_{i,t}} = \boldsymbol{\alpha} + \boldsymbol{\beta_1}\Delta \boldsymbol{DPR_{i,t-1}} + \boldsymbol{\beta_2}\boldsymbol{DER_{i,t-1}} + \boldsymbol{\beta_3}\boldsymbol{NDER_{,t-1}} + \boldsymbol{\beta_4}\boldsymbol{PDER_{,t-1}} + \boldsymbol{\beta_5}\boldsymbol{SIZE_{i,t-1}} + \boldsymbol{\beta_6}\boldsymbol{GROWTH_{i,t-1}} + \boldsymbol{u_i} + \boldsymbol{v_{i,t-1}} \quad \textbf{(6c)}$$

4.13 SPECIFICATION AND DIAGNOSTIC TESTS FOR PANEL DATA MODELS

This section discusses the specification and diagnostic tests that were carried out in this study. Commenting on specification and diagnostic testing, Indrayan (2012) pointed out that failure to conduct these tests might compromise the validity and reliability of the regression results.

4.1.9 Hausman Test

According to Greene (2008), a researcher who deals with panel data needs to run a Hausman (1978) test in order to choose between a fixed or random effects model. In line with Greene's (2008) recommendation, the researcher first ran fixed effects regression analysis using Eviews. After that, the random effects regression model was run as per the recommendation by Torres-Reyna (2007). From there, a Hausman test was conducted to choose the appropriate model. The test had a null hypothesis that the random effects model was suitable. In the event that the results resulted in a *p*-value greater than 5%, the random effects model was considered appropriate (Torres-Reyna, 2007). On the contrary, if the test yielded a significant *p*-value, the fixed effects model was the considered to be the efficient estimator (Torres-Reyna, 2007).

4.1.10 Chow F-Test

In the event that the Hausman (1978) test supported the use of the fixed effects model, Greene (2003) recommended running a fixed effects test to determine the relevance of including period fixed effects. According to Greene (2003), to test whether fixed effects are relevant or not, one can use an F-test. The test has a null hypothesis that all the firms in a sample are the same, allowing for the use of a common constant as shown below:

$$\boldsymbol{H_0}: \boldsymbol{a_1} = \boldsymbol{a_2} = \cdots \boldsymbol{a_N}$$

Alvarez, Barbero and Zofio (2017) substantiated Greene's (2003) work and recommended that all fixed effects models must be tested for fixed effects. The authors argued that including fixed effects when there are none can lead to inconsistent and biased results.

This study used the Redundant Fixed Effects Likelihood ratio, also known as an F-Chow test to determine the necessity of incorporating time effects in the model. In the event that there were no fixed effects, the dividend signalling hypothesis was estimated using OLS.

4.1.11 Breusch and Pagan Lagrange Multiplier

In the event that the Hausman (1978) test yielded results in support of the random effects model, Alvarez *et al.* (2017) recommended running the Breusch-Pagan LM test. According to Baltagi (2014), when the Breusch and Pagan LM test is run, the objective is to determine if the firms in the sample exhibit similarities. In such cases, the ordinary least squares regression model is the preferred estimator (Baltagi, 2014).

4.1.12 Testing for cross-sectional dependence

According to Baltagi (2014), cross-sectional dependence is a common problem when using panel data. However, the problem is more prevalent in long panels that have a time of over 20 years (Baltagi, 2014). Although Baltagi (2014) argued that cross-sectional dependence could be less of a problem in panels where t < i, such as this study, it was still imperative for the researcher to conduct a test to detect cross-sectional dependence.

Chipeta (2012) defined cross-sectional dependence as the correlation of residuals across entities that belong to the same dataset. According to Baltagi (2014), there are two main tests for cross-sectional dependence in panel data, namely the Breusch-Pagan's (1980) Langrage Multiplier (LM) test and the Pesaran (2004) CD test. Both of these tests have a

null hypothesis that residuals across entities are not correlated. If the event that the tests yield a *p*-value that is lower than 0.05, the researcher will have to combat the issue of cross-sectional dependence (Pesaran, 2004).

According to Chipeta (2012), the Breusch-Pagan (1980) test is used in instances when the time under study is greater than the sample under study, *T>N*. On the other hand, the Pesaran (2004) CD test works when the sample size is greater than the time under study, *N>T*. In this study, the number of firms were more than the time of study, which made the Pesaran (2004) CD test to be relevant. According to De Hoyos and Sarafidis (2006), when one is using dynamic panels, the Pesaran test remains valid under both fixed and random effects models, making it the preferred choice.

In the event of cross-sectional dependence, the Driscoll and Kraay's (1998) covariance matrix estimator had to be used as suggested by Hoechle (2007). Hoechle (2007) also recommended using Driscoll and Kraay's standard errors in the presence of autocorrelation, heteroskedasticity and cross-sectional dependence in the same dataset since they are consistent in both balanced and unbalanced panels.

4.1.13 Testing for heteroskedasticity

According to Alvarez (2017), regression disturbances whose variances are dependent on the observation being discussed are heteroskedastic. In the case of this study, if factors such as size, growth prospects and dividend policy cause a distinct variance in the disturbance term, then the variance of that disturbance term will vary for every observation in the sample *i*= 1,2, 3….n as follows:

$$\boldsymbol{var}(\boldsymbol{u_i}) = \boldsymbol{ð_i^2}$$

Asteriou and Hall (2007) emphasised the importance of testing for heteroskedasticity especially in hypothesis testing as its presence could result in higher than normal F-statistics and t-statistics. This can lead to incorrect regression results (Asteriou and Hall, 2007). Since the outcome of this study heavily relied on hypothesis testing, it was imperative for the researcher to test for the presence of heteroskedasticity. The study used the Breusch-Pagan-Godfrey test that has a null hypothesis that residuals are homoskedastic (Asteriou and Hall, 2007). In the event that the residuals were heteroskedastic, it was

recommended to use White's (1980) heteroskedasticity consistent covariance matrix estimator, which provides consistent covariance estimates in the presence of heteroskedasticity.

4.1.14 Testing for serial correlation

Asteriou and Hall (2007) defined serial correlation, sometimes referred to as autocorrelation, as a problem whereby the error term in previous years tends to be correlated to an error term in preceding periods. According to these authors, serial correlation seems to be prevalent in macro panels that have long time series. Bewick, Cheek and Ball (2003) warned researchers that if they do not dealt with serial correlation, it can cause the standard errors of the coefficients to be smaller than they actually are and can lead to a higher than expected R-squared values. This can lead to incorrect interpretations regarding the goodness of the model (Cameron and Miller, 2015). Moreover, in hypothesis testing, unresolved serial correlation may lead to higher than usual T-statistics, which can lead to incorrect inferences (Cameron and Miller, 2015).

According to Greene (2003), the most common way to test for serial correlation is the Durbin Watson (DW) test. Although a DW figure is a part of every regression output in Eviews, Baltagi (2014) cautioned that one of the limitations of the DW test is its inability to detect serial correlation in dynamic models, which have lagged dependent variables on the right-hand side of the regression model. In this regard, the DW test was not a valid indicator of serial correlation in this study. Instead, the Breusch-Godfrey test for serial correlation was used. The test had a null hypothesis indicating the absence of serial correlation. In that case, a *p*-value smaller than 0.05 is indicative of the presence of serial correlation.

In the event of serial correlation, it was recommended to use Newey and West's (1987) HAC Consistent Covariance estimator, which is consistent in the presence of both heteroskedasticity and autocorrelation. Alternatively, White's standard errors could be used. These covariance methods are readily available in Eviews, which made them easily accessible to the researcher.

4.1.15 Panel Unit Root (Stationarity) tests

Asteriou and Hall (2007) defined stationarity as the ability of variables to have a time-invariant mean and covariance. The authors pointed that stationary variables tend to be mean reverting, with occasional drifts not far off the mean. As discussed in earlier sections of this chapter, the mean reversion assumption was one of the key assumptions of this study. Following Fama and French's (2000) model, it was assumed that financial performance is mean reverting due to factors such as competition and new entrants. This study had to test for data stationarity since the concept was one of the pillars on which the estimation equations were modelled. In a way, proving that the data collected was stationary justified the estimation techniques followed in this study.

According to Jaunky and Lundmark (2017), it is important for panel data to exhibit stationarity, especially when one is testing the existence of a relationship between variables. This is because non-stationary data can lead to spurious regressions, which tend to be characterised by high R2 values, unrelated variables, and invalid conclusions (Greene,

2003).

Based on the preceding discussion, the study computed a Levin, Lin and Chu (2002) unit root test with the null hypothesis of a unit root (non-stationary data) to determine whether earnings, dividends, current ratios, and debt to equity ratios were stationary. A *p*-value of 5% or lower would indicate data stationarity In the event of non-stationarity, the variables had to be differenced and regressed without an intercept to eliminate unit root (Enders, 2010).

4.1.16 ETHICAL CONSIDERATIONS

When conducting research, one needs to exercise due diligence, honesty, and integrity (Brink, 1996). In fact, according to Bryman and Bell (2007), a researcher must avoid dishonest conduct at all costs. Brink (1996) defined dishonest conduct as the manipulation data, design, methods and results.

The researcher avoided data manipulation by downloading the ratios published by the firms on INET-BFA. Data manipulation was avoided when the researcher sent the data collected to the supervisor and an independent statistician for verification against the public and easily accessed INETBFA database. Furthermore, data collected was solely used for purposes of determining whether dividends could carry signals regarding subsequent financial performance. Moreover, data was collected after approval from the UNISA ethics committee.

4.1.17 DATA ANALYSIS AND RESULTS PRESENTATION

After the data was collected, it was organised in excel. The researcher used Eviews to analyse the data. Descriptive statistics were used to understand the nature and characteristics of the data collected. The researcher also used tables to show the results obtained. From there, statistical inferences were made based on results obtained.

4.1.18 CONCLUSION

The overall objective of this chapter was to determine and justify the paradigm, design, approach, and methods used in this study. A review of the literature on methodology showed that the methodology of a study is informed by its objectives. The main theme running throughout the chapter was the use of panel data models, specifically dynamic

panels. It was established that panel data models explain relationships in a more elaborate manner than is the case with time-series or cross-sectional studies.

The chapter also showed how the researcher tested for and maintained data reliability and validity through conducting tests for cross-section dependence, heteroskedasticity, serial correlation, and unit root. In summary, the procedures outlined in this chapter mapped the manner in which the results discussed in the following chapter were obtained.

CHAPTER 5

PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

4.14 INTRODUCTION

The previous chapter outlined the procedures and models used in order to achieve the objectives of the study. This chapter reports the findings obtained after following these set procedures. It also provides a detailed discussion to determine if the results answer the hypotheses set in section 1.5 of the first chapter.

The chapter is structured as follows: section 5.2 looks at an in-depth description of the data in the sample. Descriptive statistics tables are used to present the characteristics of the collected data. Section 5.3 looks at the results from basic specification tests such as tests of cross-sectional dependence, serial correlation, heteroskedasticity and the Hausman test. Section 5.4 looks at the ability of dividends to carry signals regarding changes in earnings, ROA, current ratio, and the debt to equity ratio. Results in this section determine whether dividends carry signals regarding a firm's expected financial performance or not. The chapter then ends with a summary in section 5.5.

4.15 DESCRIPTION OF DATA

Table 3 below shows the descriptive statistics of variables collected for this study. This table is importance since it gives an indication of the distribution and properties of the data collected.

Table 3: Descriptive Statistics

	E	DPR	ROA	CR	SIZE	GROWTH	DER
Mean	0.22987	0.03700	0.01083	0.0696	0.14990	0.24602	0.09404
Median	0.13454	0.00229	0.0003	0.01033	0.12244	0.02260	-0.02264
Maximum	79.30667	13.67720	14.29752	4.99860	11.61709	46.69231	15.25000
Minimum	-16.62500	-38.5000	-44.52850	-0.77440	-0.97200	-0.98984	-0.77778
Std. Dev.	3.08152	2.30436	2.30436	0.43584	0.65518	2.08119	0.83577

According to Table 3, the dividend policy in South Africa is quite volatile as shown by a standard deviation of about 230% in DPR. The results are also indicative of a variety of dividend policies across firms as shown by a maximum payout ratio of 136.77% and a mean of 4%. Interestingly, the glaring difference between the mean of 3.7% and the median of 0.22% for DPR could be an indication that most South African firms are paying low dividends, with only a few firms paying liberally high dividends. This claim is consistent with findings by Makka (2013) who conducted a study in the South African context and found that 77% of dividends paid were from the top 10 firms in the Basic Materials and Telecommunications industries. Makka (2013) used a sample of 152 firms. Similarly, Anton (2016) reported a mean of 0.22 and a median of 0.00 in the Romanian market and corroborated Makka's (2013) findings.

Table 3 also shows that South African earnings are just as volatile as earnings in any emerging market. This is shown by the variable E, which has a minimum value of 167% and a maximum value of 793%. Moreover, the variable has a standard deviation of 3.08, which indicates that earnings are sparsely spread. These values are consistent with those reported by Al Masum (2014) and Vermeulen (2011) using data from Bangladesh and South Africa respectively. The descriptive value for ROA also show volatile profits. This is shown by an average as low as 1%, a median to 0, yet they have a maximum of 14.30. Moreover, ROA has a standard deviation of 202%, also indicative of varied firm profitability. This supports a claim by Vermeulen (2011) that generally, profitability in developing countries is very volatile. Njonge (2012) and Ndiragu (2014) also

reported similar observations regarding the spread of profitability in the Kenyan market and attributed it to differences in firm size and industry type. Moreover, Al- Masum (2014) reported volatile profitability in Bangladesh shown by a standard deviation of 130%.

Although many studies in developing markets have shown that profits are volatile, some studies have reported otherwise. Uwuigbe *et al.* (2012) reported a standard deviation of 27% for profitability in the Nigerian market while Mui and Mustapha (2016) reported a standard deviation of 10.2% in the Malaysian market.

Results regarding the spread and volatility of data in developed markets also support the claim that developed markets have more stable profits than developing markets. Vieira (2005) reported standard deviations of 8.6%, 4% and 20% using data from Portugal, France, and the UK respectively. Similarly, Abrahamsen and Balchen (2010) reported standard deviations 8.68%, 8.19%, and 7.8% in the Norwegian market for dividend initiations, increases and decreases respectively. Taoulaou and Burchuladze (2014) also supported the notion that develop markets enjoy stable profits. They reported a standard deviation of 40% in the Swedish market.

The values for CR and DER show mean values of 0.07 and 0.09 and median values of 0.01 and -0.02 respectively. Both variables also show standard deviations of 44% and 84% respectively. This indicates that data is fairly dispersed. Interestingly, both variables have a huge margin between maximum and minimum values. CR shows a maximum value of 4.99 and a minimum of -0.77 while DER has a maximum value of 15.3 and a minimum value of -0.78. This large gap between minimum and maximum values is indicative of differences in liquidity and borrowing status amongst firms. These results are similar to those reported by Mbithi (2014) and Anton (2016), who attributed differences in liquidity and gearing to firm size.

4.16 SPECIFICATION AND DIAGNOSTIC TESTS FOR PANEL DATA MODELS

As was outlined in chapter 4, to ensure validity and reliability of results, the researcher had to first run tests such as the Hausman (1978) test, the Breusch-Pagan-Godfrey test, the

Pesaran (2004) CD test, the Breusch-Godfrey test, and Levin, Lin and Chu (2002) unit root test. The procedures for conducting these tests were discussion in chapter 4. Sections 5.3.1 to 5.3.4 below show the respective results. For simplicity, the Hausman test results are tabulated in table 4 below.

Hausman Test

The Hausman (1978) test was conducted to determine if the fixed effects or random effects model was appropriate to test the dividend signalling hypothesis. The test had a null hypothesis in support of the random effects model while the alternative hypothesis favoured the fixed effects model. A significant *p*-value indicates that the fixed effects model is more efficient than the random effects and vice versa.

Table 4: Hausman Test Results

Name of Test	**Test Results (*p*-value)**
Hausman test for the dividend signalling of earnings	0.002
Hausman test for the dividend signalling of ROA	0.039
Hausman test for the dividend signalling of liquidity (CR)	0.455
Hausman test for the dividend signalling of gearing (DER)	0.575

Based on the results shown in Table 4 above, the test yielded a *p*-value of 0.002 for the dividends-earnings test, allowing the use of the fixed effects model to test if changes in subsequent earnings are explained by changes in prior-year dividends. These results are consistent with those by Vieira and Raposo (2007) who used FEM to estimate the effect of dividend changes on financial performance in the UK and French markets.

In the same vein, the Hausman test results for the dividends-ROA test show a *p*-value of

0.039 indicating that the fixed effects model was the preferred model. This was expected since the Hausman test supported the use of FEM for the dividend signalling of earnings. The study therefore, employed the fixed effects model in determining whether dividends carry signals regarding ROA.

The Hausman tests for liquidity (CR) and gearing (DER) both resulted in insignificant *p*-values of 0.455 and 0.575. According to these results, the random effects model was the efficient estimator of both the dividend-liquidity and dividend-gearing tests.

Based on the above results, the fixed effects model was used to test the ability of dividends to carry signals regarding expected earnings and ROA. On the other hand, the random effects model was used to determine if dividend changes are related to subsequent liquidity and gearing. To validate the use of the fixed effects model for hypotheses (a) and (b), redundant fixed effects tests were carried out. The results showed *p*-values of 0.047 and 0.039 respectively, which still supported the use of the fixed effects model for objectives a) and b). In addition, the LM test yielded *p*-values of 0.0487 and 0.0258 respectively, which justified the incorporation of period random effects for hypotheses (c) and (d).

As Pedace (2013) observed, the Hausman test is misleading in the presence of heteroskedasticity. In order to ensure validity of the Hausman test, the author had to run further diagnostic tests to detect and curb the problem of heteroskedasticity and other related problems associated with panel regression. These tests are discussed in the section below.

4.16.1 Results from specification & diagnostic tests

Before conducting the relevant regression tests for hypotheses (a) to (d), the dataset was tested for the absence of cross-sectional dependence, heteroskedasticity, serial correlation, and non-stationarity. As discussed in section 4.13 of chapter 4, it was imperative that certain diagnostic tests were carried out to ensure the validity and reliability of results.

4.16.1.1 Pesaran test for Cross-Section Dependence

As discussed in chapter 4, it is important for researchers, especially in panel studies, to ensure that residuals are not correlated amongst firms. In instances where that is the case, the residuals are said to be cross dependent of each other, an event which leads to incorrect inferences.

This study followed Baltagi's (2014) recommendations and used the Pesaran (2004) CD test which is relevant for panels where the number of firms is greater than the period under study. The test was conducted based on the null hypothesis of no cross-sectional dependence amongst residuals. The test was set at a 95% confidence interval. The results for the Pesaran CD test are shown in Table 5.

4.16.1.2 Breusch-Pagan-Godfrey test for heteroskedasticity

Using panel data models can result in the inclusion of time-invariant, yet firm specific effects in the unobserved value (Asteriou and Hall, 2007). In such cases, it needs to be established that the variance of these unobserved variables is homoskedastic or constant per each observation in the sample. To detect the issue of heteroskedasticity, the Breusch-Pagan-Godfrey test was conducted. The results obtained were tabulated in Table 5.

4.16.1.3 Breusch-Godfrey test for serial correlation

The study also tested for the presence of serial or autocorrelation in the residuals. As discussed in the methodology chapter, the Durbin Watson figure was not a reliable test of serial correlation since this study used dynamic panel models. Instead, the Breusch

Godfrey test was conducted. The null hypothesis for the test was set in section 4.10.6 of chapter 4 to show the absence of serial correlation. A *p*-value of 5% was set to show the rejection region of the hypothesis.

4.16.1.4 Levin, Lin and Chu unit root test

Finally, the Levin, Lin and Chu (2002) panel unit root test was conducted. It was established in section earlier that measures of financial performance must exhibit data stationarity qualities. This is due to the assumption that financial performance is mean reverting (Fama and French, 2000). The test was based on the null hypothesis that the variables are non-stationary. The acceptance region was set within the 95% confidence interval as discussed in chapter 4.

Table 5 below summarises the results for all the tests discussed in sections above:

Table 5: Specification and Diagnostic test results

Name of test	**Results for hypothesis**	**Results for hypothesis**	**Results for hypothesis**	**Results for hypothesis**
Pesaran CD test for cross	0.481	0.405	0.15325	0.253
Breusch-Pagan-Godfrey	0.000	0.000	0.520	0.761
Breusch-Godfrey Serial correlation	0.176	0.185	0.764	0.129
Levin, Lin and Chu Panel Unit root	0.000	0.000	0.018	0.000

The table above shows the absence of cross dependence among the residuals as

shown by *p*-values of 0.481, 0.405, 0.153 and 0.253 for each hypothesis. While the tests for heteroskedasticity show that residuals are homoskedastic for hypotheses (c) and (d) with respective *p*-values of 0.520 and 0.761, results for (a) and (b) reveal the presence of heteroskedasticity. To curb the problem of heteroskedasticity, White's Heteroskedasticity consistent covariance estimators, which are inbuilt into Eviews, were incorporated into the estimation equations for hypotheses (a) and (b).

The Breusch-Godfrey serial correlation test resulted in *p*-values of 0.176, 0.185, 0.764 and 0.129 which warranted the absence of serial correlation.

The final test carried out was the Levin, Lin and Chu (2002) test to check if the data set had unit root. The results reported in Table 5 show significant *p*-values which is an indication that there was no unit root in the dividend pay-out ratio, earnings, ROA, CR and DER. These results are extremely important as they confirm that all the variables of financial performance are mean reverting as has been established throughout this whole study.

4.17 PANEL DATA REGRESSION RESULTS

After carrying out the Hausman test as indicated in Table 4 of this chapter, it was established that the FEM be used to investigate the ability of dividends to signal changes in both earnings and ROA. On the other hand, the REM was the model of choice for testing the dividend signalling of liquidity and gearing. In that regard, Tables 7(a)–(d) below report the panel regression results using FEM, for hypotheses (a) and (b) and REM for (c) and (d).

4.18 The relationship between changes in dividends and changes in future earnings

As was established in section 1.4 of chapter 1, one of the objectives of objectives of this study was to determine if increases in dividends may be an indication of expected increases in earnings. By making a comparison between current year earnings and

previous dividends, the study sought to establish if managers use dividend changes to send signals regarding future earnings. It was already mentioned in chapter 1 that there is inconclusive empirical evidence regarding dividend signalling. Yet, results from studies by authors like Arnott and Asness (2003), Gwilym *et al.* (2010) and Zhou and Ruland (2006) seem to support the ability of dividends to carry signals regarding earnings. Interestingly, authors such as Grullon *et al.* (2003), Grullon *et al.* (2005), Vieira (2005), Vieira and Raposo (2007) have strongly felt that the reason most studies find evidence of the dividend signalling of profitability is because of using flawed methodology. According to Grullon *et al.* (2003), when estimating dividend signalling models, if one does not account for the mean reversion of earnings, they yield incorrect results. Vieira (2005), who found that models which accounted for mean reversion ended up not showing evidence of signalling, corroborated this. All these authors concluded that if mean reversion is not accounted for, its effect on performance may be mistaken as evidence of signalling (Grullon *et al.*, 2003).

Based on the argument by Grullon *et al.* (2003), this study controlled for mean reversion and expected to yield results that did not support the dividend signalling of earnings. The study had a 95% level of confidence set based on studies by Ajanthan (2013), Ebiringa *et al.* (2014) and Feragen (2014), to name a few. In that regard, a *p*-value of 5% would be indicative of dividend signalling while a *p*-value greater than 5% shows the absence of dividend signalling in the South African context. Table 7(a) below shows the regression results for the dividend signalling of earnings:

Table 7(a) Panel Data Regression Results: The dividend signalling of earnings

Variable	**Coefficient**	**Probability**	**R^2 Value**	**Adjusted R^2**
C	-0.544319	0.656	0.562	0.392
DPRt-1	0.172225	0.128		
Et-1	-0.064962	0.024		
SIZEt-1	0.075844	0.036		
GROWTHt-1	-0.013226	0.187		
PDFED	-2.916322	0.001		

The results in Table 7(a) show a coefficient of 0.172225 for the variable DPRt-1, indicative of a positive association between dividends and earnings. This is consistent with Lintner's (1956) dividend signalling theory that dividends are positively related with earnings. Yet, the *p*-value of 0.128 is indicative of an insignificant relationship. In that regard, it can be concluded that although dividends may be positively related with earnings, the relationship is not significant enough to support the dividend signalling hypothesis. These findings reinforce the work of Benartzi et al. (1997), Farsio *et al.* (2004), Grullon *et al.* (2003), and Mbithi (2014) who insisted that, after controlling for mean reversion and autocorrelation of earnings, changes in earnings cannot be explained by changes in dividends.

Moreover, the results seem to support assertions regarding methodology by authors such as Grullon *et al.* (2003) and Vieira (2005). According to these authors, the inability to account for mean reversion mars regression results and show evidence of signalling when it should not. This study controlled for the mean reversion process by including PDFED. Indeed, the results which were obtained could not support the dividend signalling hypothesis. This means the issue of methodology could be a central key to unravel the dividend signalling puzzle.

The most striking result to emerge from the regression test is the negative coefficient value of -0.064962 for lagged earnings. This is indicative of a negative relationship between past

and future earnings. The *p*-value of 0.024, significant at 5% shows that past earnings have a significant influence on future earnings. This is in line with findings from studies by Vieira (2005), Takasu and Nakano (2011) and Guo (2014). This also confirms Fama and French's (2000) autocorrelation concept that past earnings influence future earnings.

Furthermore, results for PDFED, which is a dummy variable that captures the mean reversion process, reveal that firms that had positive earnings in the previous year suffer a decrease in earnings in preceding years as shown by a negative coefficient of -2.916322. PDEF also shows a significant *p*-value of 0.001 corroborating Abidin, *et al.*'s (2015) findings and proving Fama and French's (2000) mean reversion theory. The other dummy variable, NDEFD, was dropped for both the dividends-earnings test and the dividend-ROA test due to problems of perfect collinearity between variable following recommendations by Li (2014) that it will not affect regression results.

The regression results for SIZE are also consistent with the expectations set out in section 4.7.2.6 of chapter 4. SIZE has a positive coefficient of 0.075844 and *p*-value of 0.036 showing a positive and significant relationship between firm size and earnings. Although this is consistent with studies by Vijayakumar and Tamizhselvan (2010), Pervan and Visic (2012) and Ajanthan (2013), there are studies by Abrahamsen and Balchen (2010) and Abidin *et al.* (2015) which reported a negative association thus making the real effect of size on earnings debatable.

As was expected, GROWTH shows a negative coefficient of -0.013226 and an insignificant *p*-value of 0.187 when regressed against earnings. Prior studies by authors such as Gale (1972) and Shepherd (1972) found positive associations while studies by Haines (1970), Evans (1987), Nakano and Kim (2011), and Lee (2014) yielded negative associations between growth and earnings. Results from this study show that firms with more growth prospects report lower earnings as is reflected by the negative coefficient. Yet, the *p*-value of 0.1874 renders the relationship an insignificant one.

Analysis in Table 7(a) shows that 56.2% of the percentage variation in earnings is explained

by changes in the independent variables. This is reflected by the R^2 (R Squared) figure of 0.562. Consequentially, this means that 43.8% of the variations in earnings are unexplained by changes in the independent variables. This warrants further investigation into the dividend signalling of earnings as earnings can be influenced by a number of factors other than the ones cited in this study.

4.18.1 The relationship between changes in dividends and changes in future ROA

Following assertions by Hagel *et al.* (2013) that earnings are a mere reflection of overall profitability and do not necessarily reflect a firm's operating efficiency, an additional profitability measure, ROA, was added to the study. This is consistent with studies by authors such as Ahmad *et al.* (2012), Abidin *et al.* (2015), and Ahmed (2015). In that regard, the second hypothesis sought to determine if changes in dividends could carry any information regarding expected levels of ROA.

As is the case with the dividend signalling of earnings, it is still a puzzle whether dividends carry signals regarding ROA, as there still is inconclusive empirical evidence on the matter. Moreover, the issue of methodology seems to be a contributing factor to that puzzle. This study did not expect to find results in support of dividend signalling after accounting for mean reversion and autocorrelation of ROA. The regression results are outlined in Table 7(b) below:

Table 7(b) Panel Data Regression Results: The dividend signalling of ROA

Variable	**Coefficient**	**Probability**	**R^2 Value**	**Adjusted R^2**
C	-3.727205	0.237	0.503	0.439
DPRt-1	0.051484	0.322		
ROAt-1	-0.036755	0.046		
SIZEt-1	7.460006	0.342		
GROWTHt-1	-0.000154	0.988		
PDFED	-3.487515	0.021		

The results above show a positive relationship between dividend pay-out and ROA as is shown by a positive coefficient of 0.051484. Like the dividend-earnings test results shown in table 7(a) above, the relationship is also not significant as shown by a *p*-value of 0.322 corroborating findings by Farsio *et al.* (2004), Asem and Kaul (2014), Feragen (2014), and Eniola and Akinselure (2016).

Interestingly, SIZE is still positively related to ROA, but this time the relationship is not significant. This justifies why one needs to use different measures of financial performance when examining relationships. In the case of this study, if the study only used earnings as a measure of profitability, one would have concluded that size is positively and significantly related to profitability while this study showed that size is only related to earnings per share and not necessarily significantly related to ROA. This distinction would assist with making decisions that influence size as one would know the profitability metric affected. However, further research may need to be done whereby the effects of size are determined for a number of profitability measures.

Just like the results obtained in the dividend-earnings test, GROWTH is negatively and insignificantly related to ROA while SIZE is positively related to ROA. However, unlike the dividend-earnings test, the relationship between dividends and SIZE has a *p*-value of 0.342 showing an insignificant relationship.

Once again, it is interesting to note how lagged ROA shows a negative relationship with subsequent ROA. Like the earnings-lagged earnings relationship in table 7(a), ROA is found to be auto correlated. This is validated by the negative coefficient of -3.487515 for the dummy variable PDFED, which caters for the mean reversion process of ROA. The dummy variable is significant at 5% indicating the significant influence of mean reversion on subsequent ROA. These findings are consistent with the findings reported in table 7(a) and are also backed by findings by Grullon *et al.* (2005) in the USA market and by Mbithi (2014) in the Kenyan market.

4.18.2 The relationship between changes in dividends and changes in future CR

Unlike most dividend signalling studies that link dividend signalling with either earnings or ROA only, this study extended the dividend signalling hypothesis to liquidity. This was done based on the work of John and Williams (1985), and recommendations by authors such as Kale and Noe (1990), Kauko (2012), Bijia (2013), and Forti and Schiozer (2015). All these studies reinforced Bhattacharya's (1979) theory that dividends are positively related to subsequent liquidity levels. In the same vein, this study expected to obtain results in support of such a relationship with a *p*-value of 5% or lower indicative of a highly significant association.

Table 7(c) Panel Data Regression Results: The dividend signalling of CR

Variable	**Coefficient**	**Probability**	**R^2 Value**	**Adjusted R^2**
C	-0.083953	0.000	0.433	0.312
DPRt-1	0.001952	0.000		
CRt-1	-0.082426	0.000		
SIZEt-1	2.550007	0.870		
GROWTHt-1	-0.004274	0.100		

The results in table 7(c) above are consistent with Bhattacharya (1979) and John and Williams' (1985) cash flow hypothesis regarding dividends. As can be seen from the positive coefficient of 0.001952 and the *p*-value of 0.000 significant at the 1% level of confidence, changes in a firm's current ratio are positively and significantly explained by changes in a firm's DPR. As was expected, lagged CR is negatively and significantly related to subsequent CR as shown by a coefficient of -0.082426 and a *p*-value of 0.000 respectively. This highlights the negative influence of past liquidity levels on future liquidity. The effect of mean reversion could not be assessed as the inclusion of the dummy variables to cater for the reversion process were dropped from the model due to the problem of perfect multicollinearity that they created. The exclusion could not affect the

results and inference as was proven by Li (2014) who experienced similar challenges.

The variable for firm GROWTH shows a negative coefficient as expected and tabulated in Table 2. Even though this variable has been negative since the first results in 7(a), this time it has a *p*-value of 0.100 showing that this negative association between GROWTH and CR is significant but very weak.

SIZE is positively related to CR as per expectations. This tallies with findings by authors like Audretsch and Elston (2002), Soumaya (2012), Dogan (2013), and Jafari, Gord and Beerhouse (2014). Thanatawee (2011) attributed the results for SIZE to the life-cycle hypothesis that larger firms tend to have more cash flows than small firms.

4.18.3 The relationship between changes in dividends and changes in future DER

This study also extended the dividend signalling hypothesis to gearing based on recommendations by Aivazian *et al.* (2003) and Vieira (2005). The authors' argument emanated from the fact that having high debt levels leads to the payment of high interest expenses, which consequentially reduces money which would otherwise have been paid as dividends. This signifies an inverse relationship between changes in dividends and subsequent debt levels. BPP Learning Media (2017) argued in support of the claim that firms that are highly geared tend to have volatile earnings which causes changes in dividends.

Based on these arguments, a negative coefficient for the variable DER was expected to reflect that negative relationship between debt and dividends. Moreover, a *p*-value of 5% or lower would be indicative of a strong relationship.

Table 7(d) below shows the regression results for the test between changes in dividend and changes in the debt to equity ratio.

Table 7(d) Panel Data Regression Results: The dividend signalling of DER

Variable	Coefficient	Probability	R^2 Value	Adjusted R^2
C	-0.124078	0.000	0.487	0.302
DPRt-1	-0.005533	0.005		
DERt-1	-0.028217	0.000		
SIZEt-1	-2.290006	0.316		
GROWTHt-1	-0.005764	0.035		

The results in Table 7(d) above indicate that past debt levels, DERt-1, are negatively and significantly related to future debt levels as is shown by the negative coefficient of -0.028217 and a *p*-value of 0.000. These results indicate that firms with high debt levels may end up using alternative sources of capital to fund projects instead of piling on debt, thus causing a decline in the debt to equity ratio (Gitman and Zutter, 2011). This tallies with Naidu's (2011) observation that when debt levels increase, credit providers tend to demand higher returns resulting in firms seeking alternative funds. Moreover, the results are indicative of an inverse relationship between past dividends, shown by DPRt-1 and future debt levels, DER. A negative coefficient of -0.005533 shows that when there is an expected increase in debt, firms decrease dividends as a way to signal that increase. The *p*-value of 0.005 indicates that this relationship is significant at 1% level of confidence. These findings are in line with the hypothesis of this study that dividend decreases are associated with increases in debt and vice versa. Furthermore, the results corroborate findings by Aivazian *et al.* (2003), Al-Najjar (2009), and Al-Kuwari (2009). Despite this overwhelming evidence in support of the hypothesis, studies by Bhaduri (2002) and Bijia (2013) found dividends to carry positive signals regarding future gearing. To add on to the puzzle, a study by Geske and Delianedis (2001) found no link between dividends and debt while Vieira (2005) found conflicting results from different markets. This inconclusive empirical evidence warrants further research on the hypothesis.

SIZE was expected to be negatively related to debt levels following arguments by Mgudlwa (2009) and Marete (2015). A coefficient of -2.29000 supports that expectation. However, a *p*-value of 0.316 renders that relationship insignificant.

The variable GROWTH shows a negative coefficient of -0.005764, translating into an inverse relationship between growth and gearing. Furthermore, the results show a significant *p*-value of 0.035 indicating a significantly strong relationship. Although these results conflict with the expectations of this study, they not only confirm predictions by Myers (1977) that firms in their high growth phase avoid debt but compare favourably with results by Barclay and Smith (1996), Frank and Goyal (2009), and Chipeta (2012).

4.19 CONCLUSION

This study sought to determine whether dividends have the ability to carry signals regarding the expected financial performance of firms. To do so, a number of tests were carried out to determine whether a relationship exists between changes in dividends and various financial performance metrics.

The first test was to determine whether a relationship exists between changes in current dividends and changes in future earnings. The general expectation as per Lintner's (1956) theory was that dividend increases would be positively and significantly associated with increases in future earnings. Yet, this study proved otherwise. In as much as the relationship between these variables was positive as expected, the relationship was not significant enough to warrant support for the dividend signalling of earnings. Similarly, the nature of the relationship between dividends and ROA could not support the dividend signalling hypothesis either. Interestingly, when the dividend signalling hypothesis was extended to the signalling of liquidity using the current ratio, evidence gathered supported the dividend signalling hypothesis. Finally, the relationship between dividends and gearing was also in support of the ability of dividends to signal expected changes in debt levels.

To achieve all these results, the study included a number of control and dummy variables. The effect of size and growth were examined for all the performance variables. Generally, it was found that the bigger the firm, the better it will perform as was indicated by the positive coefficients of the variable SIZE in relation to earnings, ROA and CR. Moreover, it

was also found that GROWTH negatively relates to financial performance. This was consistent with various empirical studies that firms in the high growth phase prioritise investment projects at the expense of superior performance (Mworia, 2016)

The concepts of autocorrelation and mean reversion of financial performance have been recurrent in this whole study. Lagged financial performance variables were included in each estimation equation to cater for the relationship between past and expected financial performance while dummy variables accounted for mean reversion. All lagged performance variables were in support of the negative relationship between past and future performance. Authors such as Vieira and Raposo (2007) and Chipeta (2012) attributed the negative relationship to the part played by competition and new entrants in high performing industries. Although these results were supported by the negative value of PDFED, which catered for the inverse mean reversion process of profits, dummy variables for the liquidity and gearing models were dropped due to issues of perfect collinearity.

In summary, it was found that dividends can be used to send signals regarding expected liquidity levels and gearing but not profitability. This is further explained in the next concluding chapter, which sums up the entire study.

CHAPTER 6

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

The sole objective of the study was to determine whether dividends carry signals regarding future financial performance. Grounded on sound theoretical and empirical foundations, the study sought to prove that dividend signalling tests should not be limited to only one aspect of financial performance as dividends can be used to convey changes in just about any aspect of a firm's financial performance (Brigham and Houston, 2007). This is especially important since there is inconclusive empirical evidence as to the exact information that is signalled via dividend changes.

The main aim of this chapter is to highlight the theoretical and empirical implications of findings from this study. Based on some limitations experienced during the study, recommendations to help in future research will be made. Precisely, the chapter will outline the findings of the study, clearly showing theoretical contributions made to the existing body of knowledge and acknowledging areas of further research.

This chapter is organised as follows: section 6.2 outlines the findings from this study for each set objective while section 6.3 summarises those findings. Section 6.4 outlines the theoretical and methodological contributions of the study to the existing body of knowledge and section 6.5 acknowledges areas for further research. Finally, section 6.6 concludes the chapter.

5.2 FINDINGS WITH REGARDS TO THE OBJECTIVES OF THE STUDY

The overall aim of this study was to determine the aspects of financial performance signalled by managers when they announce dividend changes. Based on a thorough literature review, the four aspects of financial performance that were used in this study

were earnings and ROA for profitability and the current ratio as well as the debt to equity ratio for liquidity and gearing respectively. The motive behind examining the dividend signalling hypothesis using various aspects of financial performance was two-fold. Firstly, pondering on Brigham and Houghton's (2007) comment that a firm's dividend policy reflects its overall financial performance brought about a question that if dividends are reflective of overall financial performance, should signalling not be extended to all aspects of financial performance? Secondly, by analysing and responding to empirical arguments by Vieira (2005), Vieira and Raposo (2007), Bijia (2013) and Moscu *et al.* (2014) that dividends signalling studies must explore various aspects of financial performance if one needs to understand the information signalled in a particular market, the study ended up adopting similar arguments and methodology. In that regard, the findings reported below are based on the objectives set for this study, which are investigating the relationships between changes in dividends and changes in expected earnings, ROA, CR and DER. Presented below are the findings for each set objective as follows:

5.2.1 To investigate if a relationship exists between changes in current dividends and changes in a firm's future earnings.

The first objective was set based on Lintner's (1956) theory that firms will only increase dividends once there is a certainty that earnings increased. Although Lintner's (1956) theory is popular amongst finance scholars, there is a discord in empirical findings as some authors find results that endorse Lintner's (1956) theory while others do not. For instance, authors such as Wann and Long (2009), Flint *et al.* (2010) and Gou *et al.* (2015) have positively and significantly linked dividend changes with subsequent earnings. On the contrary, authors like Benartzi *et al.* (1997), Feragen (2014) and Jaber and Krisciunas (2016) found dividends to lack the power to signal changes in expected earnings.

This study found a positive, yet, insignificant relationship between dividends and subsequent earnings as shown by a positive coefficient of 0.17225 and an insignificant p-value of 0.1283. Based on these results, the author failed to reject the null hypothesis

that increases or decreases in the current level of dividends are not associated with increases or decreases in future earnings. These results fail to support the notion that dividends are used to send signals regarding expected earnings levels as was suggested by Linter (1956).

5.2.2 To investigate if a relationship exists between changes in current dividends and changes in a firm's future ROA

The dividend signalling hypothesis was extended to the signalling of ROA based on suggestions by authors like Ahmad *et al.* (2012), Abidin *et al.* (2015), Ahmed (2015) and Pandey (2015). It was hypothesised that increases in dividends would be accompanied by subsequent increases in ROA and vice versa. The results from this study showed that dividend changes are not used as a way to signal changes in subsequent ROA, resulting in the rejection of the dividend signalling hypothesis. This confirms Demontis' (2013) findings in the Scandinavian market and contradicts with Al-Amarneh and Yaseen's (2014) argument that dividends significantly carry signals regarding expected levels of ROA.

5.2.3 To investigate if a relationship exists between changes in current dividends and changes in a firm's future liquidity measured by CR

The third hypothesis was fashioned based on the possible link between dividends and liquidity initially suggested by Bhattacharya (1979) and supported by John and Williams (1985). It was hypothesised that increases in dividends would be positively related to subsequent liquidity levels. This study confirmed this hypothesis with a positive coefficient of 0.001952 and a *p*-value of 0.002 significant at 1%, reinforcing the work of Thanatawee (2011), Kauko (2012), Bijia (2013) and Forti and Schiozer (2015).

5.2.4 To investigate if a relationship exists between changes in current dividends and changes in a firm's future gearing measured by DER

The final hypothesis of the study was based on the work of Grullon *et al.* (2002), Waswa (2013), and Ndeto (2014) that dividends contain information about expected debt levels.

The results obtained confirmed that an inverse relationship exists between dividends and debt as shown by a negative coefficient. Moreover, a significant *p*-value of 0.0000 shows that this relationship is strong.

5.3 SUMMARY OF FINDINGS

The objectives of the study were based on the following things: Brigham and Houston's (2007) assertion about dividend policy, and Vieira's (2005) recommendation about dividend tests. Specifically, the study had four objectives which investigated if dividends can carry signals regarding earnings, ROA, CR and DER. Using these four measures of financial performance enabled the author to determine the signals sent via dividend changes in the South African context.

As is evidenced from section 6.2 above, this study could not find enough evidence in support of the signalling of earnings and ROA. Had the study only been limited to earnings and ROA, it would have been concluded that dividends do not carry signals regarding financial performance. Yet, by extending the study to various aspects of financial performance, it was established that dividends carry positive signals regarding liquidity and negative signals regarding gearing. This substantiates the claim by Vieira and Raposo (2007) that the dividend signalling hypothesis must not merely investigate the dividend signalling of profitability but needs to explore other aspects of financial performance. By doing so, maybe the dividend puzzle may eventually be solved.

Interestingly, the lack of support for the dividend signalling of earnings and ROA in this study could be an endorsement of the methodology argument raised by Nissim and Ziv (2001), Grullon *et al.* (2003) and Vieira (2005). According to these authors, once one accounts for the mean reversion and autocorrelation of profitability, dividends cease to carry their signalling power. Vieira (2005) validated this argument by using two models; one that accounts for mean reversion and autocorrelation, and one that does not. Indeed, models that did not account for mean reversion and autocorrelation showed evidence of

signalling. Looking at all these factors, it seems that the dividend puzzle is yet to be solved, as empirical studies have to also now extend their dividend signalling debate to methodological issues.

5.4 THE CONTRIBUTIONS OF THE STUDY

This study was carried with the intention of benefiting different users of accounting information, and making a contribution to the body of finance knowledge. The subsection below highlights the empirical and methodological contributions made by this study.

5.4.1 Contribution to the knowledge gap

As has been discussed above, it is common knowledge in finance literature that the dividend signalling concept is an unsolved puzzle as authors disagree on the information content dividends. There are authors such as Nissim and Ziv (2001), Arnott and Asness (2003), and Gou *et al.* (2015) who asserted that dividends are positively and significantly related to earnings while Lee *et al.* (2012), Thafani and Abdullah (2014) and Kadioglu and Ocal (2016) concluded that dividends carry information regarding ROA. On the contrary, authors such as Farsio *et al.* (2004), Grullon *et al.* (2005), and Asem and Kaul (2014) disproved such assertions. Yet, one thing common about all these authors is that they limit the dividend signalling hypothesis to profitability. These studies, and many other others discussed in chapter 3 prove that the majority of dividend signalling tests have been carried out using profitability metrics such as earnings, ROA, and ROE only. This poses the question whether profitability is all that can be signalled via dividend changes, especially if one considers that Brigham proved that dividends are reflective of overall financial performance (Masocha, and Ndlovu 2017).

It seems it would be folly to limit the dividend signalling hypothesis to one aspect of financial performance as dividends can be used to signal any aspect of financial performance. This has been evidenced from this study where dividends in the South African context are used to send signals regarding liquidity and gearing. Had this study not incorporated various measures of financial performance, these conclusions would not have been reached.

Based on the findings of this study, authors who want to investigate the information content of dividends should consider using different measures of financial performance to try and determine the information sent via dividends. In that manner, this study augments claims that dividend signalling tests should incorporate different performance metrics, especially in the South African context where tests conducted on the dividend signalling hypothesis have looked mainly at the signalling of profitability.

This study has also opened up avenues for further investigation whether dividends signal subsequent liquidity and debt levels. It is apparent from the number of empirical studies discussed in sections 3.4 and 3.5 of chapter 3 that this warrants further investigation, especially in the South African context where a large number of small and medium enterprises do not have high cash levels and rely on debt finance (Sebastian and Kransdorff, 2017).

5.4.2 Methodological contributions of this study

To achieve the objectives of the study, panel data models were used. In support of panel data models, Baltagi (2014) commented that the models effectively account for firm specific heterogeneity and are better suited to detect changes in relationships due to repeated observations over time. Furthermore, panel data models are more informative, reduce collinearity among variables while providing more degrees of freedom (Baltagi, 2014). Based on all these, this study has made a vital contribution in finance methodology. This is especially true since most studies employed time series or cross sectional models to test the dividend signalling hypothesis.

Moreover, this study used fixed effects and random effects models that account for the differences found amongst firms and differences that arise with time. As a result, the study truly captured the characteristics of firms operating in different industries and the change in their financial performance over time. Using FEM and REM proved more efficient than employing pooled OLS, which assumes that all firms from different industries

are the same. From the argument provided in this study in support of FEM and REM, studies with different firms should consider using these panel models rather than pooled OLS, as they acknowledge differences amongst firms and industries.

The concepts of mean reversion and autocorrelation of financial performance were a major determinant in the modelling of the estimation equations used in this study. This was very important considering that Nissim and Ziv (2001), Grullon *et al.* (2005), Vieira and Raposo (2007) proved that models that do not account for mean reversion incorrectly detect dividend signalling where there is no signalling effect. Yet, it is apparent that most studies in both developed and developing markets like South Africa did not account for these aspects. By accounting for mean reversion and autocorrelation, this study substantiated the claim that methodology plays a part in solving the dividend puzzle thus making a huge methodological contribution to finance literature.

5.5 SIGNIFICANCE OF THE STUDY

As was shown in chapter 3 of this study, there has been as much literature on the dividend signalling hypothesis as there have been findings. One of the key reasons for these different findings has been the fact that different authors look at different yet individual aspects of performance. By investigating the relationship between dividends and four different measures of financial performance, the study provides an important piece to the dividend puzzle, especially in the South African context where most studies have only linked dividends with one measure of financial performance.

By also linking dividends with gearing, the study enables stakeholders of high-interest-bearing firms to be able to use and interpret dividend signals appropriately. This would not have been achieved had the dividend signalling hypothesis been limited to profitability and liquidity.

Credit Providers can also benefit from the findings of this study as they can use the changes in a firm's dividend level to predict that firm's future liquidity and debt levels. This

information will be valuable to current creditors as they become informed enough to determine if a firm can settle its debt. Furthermore, the study offers some important insight to prospective credit providers since they can use it to rate the debt level for a firm and its ability to pay and then decide whether to offer credit.

Senior finance managers who need to make strategic management decisions may also use the findings of this study to improve the decision-making process regarding dividends. If indeed a relationship exists between dividends and various financial performance variables, senior managers may need to adjust their investment decisions.

5.6 DELINEATION AND LIMITATIONS OF THE STUDY

In order to determine the signalling effect of dividends on future financial performance, the study was confined to South African listed companies, as their financial information was easily accessible from the JSE. Due to time constraints, it was impossible to look at the dividend signalling concept using companies from all over the world. Moreover, there was a limitation of resources to find the relevant financial information from all over the world.

Due to practical constraints, this study could not provide a comprehensive review of all South African listed companies. The author only took a sample of the South African listed companies whose information was available on INET-BFA. For consistency, with other dividend signalling studies, banks were excluded from the listed companies considered part of the population as their funding structure is different from that of firms in the other industries.

The post-apartheid period (1995- 2015) was considered for this study since it was the period when South African standards became more aligned with the rest of the world. According to Gitman and Zutter (2011) it is common for companies to reward shareholders by means other than the payment of a cash dividend. Yet for consistency, this study only focused on normal cash dividends declared and/or distributed as they

are commonly used by most researchers who investigate the dividend signalling hypothesis.

Furthermore, the intention of the study was not to merely gather evidence that proves or disproves the dividend signalling concept. The study aimed to determine the exact signals sent via dividend changes. As a result, share price reactions to dividend changes were not incorporated in this study as is the case with other studies since they [share price reactions] only show evidence of signalling but do not specify the aspect of financial performance signalled. Instead, the study used different measures of financial performance to test if dividends can carry signals regarding future profits, cash levels and debt.

Finally, a discussion of whether dividends carry short-term or long-term signals was beyond the scope of this study. The study only sought to decipher the exact signals embedded in dividends.

5.7 RECOMMENDATIONS FOR FURTHER STUDY

It is apparent from the study that methodological issues have an influence on whether dividends carry signals regarding expected financial performance or not. Authors such as Grullon *et al.* (2005) and Vieira (2005) argued that when one fails to account for mean reversion and autocorrelation of performance, the model used yields incorrect results. As a recommendation, studies can be carried out to compare models that account for mean reversion and those that do not in order to further investigate this claim.

Furthermore, the observation that dividends carry signals regarding liquidity and gearing warrants further attention as there are only a few studies carried out in that regard. Moreover, other authors can use this study as a foundation and carry out further research to see if managers can also use dividends to send signals regarding non- financial performance measures such as expected customer satisfaction levels.

This study looked at the signalling power of dividends by investigating the relationship between lagged dividends for the previous year and changes in performance measures for the next year. Interestingly, more research needs to be done to investigate the length of the dividend signal by comparing dividend changes with changes in financial performance for a 5-year or even 10 year period. By doing so, it will be determined whether dividend signals are short term or long term in nature.

It was established in chapter 4 that this study was non-experimental in nature. This means that only the issues of correlation were addressed. More research could be conducted to determine if a causal relationship exists between dividends and financial performance.

5.8 CONCLUSION

It is apparent from empirical literature that there is diversity of opinions regarding the dividend signalling hypothesis. This emanates from the fact that the dividend signalling hypothesis is marred with theoretical and methodological discord amongst researchers. There is a group of authors that favours Linter's (1956) theory that dividends carry signals regarding earnings. Then there are others that support Bhattacharya (1979) and John and Williams' (1985) theory that dividends can be used to communicate expected levels of cash. Moreover, authors such as Grullon *et al.* (2002), and Galai and Wiener (2013) believe that dividends are used to communicate expected changes in gearing levels. From all these different groups, it is clear that dividends can be linked with a specific financial performance measure. Yet, a proposal by Vieira (2005), Bijia (2013) and Moscu *et al.* (2014) suggests examining the dividend signalling hypothesis by incorporating all these different aspects of financial performance in order to get a clearer dividend signalling picture.

In an attempt to bridge the theoretical differences surrounding the dividend signalling hypothesis, this study took heed of Vieira (2005), Bijia (2013) and Moscu *et al.*'s (2014) proposal and used four different aspects of financial performance namely earnings, ROA, CR and DER. As a result, although there was not enough evidence to support the notion that South African firms use dividends to send signals regarding expected changes

in earnings and ROA, the study endorsed the dividend signalling of liquidity and gearing in South Africa.

It has also been established earlier that there is a growing methodological issue surrounding the dividend signalling hypothesis. Most studies which have investigated the dividend signalling hypothesis have failed to account for mean reversion and autocorrelation of performance. By including dummy variables, the study proved that dividends do not carry signals regarding profitability once mean reversion and autocorrelation are controlled for.

In conclusion, it can safely be said that, if one needs to fully understand if dividends carry signals regarding financial performance, different aspects of financial performance need to be incorporated into the study. Moreover, the aspects of mean reversion and autocorrelation need to be accounted for in order to truly determine the presence of signalling.

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6 APPENDICES

6.1 APPENDIX A: Population before selection criteria

Company	Symbol	Sector
AB In Bev	ANB	Beverages
ABSA Bank Limited	ABSP	Banks
Accelerate Property Fund Limited	APF	Real Estate Investment Trusts
Accentuate Limited	ACE	Chemicals
Acsion Limited	ACS	Real Estate Investment & Services
Adapt It Holdings Limited	ADI	Software & Computer Services
Adcock Ingram Holdings Limited	AIP	Pharmaceuticals & Biotechnology
Adcorp Holdings Limited	ADR	Support Services
Adrenna Property Group Limited	ANA	Real Estate Investment & Services
Advanced Health Limited	AVL	Health Care Equipment & Services
Advtech Limited	ADH	General Retailers
AECI Limited	AFE	Chemicals
African And Overseas Enterprises Limited	AOO	General Retailers
African Bank Investments Limited	ABL	Financial Services
African Dawn Capital Limited	ADW	Financial Services
African Eagle Resources Plc	AEA	Industrial Metals & Mining

Company	Symbol	Sector
African Equity Empowerment Investments Limited	AEE	Financial Services
African Media Entertainment Limited	AME	Media
African Oxygen Limited	AFX	Chemicals
African Rainbow Minerals Limited	ARI	Industrial Metals & Mining
Afrimat Limited	AFT	Construction & Materials
Afrocentric Investment Corp Limited	ACT	Financial Services
AH-Vest Limited	AHL	Food Producers
Alaris Holdings Limited	ALH	Aerospace & Defense
Alert Steel Holdings Limited	AET	General Retailers
Alexander Forbes Group Holdings Limited	AFH	Financial Services
Allied Electronics Corporation Limited	AEN	Software & Computer Services
Amalgamated Electronic Corp Limited	AER	Electronic & Electrical Equipment
Anchor Group Limited	ACG	Financial Services
Andulela Investment Holdings Limited	AND	Industrial Metals & Mining
Anglo American Platinium Limited	AMS	Mining
Anglo American Plc	AGL	Mining
Anglogold Ashanti Limited	ANG	Mining
Ansys Limited	ANS	Industrial Transportation

Company	Symbol	Sector
ARB Holdings Limited	ARH	Support Services
Arcelormittal South Africa Limited	ACL	Industrial Metals & Mining
Argent Industrial Limited	ART	Support Services
Arrowhead Properties Limited	AWA	Real Estate Investment Trusts
Ascendis Health Limited	ASC	Pharmaceuticals & Biotechnology
Ascension Properties Limited	AIA	Real Estate Investment Trusts
Aspen Pharmacare Holdings Limited	APN	Pharmaceuticals & Biotechnology
Assore Limited	ASR	Industrial Metals & Mining
Astoria Investments Limited	ARA	Financial Services
Astral Foods Limited	ARL	Food Producers
Astrapak Limited	APK	General Industrials
Atlantic Leaf Properties Limited	ALP	Real Estate Investment Trusts
Atlatsa Resources Corporation	ATL	Mining
Attacq Limited	ATT	Real Estate Investment & Services
Aveng Limited	AEG	Construction & Materials
AVI Limited	AVI	Food Producers
Awethu Breweries Limited	AWT	Food Producers

Company	Symbol	Sector
Balwin Properties Pty Limited	BWN	Real Estate Investment & Services
Barclays Africa Group Limited	BGA	Banks
Barloworld Limited	BAW	Support Services
Basil Read Holdings Limited	BSR	Construction & Materials
Bauba Platinum Limited	BAU	Mining
Beige Holdings Limited	BEG	Personal Goods
Bell Equipment Limited	BEL	Industrial Engineering
BHP Billiton Plc	BIL	Industrial Metals & Mining
Bid Corp Limited	BID	Health Care Equipment & Services
BK One Limited	BK1P	Financial Services
Blue Financial Services Limited	BFS	Financial Services
Blue Label Telecoms Limited	BLU	Support Services
Bonatla Property Holdings Limited	BNT	Real Estate Investment & Services
Bowler Metcalf Limited	BCF	Chemicals
Brait SE	BAT	Financial Services
Brikor Limited	BIK	Construction & Materials
Brimstone Investment Corporation Ld	BRT	Financial Services
British American Tobacco Plc	BTI	Tobacco

Company	Symbol	Sector
BSI Steel Limited	BSS	Industrial Metals & Mining
Buffalo Coal Corp	BUC	Mining
Buildmax Limited	BDM	Oil Equipment, Services & Distribution
CAFCA Limited	CAC	Electronic & Electrical Equipment
Calgro M3 Holdings Limited	CGR	Real Estate Investment & Services
Capevin Holdings Limited	CVH	Beverages
Capital & Counties Properties Plc	CCO	Real Estate Investment & Services
Capital & Regional Plc	CRP	Real Estate Investment Trusts
Capital Appreciation Limited	CTA	Financial Services
Capitec Bank Holdings Limited	CPI	Banks
Cargo Carriers Limited	CRG	Industrial Transportation
Cartrack Holdings Limited	CTK	Technology Hardware & Equipment
Cashbuild Limited	CSB	General Retailers
Caxton CTP Publishers & Printers Ltd	CAT	Media
Central Rand Gold Limited	CRD	Mining
Chemical Specialities Limited	CSP	Chemicals
Choppies Enterprises Limited	CHP	General Retailers

Company	Symbol	Sector
Chrometco Limited	CMO	Industrial Metals & Mining
City Lodge Hotels Limited	CLH	Travel & Leisure
Clicks Group Limited	CLS	Food & Drug Retailers
Clientele Limited	CLI	Life Insurance
Clover Industries Limited	CLR	Food Producers
Coal Of Africa Limited	CZA	Oil & Gas Producers
Cognition Holdings Limited	CGN	Fixed Line Telecommunications
Comair Limited	COM	Travel & Leisure
Combined Motor Holdings Limited	CMH	General Retailers
Command Holdings Limited	CMA	General Retailers
Compagnie Financiere Richemont SA	CFR	Personal Goods
Conduit Capital Limited	CND	Nonlife Insurance
Consolidated Infrastructure Group Ltd	CIL	Construction & Materials
Coronation Fund Managers Limited	CML	Financial Services
Crookes Brothers Limited	CKS	Food Producers
CSG Holdings Limited	CSG	Support Services
Cullinan Holdings Limited	CUL	Travel & Leisure
Curro Holdings Limited	COH	General Retailers
Datacentrix Holdings Limited	DCT	Software & Computer Services

Company	Symbol	Sector
Datatec Limited	DTC	Technology Hardware & Equipment
Delrand Resources Limited	DRN	Industrial Metals & Mining
Delta EMD Limited	DTA	Electronic & Electrical Equipment
Delta Property Fund Limited	DLT	Real Estate Investment Trusts
Deneb Investments Limited	DNB	Financial Services
Diamondcorp Plc	DMC	Industrial Metals & Mining
Dipula Income Fund Limited	DIA	Real Estate Investment Trusts
Discovery Limited	DSY	Life Insurance
Distell Group Limited	DST	Beverages
Distribution And Warehousing Network Ld	DAW	Support Services
DRDGOLD Limited	DRD	Mining
E Media Holdings Limited	EMH	Personal Goods
Eastern Platinum Limited	EPS	Industrial Metals & Mining
Ecsponent Limited	ECS	Financial Services
Efficient Group Limited	EFG	Financial Services
ELB Group Limited	ELR	Support Services
Ellies Holdings Limited	ELI	Technology Hardware & Equipment

Company	Symbol	Sector
Emira Property Fund Limited	EMI	Real Estate Investment Trusts
enX Group Limited	ENX	Support Services
EOH Holdings Limited	EOH	Software & Computer Services
EPE Capital Partners Limited (Ethos Capital)	EPE	Financial Services
Eqstra Holdings Limited	EQS	Support Services
Equites Property Fund Limited	EQU	Real Estate Investment Trusts
Erin Energy Corporation	ERN	Oil & Gas Producers
Esor Limited	ESR	Construction & Materials
Evraz Highveld Steel & Vanadium Ltd	EHS	Industrial Metals & Mining
Exxaro Resources Limited	EXX	Oil & Gas Producers
Fairvest Property Holdings Limited	FVT	Real Estate Investment & Services
Famous Brands Limited	FBR	Travel & Leisure
Ferrum Crescent Limited	FCR	Industrial Metals & Mining
Finbond Group Limited	FGL	Financial Services
Firestone Energy Limited	FSE	Mining
Firstrand Limited	FSR	Financial Services
Fortress Income Fund Limited	FFB	Real Estate Investment Trusts
Freedom Property Fund Ltd	FDP	Real Estate Investment & Services

Company	Symbol	Sector
GAIA Infrastructure Capital Limited	GAI	Financial Services
Giyani Gold Corporation	GIY	Industrial Metals & Mining
Glencore Plc	GLN	Mining
Global Asset Management Limited	GAM	Financial Services
Globe Trade Centre SA	GTC	Real Estate Investment & Services
Go Life International Pcc	GLI	Health Care Equipment & Services
Gold Brands Investments Limited	GBI	Travel & Leisure
Gold Fields Limited	GFI	Mining
Gooderson Leisure Corporation Ltd	GDN	Travel & Leisure
Grand Parade Investments Limited	GPL	Travel & Leisure
Great Basin Gold Limited	GBG	Mining
Greenbay Properties Limited	GRP	Financial Services
Grindrod Limited	GND	Industrial Transportation
Group Five Limited	GRF	Construction & Materials
Growthpoint Properties Limited	GRT	Real Estate Investment Trusts
Harmony Gold Mining Company Limited	HAR	Mining
Holdsport Limited	HSP	General Retailers
Homechoice International Plc	HIL	General Retailers

Company	Symbol	Sector
Hosken Consolidated Investments Ltd	HCI	General Industrials
Hospitality Property Fund Limited	HPA	Real Estate Investment Trusts
Howden Africa Holdings Limited	HWN	Industrial Engineering
Hudaco Industries Limited	HDC	Support Services
Huge Group Limited	HUG	Fixed Line Telecommunications
Hulamin Limited	HLM	Industrial Metals & Mining
Hulisani Limited	HUL	#N/A
Hwange Colliery Company Limited	HWA	#N/A
Hyprop Investments Limited	HYP	Real Estate Investment Trusts
Imbalie Beauty Limited	ILE	Personal Goods
Impala Platinum Holdings Limited	IMP	Mining
Imperial Holdings Limited	IPL	General Retailers
Indequity Group Limited	IDQ	Nonlife Insurance
Indluplace Properties Limited	ILU	Real Estate Investment Trusts
Ingenuity Property Investments Ltd	ING	Real Estate Investment & Services
Insimbi Refractory and Alloy Supplies Limited	ISB	Support Services
International Hotel Group Limited	IHL	Real Estate Investment & Services
Interwaste Holdings Limited	IWE	Support Services

Company	Symbol	Sector
Intu Properties Plc	ITU	Real Estate Investment Trusts
Investec Australia Property Fund	IAP	Real Estate Investment Trusts
Investec Limited	INL	Financial Services
Investec Plc	INP	Financial Services
Investec Property Fund Limited	IPF	Real Estate Investment Trusts
Invicta Holdings Limited	IVT	Support Services
IPSA Group Plc	IPS	Construction & Materials
ISA Holdings Limited	ISA	Software & Computer Services
Italtile Limited	ITE	General Retailers
Jasco Electronics Holdings Limited	JSC	Electronic & Electrical Equipment
JSE Limited	JSE	Financial Services
Jubilee Platinum Plc	JBL	Industrial Metals & Mining
KAP Industrial Holdings Limited	KAP	General Industrials
Kaydav Group Limited	KDV	Support Services
Keaton Energy Holdings Limited	KEH	Oil & Gas Producers
Kibo Mining Plc	KBO	Mining
Kumba Iron Ore Limited	KIO	Industrial Metals & Mining
Labat Africa Limited	LAB	Technology Hardware & Equipment

Company	Symbol	Sector
Lewis Group Limited	LEW	General Retailers
Liberty Holdings Limited	LBH	Life Insurance
Life Healthcare Group Holdings Ltd	LHC	Health Care Equipment & Services
Lodestone REIT Limited	LDO	Real Estate Investment Trusts
London Finance & Investment Group Plc	LNF	Financial Services
Lonmin Plc	LON	Industrial Metals & Mining
M-FiTEC International Limited	MFI	Software & Computer Services
Mara Delta Property Holdings	MDP	Real Estate Investment Trusts
Marshall Monteagle Plc	MMP	Support Services
MAS Real Estate Inc	MSP	Real Estate Investment & Services
Masonite (Africa) Limited	MAS	Forestry & Paper
Massmart Holdings Limited	MSM	Food & Drug Retailers
Master Drilling Group Ltd	MDI	Industrial Metals & Mining
Mazor Group Limited	MZR	Construction & Materials
Mediclinic International Limited	MEI	Health Care Equipment & Services
Merafe Resources Limited	MRF	Industrial Metals & Mining
Metair Investments Limited	MTA	Automobiles & Parts

Company	Symbol	Sector
Metrofile Holdings Limited	MFL	Software & Computer Services
MICROmega Holdings Limited	MMG	Financial Services
Middle East Diamond Resources Limited	MED	Industrial Metals & Mining
Mine Restoration Investments Ltd	MRI	Support Services
Miranda Mineral Holdings Limited	MMH	Industrial Metals & Mining
Mix Telematics Limited	MIX	Support Services
MMI Holdings Limited	MMI	Life Insurance
Mondi Limited	MND	Forestry & Paper
Mondi Plc	MNP	General Industrials
Moneyweb Holdings Limited	MNY	Software & Computer Services
Montauk Holdings Limited	MNK	Electricity
Mpact Limited	MPT	General Industrials
Mr Price Group Limited	MRP	General Retailers
MTN Group Limited	MTN	Mobile Telecommunications
Murray & Roberts Holdings Limited	MUR.ZA	Construction & Materials
Mustek Limited	MST	Technology Hardware & Equipment
Nampak Limited	NPK	General Industrials
Naspers Limited	NPN	Media

Company	Symbol	Sector
Nedbank Group Limited	NED	Banks
Net 1 UEPS Technologies Inc	NT1	Technology Hardware & Equipment
Netcare Limited	NTC	Health Care Equipment & Services
New Europe Property Investments Plc	NEP	Real Estate Investment & Services
New Frontier Properties Limited	NFP	Real Estate Investment & Services
Newpark REIT Limited	NRL	Real Estate Investment Trusts
Nictus Beperk	NCS	Financial Services
Niveus Investments Ltd	NIV	Financial Services
Northam Platinum Limited	NHM	Mining
Novus Holdings Limited	NVS	Support Services
Nu-World Holdings Limited	NWL	Household Goods & Home Construction
Nutritional Holdings Limited	NUT	Food Producers
NVest Financial Holdings Limited	NVE	Financial Services
Oakbay Resources And Energy Limited	ORL	Mining
Oando Plc	OAO	Oil & Gas Producers
Oasis Crescent Property Fund	OAS	Financial Services

Company	Symbol	Sector
Oceana Group Limited	OCE	Food Producers
Octodec Investments Limited	OCT	Real Estate Investment Trusts
Old Mutual Plc	OML	Life Insurance
Omnia Holdings Limited	OMN	Chemicals
Onelogix Group Limited	OLG	Industrial Transportation
Orion Real Estate Limited	ORE	Real Estate Investment Trusts
Pallinghurst Resources Limited	PGL	Financial Services
Pan African Resources Plc	PAN	Industrial Metals & Mining
Peregrine Holdings Limited	PGR	Financial Services
Petmin Limited	PET	Industrial Metals & Mining
Phumelela Gaming & Leisure Limited	PHM	Travel & Leisure
Pick N Pay Holdings Limited	PWK	Food & Drug Retailers
Pick N Pay Stores Limited	PIK	Food & Drug Retailers
Pinnacle Holdings Ltd	PNC	Technology Hardware & Equipment
Pioneer Food Group Limited	PFG	Food Producers
Platfields Limited	PLL	Mining
PPC Limited	PPC	Construction & Materials
Prescient Limited	PCT	Financial Services
Primeserv Group Limited	PMV	Support Services

Company	Symbol	Sector
Protech Khuthele Holdings Limited	PKH	Construction & Materials
PSG Group Limited	PSG	Financial Services
PSG Konsult Limited	KST	Financial Services
PSV Holdings Limited	PSV	Industrial Engineering
Purple Group Limited	PPE	Financial Services
Putprop Limited	PPR	Real Estate Investment & Services
Quantum Food Holdings Limited	QFH	Food Producers
Quantum Property Group Limited	QPG	Real Estate Investment & Services
Rand Merchant Investment Holdings Limited	RMI	Life Insurance
Randgold & Exploration Company Ltd	RNG	Mining
Rare Holdings Limited	RAR	Support Services
Raubex Group Limited	RBX	Construction & Materials
RBA Holdings Limited	RBA	Real Estate Investment & Services
RCL Foods Limited	RCL	Food Producers
Rebosis Property Fund Limited	REB	Real Estate Investment Trusts
RECM And Calibre Limited	RACP	Financial Services
Redefine International Plc	RPL	Real Estate Investment Trusts

Company	Symbol	Sector
Redefine Properties Limited	RDF	Real Estate Investment Trusts
Reinet Investments SCA	REI	Financial Services
Remgro Limited	REM	Financial Services
Renergen Limited	REN	Financial Services
Resilient REIT Limited	RES	Real Estate Investment Trusts
Resource Generation Limited	RSG	#N/A
Reunert Limited	RLO	General Industrials
Rex Trueform Clothing Company Ltd	RTO	General Retailers
Rhodes Food Group Holdings Limited	RFG	Food Producers
RMB Holdings Limited	RMH	Financial Services
Rockcastle Global Real Estate Company Limited	ROC	Real Estate Investment & Services
Rockwell Diamonds Incorporated	RDI	Industrial Metals & Mining
Rolfes Holdings Limited	RLF	Chemicals
Royal Bafokeng Platinum Limited	RBP	Mining
SA Corporate Real Estate Limited	SAC	Real Estate Investment Trusts
Sabmiller Plc	SAB	Beverages
Sabvest Limited	SBV	Financial Services
Sacoil Holdings Limited	SCL	Oil & Gas Producers
Sacoven Plc	SCV	Financial Services

Company	Symbol	Sector
Safari Investments RSA Limited	SAR	Real Estate Investment Trusts
Sanlam Limited	SLM	Life Insurance
Santam Limited	SNT	Nonlife Insurance
Santova Limited	SNV	Industrial Transportation
Sappi Limited	SAP	Forestry & Paper
Sasfin Holdings Limited	SFN	Banks
Sasol Limited	SOL	Oil & Gas Producers
Schroder European Real Estate Investment Trust plc	SCD	Real Estate Investment Trusts
Sentula Mining Limited	SNU	Oil & Gas Producers
Sephaku Holdings Limited	SEP	Construction & Materials
Shoprite Holdings Limited	SHP	Food & Drug Retailers
Sibanye Gold Limited	SGL	Mining
Silverbridge Holdings Limited	SVB	Software & Computer Services
Sirius Real Estate Limited	SRE	Real Estate Investment & Services
South African Coal Mining Holdings Ltd	SAH	Oil & Gas Producers
South Ocean Holdings Limited	SOH	Electronic & Electrical Equipment
South32 Limited	S32	Industrial Metals & Mining

Company	Symbol	Sector
Sovereign Food Investments Limited	SOV	Food Producers
Spanjaard Limited	SPA	Chemicals
Spur Corporation Limited	SUR	Travel & Leisure
Standard Bank Group Limited	SBK	Banks
Stefanutti Stocks Holdings Ltd	SSK	Construction & Materials
Steinhoff International Holdings Limited	SHF	Personal Goods
Steinhoff International Holdings NV	SNH	Personal Goods
Stellar Capital Partners Limited	SCP	Software & Computer Services
Stenprop Limited	STP	Real Estate Investment & Services
Stor-Age Property REIT Limited	SSS	Real Estate Investment Trusts
StratCorp Limited	STA	Financial Services
Sun International Limited	SUI	Travel & Leisure
Super Group Limited	SPG	General Retailers
Sygnia Limited	SYG	Financial Services
Synergy Income Fund Limited	SGA	Real Estate Investment Trusts
Taste Holdings Limited	TAS	Travel & Leisure
Tawana Resources NL	TAW	Industrial Metals & Mining
Telemasters Holdings Limited	TLM	Fixed Line Telecommunications

Company	Symbol	Sector
Telkom SA SOC Limited	TKG	Fixed Line Telecommunications
Texton Property Fund Limited	TEX	Real Estate Investment Trusts
Tharisa Plc	THA	Mining
The Bidvest Group Limited	BVT	General Industrials
The Foschini Group Limited	TFG	General Retailers
The Pivotal Fund Limited	PIV	Real Estate Investment Trusts
The SPAR Group Limited	SPP	Food & Drug Retailers
The Waterberg Coal Company Limited	WCC	Mining
Tiger Brands Limited	TBS	Food Producers
Tiso Blackstar Group SE	TBG	Financial Services
Tongaat Hulett Limited	TON	Food Producers
Torre Industries Limited	TOR	Support Services
Total Client Services Limited	TCS	Software & Computer Services
Tower Property Fund Limited	TWR	Real Estate Investment Trusts
Tradehold Limited	TDH	Real Estate Investment & Services
Trans Hex Group Limited	TSX	Mining
Transaction Capital Limited	TCP	Financial Services
Transpaco Limited	TPC	General Industrials
Trellidor Holdings Limited	TRL	Construction & Materials

Company	Symbol	Sector
Trematon Capital Investments Ltd	TMT	Financial Services
Trencor Limited	TRE	Industrial Transportation
Trustco Group Holdings Limited	TTO	Financial Services
Truworths International Limited	TRU	General Retailers
Tsogo Sun Holdings Limited	TSH	Travel & Leisure
Universal Partners Limited	UPL	Financial Services
Value Group Limited	VLE	Travel & Leisure
Verimark Holdings Limited	VMK	General Retailers
VestIN Holdings Limited	VIN	Financial Services
Visual International Holdings Limited	VIS	Real Estate Investment & Services
Vodacom Group Limited	VOD	Mobile Telecommunications
Vukile Property Fund Limited	VKE	Real Estate Investment Trusts
Vunani Limited	VUN	Financial Services
W G Wearne Limited	WEA	Construction & Materials
Wescoal Holdings Limited	WSL	Support Services
Wesizwe Platinum Limited	WEZ	Mining
Wilderness Holdings Limited	WIL	Travel & Leisure
William Tell Holdings Limited	WTL	Forestry & Paper
Wilson Bayly Holmes-Ovcon Limited	WBO	Construction & Materials

Company	Symbol	Sector
Winhold Limited	WNH	General Industrials
Woolworths Holdings Limited	WHL	General Retailers
Workforce Holdings Limited	WKF	Support Services
York Timber Holdings Limited	YRK	Forestry & Paper
ZCI Limited	ZCI	Industrial Metals & Mining
Zeder Investments Limited	ZED	Financial Services

6.2 APPENDIX B: Population after the selection criteria

Company	Sector
Adcorp Holdings Limited	Support Services
AECI Limited	Chemicals
African Oxygen Limited	Chemicals
Allied Electronics Corporation Limited	Software & Computer Services
Argent Industrial Limited	Support Services
Assore Limited	Industrial Metals & Mining
AVI Limited	Food Producers
Barloworld Limited	Support Services
Bowler Metcalf Limited	Chemicals
Cargo Carriers Limited	Industrial Transportation
Caxton CTP Publishers & Printers Ltd	Media
City Lodge Hotels Limited	Travel & Leisure
Clicks Group Limited	Food & Drug Retailers
Comair Limited	Travel & Leisure
Combined Motor Holdings Limited	General Retailers
Compagnie Financiere Richemont SA	Personal Goods
Crookes Brothers Limited	Food Producers
Delta EMD Limited	Electronic & Electrical Equipment
Distell Group Limited	Beverages
Gold Fields Limited	Mining
Group Five Limited	Construction & Materials
Hudaco Industries Limited	Support Services
Invicta Holdings Limited	Support Services
Italtile Limited	General Retailers
Life Healthcare Group Holdings Ltd	Health Care Equipment & Services
Mr Price Group Limited	General Retailers
Oceana Group Limited	Food Producers
Pick N Pay Stores Limited	Food & Drug Retailers
PutProp LTD	
PPC Limited	Construction & Materials
Reunert Limited	General Industrials
Rex Trueform Clothing Company Ltd	General Retailers
Santam Ltd	
Shoprite Holdings Limited	Food & Drug Retailers
Tiger Brands Limited	Food Producers
Tongaat Hulett Limited	Food Producers
Truworths International Limited	General Retailers
Vodacom Group Limited	Mobile Telecommunications