THE RELATIONSHIP BETWEEN DIVIDEND PAYOUT AND SUBSEQUENT EARNINGS GROWTH: A SOUTH AFRICAN STUDY

An analysis into the relationship between the dividend payout ratio and the subsequent earnings growth at the market level.

Research report presented in partial fulfilment of the requirements for the degree of Master of Commerce: Financial Management at the University of Cape Town.

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LISA MONTGOMERY
Supervisor: Associate Professor Francois Toerien

Declaration

This work has not been previously submitted in whole, or in part, for the award of any degree. It is my own work. Each significant contribution to, and quotation in, this dissertation from the work, or works of other people has been attributed, and has been cited and referenced.

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Abstract

Traditionally, it has been widely accepted that current reinvestments leads to future growth, and hence that there exists a negative relationship between dividend payout ratios and subsequent earnings growth at both the company and market level. Surprisingly, more recent research found a positive relationship between these two variables, rationalised in terms of management signaling positive future prospects through higher dividend payouts.

Following the methodology developed by Arnott and Asness (2003), this study conducted an analysis into which hypothesis is supported at the market level (proxied by the All Share Index) in South Africa, and how these findings compared to international market level findings. Furthermore, the findings were analysed within the context of the political and economic conditions unique to the South African market over the 1960-2014 study period.

The results indicated a negative relationship between the payout ratio and subsequent earnings growth from 1960 to 2014. When the time period was subdivided into periods before and after 1994 (a year considered to be a structural break in South African political-economic history), a positive relationship was found from 1960-1994, while a negative relationship was found from 1994-2014. The possible explanations for this contradiction were investigated. For the counterintuitive pre-1994 result, several literature-based tests were conducted in order to eliminate possible explanations other than the link between payout ratio and earnings growth. Firstly, the tests were repeated for three and five year earnings growth periods. With regard to the five year period, although the coefficient for the payout ratio was positive from 1960-2014, the results were statistically insignificant. The subdivided regression periods, 1960-1994 and 1994-2014, also indicated less significant results. For the three year earnings growth period, the regression test generated positive coefficients for the payout ratio variable for all the time periods, with both sub-periods being statistically significant. The difference between the ten and three year subsequent earnings growth findings may have been as a result of South Africa companies making better long-term (ten year) than short-term (three year) investments during that time period. In addition, the possible impact of share repurchases, earnings yields as earnings growth predictors (*i.e.* the market valuation impact), and the possible role of mean reversion were all either considered, or statistically tested. Although the former two played no role, it was found that mean reversion was a statistically stronger predictor of future earnings growth on the index level than payout ratio. As the above results differ not only from most (but not all) international studies, and also from the one company-level study previously conducted for South Africa, these differences were further investigated. In terms of the latter, it was found that the most likely reason for the discrepancy was that the previous researcher, who confined her study to JSE-listed industrial stocks,

used nominal earnings growth data as opposed to real growth data. It is argued that this is an incorrect approach.

Nonetheless, given that means reversion is as good, if not a better, predictor of earnings growth at the market level in South Africa, the traditional hypothesis that a higher payout ratio implies reduced future earnings growth, cannot be ruled out for the JSE.

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List of Acronyms and Abbreviations

ALSI	All Share Index
ASX	Australian Stock Exchange Composite Index
BRICS	Brazil, Russia, India, China and South Africa
CPI	Consumer Price Index
JSE	Johannesburg Stock Exchange
P/E	Price to Earnings
PEG	Price/Earnings to Growth Ratio
TSX	Canadian Stock Exchange Composite Index
United States	United States of America

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Chapter 1: Introduction

1.1 Overview

It is commonly accepted that a key input when valuing businesses, is the expected growth rate in earnings. More specifically, the use of a higher earnings growth rate when conducting financial modelling usually translates into a higher firm value. This requires an understanding of the forces that drive growth. Damodaran conducted research which traced growth back to two forces, namely sustainable growth, which is the investment in new assets, and efficiency growth, achieved by improving efficiency on existing assets (Damodaran, 2008).

According to Modigliani and Miller (1961), when firms operate in perfect and complete capital markets, their financial structure is irrelevant for real investment decisions. However, independent research by Weiss and Myers in 1984 indicated that the financial and investment decisions were related. More specifically, financial structure was found to be relevant to the investment decisions of companies which are both facing uncertain prospects, and operating in imperfect or incomplete capital markets, where the cost of external capital exceeds that of internal funds (Cleary, 2002). Since firms in the real world operate within imperfect markets, the retention ratio, or alternatively, it's complement the payout ratio, has a significant role in determining the investment decision and subsequent earnings growth achieved. Both forms of growth identified by Damodaran (2008) above, but more pertinently sustainable growth, are largely determined by the availability of funds to a firm, and the subsequent capital budgeting decision process.

Surprisingly, although a significant amount of research has been conducted into the forecasting of earnings growth, and many systems have been developed to assist in this regard, little has been done in terms of incorporating the payout ratio into this framework. There is therefore a significant gap in literature surrounding the role of the payout ratio in asset pricing, and in particular its predicative ability. In 2003 Arnott and Asness identified this and conducted a study in the United States, which revealed the unexpected result that higher dividend payout ratios at the market level correspond to higher subsequent earnings growth.

Therefore, two hypotheses exist in this regard. The first postulates a negative relationship between the two variables, specifically funds available to finance subsequent growth opportunities are reduced when the payout ratio increases, leading to lower subsequent earnings growth. The opposing hypothesis suggests a positive relationship, namely an increase in payout ratios lead to higher subsequent earnings growth.

The ‘surprising’ positive relationship result gave rise to several potential explanations. Since dividends have a greater level of stability over time, the positive relationship may be as a result of earnings reverting to their mean value. Secondly, managers may utilise the signalling ability of dividends and change the payout ratio to indicate their insider information regarding the firm’s subsequent cash flows. Furthermore, when firms have large free cash flow balances and/or poor investment opportunities, dividends may be used to help mitigate the resultant conflicts which arise between the principal and agent (Flint *et al.*, 2010).

Following the surprising results found by Arnott and Asness (2003), various authors have conducted similar studies at the market (index) level in selected public equity markets including Australia, several Western European countries, Canada, Singapore, Malaysia and Taiwan. To date, only one study (Vermeulen, 2011) has specifically investigated South Africa, but only at the company level. To the author’s knowledge this study has not yet been conducted at the market level for South Africa, and that is what the research described in this dissertation sets out to do.

1.2 Problem Statement

The two opposing hypotheses described above could have implications for investors who are faced with a decision as to which school of thought to incorporate into their subsequent investment decision process.

The questions which will be researched and answered in this study are:

1. What is the relationship between the payout ratio and subsequent earnings growth at the market level in South Africa?
2. How do the results compare to the other international studies which have previously been conducted?

1.3 Purpose and Importance of this Study

The purpose of this dissertation is to examine whether the positive relationship found between the payout ratio and subsequent earnings growth in several other countries also exists at the market level in South Africa, a study which has not yet been conducted.

The result of this study has the potential to influence the way individual and institutional investors in South Africa evaluate the market and assist in the forecasting of aggregate earnings growth, a subject which has historically proven to be subjective and difficult to justify. The conclusion regarding the relationship between the dividend payout ratio and subsequent earnings growth may assist investors both locally and internationally to make better informed investment decisions, particularly if their mandate includes market level (*i.e.* index-based) investments.

1.4 Chapter Outline

The remainder of this dissertation is structured as follows. Chapter 2 details the literature review, Chapters 3 and 4 present the data and methodology, findings and analysis respectively, and Chapter 5 concludes with a summary and recommendations.

Chapter 2: Literature Review

Corporate finance decisions, more specifically dividend payouts, have proved both complex and imperative in determining a firm's success. The optimal dividend policy decision, including the dividend payment amount, as well as the form of distribution, has to meet the needs of both shareholders and management. For shareholders, the dividends reflect, in addition to their capital gain, the return on their investment. Management's responsibility includes ensuring sufficient retained earnings to facilitate the most optimal capital allocation for all potential projects. Historically, because management has insider information regarding the future strategy of the firm, the dividend decision has also been interpreted by the market as a signal for future expected investment projects and profitability. For these reasons, the dividend policy and its subsequent implications have become a topical focus for researchers and analysts.

In the late 1950's Gordon (1959) developed the dividend discount model. In 1956, Lintner wrote a paper which detailed the relevance of the dividend payout decision. In the early 1960's, Modigliani and Miller (1961) studied capital structure theory and developed the opposing capital structure irrelevance proposition. Since then, dividends and the payout ratio have attracted the attention of practitioners and academics alike, and much financial research has been conducted in this regard.

The following literature review will examine both the research papers prior to the key article published by Arnott and Asness (2003) on which this study is based, as well as the studies which have occurred subsequently.

2.1 Dividend Relevance and Irrelevance Theories

As previously stated, the dividend policy decision has been shown to have a significant impact on the performance and value of the firm. Lintner (1956) conducted research regarding the determinants considered by senior management when formulating the firm's dividend policy decisions. His model included earnings stability, plant and equipment expenditures, willingness to use external financing, firm size, ownership by control groups and use of stock dividends as variables, and was tested on a sample of 600 listed companies. The results indicated that the factors most frequently considered by management were current earnings and target levels of dividend payout.

The additional factors found in Linter's model included management's resistance to changing dividend policies, unless the changes remained consistent, the importance of the subsequent (T+1), not current (T) time period and management's focus on the change of the payout ratio, rather than the absolute level. Furthermore, when firms have a large balance of accumulated excess cash, and an alteration of the capital structure is a goal, management selects share repurchases as the preferred form of distribution. Lastly, a major unanticipated and nontransitory change in earnings was found to be an important reason to change dividends.

Lintner (1956) developed a dividend model which described the relationship between the previous period's dividend payment, the current period's dividend payment and the future target dividend payout ratio in the next period. The estimated equation was as follows:

ΔDIV_t = constant + SOA x (DIV_{t+1} x EPS_t – DIV_{t-1})

Where:

DIV_t is the dividend for the current period,

DIV_{t-1} is the dividend for the previous period,

SOA is the speed of adjustment

DIV_{t+1} is the target dividend ratio and

EPS_t is the earning per share for the current period (Lintner, 1956).

In 1959, Gordon conducted research into the future stream of payments expected by investors. His investigation concluded that when investors purchase stocks, they are not only purchasing the expected capital gains from the anticipated increase in value, but also the stream of dividend payments expected. In addition, the results found that the investors are not only interested in the current value of the dividends declared, but also the entire sequence of dividend payments. Lastly, Gordon emphasize that dividends are one of the sole contributors and most relevant factors in evaluating investments (Purmessur & Boodhoo, 2009).

Later, Modigliani and Miller (1961) disputed Lintner's (1956) and Gordon's (1959) theories. The results of their study indicated that the firm's value is completely independent of its dividend policy. The basic theorem stated that under the random walk theory developed by Malkiel in 1973, the value of a firm is not affected by how that firm is financed. This result was subject to the assumptions of firms operating in an efficient market, and in the absence of taxes, bankruptcy costs, agency costs and asymmetric information (Nirajina and Priya, 2013). Modigliani and Miller's reasoning was that in each period, firms manage an investment policy, namely they invest and retain cash. They also manage a financing policy through the raising of new capital, and lastly execute a payout policy through the payment of dividends. If the investment is assumed to be constant, a change in the payout ratio would necessarily need to be met by a change in financing. By way of explanation, an increase in dividends could be financed with a new debt issue, or a dividend decrease could be met by a retirement of debt. The result of the above is that both existing shareholders and new investors form a 'closed system' where the total value of their claims remains unaffected. This value conservation mechanism demonstrates the dividend irrelevance theory. In summary, whether the firm's capital is raised through the issuance of new shares or the retirement or selling of existing debt, there is not resultant impact on the value of the firm, and the dividend policy is therefore deemed irrelevant (Parlour, 2006).

Modigliani and Miller's (1961) dividend irrelevance theorem seems to collapse when the real-world environment, in which capital gains receive preferential tax treatment relative to dividends, is considered. Modigliani and Miller (1961) dispute this by arguing that the investors are subject to various tax rates, and therefore, each firm would attract its own group of investors which most desired its specific dividend policy. Thus, Black and Scholes (1974) conducted a study in which it was found that firms adjust their payout policies to reach an equilibrium state such that if all payout policies are considered, and therefore any one firm is unable to affect the price of its shares by marginally changing its payout policy (Black & Scholes, 1974).

Capital budgeting research and teaching has continuously suggested that firms should accept all projects with positive net present values. With regards to the relevance of the financing and investment decisions, management should aim to achieve a balance which ensures that the dividend policy does not outweigh the investment policy decisions, thus causing delays or decreases in the profitability and value of the firm and the consequent reduction in shareholder wealth. On the contrary, Fama (1973) investigated the relationship between investment and dividend decisions and found that the two are not correlated and have no relevance to one another (Fama, 1973).

Unsurprisingly, the findings presented by Modigliani and Miller (1961), Gordon (1959) and Lintner (1956) had potential significant implications on the valuation of portfolio managers' investments.

2.2 Tax Preference Theory

Brennan (1970) developed an after-tax version of the capital asset pricing model (CAPM) to investigate the relationship between tax risk-adjusted returns and dividend yield. His research concluded that the pre-tax return of a stock should be positively and linearly related to both its dividend yield and systematic risk. In other words, higher pre-tax returns should be generated from higher risk and dividend yielding stocks to compensate investors for the tax disadvantage of these returns (Rafferty *et al.*, 2010).

In 1984, Shefrin and Statman supported Brennan's findings by finding that because the cash dividend tax rate is greater than the tax rate imposed on capital gains when selling stocks for most investors, rational investors should prefer to receive their returns in the form of dividends, on condition that the firm has investment opportunities with yield a return equal to or higher than the firm's cost of capital (Shefrin and Statman, 1984). In this way, they would receive their return under the lower form of tax rate rather than the higher dividends cash tax rate.

In 2006, Amromin *et al.* furthered the investigation into the tax preference theory by analysing how dividend policies affect firm valuations. The study tested the hypothesis that the 2003 dividend tax cut boosted U.S. stock prices and therefore lowered the cost of equity (Amromin *et al.*, 2006). The findings concluded that "the tax cut did appear to have statistically significant, cross-sectional effects on stock valuations, with high dividend paying firms receiving a boost at the expense of low dividend paying firms, although this effect seems to have been short-lived." Furthermore, confirming the results found by Brennan (1970) and Shefrin and Statman (1984), in an environment where the dividend tax rate is higher, shareholders should prefer a lower dividend payout ratio and consequently, a negative relationship exists between the payout ratio and value of the firm (Chau, 2013).

2.3 Bird-in-the-Hand Theory

Market sentiment suggests that although tax rates for cash dividends exceed those of capital gains, the strong preference for cash dividends is difficult to refute (Shefrin and Statman, 1984). Both Gordon (1959) and Lintner (1956) developed the 'Bird-in-the-Hand' theory which countered the Modigliani and Miller (1961) dividend irrelevance theory. Their studies explained that from the investor's perspective, the certainty of cash proceeds that derive from dividend payments was preferential to the higher future cash proceeds that derive from capital appreciation via retained earnings (Kostohryz, 2011).

2.4 Agency Costs

In the late 1970's, Jenson and Meckling applied the existing agency costs theory to the ownership structure of a firm, namely the conflict of interest between managers and shareholders. Their theorem stated that as the amount of dividends paid to shareholders increases, the management of the firm has fewer funds available for investment decisions, and therefore a reduction in their decision-making power. As a result, the firm is subject to increased scrutiny and monitoring from the capital markets. Furthermore, agency costs may overlap with empire building theories, in that management of companies with substantial excess free cash flows may be motivated to invest in projects generating lower, or even negative, returns. This is further exasperated by monetary or power based incentives such as employee share options. An increase in the payout ratio may reduce the funds available to management, potentially compelling them to execute stricter capital budgeting which is focused on increasing shareholder wealth. This has the potential to eliminate the empire building trend. If firms later require addition funds for investments, outside capital could be accessed, which should motivate management to maintain positive cash flows to meet liquidity requirements, and as a result, maximise shareholder value. Under the agency theory, higher dividends have the potential of resulting in higher growth rates and vice versa, since the free cash flow under management's control and the subsequent agency conflict is reduced (Chau, 2013).

2.5 Information Content of Dividends/Dividend Signalling

For many years, the concept that dividends convey information content regarding the state of the company has been supported by financial literature. Modigliani and Miller (1961) claimed that dividends may have a signalling effect. Since senior management has access to financial statements and other data which is not readily available to the other investors in the market, they have an advantage regarding the strategy of the firm and can more accurately forecast the company's future earnings. This leads to information asymmetry in the market place. Hence, firms have the ability to use the declaration of dividends and changes in their payout ratio as a signal of information regarding the company. An increase in dividends may signal greater expected future profitability, and lead to increased investment into the firm. A decrease in the payout ratio may signal that the company is expecting a reduction in profitability and value. Management is able to use the payout ratio as a signalling mechanism to alter the expectations of both shareholders and investors alike (Purmessur & Boodhoo, 2009).

As mentioned above, in 1956 Lintner investigated the determinants of the dividend policy and found that firms only change their payout ratios when the changes which caused the adjustment are expected to continue permanently, suggesting that a dividend increase implies a rightward shift in the expected distribution of earnings (Benartzi *et al.*, 1997).

In 1979 Bhattacharya developed a model which hypothesized that in an imperfect-information setting, cash dividends function as a signal of a firm's expected cash flows. His theorem stated that because firms increase their payout ratios, irrespective of the tax disadvantage caused by the differing tax rates for various distributions, it can be postulated that dividends exhibit signalling functionality. Furthermore, his study investigated dividend signalling mechanism costs. Since the signal was a function of an increase in expected future earnings, if the anticipated increase did not materialise, the company would still need to cover the dividend payment. In addition, as mentioned above, dividends are sticky and investors will expect the increase to be maintained. The cost of the potential downside risk of declaring an increased dividend should be weighed up against the benefit of the signal. Lastly, his findings concluded that "the signalling cost structure developed was not only realistic (dividends linked only to *expected* cash flows), but also the only simple structure consistent with the assumption of an exogenously costly dividend-signalling equilibrium" (Chau, 2013).

In 1985, John and Williams developed a model which included many simplifying assumptions, namely a uniform tax rate, a theoretical firm that uses only equity financing, and insiders making transactions at the same time as investors. Their theorem described that firms will either issue new shares or retire outstanding shares when additional funds for investments are required. Furthermore, taxable dividends are only distributed if the demand for cash exceeds the supply of internal retained earnings. The results of their model indicated that after the payout ratio has increased and dividends have been paid, firms either simultaneously sell new shares or boost the share prices. Should the sale of shares occur, some shareholders may suffer a dilution in their fractional ownership of the firm. Therefore, if the inside information regarding future expected earnings is favourable, it will be more valuable for shareholders to reduce the dilution and vice versa. John and William's (1985) study concluded that "in the resulting signalling equilibrium, firms with more favourable inside information optimally pay higher dividends; other things equal, and receive appropriately higher prices for their stock, and there is a positive relationship in which an increase in dividends signals that management of the firm has insider information about potential subsequent earnings and cash flow" (Chau, 2013).

Miller and Rock (1985) investigated the signalling ability of dividends and claimed that once the investment decision of a firm is made, this remains unchanged for the short to medium term. Any subsequent unanticipated changes to the dividend policy then signal changes in earnings and cash flows. With this said, and confirming Bhattacharya's (1979) findings, Miller and Rock (1985) found that in addition to the signalling mechanism of dividends, 'dissipative' costs are also involved, namely the firm's investment decisions. Management should aim for the dividend policy to be large enough to ensure smaller firms do not imitate similar strategies. Over time, increases in payout ratios should lead to share price increases and similarly, a reduction in the dividend payout ratios should cause the price of shares to decline (Purmessur & Boodhoo, 2009). Griffin investigated the information content of dividends and concluded that some studies have found that the relationship between dividends and share prices provides support to the hypothesis that dividends carry information to the market regarding future expectations (Griffin, 1976).

In 1997, Benartzi *et al.* conducted research which expanded on the previous studies conducted by Watts in 1973. They extend their research beyond the signalling theory, and examined whether the payment of dividends translated into greater future earnings. Their research found that "firms that increase dividends in year 0 have experienced significant earnings increases in years - 1 and 0, but show no future unexpected earnings growth. Moreover, the size of the dividend increase did not predict future earnings. Firms that cut dividends in year 0 experienced a reduction in earnings in year 0 and in year -1, but these firms went on to experience significant increases in earnings in year 1. However, consistent with Lintner's (1956) model on dividend policy, firms that increase dividends are less likely than nonchanging firms to experience a drop in future earnings. Thus, their increase in concurrent earnings can be said to be somewhat "permanent." In spite of the lack of subsequent earnings growth, firms that increase dividends have significant, though modest, positive excess returns for the following three years" (Benartzi *et al.*, 1997).

2.6 Dividend Smoothing

In addition to Lintner's investigation of dividend relevance in 1956, he also examined the importance of dividend stability. This research found that not only do shareholders prefer a stable payout ratio, but also ratios which gradually increase. Because shareholders perceive stability in dividends as a signal of sustainable and organic growth in the profitability of the firm, the stability of the payout ratio is preferred to the absolute value of the dividend. It is necessary to note that this theory is from the perspective of the firm, and management responds by setting a target long term payout ratio through an adjustment of the level of distributions to 'smooth' dividends in certain, less profitable periods (Chau, 2003).

2.7 The Relationship between the Payout Ratio and Subsequent Earnings Growth

Traditionally, financial literature has supported the theory that higher payout ratios lead to lower subsequent earnings growth. This forecasted inverse relationship between dividend payout ratio and subsequent earnings growth has been traditionally accepted as an intertemporal extension of the Modigliani and Miller dividend irrelevance theorem (Arnott and Asness, 2003). As previously described, their work established that when firms operate in a frictionless economic environment, and their investment policy is held constant, the impact of the dividend policy is irrelevant for shareholders wealth. More specifically, the results of their theorem indicate that the value of the firm is completely independent of the proportion of earnings retained. An extension of the theorem is that with constant expected investments and returns, an increased payout ratio will be followed by lower earnings growth (Ping and Ruland, 2006). The rationale behind the negative relationship is that as a firm pays out a lower proportion of its retained earnings as dividends, the firm has greater internal funds available with to undertake future profitable investment opportunities, resulting in a higher growth in subsequent earnings (Gwilym *et al.*, 2006).

This inverse relationship is further supported by Gordon's return model, which was based on the subsequent dividend payments of a security.

R = (D/P) + G

As detailed by Arnott and Asness (2003), Gordon's valuation model above describes that the expected return, R, equals the dividend yield, D/P, plus an assumed constant expected growth term, G. The dividend yield can be alternately expressed as the product of the dividend payout ratio, D/E, and the earnings yield, E/P, creating the following formula:

R = (D/E)*(E/P) + G

Under the assumption that the dividend policy does not affect the expected return of the market portfolio, and that the payout ratio is constant, creating equal values for earnings and dividends, a low payout ratio (D/E) must be offset either by a high E/P or by high expected growth. If the P/E (inverse of the E/P) is high, it will not offset the low payout ratio leaving growth as the only remaining variable (Arnott & Asness, 2003).

Capital structure literature, more specifically the pecking order theory developed by Myers in 1984, described that companies with many positive net present value investment opportunities should prefer to utilise internally generated funds compared to external sources. Myers' (1984) hypothesis suggested that companies with high retention and low payout ratios would be the ones exposed to the greatest profit generating investments. According to Ping and Ruland (2006), empirical studies on the determinants of dividend payout ratios generally support the idea that dividend payout is inversely correlated with investment opportunities (Ping & Ruland, 2006).

The literature above remained generally widely accepted and undisputed within the financial market for many years. It formed the basis of analysis and asset pricing until the 2003, when Arnott and Asness (2003) published research which contradicted the traditionally accepted theories.

2.8 Surprise! Higher Payout Ratios = Higher Growth

In 2003, Arnott and Asness identified the lack of comprehensive financial research on the predictive ability of the dividend payout ratio and subsequent earnings growth. The authors noted that the United States market, between 1995 and 2003, when their research was conducted, was characterised by historically low dividend payout ratios, and record high price-to-earnings and price-to-dividends ratios. Arnott and Asness (2003) determined that the combination of recent valuations at high levels and dividend payouts at low levels, implied that the subsequent equity returns would only match up to historical trends if subsequent earnings growth was considerably faster than normal.

With the support of traditional theories, some market observers deemed this considerably fast earnings growth to be reasonable. On the contrary, others believed that the high level of growth required could potentially be achieved at a company level, through the scaling of operations or engaging in offsetting transactions; however this would be far more difficult to achieve at a market wide level. The growth at a market level would be subject to a perfect capital markets assumption. If this assumption was to be disregarded, many behavioural or information based theories could arise as potential explanations for the relationship between dividend payout ratios and subsequent earnings growth. In an attempt to understand the relation between the two variables, Arnott and Asness (2003) conducted an empirical study at the market level.

Arnott and Asness (2003) created a history of earnings for the S&P 500 index by calculating a total return index for the stocks. They then subtracted the monthly dividend income to create a stock price index, which was then divided by the consumer price index to calculate a real stock price series. This was then multiplied by the earnings yield data. They noted that the aggregate earnings for the market portfolio was different to that of a static portfolio of stocks, since the economy was dynamic, and the market portfolio would make adjustments in this regard. 'Old' stocks, which are no longer an important factor in the portfolio, would be sold, and 'new' stocks would be bought. Seldom, the proceeds from the deleted stocks would be sufficient to cover the costs of the newer stocks, and therefore the devisor of the index increased.

The payout ratio was defined as the ratio of the previous year's trailing dividends divided by the previous year's trailing earnings. The S&P 500 index payout ratio and subsequent ten year earnings were plotted from 1946 -2001. The figure illustrated that firstly, payout ratios were at their lowest levels since 1946, and secondly that the expected inverse relationship between dividend payout ratios and ten year subsequent earnings growth was not present. A scatter gram diagram, using the same data, supported the above findings that the inverse relationship did not exist, and that the relationship of current payout to subsequent earnings growth was strongly positive.

The monthly regression formula of the rolling ten year real earnings growth of the S&P 500 index on the starting payout ratio, PR for the period 1946 – 2001 was as below:

Regression: Earnings growth ten year = constant term (a) + (b) preceding payout ratio (PR)

The results were compelling, particularly because the link had the ‘wrong’ sign, at least according to the traditional expectations. The results indicated a positive relationship between the payout ratio and subsequent ten year earnings growth. To corroborate findings, a quartile comparison test was conducted. The results were the same; when the equity market started from a low payout ratio base, the subsequent real earnings growth was low, and conversely, when the base payout ratio was higher, the subsequent real earnings growth increased. Contrary to the arguments which the ‘new paradigm’ advocated, earnings had been increasing, not declining, since earnings retention had reached record levels.

Arnott and Asness (2003) considered various potential explanations for their findings. As detailed above, according to Lintner’s 1956 investigation, managers were reluctant to cut dividends. Perhaps the high payout ratio was an indication of managerial confidence of future profitability, and vice versa in terms of the low payout ratio. The confidence could have been based on private or public information.

Secondly, the concept of empire building could have explained the relationship. Companies retain a substantial portion of earnings to fulfil management’s desire to build empires. Conversely, financing in the form of share issuance and high dividend payment results in management being subjected to increased scrutiny and therefore reduces the potential of empire building. This explanation is subject to the assumption that inefficient empire building provides the basis for poor earnings growth in the future whereas discipline has the opposite effect.

Possibly the most intuitive explanation was mean reversion in earnings. As mentioned above, Lintner’s (1956) studies also confirmed that dividends are sticky. Temporary highs and lows in earnings, when subsequently reversed, could have caused the payout ratio to be positively correlated with subsequent earnings growth. In other words, if earnings were currently low, for a temporary period of time, the payout ratio would have been higher. This would have forecasted the earnings snapback for the following period. The authors noted that “the testable difference between this hypothesis and the first two is that dividend policy has no special standing, so any reasonable measure of mean reversion in earnings should work to forecast subsequent earnings growth” (Arnott and Asness, 2003).

Lastly, Arnott and Asness considered that their data or methodology could have been erroneous. Tests for these possibilities were conducted, as detailed in the subsections below.

At the time of Arnott and Asness’s (2003) analysis, the United States equity market was in a bear state and for contrarian investors, this would have led to favouring the purchase of equities. The results of their regression study indicated that equities were actually not undervalued. The authors considered whether the premium on shares was going to translate to into higher earnings and returns for the following ten years. According to the traditional theory developed by Modigliani and Miller (1961), the negative relationship between the payout ratio and subsequent earnings growth would prevail. This, together with the assumptions of market efficiency and consistent expected market returns, implied that subsequent earnings growth was going to compensate for the low earnings yield. This rationale was predicting high subsequent earnings growth. On the contrary, Arnott and Asness (2003) argued that their results proved the inflated equity prices and the historically reasonable estimates of subsequent earnings growth was going to lead to low returns and equity risk premium, essentially predicting low subsequent earnings growth (Arnott and Asness, 2003).

2.9 International Market Level Extension

In 2006, Gwilym *et al.* expanded on the previous work conducted by Arnott and Asness (2003) into the international market, and further extended the study of the explanatory power of the payout ratio to subsequent dividend growth and stock returns. Their methodology and calculations remained largely the same as those developed by Arnott and Asness (2003), with alterations made for relevant tests.

Gwilym *et al.* (2006) made reference to Arnott and Asness's (2003) suggestion that their findings conform to a world in which managers have access to insider and private information about the firm, which causes them to increase the payout of earnings when prospects are positive, and to pay out a smaller proportion when they are pessimistic about future expected earnings. The authors also note that the findings exist in a world in which low payout ratios lead to inefficient empire building. Given the different managerial cultures, financial market theories and corporate and individual tax regimes of various countries, Gwilym *et al.* (2006) deemed it appropriate to discover whether the findings in the United States would be present in international markets.

France, Germany, Greece, Italy, Japan, The Netherlands, Portugal, Spain, Switzerland, the United Kingdom and the United States were selected based on data availability. The authors also created two world indices, which included all 11 countries. The first was an equally weighted index, while the second was a value weighted index created by assigning a set of weights based on each country's market value (expressed in US dollars). The time periods differed to those used by Arnott and Asness (2003), more specifically Gwilym *et al.* (2006) ran the regression from 1965 -2004, 1973 -2004 and 1990 – 2004. Both ten and five year time horizons were tested. The data was also adjusted to account for the changing index constituents over time. The regression model was repeated to test the explanatory power of the payout ratio, dividend yield, earnings yield, lagged earnings growth and lagged dividend growth.

The results of the regression of the payout ratio against the subsequent earnings growth were consistent with the Arnott and Asness's (2003) findings, with a positive payout ratio coefficient for the ten, five and one year time frames. Each of the countries had positive coefficients for the payout ratio variable, apart from Italy between 1990 -2004. The extent of the explanatory power varied between the countries, with the United Kingdom being strongest in 1964-2004. In 1973 -2004, the explanatory power was the greatest for France, Japan, the United States and the value-weighted world index. Germany, Greece, Italy and Spain were the only countries which had particularly low values in 1990 – 2004. With this said, across the various earnings growth horizons and for a number of countries, the evidence clearly pointed to the existence of a positive relationship between payout ratios and real subsequent earnings growth.

As a further expansion on Arnott and Asness (2003) work, Gwilym *et al.* (2006) also analysed whether higher dividend ratios delivered higher subsequent real earnings growth. A table was created which ranked the real earnings growth experienced by an investor who, at the beginning of each year, ranked the seven individual markets available between 1973 and 2004 according to their payout ratios and then invested in the same ranking each year. The results indicated that investing in countries with higher payout ratios led to higher real earnings growth however this relationship was not consistent throughout (Gwilym *et al.*, 2006).

One year earlier, Parker (2005) conducted a similar study. His paper extended on the previous work by investigating the relationship between the payout ratio and subsequent earnings growth for the TSX composite index in Canada and the ASX composite index in Australia. Similarly to Arnott and Asness (2003), Parker (2005) also included the S&P 500 index from the United States in the test.

While Gwilym *et al.* (2006) focused their international study on European countries and Japan; Parker (2005) focused on Canada, explaining that because the variables used in the regressions as observed in Canada took on some extreme values, all of the regression tests were repeated using the Australian stock market data. The market capitalisation, liquidity and sector weightings of the ASX had greater similar to the TSX than the S&P 500 index, and therefore it was included to improve the comparability study. Parker noted that if the results of the regression showed that the relationship between the variables was significantly weaker on the TSX and the ASX than the S&P 500 index, it could be argued that this was as a result of their common factors, such as size. Lastly, Parker (2005) acknowledged that the maximum payout ratio for the ASX and TSX exceeded that of the S&P 500 index, and furthermore, that the TSX exhibited significantly more extreme observations than the ASX.

Unlike the previous papers, Parker (2005) calculated the payout ratio using a slightly alternative method. Rather than using monthly dividend income, the 12 month trailing dividend yield was divided by 12, and rather than using a monthly earnings figure, a monthly earnings figure was estimated by manipulating the trailing price earnings ratio and market index level. The real earnings series was calculated by dividing the price level by the CPI and multiplied by the earnings yield. Unlike the other papers, and for comparison purposes, Parker (2005) also created adjusted real earnings growth and adjusted payout ratio variables. The average, median, minimum and maximum values of the payout ratio, earnings growth, price earnings ratios and dividend yield were determined. All observations of the payout ratio which exceeded 200% as well as the corresponding earnings growth observations were excluded. Due to the constraints of data availability, a significantly shorter time span was used, more specifically, time periods of 1956-2005, 1969-2005 and 1976-2005. The regression model matched the one used by Gwilym *et al.* (2006) and Arnott and Asness (2003). Parker (2005) noted that because his investigation used a slightly different methodology for calculating the payout ratio and different time horizons, it was expected that the results from the S&P 500 index regression would not have precisely matched that of Arnott and Asness (2003). If this was not true, it would have raises uncertainty as to the accuracy of the results found by Arnott and Asness (2003), and furthermore, whether the tests extended to the other markets could be accepted as reasonable. Fortunately the relationship between the payout ratio and subsequent earnings growth on the S&P 500 index remained statistically significant.

The regression results were similar to those found by the previous two studies, namely a positive relationship between the payout ratio and subsequent earnings growth was found. The relationship between the two was strongest for the S&P 500 index, followed by the TSX composite. It was less obvious for the TSX composite because of the greater quantity of extreme values. The payout ratio was statistically significant for all three markets in each of the time periods, for the regressions of the payout ratio against both the five and ten year subsequent growth in earnings.

Similarly to Arnott and Asness (2003), Parker (2005) divided the payout ratio data into quartiles after which the average, minimum and maximum earnings growth rates were calculated. Although not statistically significant, the earnings growth for each quartile decreased from quartile 1, being the highest, to quartile 4, the lowest. This is contrary to what was expected, but was perhaps not surprising given the extreme values observed in both the payout ratio and subsequent earnings growth for the TSX. Unlike Arnott and Asness (2003), Parker (2005) conducted tests of significance on the quartiles.

A t-statistic was calculated to determine whether the differences between the observed values in quartile 1 and quartile 4 were statistically significant. Once again, contrary to expectations, the average value in quartile 1 was not significantly different from that of quartile 4 for any of the three markets. The only two differences between quartile 1 and 4, which were statistically significant, were the maximum value for the TSX and ASX. This confirmed the idea that the TSX had growth in earnings which exhibited the largest swings in value.

Parker (2005) considered it an anomaly that the market with the strongest relationship between the payout ratio and subsequent growth in earnings variables was the same market with the extreme swings. A possible explanation for these findings could have been that the extreme outliers occurred infrequently, or only occurred during one time span. This was tested for and discovered to be correct. The relatively stable dividend yield implied that this could have possibly been a case of mean reversion. Parker stated that “if a handful of companies in the TSX composite reported massive losses without corresponding changes in their dividends; this would have increased the price earnings ratio and increased the payout ratio consistent with the evidence. If the write offs were truly once-offs, however, spectacular subsequent earnings growth could not be unusual since the starting earnings level was so low. In other words, mean reversion in growth could have been occurring” (Parker, 2005). This was tested for, as detailed in a subsection below.

In 2010, Lee conducted an investigation into the dividend signalling theory in the Singapore market from 1990-2007. His study also analysed the correlation between the dividend payout ratio and subsequent earnings. His study applied Johansen’s vector error-correction model (VECM). The results of his investigation concluded that dividend payouts do convey information about subsequent earnings, and that dividend payouts are positively correlated to subsequent earnings, more specifically that increases in dividend payout ratios led to permanent increases in subsequent earnings over time for companies operating in the Singapore market (Vermeulen, 2011).

2.10 Company Level Extension

In 2006, Ping and Ruland published an expansion on the original methodology. The authors noted that the surprising positive relationship found between the variables in Arnott and Asness’s (2003) investigation had significant implications for the valuation of the overall equity market, and subsequently questioned whether the same relationship would also exists at the company level.

In their study of the possible reasons for differences between company and market level results, Ping and Ruland (2006) observed that the S&P 500 is capitalisation weighted; meaning that the policies and performance of a few large firms which constitute the index may significantly dominate the aggregate results. Furthermore, constituents of the S&P 500 index tend to be large, well-established businesses. An empirical study was necessary to determine whether the findings applied to a more diverse sample of companies.

Ping and Ruland (2006) conducted both a univariate and multivariate analysis from 1950- 2003. The sample of companies was derived from those listed on the New York Stock Exchange, the former American Stock Exchange and the NASDAQ Stock Exchange. For their multivariate analysis, the following equation was formulated.

$$EG_{0,t} = \alpha_0 + \beta_1 \textit{Payout} + \beta_2 \textit{Size} + \beta_3 \textit{ROA} + \beta_4 \textit{E/P} + \beta_5 \textit{LEV} + \beta_6 \textit{PEG}_{-t,0} + \beta_7 \textit{AG}_{0,t} + e$$

In order for the results to be similar to those found by Arnott and Asness (2003), and the other two authors, the coefficient of the payout variable would necessarily have been positive. The size variable was included for the reason that large companies, in comparison to smaller companies, were in the mature stage of the business cycle and thus were less likely to exhibit stronger growth. Therefore, a negative coefficient sign was expected. Return on assets was controlled for because, when firms were already experiencing high levels of profitability, ceteris paribus, it should have been difficult to achieve strong earnings growth. Therefore, the coefficient of the return on assets variable was also expected to be negative. In 2002, Fama and French suggested that companies with high levels of leverage on their balance sheets tended to have large investments, and therefore higher earnings growth. Thus, a positive coefficient was expected for the leverage variable. In a similar fashion to the Arnott and Asness's (2003) investigation, earnings yield and past earnings growth was considered. Subject to the assumption that the market was reasonably efficient and investors were rational, if future earnings were expected to be high, Ping and Ruland (2006) expected investors to pay more per dollar of current earnings. In this regard, the E/P variable would have a negative coefficient. Past earnings growth was included to consider the possibility of mean reversion in earnings. The same time periods were used for both the past and future earnings growth. Similarly, the coefficient for the past earnings growth variable was expected to be negative. Lastly, the effect of future asset growth was controlled for. Ceteris paribus, large companies were expected to generate higher earnings than small companies. Furthermore, there was an expectation that along with growth in the size of a company, earnings growth would also increase. Therefore, a positive relationship was expected between the variable and subsequent earnings growth.

A notable difference between the Ping and Ruland (2006) study and the previous publications related to the time horizon. Whereas the preceding papers focused on five and ten year long term earnings growth, Ping and Ruland (2006) included earnings growth over short (one year), intermediate (three year), and long term (five year) horizons. This change was made for two reasons, namely because market players were interested in both the long term and short to intermediate term earnings growth and secondly, long term growth analysis requires a large number of observations. As the number of observations increases, the potential of survivorship bias observed also increases. The authors intended to avoid this potential data quality issue by reducing the time horizon of the regression.

With regard to the criteria for companies selected, all listed companies that had paid dividends in year 0, positive earnings for year 0, book value of equity greater than $250000 or total assets greater than $500000 and had membership in industries other than financial and utilities were included. To account for outliers, the top and bottom 1% of observations were removed. Companies which missed dividend or reported losses in particular years when the dividend and earnings criteria were met in year 0 were included.

Prior to the multivariate regression test, a univariate analysis was conducted between the current payout ratio and the subsequent earnings growth. The results were in the form of Pearson product moment correlation coefficients between the current payout ratio, and past and future earnings growth over one, three and five years. The findings of the analysis concluded that companies exhibited opposite simultaneous trends for future and past earnings growth, more specifically companies with high current dividend payouts tended to have high subsequent earnings growth but relatively low past earnings growth. Furthermore, because earnings growth had a tendency to revert to the mean, the positive relationship between the payout ratio and subsequent earnings growth could have been caused by the low past earnings growth of high payout companies. This was controlled for in multivariate analysis.

The multivariate regression was conducted using the procedure developed by Fama and Macbeth (1973), namely regression coefficients were estimated for each year to control for cross sectional dependence and therefore, the reported coefficients were averages of yearly regressions.

Similar to the results from Arnott and Asness (2003) investigation, the coefficients of the payout ratio variable were positive and highly significant for the three periods. The remaining control variables were generally highly significant and all exhibited the expected relationships with subsequent earnings growth, as described above.

Unlike the previous studies, Ping and Ruland (2006) tested for survivorship bias. The authors noted that although the examination of five year future earnings growth, with provision for past earnings growth, required 11 years of observations; the results of the tests were essentially the same as the one year growth measure. Consequently, the authors could conclude that the results did not appear to be materially influenced by survivorship considerations.

Ping and Ruland (2006) noted that an implication inherent in the Fama and Macbeth (1973) method was that the "statistical significance of the average coefficient was based on the assumption that the annual coefficients were normally distributed" (Ping and Ruland, 2006). The validity of the statistical significance found in the results was subject to whether the data was normally distributed. In order to consider this implication, the authors conducted the Shapiro-Wilk test to determine whether the annual coefficients on the payout ratios were normally distributed. The test concluded that the null hypothesis stating the annual coefficients on the payout ratios were normally distributed could not be rejected in any of the regressions for the one, three of five year time periods. Lastly, the potential nonlinearity in the relationship between the payout ratio and subsequent earnings growth was tested for via a ranking regression test of the equation. The results of the test indicated positive coefficients for the payout ratio variable for the three time periods. This supported the initial finding of a positive relationship between the payout ratio and subsequent real earnings growth at the company level.

Similarly to the preceding papers, Ping and Ruland (2006) conducted sensitivity tests beyond the survivorship bias and normal distribution tests above. The authors tested for three alternative measures of earnings, namely net income before extraordinary items available to common shareholders, operating income before depreciation and income excluding extraordinary items. The results were not materially different for any of the three measures. Furthermore, companies operating in the financial and utilities sector, and those not necessarily with a book value of equity greater than $250000 or total assets greater than $500000 were included in the regression model and the findings remained unchanged (Ping and Ruland, 2006).

In 2005, Parker recreated Arnott and Asness original study in the Australian market and found the equivalent results, namely that a higher payout ratio led to higher subsequent earnings growth. In 2010, Flint *et al.* conducted a study at the company level and examined the use of the payout ratio as a predictor of a firm's subsequent earnings growth.

The data and methodology was, for the most part, the same as that developed by Ping and Ruland (2006). The data for the company level study was obtained from Huntley's Financial Analysis Database and the sample include both listed and delisted firms over the period 1989 to 2008 on the Australian Stock Exchange. The criterion for company selection was exactly the same as Ping and Ruland (2006).

The regression variables, namely the subsequent earnings growth, dividend payout ratio, firm size, leverage, return on assets, E/P ratio and lagged earnings growth, as well as the calculations of each were identical to Ping and Ruland (2006). The only variable excluded from the Ping and Ruland (2006) regression formula was asset growth. The regression formula was as follows

$$EG_{it,\,1,\,3,\,5} = \alpha_0 + \beta_1\, Payout_{it} + \beta_2\, Size_{\,it} + \beta_3\, ROA_{\,it} + \beta_4\, E/P_{\,it} + \beta_5\, LEV_{\,it} + \beta_6\, PEG_{\,it,\,-1,\,-3,\,-5} + e_{\,it}$$

As stated above, the regression model used in Flint *et al.*'s (2010) investigation followed the same methodology as the one developed by Ping and Ruland (2006). The authors noted that an importance different between their investigation and that of Arnott and Asness (2003) and Parker (2005) was the time horizon considered. Whereas the previous studies had included ten and five year subsequent earnings growth in their regression models, Flint *et al.* (2010) followed the methodology of Ping and Ruland (2006) and studied the relationship between the payout ratio and subsequent earnings growth for one, three and five years. The explanation for the change in earnings growth time period in the company level studies was because the use of ten years required considerably more data, and an increased number of observations. When a lagged earnings growth variable was included into the regression formula, the number of observations increased to 21 year company year observations. This requirement would have substantially reduced the sample size used in the regression. Furthermore, similarly to the rationale in Ping and Ruland's (2006) investigation, from an investment perspective, the short to medium term growth horizon that can be predicted with a higher degree of certainty was of equal or greater importance to investor compared to the long term view.

In a similar manner to Ping and Ruland (2006), prior to the multivariate regression test, a univariate analysis was conducted between the current payout ratio and the subsequent earnings growth. The results were also in the form of Pearson product moment correlation coefficients. The results of the test indicated that there was a positive relationship between the dividend payout ratio and subsequent earnings growth over the one, three and five year growth time periods, and furthermore, that this relationship was statistically significant at the one percent level for the three growth periods. Similarly to the results of Ping and Ruland (2006), the findings of the univariate tests also showed preliminary support for mean reversion in earnings. The mean reversion trend was indicated by the statistically significant negative correlation between the past and future earnings growth, at the one percent level for the three and five year earnings growth regression tests. The statistical significance for the one year historical and future earnings growth was only at the ten percent level. As with the previous investigation, this was tested for in the multivariate analysis.

Before conducting the multivariate analysis, there were numerous econometric issues that Flint *et al.* (2010) addressed. Firstly, as denoted by the subscripts i and t where i = 1, 2,…, N sections and t = 1, 2,…, T time periods, the regression equation was a panel data regression model. The authors noted that for panel data estimation, there were three different estimation selections, the common constant, fixed effects and random effects models. In order to accurately determine if the use of fixed effects was preferred over the common constant method, the authors conducted an F-test, with the null-hypothesis that all the constants were homogenous which allowed the use of the pooled common constant method. In determining whether to use the random effects over the fixed effects model, the Hausman (1978) test was used. The results of this test indicated that the fixed effects model was the most appropriate. In estimating the fixed effects model, a feasible GLS specification that allowed for the presence of cross-section heteroscedasticity was estimated. The authors explained that this was done by adding cross section weights, where each panel equation was down weighted by an estimate of its cross-section residual standard deviation. Examining the estimated regressions, it was determined that they were all highly significant at the one percent level, as indicated by the F-statistics. The adjusted R2 ranged between 0.2956 (one-year EG) and 0.4899 (five-year EG). Therefore, the results of their tests indicated that approximately 30% to 50% of the variation in earnings growth over one, three and five year periods was explained by the estimated models. This result was similar to that found by Ping and Ruland (2006) (Flint *et al.*, 2010).

The results of the regression indicated a significant, expected sign for the payout ratio explanatory variable, at the five and one percent levels. Importantly, the coefficient was positive and highly significant at the one percent level for one, three and five year earnings growth. Therefore, the authors could conclude a positive relationship between the payout ratio and subsequent earnings growth existed in Australia at the company level. The remaining control variables exhibited the expected signs, and were in line with the findings of Ping and Ruland (2006), namely a negative coefficient for the return on assets and earnings yield variables, and a positive coefficient for the leverage control variable. Furthermore, these findings were all statistically significant for the one percent level. Lastly, confirming the findings of Ping and Ruland (2006), the lagged earnings variable had a statistically insignificant, negative coefficient for the three periods, indicating mean reversion in earnings. It is necessary to note that the lagged earnings growth variable did not reduce the predictive power of the payout ratio, indicating that mean reversion in earnings was not entirely responsible for the positive relationship between the dividend payout ratio and subsequent earnings growth. This resolved the complication in the univariate analysis.

By 2011, studies had been conducted, amongst other countries, in the United States (Arnott and Asness, 2003; Ping and Ruland, 2006), Europe (Gwilym *et al.*, 2006), Australia (Parker, 2005; Flint *et al.*, 2010), Taiwan (Huang, 2009), Singapore (Lee, 2010) and Malaysia (Al-Twaijry, 2007), however no such study had been conducted in any African country. Vermeulen (2011) expanded on the previous work conducted by Flint *et al.* (2010) and Ping and Ruland (2006) by analysing the relationship between the current dividend payout ratio and subsequent earnings growth for South African companies listed on the Johannesburg Stock Exchange, and compared the findings to those from the developed countries, the United States and Australia.

Similarly to Parker (2005), the methodology was based on that of Ping and Ruland (2006). The data was mainly sourced from Mcgregor BFA, with data prior to 1990 being sourced from a private database of the University of Stellenbosch Business School. The sample period ranged from 1973 to 2009, since data prior to 1973 was not readily available for research. Similarly to the previous company level studies, one, three and five year time horizons were considered. Although Vermeulen (2011) considered analysing ten year time horizons, the short time frame in which South African companies had been listed created a loss of data when the periods had been extended. The sample included both listed and delisted companies, and the criterion for company selection was exactly the same as Ping and Ruland (2006).

The regression formula included the asset growth variable and was therefore based on Ping and Ruland's (2006) model, as detailed above. Similarly to the previous two company level studies, a univariate and multivariate analysis was conducted. The Pearson product moment correlation coefficients between the current payout ratio and past and future earnings growth over the three time periods indicated that the relationship between dividend payouts and subsequent earnings growth for South African companies was positive, although weaker than in the United States. The results also indicated that the relationship between the dividend payout ratios and past earnings growth was negative; however the strength of the relationship was considerably weaker than the United States comparative. At the company level, in South Africa, the relationship between past and future earnings growth for the one year period was negative, however the relationships for the three and five-year periods were positive. These results implied that it appeared as if mean reversion in earnings was not the cause of the positive relationship between payout and subsequent earnings growth. Similarly to the previous company level studies conducted by Ping and Ruland (2006) and Flint *et al.* (2010), the concept of mean reversion in earnings was further investigated in the multivariate analysis. The main result of the univariate analysis was the firms with high payout ratios for the current period generally experienced higher subsequent earnings growth, but was preceded by relatively low past earnings growth.

Unlike the previous company level studies, the Fama and Macbeth (1973) procedure was not used by Vermeulen (2011). Instead, the SAS procedure "TSCSREG" (time series cross sectional regression) was used to analyse the data. "This procedure takes into account the time series dependence in the data. The TSCSREG procedure analyses a class of linear econometric models that commonly arise when time series and cross-sectional data are combined. The TSCSREG procedure analyses panel data sets that consist of multiple time series observations on each of several individuals or cross-sectional units. The performance of any estimation procedure for the model regression parameters depends on the statistical characteristics of the error components in the model. The TSCSREG procedure estimates the regression parameters in the preceding model under several common error structures, including one and two-way fixed and random effects" (Vermeulen, 2011).

The results of the regression indicated a significant positive coefficient for the payout ratio variable, meaning that for South African companies, subsequent earnings growth increased as their payout ratio increased. Vermeulen (2011) also compared emerging markets to developed markets, as detailed in a subsection below.

Lastly, Huang *et al.*. (2009) conducted a similar investigation at the company level in Taiwan. Research indicated that Taiwanese companies had a trend of declaring dual distributions, namely cash and stock dividends (Huang *et al.*, 2009). As a result, the sample used in the test included both the traditional forms of distributions, as well as the more recent dual distributions. The results of their investigation indicated a significant positive association between dividend payout ratios and subsequent earnings growth. The authors also repeated their regression tests on subsamples created based on cash-to-stock ratios of the dividends. The results indicated that a significant positive relationship between dual-dividend payouts and subsequent earnings growth only existed in the balanced-divided subsample. Furthermore, their findings indicated that the relationship between payout ratios and subsequent earnings growth weakens as the size of the firm increases.

2.11 Mean Reversion

2.11.1 Market Level

One of the most intuitive explanations for the positive relationship found is possible mean reversion in earnings. Arnott and Asness (2003) highlighted that mean reversion could either occur in its true statistical form, or alternatively by temporary reporting errors which would cause apparent mean reversion in the closely measured changes. If earning decreased for a temporary period of time, the result could be an increase in the expected future earnings growth from the temporary lower base. Since dividends have been shown in historical financial literature to not decrease as much as earnings, the temporary drop in earnings would simultaneously increase the current payout ratio. This form of true mean reversion would have implied that the dividend policy had no predictive power.

To test for the mean reversion, Arnott and Asness (2003) created two proxies. The first was a lagged earnings variable, namely the prior ten year real earnings growth, which was added to the regression formula. The authors stated that if the mean reversion in earnings hypothesis proved to be correct, the addition of the lagged earnings growth variable could have clearly shown the mean reversion that was being investigated, and furthermore, might have caused the payout ratio to lose much of its importance in bivariate tests. After repeating the regression, the results indicated that the variable had the expected negative sign but the relationship was weak. The lagged earnings growth measure did not have the efficacy or predictive ability of the payout ratio.

Arnott and Asness (2003) constructed a second proxy for mean reversion, namely the MA_{20} variable. This was calculated by dividing the prior one year real earnings by the average of real earnings over the past 20 years. The authors hypothesized that when the moving average of earnings growth over the last 20 years was high, the temporary component of earnings would also have been high and consequently, the MA_{20} variable would have forecasted lower subsequent real earnings growth. Confirming the findings of the lagged earnings growth variable regression test, the results of the MA_{20} test indicated that the negative expected sign was found, however the relationship was weak and did not reduce the power of the payout ratio.

Arnott and Asness's (2003) findings indicated that at the market level, the payout ratio's predictive power admirably survived head-to-head competition against two reasonable proxies for simple mean reversion in earnings, implying this was not the cause for the positive relationship.

Similarly to Arnott and Asness's (2003) MA_{20} variable, Parker (2005) also tested for a rolling 20 year regression of the payout ratio against the ten year growth in earnings. The results indicated that the relationship fell apart for the TSX. This was in sharp contrast to the statistics for the regression using the S&P 500 index and ASX, which were significant in all of the regressions, similar to Arnott and Asness' (2003) findings. Parker (2005) noted that a strong relationship overall which failed for periods at a time was likely less desirable than a moderately strong relationship which did not fail.

Gwilym *et al.* (2006) also tested for mean reversion at the market level through the addition of a lagged earnings growth variable to the regression. Their results confirmed the findings above, specifically that although lagged earnings growth had the anticipated negative sign, the predictive ability of the power was poor and it failed to materially diminish the role of the payout ratio. This result had the greater degree of accuracy in the 1946-2001 regression time period. With this said, the statistical significance of the results varied, with the highest degree of significance present for the five year lagged earnings growth. Gwilym *et al.* (2006) noted that although an element of the positive relationship between the payout ratio and real earnings growth could be explained by mean reversion in earnings, this could not fully explain the findings.

A possible explanation provided by the authors for the positive relationship between the payout ratio and future earnings growth variables was the concept of limited profitable investment opportunities, and insufficient monitoring of management. Because companies require higher retained earnings in order to invest, their payout ratios decrease. At the same time, positive net present value investment opportunities are being chased by most managers in the market, and therefore, managers eventually invest in suboptimal projects. Because management is not under constant scrutiny, this trend continues. As a result, returns from the projects are poor and the earnings growth declines. The opposite finding is that if there are no attractive investment opportunities within which to invest their excess retained earnings, management will increase the company's payout ratio. This would then decrease the competition for each opportunity in the market, resulting in greater rates of return.

Another explanation provided in the paper is that mean reversion existed in the payout ratio itself. Under this assumption, higher payout ratios would lead to expectations that not only would the subsequent earnings growth increase, but the dividends would also increase, just at a slower rate. As discussed in Lintner's (1956) investigation, management were reluctant to reduce dividends because of the signalling impact. When earnings were increasing, management would increase dividends but at a slower rate than the growth of the earnings, therefore reducing the payout ratio to a lower level. This provided a buffer for management should earnings decrease or stagnate in the future, since earnings would have been adequate to cover the dividend payment. When the payout ratios were at a lower level, there was increased pressure for earnings to remain at a higher level and prevent a change in the dividend payout policy. The authors tested for this by adding a variable, the future change in payout ratio, into the regression and found that mean reversion in the payout ratio may have explained some of the negative relationship between the payout ratio and the real dividend growth, but failed to give a full explanation.

Lastly, Parker (2005) added a lagged earnings variable which was non-overlapping. Consistent with the results found by the preceding papers, the lagged earnings growth variable did not have the positive sign associated with mean reversion. The lagged earnings growth variable for all three countries was not consistently statistically significant for either the five or ten year earnings growth regression tests. As a supplementary test, Parker (2005) repeated the regression using the adjusted payout ratio and adjusted real earnings growth previously described. The purpose of the additional test was to investigate whether the same relationship existed after the extreme outliers, which had previously strongly supported the results of the regression, were removed. The results found the same positive relationship as before and that the adjusted payout ratio variables were statistically significant. Although the adjusted r^2 was lower for the ASX and TSX, overall the figures remained high.

In conclusion, the tests above indicated that mean reversion was not an explanation for the findings at the market level.

2.11.2 Company Level

At the company level, both mean reversion and the concept of symmetrical business cycles were considered intuitive explanations for the 'surprising' findings. The previous regressions assumed symmetrical growth rates; however, this may not have always been the case. Earnings may have increased for one year then decreased for five years, or earnings may have increased for three years and then decreased for one year. Under the assumption of symmetrical earnings growth cycles, if mean reversion was the cause for the positive relationship between the payout ratio and subsequent earnings growth variables, it would not have been clearly observable.

In their initial regression tests, Ping and Ruland (2006) used the same time periods for past and future earnings growth. The authors subsequently tested for growth cycles which may have been asymmetrical for the three price earnings growth measures. The results did not differ, with the conclusion of a positive relationship between the payout ratio and subsequent earnings growth remaining.

In considering the effect of asymmetrical business cycles, Flint *et al.* (2010) repeated the regressions making adjustments to ensure all lagged earnings growth variables were controlled for. By way of explanation, for the one year earnings growth horizon, the one year lagged earnings growth variable, as well as the three and five year lagged earnings growth variables were included in the regression equation. Similarly to the results found by Ping and Ruland (2006), a positive relationship existed between the payout ratio and subsequent earnings growth. The results were statistically significant at the one percent level for the one and three year growth horizons and at the five percent level for the five-year growth horizon. Regardless of the inclusion of the asymmetric business cycle control, the positive relationship remained.

Ping and Ruland (2006) tested for pure mean reversion at the company level in two ways, namely via a grouping test, and a dummy variable addition. The companies were subdivided into 4 groups on the basis of past earnings growth and payout as below.

1. Low payout low PEG
2. High payout low PEG
3. Low payout high PEG
4. High payout high PEG

If mean reversion was responsible, the relationship between the payout ratio and subsequent earnings growth variables would have been negative for groups 1 and 4. The results of the repeated regression test indicated a positive association between the variables for groups 1, 2 and 4. The results for group 2 and 4 had the highest level of statistical significance. The findings indicated that the relationship between the payout ratio and subsequent earnings growth was unchanged, and was not as a result of mean reversion in earnings.

Secondly, two dummy variables were created and included in the regression equation to test for the joint effect of past earnings growth and current payout on the relationship between the payout ratio and subsequent earnings growth. Dummy variable D_{PEG} was developed to test whether the company's past earnings growth in year t was above the median past earnings growth of the time horizon in year t. The second variable, D_{Payout} tested whether the company's payout in year t was above the median payout in that same year. The test was conducted for all 4 group classifications defined above. The results of the regression repeated including the dummy variables indicated a positive relationship between the payout ratio and subsequent earnings growth for all of the groups for the three growth measures, except group three for the one year earnings growth. Ping and Ruland (2006) also found that given past earnings growth, the positive relationship between the payout ratio and subsequent earnings growth was generally stronger for companies with higher dividend payout ratios. The results suggested that mean reversion was not the driving force behind the findings.

At both the company and market level, mean reversion was rejected as the conclusive cause for the positive relationship between the payout ratio and the subsequent earnings growth.

2.12 Market Valuation

A selection of authors of the previous investigations deemed it necessary to consider whether the ability to explain subsequent growth may have been improved by introducing the overall valuation of the aggregate stock market into the model.

In 1999, Elliot and Finn found that companies, at the individual stock level, with track records of consistent earnings growth, achieved higher P/E multiples (Gwilym *et al.*, 2006).

Arnott and Asness (2003) believed that if earning growth was expected to be at inflated levels in the future, rational investors should be willing to pay for this, and therefore the price to earnings ratios should be high, and the inverse earnings yield ratio should be low. Arnott and Asness (2003) investigated whether a low earnings yield predicted high subsequent earnings growth. In other words, the authors were testing the presumption that the market expected consistent performers to continue to deliver adequate earnings growth, and, provided the aggregate market discounts subsequent prospects, it was expected that earnings yield would be negatively related to subsequent real earnings growth.

Arnott and Asness (2003) included the earnings yield variable in the regression formula, and then repeated the regression of the ten year earnings growth on the payout ratio and the earnings yield, E/P, for the various time periods. The results indicated that the relationship existed, implying investors do pay for higher earnings growth; however the relationship was weak and suffered under a multiple regression test. This led to an analysis of the contradiction between the valuation (P/E ratio) and payout ratio as a predictor of earnings growth; however Arnott and Asness (2003) concluded that their results indicated the payout ratio was the successful measure.

Gwilym *et al.* (2006) also repeated their regression testing the payout ratio and earnings yield as explanatory variables for subsequent earnings growth. The results varied for the different countries, as detailed in their article, however the consistent finding was that the inclusion of the earnings yield did not detract in any meaningful way from the positive relationship previously found between dividend payout ratio and subsequent real earnings growth. Moreover, Gwilym *et al.* (2006) found that comparing the regression with only the payout ratio as the independent variable, the explanatory power of the payout ratio increased in the regressions which were repeated including the earning yield, but the effect was only significantly noticeable in the one year earnings growth time period.

Lastly, Parker (2005) conducted the same test and found that for the TSX and S&P 500 index, the earnings yield was a good predictor of ten and five year subsequent earnings growth, both when used in isolation and when used alongside the payout ratio. This relationship did not extend to the ASX.

2.13 The Payout Ratio against the Yield Curve

Historical financial literature has demonstrated that the slope of the US Treasury yield curve has been an accurate forecaster of economic growth. The rationale for considering this factor into the regression tests was that if the yield curve slope was a positive forecaster of economic growth, firstly, was it a forecaster of earnings growth and secondly, did it have any impact on the predictive power of the payout ratio (Arnott and Asness, 2003).

Arnott and Asness (2003) repeated a regression of earnings growth as a function of the yield curve slope and payout ratio. The yield curve slope was defined as the difference between the ten year T-Bond yield and the three month T-Bill yield at the start of any period. The regression was repeated for both the ten and five year subsequent real earnings growth and the results indicated that the yield curve slope, when used alone to forecast earnings growth, generally showed the expected positive coefficient sign. In addition, the results indicated that the predictive ability of the yield curve was significantly weaker than the predictive power of the payout ratio.

Parker (2005) conducted the same test, with findings similar to Arnott and Asness (2003). The results indicated that the yield curve slope variable offered very little in terms of incremental explanatory power, particularly for forecasting ten year earnings growth.

Ultimately, consideration of the slope of the yield curve did not diminish the power of the payout ratio to predict subsequent growth in earnings.

2.14 Share Repurchases

Share repurchases gained significant popularity during the 1980's and 1990s. Arnott and Asness (2003) had considered that if regular dividends were frequently substituted by share repurchases, the defined measure of the payout ratio could have been significantly understated. Furthermore, the increase in share repurchases would have increased earnings per share growth (Arnott and Asness, 2003). Arnott and Asness (2003) reasoned that if the decline in payout ratios present in the United States between 1980 and 2001 was due to the increase in repurchases, this could have directly corresponded to increases in subsequent earnings growth and weakened the results found from their initial regression tests. Their test for the influence of share repurchases was indirect, in that if the relationship between the payout ratio and subsequent earnings growth was similar in the pre- and post-1980 periods, it could be inferred that the share repurchases trend did not unduly influencing the findings. If the results from the repeated regressions both before and after 1980 indicated the same positive relationship between the payout ratio and subsequent earnings growth, it could be postulated that share repurchases did not have a material impact on their results. The regression was repeated for the 1946 – 1979 and 1871 – 1979 time periods, and the link between the payout ratio and the real subsequent earnings growth was almost as significantly positive as over the longer time period. Lastly, the same relationship was found in the regression which was repeated from 1980-2001. Although the true effect was not conclusively determined, it seemed as though share repurchases did not alter the results.

Ping and Ruland (2006) considered the impact of share repurchases at the company level by examining the relationship between earnings growth, and three alternative measures of payout ratios, namely dividend payout ratios, repurchase payout ratios and total payout. Dividend payout was the same measure which had previously been used and remained unchanged for this test, repurchase payout was defined as the ratio of common stock repurchases to earnings, and total payout was the sum of the dividend payout and repurchase payout. The findings indicated that the repurchase payout was also positively related to subsequent earnings growth but the significance levels, although high, were not as high as the other payout measures. Total payout was positively related to subsequent earnings growth and the relation was stronger for dividends than for share repurchases. Ultimately, the relationship between the payout ratio and subsequent earnings growth variables remained positive, even after explicit consideration of share repurchases.

The regression tests repeated by both authors indicated that the results were robust to share repurchases, at the company and market level.

2.15 Methodological Tests – Change in Time Horizons and Predictive Consistency

Arnott and Asness (2003) deemed it imperative to tests the robustness of their results to various time horizons. Instead of repeating the regression model from 1946 – 2001, the regression model was repeated from 1871 – 1945, and 1871 – 2001. The coefficient of the payout ratio had the same surprising positive sign in both time periods. The earnings growth time frame for which the regression was run was also changed. Arnott and Asness (2003) selected to run their initial regression on ten year earnings growth time spans. The rationale provide was that ten years balanced two conflicting goals, namely a time span which was long enough to provide economically significant results, but remained short enough to provide the authors with a useful number of independent observations and for the findings to provide relevance to the average investors career horizon. The regression was repeated for five year subsequent real earnings growth, for the same time periods as before. The results for 1946-2001 and 1871-2001 remained statistically significant and positive. Furthermore, Arnott and Asness (2003) tested for the consistency of their t-statistic and R^2 results. A five year time period was selected, for 1871 – 2001 with the intention of considering more independent data points. The results of the repeated regression tests indicated substantial variation over time. This finding was expected by the authors, since the statistical noise in the relationship should have caused such variability, and the fundamental relationship may have strengthened or weakened with changes in the economic, tax, or political environment. With this said, the results of the predictive consistency regression analysis showed considerable stability, and were in line with the previous positive relationship findings of the initial regression.

Ping and Ruland (2006) also investigated whether the results would have been impacted by a change from a single to multiple time periods, at the company level. Firstly, the regression was repeated for each decade from the 1950's. The relationship between the payout ratio and subsequent earnings growth remained positive and statistically significant. It was found that earnings growth was weaker in 1950s and 1960s than the 1970's and 1980's. Secondly, similarly to the mean reversion tests, dummy variables were created for each decade. The decade variable was coded 1 if the observation was in that decade and was coded 0 otherwise. Importantly, the authors found negative interaction terms between decade dummies and payout ratio. The results also indicated that the positive relationship between payout ratio and subsequent earnings growth had strengthened in recent years.

The time horizons did not materially the results at the neither the company nor the market level.

2.16 Specific Industries Effects

Unlike the previous investigations, Ping and Ruland (2006) considered the impact of various industries on their findings, more specifically if the positive relationship which had previously been discovered was merely reflecting different industry effects. If this hypothesis was true, after controlling for industry membership, if companies with high dividend payouts tended to concentrate in industries that experienced higher earnings growth, a positive relationship between payout and high It was found that earnings growth was weaker in 1950s and 1960s than the 1970's and 1980's earnings growth should not have been found. This was tested in two ways, namely by replacing the payout ratio variable with an industry adjusted payout variable, and secondly adding a dummy variable to the regression equation. Both tests found that the coefficients were strong and statistically significant for the payout variables. Therefore, the results could be concluded as not having been driven by the industry.

2.17 Link to the Macro Economy

As previously described, Arnott and Asness (2003) provided the empire building hypothesis as a potential explanation for the positive relationship between the payout ratio and subsequent earnings growth. More specifically, if payout ratios were low, earnings were retained to invest in non-profitable investment opportunities to build large empires, for the benefit of management. The investment opportunities did not generate sufficient returns and the subsequent earnings growth declined.

The authors tested this theory by evaluating whether the payout ratio was correlated through time with a measure of economy wide investment, specifically the ratio of gross domestic investment to gross domestic product. In other words, the regression test was used to determine whether greater retained earnings led to greater investment, or empire building. If the empire building hypothesis was the explanation for the positive relationship between the variables, the findings of the regression would have indicated a positive correlation between investment/GDP measure variable and the retention ratio, the inverse of the payout ratio. The results of the regression indicated that in times of high cash retentions, there was high investment, but not necessarily simultaneous times of depressed earnings. Furthermore, the results indicated a positive relationship between the payout ratio and investment/GDP measure. More specifically, a higher retention ratio was a forecaster of lower earnings and greater investment was a predictor of lower GDP growth. With regards to the payout ratio, the coefficient for the investment/GDP variable was negative. The findings also indicated that when investment was high, subsequent GDP growth was low. Lastly, the results of the repeated regression illustrate that at the macroeconomic level, the dividend policy and investment policy were not independent of one another.

2.18 Dividend Growth and Stock Returns Extension

As previously stated, Gwilym *et al.* (2006) extended the explanatory power of the payout ratio beyond the work previously done by Arnott and Asness (2003). The authors deemed it relevant to test whether the surprising results found between the payout ratio and the subsequent real earnings growth translated to subsequent real dividend growth. They referenced Modigliani and Millers traditional hypothesis which described a negative relationship between the payout ratio and subsequent real dividend growth, unless the company's funds were replenished by stock issuance and vice versa. The regression was repeated, with real dividend growth as the dependent variable. Once again, the results differed for the various countries, and time period, as detailed in the original article. With this said, the common trend present in the results indicated that the payout ratio and subsequent real dividend growth were negatively related. Unlike the findings for the payout ratio and subsequent real earnings growth, the results of the regression tests agreed with traditional hypotheses.

Similarly to how market valuations could have partially explained the relationship between the payout ratio and subsequent real earnings growth, market valuations could have influenced the relationship between the payout ratio and subsequent real dividend growth. Therefore, Gwilym *et al.* (2006) repeated the regression with the dividend yield added as an additional variable to proxy for overall market valuation. The results were such that the dividend yield was negative for almost all the countries, except Japan and the United Kingdom, which confirmed the hypothesis that higher market valuations were consistent with greater subsequent growth for both earnings and dividends. Once again, the theme of mean reversion in dividends was considered. Similarly to real earnings growth, mean reversion was tested for by adding a lagged variable, namely lagged dividend growth. The coefficient for the lagged dividend growth variable was negative for all the countries except the United Kingdom and Switzerland from 1978-2004. The inclusion of the lagged variable added considerably to the explanatory power of regression model.

Lastly, Gwilym *et al.* (2006) analysed the relationships between the payout ratio and stock returns. The first investigation was a quartile analysis. The authors ranked five year periods of real earnings growth and real dividend growth on an annual basis, for the markets where data was available, from 1973 to 2004. The data was divided into quartiles and the results indicated that high real earnings dividend growth tended to exist in parallel with relatively higher returns. Secondly, regression tests were repeated, but with real returns as the dependant variable. The results for the various countries for the three time periods were mixed, and statistically insignificant. This implied that there was no general relationship between the payout ratio and returns, and where the relationship existed, the explanatory power was negligible.

2.19 Free Cash Flow Theory and Cash Flow Signalling

Ping and Ruland (2006) expanded on the free cash flow theory presented as an explanation by Arnott and Asness (2003). In 1986, Jensen developed the theory that when companies had excess free cash flows, management had an incentive to overinvest, particularly if management compensation schemes were linked to the company performance or share prices. As previously stated, this also led to greater principal-agency conflicts between management, who intended on empire building, and shareholders who expected an increase in wealth. The overinvestment into suboptimal investment opportunities would have resulted in a decrease in returns and the value of the firm (Ping and Ruland, 2006). Following the methodology developed by Fama and French in 2002, Ping and Ruland (2006) investigated the potential impact of the free cash flow theory by creating a proxy for growth opportunities. This proxy, V/A, was defined as the ratio of the company market value of equity and book value of debt to the book value of its assets. If the V/A variable was high, it would have indicated that there were many growth opportunities available in the market, decreasing the temptation of empire building and therefore decreasing the free cash flow problems. The authors also created a variable which considered the interaction between V/A and the payout ratio, namely V/A x payout. If the free cash flow had been present and had an effect in the market, the coefficient for the V/A x payout variable would have been negative, suggesting that when growth opportunities were limited, the positive relationship between the payout ratio and subsequent earnings growth was more prominent than when growth opportunities were plentiful. The variable V/A x payout was added as a variable to the regression formula. The results of the repeated regression found the coefficient on VA x Payout to be negative and statistically significant for all three growth periods. Ping and Ruland (2006) were able to conclude that the relationship between the payout ratio and subsequent earnings growth continued to be strong despite the introduction of the V/A and V/A x payout ratio variables. Furthermore, the relationship between the V/A variable and subsequent earnings growth was positive, while the relationship between the V/A x payout ratio and earnings growth variable was negative. Their findings supported the free cash flow theory and supported the findings of Arnott and Asness (2003).

Similarly to Ping and Ruland (2006), Flint *et al.* (2010) also added the V/A variable, to the equation. The results showed that the V/A x payout variable was highly insignificant for all three growth periods. This was contrary to what was expected under the free cash flow hypothesis and differed to the results of Ping and Ruland (2006) who found the coefficient of the varilable to be negative and significant for all three growth horizons. Unlike the previous research papers, Flint *et al.* (2010) concluded that the free cash flow hypothesis was unlikely to explain the positive relationship between the payout ratio and subsequent earnings growth (Flint *et al.*, 2010).

Flint *et al.* (2010) considered that in addition to the free cash flow theory, a cash flow hypothesis may provide an explanation for the positive relationship between the payout ratio and subsequent earnings growth variables. The hypothesis suggested that management has access to insider information not available to shareholders, dividends and the payout ratio signal information about the firms expected future cash flows, and therefore mitigate the information asymmetry between the parties. The mechanisms and costs of dividend signalling are detailed in chapter 2.5

Similarly to the approach developed by Vivian in 2006, Flint *et al.* (2010) investigated the potential impact of the cash flow signalling hypothesis. A regression model was developed with the earnings growth for one, three and five years as the dependent variable, and the rate of change in dividends at period t as the independent variable, as detailed in the regression equation below.

$$EG_{it\ 1,3,5} = \alpha + \beta_1\ \Delta Div_{t-1} + e_{it}$$

If the cash flow signalling theory existed, and management did signal cash flow expectations through changes in dividend payments, the results of the regression should indicate a statically significant, positive coefficient for the Δ *Div*$_{t-1}$. This would imply that an increase in dividend payments is associated with an increase in higher subsequent earnings growth. The results indicated that the coefficient on the dividend change rate was negative for all three growth periods, meaning that an increase in the growth rate of dividend payments led to a reduction in subsequent earnings growth, the opposite to what would have occurred had the cash flow signalling theory been correct.

Flint *et al.* (2010) noted that in 2001, Nissim and Ziv disputed the findings of the model, stating that the Δ Div$_{t-1}$ variable was positively correlated with current profitability. Since Fama and French (2002) had shown that profits revert to their mean, the expected change in earnings was likely to be negatively correlated with the change in dividends, leading to a bias against the hypothesis that dividends have information content.

In an attempt to avoid the potential bias, Flint *et al.* (2010) added both a return on assets and a lagged earnings growth variable to the regression equation, as per below.

$$EG_{it\,1,\,3,\,5} = \alpha + \beta_1 \, \Delta Div_{t-1} + ROA_{\,it} + LEG_{\,it\,-1,\,-3,\,-5} + e_{\,it}$$

After the regression was repeated, the coefficient on the dividend change rate remained negative but became statistically insignificant, for all three growth horizons. The coefficients of the return on assets and lagged earnings growth variables were statistically significant and negative. This implied that the significance of the rate of dividend change announcement was a result of omitted variable bias in the model, not due to the effect of dividend signalling on subsequent earnings growth, and therefore that the cash flow signalling hypothesis did not explain the positive association between the payout ratio and subsequent earnings growth.

Although the cash flow signalling hypothesis could not explain the payout-earnings growth relationship, both the results of Arnott and Asness (2003) and Ping and Ruland (2006) suggested that this relationship could have been explained by the free cash flow hypothesis.

2.20 Emerging Market Studies

Between 2003 and 2007, a fair amount of financial research had been conducted which contradicted the traditional theories; however no literature had been published comparing emerging and developed markets. Both Al-Twaijry (2007) and Vermeulen (2011) conducted studies at the company level in emerging markets.

In 2011, Vermeulen (2011) investigated whether the relationship found by Ping and Ruland (2006) existed in South Africa, and secondly, compared the findings to those of the United States and Australia, two developed markets. South Africa has been characterised by political, and consequent economic turmoil. Although the country is the most sophisticated on the African continent, it remains an emerging market. Vermeulen (2011) conducted a similar regression test to that of Ping and Ruland (2006), and therefore used the same regression formula. The author also conducted a univariate and multivariate analysis. The regression results indicated that the payout ratio of all three countries was positively related to subsequent earnings growth for one, three and five years. The findings were statistically significant at the one percent level, except for South Africa's five year relationship which tested significantly at the two percent level. Therefore, the inverse relationship between the payout ratio and subsequent earnings growth discovered by Arnott and Asness (2003) also existed for South African companies.

The other control variables had greater levels of statistical significance for the United States and Australia than South Africa, except for return on assets and asset growth which were more significant. With this said, all of the independent variables displayed the expected relationship with subsequent earnings growth. The author noted that because the variables had less explanatory power in South Africa compared to the United States and Australia, there could have potentially been other factors which were influencing earnings growth in South Africa. Vermeulen (2011) postulated that these factors related to emerging market characteristics. With this said, it was concluded that at the company level in developed markets, firms that pay out dividends tended to perform better in terms of subsequent growth in earnings than companies that retain a greater proportion of their earnings.

In 2007, Al-Twaijry conducted a study to identify the variables with an expected influence on dividend policy and payout ratio in an emerging market, Kuala Lumpur. Although the methodology was entirely different to the research papers listed above, the findings remained relevant. The author developed eight hypotheses and conducted tests on 300 firms randomly selected from the Kuala Lumpur Stock Exchange from 2001 to 2005. The results of the tests indicated that current dividends were affected by their past and future prospects. There was also a weaker association between dividends and net earnings. There was a weak relationship between the payout ratio and subsequent earnings growth, however a significant negative relationship between the payout ratio and company leverage. Lastly, Al-Twaijry (2007) found that contrary to previous findings, cash per share and share book value significantly and positively affected both the dividends per share and payout ratios.

Al-Twaijry (2007) concluded that the payout ratio did not significantly impact a company's subsequent earnings growth in a developing country such as Kuala Lumpur. This did not confirm Vermeulen's (2011) finding for South Africa. It can be postulated that not all developing countries can be treated the same with regard to dividend policy decisions. The Al- Twaijry (2007) study was not based on the original article written by Arnott and Asness (2003), nor the original company level article written by Ping and Ruland (2006). Perhaps the contradictory results between the two emerging market studies could be as a result of the difference in methodology or because of the characteristics unique to each emerging market.

In order to further analyse the emerging market contradiction above, a market level study based on the original Arnott and Asness (2003) paper was conducted in South Africa. This study will be described in the remainder of this document.

Chapter 3: Data

3.1 Data Selection

This study was conducted on the FTSE/JSE All Share Index (ALSI) in South Africa, which is based on the market capitalisations of approximately the 150 largest stocks listed on the Johannesburg Stock Exchange (JSE). Together, these stocks account for almost 100% of the market capitalisation and liquidity of the South African market.

Similarly to the previous studies, a 12 month trailing earnings series was estimated for the index. This was calculated by initially dividing the monthly stock price index level by the corresponding monthly consumer price index level to obtain real price index values, and then multiplying that figure by the earnings yield data for that month. The dividend series for the index was calculated in the same way, but by multiplying the series by the dividend yield in the last step. The payout ratio was calculated by dividing the monthly dividend for the index by the monthly earnings for the index. The earnings growth was geometrically calculated for each time period. For the purposes of this study, the following data was obtained from INET BFA:

- ALSI monthly closing value
- ALSI monthly earnings yield
- ALSI monthly dividend yield
- Monthly Consumer Price Index

This regression-based study was conducted using the maximum index data available, namely for the period 1960 – 2014. The full period was further subdivided into two sub- periods, namely 1960- 1994 and 1994-2014. The rationale for the additional division of this study into these two sub-periods is as follows.

Between 1960 and 1994 the South African economy was largely inward-focussed, highly concentrated and to a large extent protected against external competition by government policies. South Africa's racial policies of the time resulted in economic and financial sanctions being imposed against it by the international community, as well as international disinvestment, especially in the 1980s. One effect of this was that South African companies faced ever decreasing offshore investment opportunities, and a second was that as a result, the South African economy came to be dominated by conglomerates and large business (mostly represented in the JSE ALSI) (Mohamed, unknown) (Havemann and Fani, 2014).

Following South Africa's first fully democratic election in 1994, its economy was essentially integrated into the global economy overnight, both as a result of pent-up foreign interest and investment, as well as the dismantling of the protective policies previously favouring large local interests by the new ANC government. For South African companies (especially the large ones constituting the JSE ALSI) the implications were both positive and negative. Although they were now faced with much more intense (international) competition, at the same time they could now invest in opportunities outside of South Africa, which vastly expanded their investment opportunity set, with obvious implications for their investment (and hence dividend payout) decisions (Arvanitis, 2006).

Given the above structural change in the South African economy related to the structural change in the South African political landscape, it is therefore not unreasonable to hypothesise that these changes could also have structurally affected payout decisions and long-term earnings growth, and hence in the relationship between these two variables.

3.2 Descriptive Statistics

The summary statistics computed for the pay-out ratio and earnings for the ALSI for the three time periods are displayed in Table 1 below.

	Payout Ratio				Compound Annual Real Growth	
	Max	Min	Mean	Median	Earnings	Dividends
1960 – 2014	0.629	0.333	0.463	0.449	2.99%	2.72%
1960 – 1994	0.629	0.360	0.508	0.517	1.39%	0.56%
1994 – 2014	0.512	0.333	0.390	0.380	5.89%	6.51%

Table 1: Summary Statistics - Payout Ratio and CAGR for ALSI, 1960-2014

The actual payout ratio ranges from 0.333 as the minimum, to 0.629 as the maximum over the 54 year period. The average payout ratio value varies from 0.39 to 0.508 for the three time periods, while the median ratio for 1994-2014 (0.380) is less than the median ratio for 1960-1994 (0.517), indicating a decreasing trend in dividend payouts. In terms of the compounded annual real growth rate, both earnings and dividend growth were greatest in 1994-2014, a period which, for the most part, coincided with the integration of the South African economy into a strongly growing global economy.

The payout ratios of the ALSI from 1960-2014 were plotted, as below.

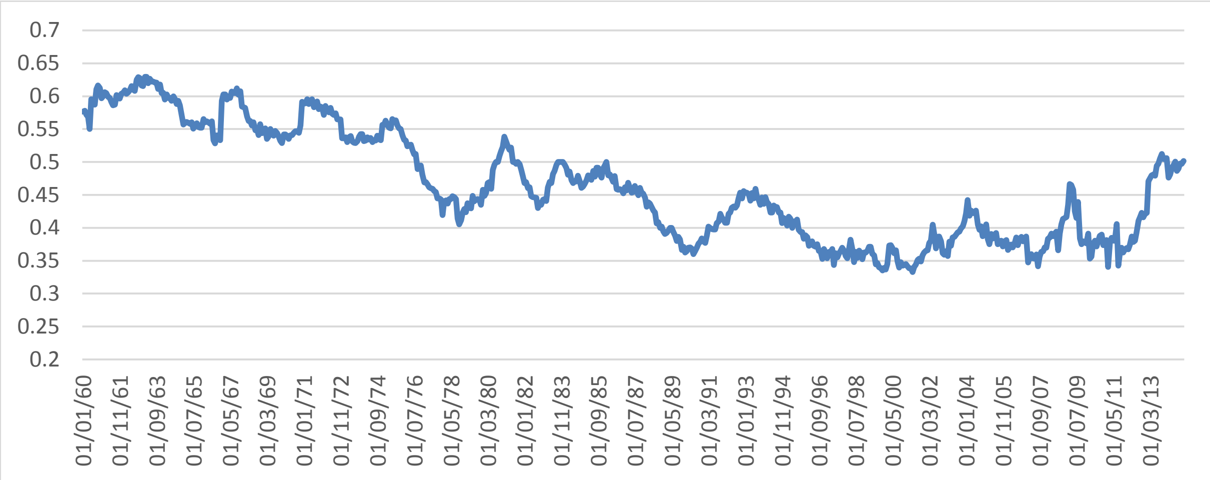

Figure 1: Payout Ratios of the ALSI, 1960-2014

Figure 1 above clearly depicts an overall decreasing trend in the payout ratio between 1960 and around 1996, followed by a slowly increasing trend from around 2002. Payout ratios depend on a number of factors, including the alternative possible uses of cash (*i.e.* investment opportunities), and the dividends tax regime. In terms of both factors, South Africa has a somewhat unique history, which may in part explain some of the trends shown above.

In addition, the earnings of the ALSI from 1960-2014 were plotted, as below.

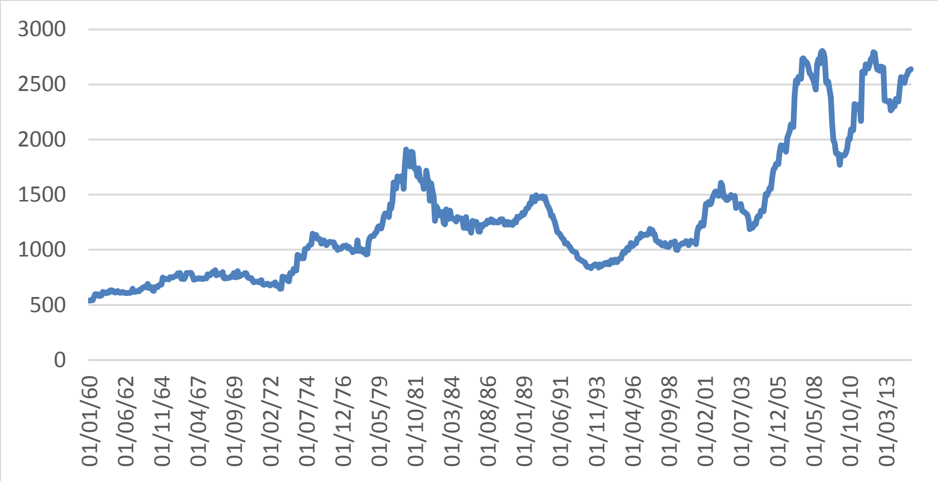

Figure 2: Real Earnings of the ALSI, 1960-2014

In the 1950's and 1960's, the South African economy grew at approximately 4.5% per year, which was in line with many other western economies (Voogt, 1996). At this time, companies were not subject to a dividend tax, and had no tax incentive to retain earnings, especially as dividends were also not taxed in the hands of shareholders. Payout ratios were at their highest levels for the time period analysed.

As detailed above, from 1948-1994, South Africa was ruled under an apartheid regime. The unjust oppression of the majority black population caught the attention of freedom and human rights groups worldwide. In an attempt to discourage the ruling party, and to end apartheid, many countries instituted economic sanctions against South Africa, resulting in an increasing isolation of the South African economy. At the same time, disinvestment resulted in the withdrawal of foreign capital invested into South Africa, while divestments meant financial and economic relations with companies that profited from business done in South Africa were terminated. The consequence of the sanctions and isolation of the South African economy was presumably to limit investment opportunities for local companies to the relatively small local economy. With this decreasing set of investment opportunities, one would have expected the payout ratio of the large listed companies to have increased over this period, as alternative uses of cash dried up. However, as seen above, the converse trend is observed. Possible reasons for this could be that increased competition for a smaller investment opportunity set, and/or greater uncertainty with regards to obtaining debt finance as a result of international financial sanctions, necessitated the maintenance of greater cash balances. The latter may offer an explanation for the sharp drop in the payout ratios of JSE-listed companies in the period after mid-1985, when many large foreign banks stopped granting credit to South Africa for political reasons.

In the early 1990's payout ratios became to exhibit a sharp upward trend, presumably as financial sanctions started to ease in the period of negotiations that eventually led to South Africa's full democratisation. However, in 1993, in an attempt by the South African Government to encourage greater local investment and to deter high dividend payouts, a so-called Secondary Tax on Companies (STC) was introduced. STC was a globally unique tax levied at company level on dividends paid from after-tax profits. The introduction of STC impacted the payout policy of a firm since it affected both the cost of equity capital by imposing a further cost of declaring dividends to satisfy investors' expected return, and the residual capital growth of stocks after dividend payments via attrition of retained earnings/book value due to an increased tax charge (Marcus and Toerien, 2013). Figure 1 illustrates that the intended outcome was achieved, as the payout ratios between 1993 and 1997 decreased dramatically, before largely stabilising for the next few years. STC was abolished in 2012, and replaced by a dividend withholding tax (DT), which is withheld and paid over to the tax authorities on behalf of the shareholder by the company paying the dividend or by a withholding agent (Nieman, 2012). It is probably no coincidence that the abolishment of STC in 2012 largely coincided with a period of increased payout ratios.

An additional factor that can impact payout ratios are share repurchases which, although being an alternative form of profit distribution to shareholders, is not captured in the payout ratio. A share repurchase scheme is a situation where a company buys back its shares from shareholders and then cancels them or creates treasury shares. In South Africa the Companies Act, 1973 (act 61 of 1973), previously limited the reduction in the number of preference shares which could only be redeemed by a transfer of the equal amount to the capital redemption reserve fund, the non-distributable reserve in order to maintain capital levels. After 1999, Section 85 of the then Companies Act, No 61 of 1973 permitted companies to acquire their own shares from shareholders by way of special resolution and subject to meeting the solvency and liquidity requirements (Mkhonza, 2007). In 2006, Le Roux analysed share repurchases by South African companies and found that this form of distribution is preferred to special dividends when distributing surplus cash to shareholders. The research found that local firms not only perceived it to be the most tax effective way of distributing cash to shareholders but also regarded a share repurchase to be safer for a company than paying a special dividend, as a consequence of companies being able to raise or lower the value of a repurchase more easily than adjusting a value of a special dividend (Le Roux, 2006). In 2011, Ramorwa confirmed that an increasing amount of companies adopted this form of payout in the 1980's and 1990's, which potentially could have played a role in reducing payout ratios over this period (Ramorwa, 2011).

Lastly, it is important to acknowledge that payout ratios, defined as dividends paid over earnings, also depend heavily on earnings. This, however, only holds true if managers target absolute dividends in their payout decisions, as opposed to payout ratios *per se*. Nevertheless, Firer, Gilbert and Maytham (2009) found the latter to be the case for South African managers. Despite this, it is possible that short term earnings shocks could have an impact on payout ratios if managers expect such earnings shocks to be temporary and hence elect to maintain a consistent absolute dividend payment (Marx, 2001). This may, for example, explain the short-term payout ratio spike subsequent to the financial crisis of 2008.

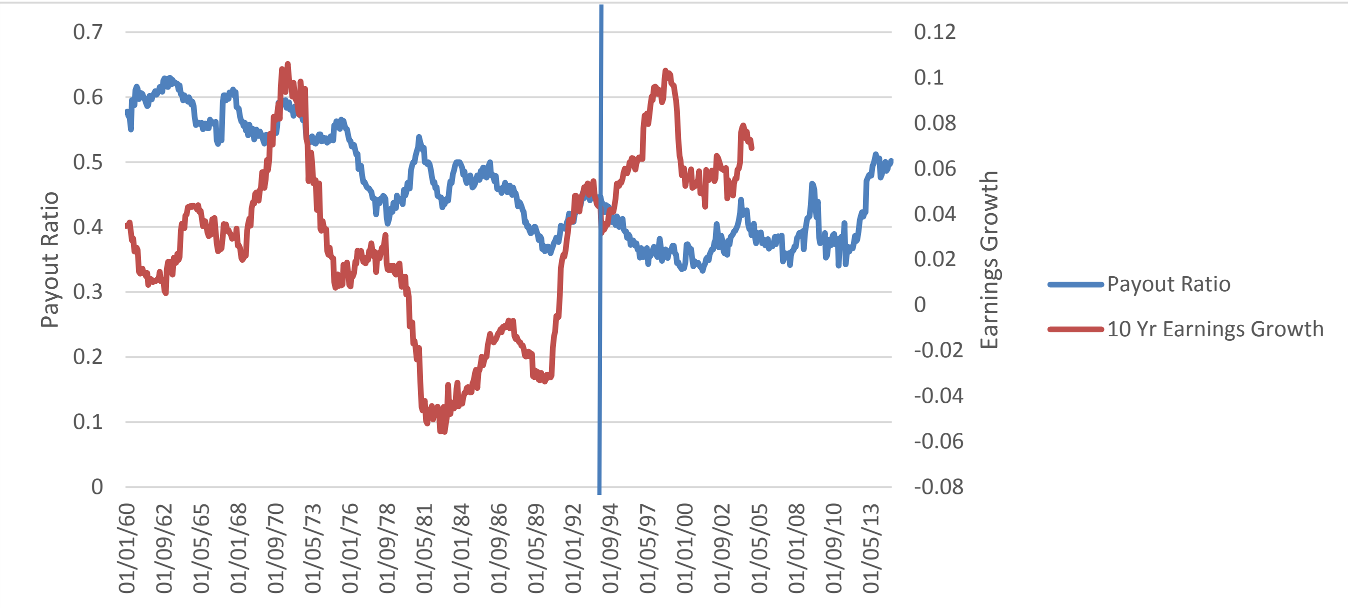

Figure 3: ALSI Payout Ratio and subsequent 10-YR Earnings Growth: 1960-2014

Figure 3 above is a representation of the payout ratio and subsequent (lagged) ten year earnings growth for the ALSI. Unlike the S&P 500, where a clearly positive relationship between payout ratio and subsequent ten year earnings growth was observed (Arnott and Asness, 2003), the situation for the ALSI is far less clear, as the figure above illustrates. At first glance, it appears that prior to 1994 the relationship between the two variables was mostly positive, as expected in terms of classical theory, but that this relationship may subsequently have become negative. Based on the graph above, it is therefore possible to postulate that the relationship between the payout ratio and subsequent ten year earnings growth may not necessarily follow the findings of Arnott and Asness (2003). This will be explored further in Chapter 4, which will involve the statistical evaluation of the relevant data.

In similar fashion to Arnott and Asness (2003), a scattergram of the payout ratio and subsequent real earnings growth of the ALSI was generated, as seen below.

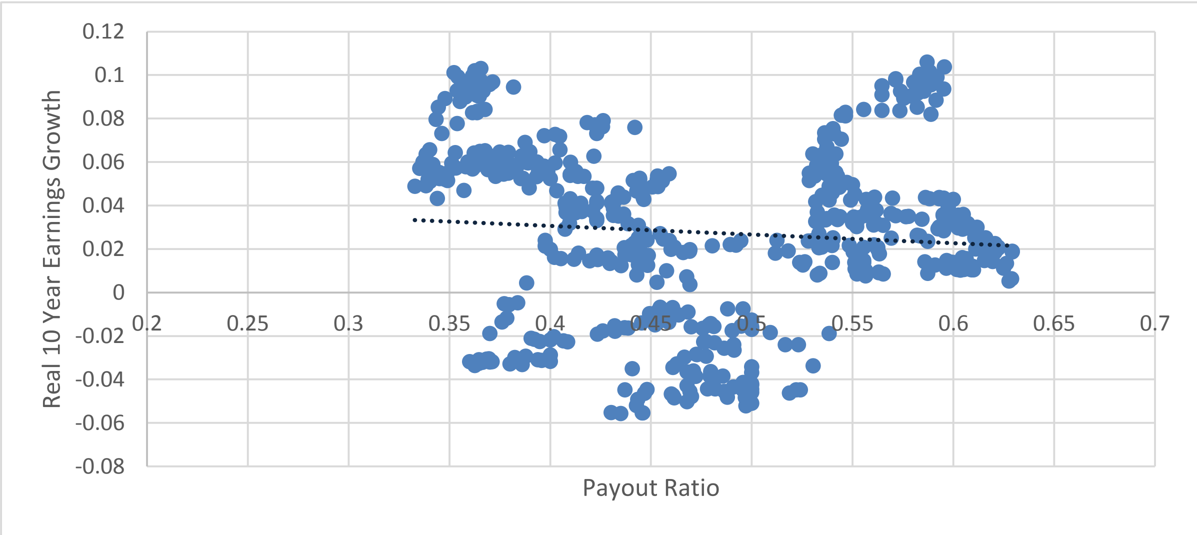

Figure 4: Scattergram of Payout Ratio vs. Subsequent 10-Year Real Earnings Growth of ALSI, 1960-2014 data

Although the overall trend is slightly downward (in contrast to findings for the United States), the scatter plot above confirms the impression that there is no consistent trend across the period. To further determine whether a clearer trend existed in the data, scattergram graphs were repeated for the time period prior to 1994, as well as after 1994, as illustrated below.

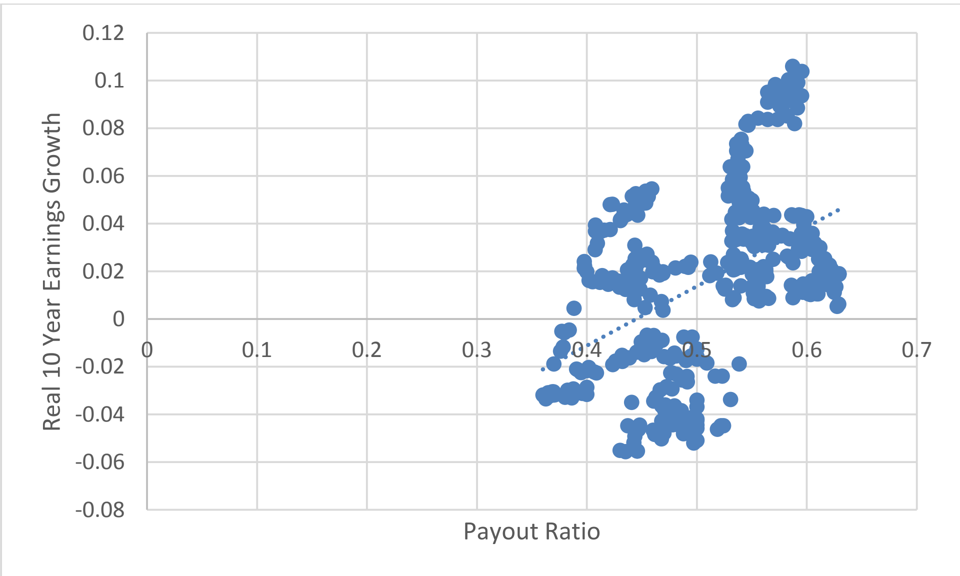

Figure 5: Scattergram of Payout Ratio vs. Subsequent 10 Year Real Earnings Growth of ALSI, 1960-1994 data

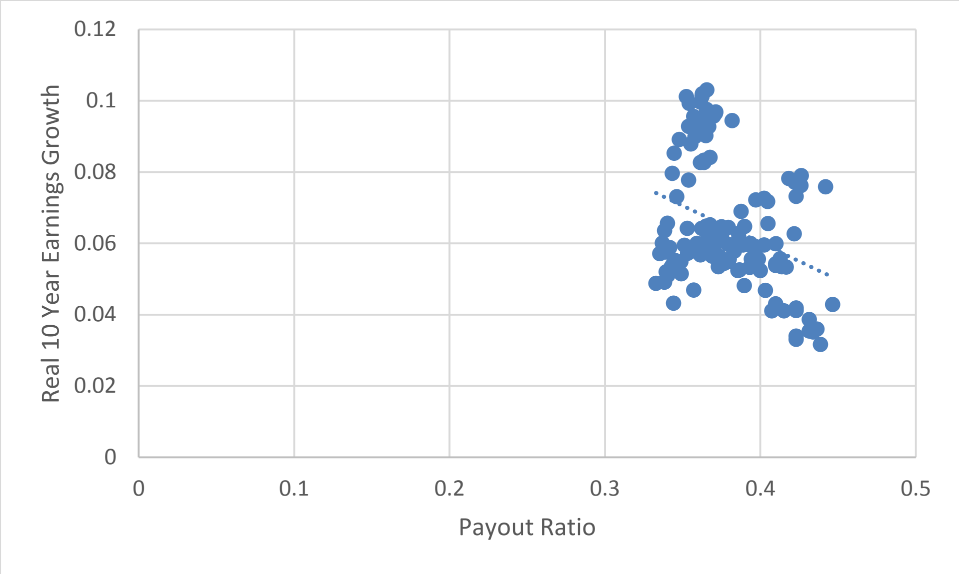

Figure 6: Scattergram of Payout Ratio vs. Subsequent 10 Year Real Earnings Growth of ALSI, 1994-2014 data

Figures 5 and 6 above clearly illustrate two distinct groups of data points, and two contradictory trend lines. From 1960-1994, the trend line illustrates a positive relationship between the payout ratio and subsequent real earnings growth, whereas the 1994-2014 scattergram shows a broadly negative relationship between the two variables.

It would be reasonable to postulate that the regression results of the ALSI South African study will differ from those found by Arnott and Asness (2003) in the United States, Parker (2005) in Australia and Canada and Gwilym *et al.* (2006) in the selected European countries and Japan. Furthermore, the results for South Africa appear to be contradictory for the time periods before and after the 1994 split.

The results for the previous investigations detailed in the literature review above and used in the international comparisons below are summarised in table one of the appendix.

Chapter 4: Methodology, Results and Analysis

4.1 Methodology

In a similar fashion to Arnott and Asness (2003), a regression test was conducted between the payout ratio and subsequent ten year earnings growth for the ALSI from 1960-2014. The regression equation used was as below:

Regression formula: EG_{10}= a + b (PR)

Where:

EG_{10} is the earnings growth for the subsequent 10 years

a is the constant term

b is the coefficient of the payout ratio variable

PR is the preceding payout ratio

Furthermore, similarly to the previous research papers discussed in the literature review section, robustness tests for various possible explanations will be conducted. An analysis of the findings will follow each table of results presented.

The analysis in Chapter 3 suggested contradictory results would be found for the time period before 1994 and after 1994. Therefore, in addition, the regression was repeated from 1960-1994, and 1994-2014.

4.2 Regression Results

Regression Span	a	b(PR)
1960-2014		
Co-efficient	0,0466	-0,0401
T-statistic	4,7798*	-1,9860**
P-value	2,2691E-06	0,0475396
1960-1994		
Co-efficient	-0,1107	0,2488
T-statistic	-9,4435*	10,8733*
P-value	2,9043E-19	2,466E-24

1994-2014		
Co-efficient	0,1410	-0,2017
T-statistic	7,0031*	-3,7879*
P-value	1,27E-10	0,0002

Table 2: Regression Results- Payout Ratio and 10 Yr Subsequent Earnings Growth (ALSI)

***significant at the 1% level**

****significant at the 5% level**

The results above display a clear difference in the relationship between the payout ratio and ten year subsequent earnings growth prior to and after 1994. Firstly, the coefficient for the payout ratio variable for the full period (1960-2014) is weakly negative, implying that an increase in payout ratio leads to a slight decrease in the subsequent ten years earnings growth, confirming the traditional theories. This result, however, masks a clear and opposite effect observable for the two sub-periods.

A noteworthy result of the regression is the contradictory coefficient for the payout variable for 1960-1994 and 1994-2014. The first time period, prior to 1994, exhibits the same relationship found by Arnott and Asness (2003), Parker (2005) and Gwilym *et al.* (2006). In contrast, the coefficient of the payout ratio variable for 1994-2014 is negative. Both of these findings are statistically significant, and in both cases the coefficient associated with the payout ratio is quite large, at 0.25 and -0.20 respectively. This indicates that for the period 1960-1994, an increase of one unit in the market level payout ratio resulted in an **increase** in ten year subsequent earnings growth of 13.81% (0.2488x1+ (-0.1107), whereas for the period 1994-2014 an increase of one unit in the market level payout ratio resulted in a **decrease** in ten year subsequent earnings growth of 6.07% (-0.2017x1 + 0.1410). Clearly, the time period being looked at makes a difference, but it seems that by combining the two results, both the relationship and statistical significance is weakened substantially. Specifically, these results seem to support the hypothesis that the 1994 transition in South Africa represents a structural break that affected business behaviour and decisions, possibly for the various reasons mentioned at the end of Chapter 3 (most especially the impact of the initial progressive isolation of the South African economy, and the rapid integration thereof with the global economy post-1994).

By way of further explanation and as mentioned above, between 1960 and 1994, South Africa was becoming a closed economy. The restrictions to invest offshore likely forced large companies to bid for the same domestic investment opportunities, therefore increasing the price. If companies were, because of external constraints, not able to effectively execute capital budgeting and, as a result were investing in value-destroying or unprofitable investments, a positive relationship between payout ratios and subsequent earnings could be expected. Furthermore, in addition to limited profitable investment opportunities explaining the positive relationship, inefficient management decisions would have exasperated this finding. Management of firms with abundant cash flows, or limited investment opportunities had an incentive to overinvest. The management faced greater principal-agent conflicts between shareholders and themselves, since the excess cash provided an opportunity for empire building. As stated previously, this was often for the purposes of managerial compensation benefits. The lack of strict management supervision, available funds for investing, and limited profitable investment opportunities provides a possible explanation for the low divided, low growth relationship found for that time period.

The aforementioned political power shift in 1994 resulted in a significant change in the South African market. When economic isolation ended, trade patterns changed. The corporate valuation gap between the JSE and developed markets closed, setting the stage for South African companies to compete globally for assets. The deeply liquid JSE became the ideal investment hub for Africa (Coleman, 2013). Sanctions were lifted and instead of limited options, companies had access to offshore capital and the freedom to invest internationally. Therefore, companies were exposed to potentially far more profitable opportunities in which to invest. If earnings were consequently retained and reinvested by the company, decreasing the payout ratio, the projects invested in would have generated positive returns and created an increase in subsequent ten year earnings growth, possibly contributing to the negative relationship found between the JSE payout ratio and subsequent earnings growth over this period. Although the above results can be rationalised in light of the unique South African political and economic situation over the period under investigation, further tests are necessary to test the robustness of the findings and conclusively eliminate other possibilities.

4.3 Test: Earnings Growth Periods

Although the base case scenario tested above considered the impact of payout ratio decisions on earnings on a ten year time horizon (*i.e.* an implicit assumption is made that present investments have an impact on earnings growth only over ten-year period), these decisions may well have a shorter term impact on earnings growth. Therefore, similarly to Arnott and Asness (2003) and Ping and Ruland (2006), the above regressions were repeated using five year and three year earnings growths as dependent variables. The results for the repeated tests were as below.

Regression Span	A	b(PR)

1960-2014		
Co-efficient	0,020371	0,017227
T-statistic	1,630996	0,654504
P-value	0,103419	0,51304
1960-1994		
Co-efficient	-0,16875	0,363353
T-statistic	-9,78854*	10,79953*
P-value	1,89E-20	4,61E-24
1994-2014		
Co-efficient	0,057763	-0,0056
T-statistic	1,314941	-0,0486
P-value	0,190131	0,96129

Table 3: Regression Results - Payout Ratio and 5 Yr Subsequent Earnings Growth of the ALSI

***significant at the 1% level**

****significant at the 5% level**

The results for the regression using the five year subsequent earnings growth indicate a positive coefficient for the payout ratio variable for the full time period, 1960-2014, and 1960-1994 time period. With this said, the 1960-2014 payout ratio variable is weak, at 0.017, and is not statistically significant. The most recent time period, 1994-2014, again generates a non-statistically significant negative coefficient for the payout ratio variable. Similarly to the ten year subsequent earnings results, the time period prior to 1994 is the one which not only confirms the findings of Arnott and Asness (2003), but it also the only one which has statistical significance.

Regression Span	A	b(PR)

1960-2014		
Co-efficient	0,01625	0,033169
T-statistic	0,842687	0,81026
P-value	0,399728	0,418102
1960-1994		
Co-efficient	-0,16967	0,367754
T-statistic	-6,03764*	6,705576*
P-value	3,54E-09	6,76E-11
1994-2014		
Co-efficient	-0,3492	1,076164
T-statistic	-4,26758*	5,002328*
P-value	2,98E-05	1,19E-06

Table 4: Regression Results - Payout Ratio and 3-Yr Subsequent Earnings Growth of the ALSI

***significant at the 1% level**

****significant at the 5% level**

Unlike the ten and five year subsequent earnings growth regressions, the three year earnings growth regression test generates positive coefficients for the payout variable for all the time periods, with both sub-periods being statistically significant. The most recent time period, 1994-2014, generates the most interesting results, yielding a statistically significant 1.076 coefficient for the payout ratio variable, implying that for every one unit of increase in the payout ratio, the subsequent three year earnings growth increases by 72,69% (1.076164x1 + (-0.3492)). This differs from the ten year case, and may (among other possible contributing factors) imply that South Africa companies over this period made better long-term (ten year) than short-term (three year) investments, or that investments simply took longer to provide sufficient profitable returns.

Although the three regression tests using different periods of subsequent earnings growth generate somewhat inconsistent results, a definite trend exists for the initial 1960-1994 period, namely that all three generate a positive, statistically significant coefficient for the payout ratio variable, ranging from 0.24 to 0.36. This implies that in South Africa, at the market level, an increase in the payout ratio led to an increase in the ten, five, and three year subsequent earnings growth between 1960 and 1994. For the post-1994 period, the results are varied, although the statistically significant three year relationship supports the international finding that a greater payout ratio implies higher earnings growth. The reasons for the quite different ten year result over this period are not clear, but it is necessary to consider that given the requirement for ten year lagged data, this test was essentially conducted over a ten year period (i.e. 120 data points), and is therefore not as comprehensive as the test for the earlier period.

4.3 International Comparison

Although the regression results for the 1960-1994 time period for the South African market are consistent with the international findings of Arnott and Asness (2003), Parker (2005) and Gwilym *et al.* (2006), the full time period results (1960-2014) and the latter period (1994-2014) are contradictory. In order to conduct an accurate comparison between South Africa and the international markets, the regressions were repeated for the same time periods as the international literature in order to arrive at a more direct comparison, and to investigate whether the time period over which the study was conducted plays a role in these differences.

Arnott and Asness (2003) conducted their study from 1871 to 2001, with a regression test from 1946-2001. Because the South African market data is only available after 1960, the regression was repeated for both five and ten year subsequent earnings growth from 1960-2001, to provide as close a comparable time period as possible. The regression results are presented below.

1946/1960-2001	10 YR Earnings Growth	5 YR Earnings Growth
South African Study		
Co-efficient of b (PR)	-0,013	0,091
T-statistic	-0,63	3,4
Arnott and Asness- S&P 500 United States Study		
Co-efficient of b (PR)	0.25	0.44
T-statistic	8.6	7.3

Table 5: Summary of Regression Results of South African Study and Arnott and Asness Study: 1960-2001/1946-2001

Table 5 above indicates that the results for the United States and South Africa are contradictory for the ten year subsequent earnings growth period, and have the similar sign for the payout variable coefficient but to a lesser degree for the five year subsequent earnings growth period. Moreover, the findings for the United States have greater statistical significance.

Parker (2005) conducted the regression for the Canadian Stock Exchange and Australian Stock Exchange from 1956 – 2005, 1969-2005 and 1976-2005. As described previously, this research also confirmed Arnott and Asness (2003) findings for the S&P 500 index from the United States. The South African regression was repeated for the five and ten year subsequent earnings growth for the same time periods, from 1969 onwards based on availability of data, with the results detailed in table two of the appendix. The findings indicate that for both time periods, the coefficient for the payout ratio variable for the South African Market was opposite to the sign for the Canadian market (from 1969-2005 and 1976-2005 tests) and the Australian market (from 1969-2005). In addition, similarly to above, the findings for the international markets had greater statistical significance, as indicated by the t-statistic.

In addition, Gwilym *et al.* (2006) conducted an international study from 1965-2004, 1973-2004 and 1990-2004. The South African regression was repeated for each of these time periods, using the same subsequent earnings growth as the original regressions, with the results presented in table three of the appendix. From 1965-2004, the South African payout ratio variable coefficient was negative, the opposite sign to the United States and United Kingdom variables, and statistically less significant than the two international countries for both five and ten year subsequent earnings growth. Similarly, the payout ratio coefficient had the opposite sign and at a lesser degree of statistical significance than the other seven international countries for the 1973-2004 time period. The same results were found for the 1990-2004 time period, barring Italy. The coefficient for the payout ratio variable for Italy was the exact same -0.09 as South Africa, with a very similar level of statistical significance. The remaining countries had positive coefficients and relatively high levels of significance.

4.4 Share Based vs Index Based Regressions

As detailed in the literature review, Vermeulen (2011) conducted a share-level study on the South African market for the period 1973-2009, based on the work of Zhou and Ruland (2006). Notably, though, Vermeulen's study only involved South African listed industrial shares. For the purposes of comparison, the index-level regression was therefore repeated using the ALSI data for the same subsequent earnings growth periods and time period as Vermeulen's (2011) study. The results are presented below.

1973-2009	5 YR Earnings Growth	3 YR Earnings Growth	1 YR Earnings Growth
South African *Market* level regression			
Co-efficient of b (PR)	-0.06	-0.04	-0.07
T-statistic	-1.37**	-0.51	-0.61
Vermeulen – South African *Company* level regression			
Co-efficient of b (PR)	0.085	0.204	0.695
T-statistic	2.43**	7.83*	16.37*

Table 6: Summary of Regression Results of South African Market Study and Vermeulen South African Company Study: 1973-2009

***significant at the 1% level**

****significant at the 5% level**

Vermeulen concluded that the positive relationship between the payout ratio and subsequent earnings growth existed for South African companies. In the comparison between South African companies and United States and Australian companies, Vermeulen (2011) concluded the same results as this market level study, more specifically that the international companies exhibited the same positive relationship but at a greater coefficient value, and with greater statistical significance.

The table above illustrates that the within South Africa, the market level results contradict those of the (industrial) company level. A possible explanation for this finding is the potential index distortion. Ping and Ruland (2006) were the first authors to identify that since the S&P 500 index is capitalisation weighted, the index may be dominated by the dividend policies and performance of a few large companies. Similarly, the South African ALSI is also capitalisation weighted and is exposed to the same potential distortion, whereas the company level study weights each company equally, removing the potential of a small number distorting the aggregate results. Moreover, the index is subject to a concentration effect. In the early 1900's, Pareto observed a phenomenon whereby 80% of results can be attributed to 20% of the causes. In 1941, Juran expanded on this finding and developed the law of the vital few, which has since been utilised in business, marketing and many other fields. In 2004, Muzea published a book which detailed his application of the Pareto 80:20 rule to the stock market, more specifically that 80% of the returns from a stock exchange are generated from 20% of the top shares. From 1977-1986, Muzea followed this rule for investing in the stock market and generated consistent profits (Muzea, 2004). The implication of the Pareto rule in this study is that the index data could be completely distorted by a few large stocks. If the top 3 or 4 stocks increase their payout ratios, this could completely alter the data and change the outcome of the study, provide a cause for the difference between the company and market level findings.

Moreover, as mentioned above, Vermeulen's study excluded companies in the financial and mining sector. Since South Africa is largely resources dominated, and is the financial hub of Africa, a large portion of the market capitalisation of the JSE falls within these two sectors. The ALSI used in the market level study comprises all sectors, and therefore includes all mining and financial companies. The exclusion of these companies would have created a significant difference in the data used in each study. It would be reasonable to postulate that this would have translated into creating a large impact in the difference in the results displayed in table 6 above.

With the intention of determining the possible impact of the inclusion of the financial and mining sector companies in the market level study, as part of the present study a regression was repeated for the JSE industrial index for the same time period (1973-2009) as Vermeulen's (2011) company-level study. Ten, five, three and one year subsequent earnings growth time periods were considered. The industrial index (J257) includes all remaining companies from the ALSI which do not form part of the South African Resources (oil & gas and mining) and South African financial indices. Similarly to the ALSI, the following data for the Industrial Index was obtained from INET BFA:

- J257 monthly closing value
- J257 monthly earnings yield
- J257I monthly dividend yield
- Monthly Consumer Price Index

The earnings and dividend series, and the payout ratio for the industrial index were calculated using the same method as for the ALSI as described above. The regression was initially repeated for real data; more specifically the earnings and dividend series were divided by the consumer price index to obtain real values, prior to the payout ratio calculation. The regression was then repeated using nominal values, as per Vermeulen's (2011) study. The results are as below.

1973-2009	10 YR Earnings Growth	5 YR Earnings Growth	3 YR Earnings Growth	1 YR Earnings Growth
Real Data				
Co-efficient of b (PR)	-0.4336	-0.2709	-0.0715	0.0103
T-statistic	-13.633*	-5.3383*	-0.8925	0.0859
P-value	9.535E-35	1.5E-07	0.3726	0.9316
Nominal Data				
Co-efficient of b (PR)	0.0190	0.2153	0.4289	0.4994
T-statistic	0.7102	4.3687*	5.1482*	3.8418*
P-value	0.4780	1.56E-05	3.96E-07	0.0001

Table 7: Summary of Regression Results of South African Industrial Index Study, Real and Nominal Values: 1973-2009

***significant at the 1% level**

****significant at the 5% level**

The table above indicates that the payout ratio coefficients for the ten, five and three year subsequent earnings growth time periods, using real data, were negative. The three and one year findings were also statistically insignificant. This confirms that the original findings of the regressions using the ALSI (*i.e.* market level) data also apply at the industrial market level. Interestingly, when the regression was repeated using nominal data, the coefficients were positive in accordance with Vermeulen's (2011) company-level study. Furthermore, the results were statistically significant, except for the ten year earnings growth period.

The results indicate that when nominal values were used, an increase in the payout ratio led to an increase in the subsequent ten, five, three and one year earnings growth between 1973 and 2009 at the company and industrial index level. It is there suspected that the that the difference in the results for the market level and company level studies with South Africa is not attributable to the company selection or index weighting distortion, but rather the impact of using real data as opposed to nominal data.

The use of real data accounts for the potential impact of inflation. In addition, real data is calculated off a base value and therefore it facilitates an accurate yearly growth calculation. Dividing by the consumer price index allows investors to determine the actual level of growth and payout ratio achieved, and should consequently be of more use in analysis. If earnings are not grown by more than inflation, effectively growth has not occurred. Growth which matches the inflation rate is not as a result of successful investment decisions (i.e. the link to the P/E ratio) but is rather due to outside influences. This is not an accurate measure of the link between the payout ratio/investment decision and subsequent growth being generated. For these reasons, it is argued that Vermeulen's study is flawed in not using real data, and that the results of the present study should be a truer reflection of the South African situation.

4.5 Share Repurchases

As previously detailed, share repurchases were informally permitted in South Africa from 1999, and were allowed in the open market from 2000. The 2011 study conducted by Ramorwa depicted the increase in share repurchases between 2002 and 2009 in the South African market.

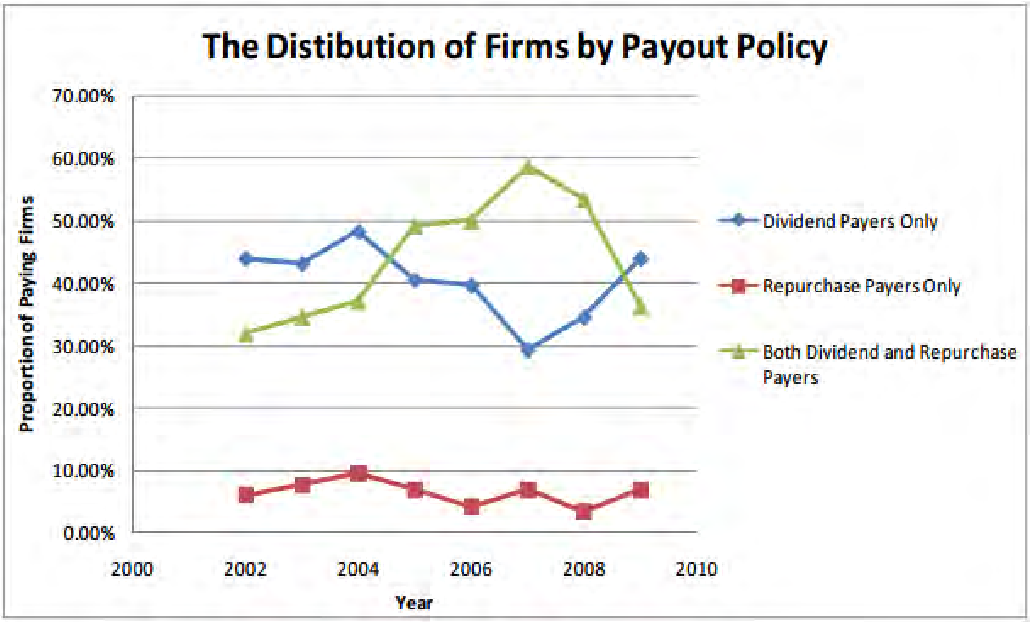

Figure 7: The Distribution of Firms by Payout, Sourced from Ramorwa (2011)

Given that share repurchases were not permitted in South Africa in the initial regression period of 1960-1994, where the most of the (counter-intuitive) positive regression relationships were found, there is no need to eliminate share repurchases as an explanation for these results.

4.6 Market Valuation Impact

Following the Arnott and Asness (2003) study, the predictive ability of the market's earnings yield, in comparison to the payout ratio, was tested. The literature review describes the rationale, namely that investors should be willing to pay for higher and faster future earnings growth, hence increasing the P/E multiple. Based on this, a lower earnings yield may be a good predictor of higher subsequent earnings growth.

Figure 8 below depicts the earnings yield of the ALSI from 1960-2014. Evidently, the earnings yield peaked between 1975 -1983, but for most of the period ranged 5 and 15.

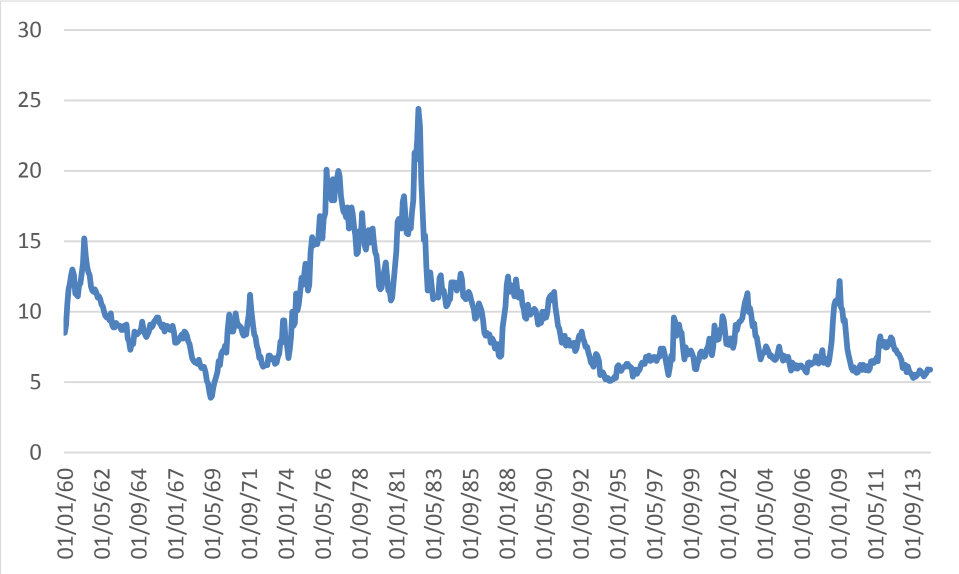

Figure 8: ALSI Earnings Yield, 1960-2014

Similarly to Arnott and Asness (2003), the regression was initially repeated with only the market earnings yield as the independent variable, and then included as a second variable in the original regression formula, as below.

Regression formula: $EG_{10} = a + b_1 (E/P)$

$$EG_{10} = a + b_1 (PR) + b_2 (E/P)$$

Regression Span	A	b(E/P)
1960-2014		
Co-efficient	0,089604712	-0,006305388
T-statistic	21,47018298*	-15,79375911*
P-value	2,97328E-74	2,04158E-46
1960-1994		
Co-efficient	0,067773025	-0,004888303
T-statistic	13,3872541*	-10,88182123*
P-value	4,26868E-34	2,29375E-24
1994-2014		
Co-efficient	0,053996248	0,001512925
T-statistic	6,487407299*	1,340506121
P-value	1,73657E-09	0,182455232

Table 8: Regression Results- Earnings Yield and 10 Yr Subsequent Earnings Growth of ALSI, 1960-2014

***significant at the 1% level**

****significant at the 5% level**

Table 8 above confirms that the relationship is as expected in most cases, namely that from 1960-2014 and 1960-1994, a low earnings yield signals high subsequent ten year earnings growth. These findings support the view that the market correctly anticipates faster future earnings growth and pays for it. Both periods yield statistically significant results, but the relationships are weak as indicated by the low coefficients. The results for the 1994-2014 time period are contrary to expectations, but again the coefficient is small, and this result is not statistically significant.

Regression Span	a	b_1(PR)	b_2(E/P)
1960-2014			
Co-efficient	0,095392556	-0,012817467	-0,00627368
T-statistic	11,0014527*	-0,76160276	-15,62351638*
P-value	1,61535E-25	0,446632714	1,32474E-45
1960-1994			
Co-efficient	-0,043539548	0,1985836	-0,003902953
T-statistic	-3,372436651*	9,229371958*	-9,238744596*
P-value	0,000816942	1,54609E-18	1,44E-18
1994-2014			
Co-efficient	0,139866	-0,20025	8,54E-05
T-statistic	5,428809*	-3,50531*	0,073852
P-value	2,77E-07	0,000631	0,941244

Table 9: Regression Results- Earnings Yield, Payout Ratio and 10-Yr Subsequent Earnings Growth

***significant at the 1% level**

****significant at the 5% level**

The results for the second regression test are presented above. Not only is the relationship far weaker for the earnings yield variable in comparison to the results in table 7, but the payout ratio has much a stronger relationship for all three time periods. The coefficient is greater for the payout ratio variable from 1960-2014, indicating that the power of market valuation levels to forecast subsequent returns is weaker than the power of the payout ratio. The coefficients for the payout ratio variable and earnings yield variable from 1960-1994 are opposing; however the payout ratio relationship is stronger, with a higher degree of statistical significance. Similarly, from 1994-2014, the coefficient signs are opposing; however the payout ratio value is far larger and more statistically significant than the earnings yield. Although the signs are not consistent, it can be concluded that the predictive power of the payout ratio on subsequent ten year earnings growth is stronger than the power of market valuation levels.

4.7 Mean Reversion

As mentioned in the literature review, mean reversion in earnings is one of the most intuitive explanations for the positive relationship between payout ratios and subsequent earnings as found above. Although the studies conducted historically have all found a more consistent trend in the relationship between the variables, it remains necessary to conduct this test in this study to determine whether mean reversion in earnings is responsible for the positive coefficient for the payout ratio variable found in the initial (1960-1994) regression time period, or whether there is an alternative explanation for this trend.

Following the method applied by Arnott and Asness (2003), Parker (2005) and Gwilym *et al.* (2006), a prior-ten-year real earnings growth variable was added to the regression as lagged earnings growth (LEG_{10}). If the mean-reversion hypothesis was true, then adding prior earnings growth as an additional right-hand-side variable could explicitly show the mean reversion trend in the form of a negative coefficient. The latter would imply that a poor prior ten-year real growth forecasts superior subsequent earnings growth and vice versa, which would result in the payout ratio losing its importance as explanatory variable.

The regression formula is as below:

Reversion as prior-ten-year earnings growth: $EG_{10} = a + b_1(PR) + b_2(LEG_{10})$

Regression Span	A	b^1(PR)	b^2(LEG_{10})
1960-2014			
Co-efficient	0,017093672	0,044580775	-0,606292306
T-statistic	1,300617484	1,492066046	-10,83526698*
P-value	0,194109441	0,136439773	2,89128E-24
1960-1994			
Co-efficient	-0,209821672	0,498888727	-0,749247786
T-statistic	-16,88008232*	18,88278767*	-17,56335198*
P-value	8,57475E-45	3,84238E-52	2,63494E-47
1994-2014			
Co-efficient	0,142897315	-0,206877161	-0,035468903
T-statistic	7,261016415*	-3,981289305*	-0,760400371
P-value	3,31058E-11	0,000114224	0,448413704

Table 10: ALSI 10 Yr Earnings Growth as a Function of Payout Ratios and Direct Measure of Mean Reversion (LEG): Regression Coefficients

***significant at the 1% level**

****significant at the 5% level**

The table above shows that a negative sign for the lagged earnings growth variable is indeed found for the three time periods. The 1960-2014 and 1960-1994 variables are statistically significant, and unlike the Arnott and Asness (2003) results, the lagged earnings variable has greater predicative ability than the payout ratio variable. The 1994-2014 results are insignificant.

As a second test, a 20 year moving average variable was calculated and added to the regression formula as below:

Reversion as prior-ten-year earnings growth: $EG_{10} = a + b_1(PR) + b_2(MA_{20})$

The rationale for using this moving average is that when the variable is high, the temporary component of earnings will be high, and it is therefore expected that this variable will forecast lower subsequent real earnings growth.

Regression Span	A	$b_1(PR)$	$b_2(MA_{20})$
1979-2004			
Co-efficient	0,265587873	-0,566083007	-0,629131152
T-statistic	15,476437*	-13,17727359*	-3,572394633
P-value	5,38542E-40	1,61958E-31	0,000412758
1979-1994			
Co-efficient	-0,131524419	0,357236884	-2,684540305
T-statistic	-7,295438868*	8,248681287*	-18,56885965*
P-value	1,18653E-11	4,8203E-14	2,87065E-42
1994-2004			
Co-efficient	0,140529185	-0,201472977	0,03594635
T-statistic	6,923875353*	-3,768712667*	0,281142421
P-value	1,94913E-10	0,000250126	0,779058695

Table 11: ALSI 10 YR Earnings Growth as a Function of Payout Ratios and 20 YR Direct Measure of Mean Reversion (MA_{20}): Regression Coefficients

***significant at the 1% level**

****significant at the 5% level**

Table 11 above generates similar results to the lagged earnings variable regression, namely that there is a statistically significant negative coefficient for the MA_{20} variable. Since Arnott and Asness (2003) had access to data ranging from 1871 to 2001, their regression was repeated for substantially more data points. The ALSI South African study only had data available from 1960-2014, and in an attempt to repeat the regression using as many data points as possible and potentially increasing the accuracy of the results, the moving average variable was also conducted for the average of the last ten years earnings.

Regression Span	A	b_1(PR)	b_2(MA_{10})
1971-2004			
Co-efficient	0,145196008	-0,18268868	-0,037946877
T-statistic	9,434926913*	-5,611453072*	-4,454402319*
P-value	3,52462E-19	3,79939E-08	1,0989E-05
1971-1994			
Co-efficient	-0,08083	0,347749	-0,07083
T-statistic	-4,86478*	9,397838*	-9,15588*
P-value	1,98E-06	2,94E-18	1,62E-17
1994-2004			
Co-efficient	0,192617	-0,27617	-0,02218
T-statistic	7,160474*	-4,738*	-2,80271
P-value	5,75E-11	5,69E-06	0,005863

Table 12: ALSI 10 Yr Earnings Growth as a Function of Payout Ratio and 10 YR Direct Measure of Mean Reversion (MA10): Regression Coefficients.

***significant at the 1% level**

****significant at the 5% level**

Tables 11 and 12 above generate similar results to the lagged earnings variable regression.

Both of the above results seem to suggest that in the South African case, unlike for the previously reported international markets, a simple mean reversion argument may in fact be a possible alternative explanation for the positive relationship than the payout ratio itself.

The tests above provide contradictory results to the international findings. Although the studies in the United States, Australia, Canada, select European countries and Japan found a negative coefficient for the mean reversion proxy variables, the level of statistical significance was far smaller than that of the ALSI South African study. Moreover, the payout ratio coefficients and statistical significance was greater than that of the mean reversion proxies. This implied that the two proxies created to test for simple mean reversion in earnings did not reduce the predictive power of the payout ratio. In the South African regression tests, mean reversion existed, and was statistically significant. It was also greater than the payout ratio variable for the lagged earnings growth and moving average ten year regressions. The results cannot exclude the proposition that mean reversion in earnings is responsible for the positive relationship between the payout ratio and subsequent earnings growth between 1960 and 1994 in the South African Market. This would, in turn, suggest that the findings cannot conclusively deny hypothesis one detailed in the introduction, namely that a higher payout ratio would lead to lower subsequent earnings growth.

Chapter 5: Summary, Conclusion and Recommendations

5.1 Summary and Conclusion

Both earnings growth forecasting and dividend policies are important decisions for the management of firms and investors. This is evidenced by the substantial amount of financial literature published on both subjects. From the early 1950's, theories have been developed regarding the importance of the dividend policy decision, with Lintner (1956) and Gordon (1959) suggesting relevance of the decision to performance and value of the firm, while Modigliani and Miller (1961) suggested the irrelevance of the decision. Until 2003, a gap existed in the financial literature regarding the relationship between the payout ratio and subsequent earnings growth, and the predictive ability of the payout ratio. Arnott and Asness (2003) identified this and conducted research in this regard.

The historical research, both prior to the 2003 research and subsequently, has led to the development of two opposing hypotheses. The traditional school of thought believes that a negative relationship exists between the payout ratio and subsequent earnings growth, namely that an increase in payout ratio will result in a decrease in earnings growth in the future. The more recent, and 'surprising' results indicate that a positive relationship exists between the two variables, more specifically an increase in the payout ratio leads to an increase in subsequent earnings growth.

Numerous studies have been conducted in an attempt to clarify which hypothesis is supported in various markets. Market level studies were conducted in the United States by Arnott and Asness (2003), Australia and Canada by Parker (2005) , the United Kingdom, France, Germany, Japan, The Netherlands, Switzerland, Greece, Italy, Portugal, and Spain by Gwilym *et al.* (2006) and Singapore by Lee (2010). Each country exhibited a positive relationship between the payout ratio and subsequent earnings growth, supporting the second hypothesis, except for Italy which exhibited a negative relationship and supported hypothesis one. Furthermore, studies were conducted at the company level in the United States by Ping and Ruland (2006), Australia by Flint (2010), Malaysia by Al-Twaijry (2007) and South Africa by Vermeulen (2011). Similarly, positive relationships were found for the two variables for each country besides Malaysia, which supported the traditional hypothesis.

This study was conducted with the intent to determine the relationship between the payout ratio and subsequent earnings growth at the market level in South Africa, and consequently, which hypothesis prevailed. In addition, a comparison between the findings in South Africa and the international markets was conducted.

Similarly to the method used by Arnott and Asness (2003), a regression model was conducted for the payout ratio and the 10 year subsequent earnings growth. The results indicated a relatively weak negative relationship between the variables for the full 1960-2014 time period. When the regression was repeated from 1960-1994, a positive relationship, which confirmed hypothesis two and the previous findings of Arnott and Asness (2003) in the United States, was found. From 1994-2014, the coefficient for the payout ratio variable was negative. The contradictory results for the two time periods were initially suggested by the descriptive statistics of the data.

A comparison between the international and local markets and the South African ALSI results was conducted. Italy and Malaysia were the only two countries which generated results similar to South Africa. Vermeulen (2011) conducted a company level study in South Africa and found the opposite relationship, namely a positive coefficient for the payout ratio for South Africa. The differences between that study and this dissertation were analysed, with the biggest being the exclusion of mining and financial sector companies in the company level regressions. It is postulated that this could have potentially been a significant cause for the difference in results. The regression was repeated for the industrial index (J257) to test for the potential impact, and the results indicated that, using real data, from 1973-2009, there was a negative relationship between the payout ratio and subsequent five, three and one year earnings growth. This confirmed the previous findings of this study at full market level. When nominal data was used, a positive relationship was found between the two variables at industrial index level, implying that the previously found difference was as a result of the effect of inflation not being taken into account by Vermeulen (2011). The benefits of using real data were detailed, and it was concluded that this should be the preferred method.

Both additional time period tests and the potential impact of share repurchases were considered. The market valuation level was tested for by adding the ALSI earnings yield to the regression equation. The results indicated that firstly, the market correctly anticipates faster subsequent earnings growth and pays up for it, and that the predictive power of the earnings yield did not outweigh the predictive ability of the payout ratio. This was in line with previous international findings. Furthermore, since mean reversion in earnings has historically been the most intuitive explanation for the positive relationship between the payout ratio and subsequent earnings growth, the regression was repeated including mean reversion proxies for the period in which the positive relationship was found in South Africa, namely 1960-1994. Unlike the previous international studies, the mean reversion variable coefficients were negative, as expected, and statistically significant, implying mean reversion was a likely cause of the relationship.

The results of this study have important implications for the South African market. Since South Africa has relatively unique characteristics in terms of its political and economic history, the findings are dissimilar to the majority of the international results. The full period regression presented a negative relationship between the two variables, and when the positive time period was tested for mean reversion in earnings, this was found to be a more likely cause of the observed relationship. Therefore, it is possible to conclude that a negative relationship exists between the payout ratio and subsequent earnings growth in South Africa and consequently, hypothesis one prevails. The payout ratio should be considered when evaluating growth expectations, with importance being placed on the negative relationship between the two. Since payout ratios have been increasing since 2012, and should this trend continue, based on hypothesis one, it is expected that subsequent earnings growth will decrease.

5.2 Recommendations and Suggestions for Future Research

This dissertation identified the limitations and potential bias of an index level study. Perhaps an index which was not capitalisation weighted, such as an equally weighted index, would provide more reliable findings.

In addition, this dissertation is subject to the limited availability of data in South Africa. The original study completed by Arnott and Asness (2003) in the United States used data from 1871-2001. This is 130 years of data, versus the 54 which was available for the ALSI. Perhaps the results would be different, not only if it the study was conducted over a longer period of time, but also in a less politically and economically volatile time span.

Lastly, the international studies were conducted in the United States, Australia, Canada, France, Germany, Greece, Italy, the Netherlands, Portugal, Spain, Switzerland, the United Kingdom and Japan. Although Al-Twaijry (2007) conducted a study in an emerging market, Malaysia, his methodology was completely unrelated to the works aforementioned. It is therefore suggested that one option for future research would be to repeat Al-Twaijry's methodology for the JSE.

In addition, a comparative study across a number of developing markets (such as the so-called BRICS countries) may prove interesting in perhaps confirming whether developing markets do indeed exhibit a different behaviour to the mostly developed markets previously tested.

Reference List

Al-Twaijry, A., 2007, *Dividend Policy and Payout Ratio: Evidence from the Kuala Lumpur Stock Exchange*, The Journal of Financial Risk, vol. 8, issue 4, pp. 349 – 363.

Amromin, G., Harrison, P., and Sharpe, S., 2006, *How did the 2003 Dividend Tax Cut Affect Stock Prices*?, finance and Economic Discussion Series, Division of Research & Statistics and Monetary Affair, Federal Reserve Board, [Online], Available at: http://www.federalreserve.gov/pubs/feds/2005/200561/200561pap.pdf, (Accessed on: 06 October 2014).

Arnott, R. and Asness, C., 2003, *Surprise! Higher Dividends = Higher Earnings Growth*, Financial Analysts Journal, vol. 59, no. 1, pp. 70-87.

Arvanitis, A., 2006, *Foreign Direct Investment in South Africa: Why Has it Been So Low?,* International Monetary Fund Publication, [Online], Available at: https://www.imf.org/external/pubs/nft/2006/soafrica/eng/pasoafr/sach5.pdf, (Accessed on: 27 January 2015).

Benartzi, S., Michaely, R. and Thaler, R., 1997*, Do Changes in Dividends Signal the Subsequent or the Past?*, The Journal of Finance, vol. 52, issue 3, pp. 1007–1034.

Bhattacharya, S., 1979, *Imperfect Information, Dividend Policy and 'The Bird in the Hand' Fallacy*, The Bell Journal of Economics, vol. 10, no. 1, pp. 259-270.

Black, F. and Scholes, M., 1974, *The Effects of Dividend Yield and Dividend Policy on Common Stock Prices and Returns*, Journal of Financial Economics, vol. 1, issue 1, pp. 1-22 .

Brennan, M., 1970, *Taxes, Market Valuation and Corporate Financial Policy*, National Tax Journal, vol. 23, no. 4, pp. 417-427.

Chau, N., 2013, *The Effect of Dividend Policy on Firms Performance, Evidence from Vietnamese Stock Market*, Vietnam National University School Of Business, [Online], Available at: http://csc.hcmiu.edu.vn:8080/dspace/handle/123456789/916 , (Accessed on: 29 August 2014).

Cleary, S., 2002, *The Relationship between Firm Investment and Financial Status*, The Journal of Finance, vol. 54, issue 2, pp. 673-692.

Coleman, C., 2013, *Mandela's South Africa: Two Decades of Freedom*, Media Club South Africa, [Online], Available at: http://www.mediaclubsouthafrica.com/twenty-years-of-freedom/3536-mandela-s-sa-reviewing-two-decades-of-freedom, (Accessed on: 16 January 2015).

Damodaran, A., 2008, *Growth and Value: Past Growth, Predicted Growth and Fundamental Growth*, Stern School of Business, [Online], Available at: http://people.stern.nyu.edu/adamodar/pdfiles/papers/growthorigins.pdf, (Accessed on: 25 January 2015).

Fama, E., 1973, *The Empirical Relationships between Dividend and Investment Decisions of the Firm*, The American Economic Review, vol. 64, no. 3, pp. 304-318.

Fama, E., and French, K., 2002, *Disappearing Dividends; Changing Firm Characteristics or Lower Propensity to Pay?*, Journal of Financial Economics, vol. 60, pp. 3‑43.

Firer, C., Gilbert, E. and Maytham, A., 2009, *Dividend Policy in South Africa*, Investment Analysts Society of Southern Africa, [Online], Available at: http://www.iassa.co.za/wp-content/uploads/2009/06/0801-Firer-Gilbert-Maytham-68-No1final.pdf, (Accessed on: 22 January 2015).

Flint, A., Tan, A., and Tian, G., 2010, *Predicting Subsequent Earnings Growth: A Test of the Dividend Payout Ratio in the Australian Market*, The International Journal of Business and Finance Research, vol. 4, no. 2.

Gordon, M., 1959, *Dividends, Earnings and Stock Prices*, The Review of Economics and Statistics, vol. 41, no. 2, pp. 99-105.

Griffin, P., 1976, *Competitive Information in the Stock Market: An Empirical Study of Earnings, Dividends, and Analysts' Forecasts*, Journal of Finance, vol. 31, issue 2, pp. 631-650.

Gwilym, O., Seaton, J., Suddason, K., and Thomas, S., 2006, *International Evidence on the Payout Ratio, Earnings, Dividends, and Returns*, Financial Analysts Journal, vol. 62., no. 1 , pp. 36-53.

Hausman, J., 1978, *Specification Tests in Econometrics*. Econometrica, vol. 46, pp. 1251-1271.

Havemann, R. and Fani, L., 2014, *The Exchange Control System under Apartheid*, Economic History of Developing Regions, Taylor & Francis Journals, vol. 29, issue 2.

Huang, C., You, C., and Lin, S., 2009, *Dividend Payout Ratios and Subsequent Earnings Growth : Evidence from Taiwanese Stock-Listed Companies*, Investment Management and Financial Innovations, vol. 6, issue 2, pp. 83 – 99.

Jensen, M. and Meckling, W., 1976. *Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure*, Journal of Financial Economics, vol. 3, pp. 305-360.

John, K. and Williams, J., 1985. *Dividends, Dilution, and Taxes: a Signalling Equilibrium,* The Journal of Finance, vol. 40, pp. 1053-1071.

Kostohryz, A., 2011, *Is A Bird In Hand Better Than Dividends In The Bush?,* Seeking Alpha, [Online], Available at: http://seekingalpha.com/article/301288-is-a-bird-in-hand-better-than-dividends-in-the-bush, (Accessed on: 05 September 2014).

Le Roux, H., 2006, *Share Buybacks can Scare Investors, Leading Analyst Warn*, Mining Weekly, [Online], Available at: http://www.miningweekly.com/article/share-buybacks-can-scare-investors-leading-analyst-warns-2006-10-06, (Accessed on: 22 January 2015).

Lee , K., 2010, *An Empirical Study of Dividend Payout and Subsequent Earnings in Singapore*, Preliminary draft, Paper No. 23067, [Online], Available at: http://mpra.ub.uni-muenchen.de/23067/MPRA, (Accessed on: 29 November 2014).

Lintner, J. , 1956, *Distribution of Incomes of Corporations Among Dividends, Retained Earnings and Taxes*, The American Economic Review, vol. 46, no. 2, Papers and Proceedings of the Sixty-Eighth Annual Meeting of the American Economic Association, pp. 97-113.

Lintner, J., 1964, *Optimal Dividends and Corporate Growth under Certainty*, The Quarterly Journal of Economics, vol. 78, no. 1, pp. 49-95.

Litzenberger, R. and Ramaswamy, K., 1979, *The Effect of Personal Taxes and Dividends on Capital Asset Prices,* Journal of Financial Economics, vol. 7, pp. 163-195.

Marcus, M. and Toerien, F., 2013*, The Relative Cost of Internal vs. External Equity in South Africa: The Impact of Capital Gains and Dividend Taxes*, South African Journal of Accounting Research, [Unpublished], Accessed from Supervisor.

Marx J. 2001. *Empirical Findings on Directors' Views on Dividend Policy*, Management Dynamics: Journal of the Southern African Institute for Management Sciences, vol. 10, issue 2, pp. 50-66.

Miller, M., and Rock, K., 1985, *Dividend Policy under Asymmetric Information*, Journal of Finance, vol. 40, issue 4, pp. 1031-1051.

Modigliani, F. and Miller, M. 1961, *Dividend Policy, Growth and the Valuation of Shares*, The Journal of Business, vol. 34, no. 4, pp. 411-433.

Mohamed, S., *The Impact of International Capital Flows on the South Africa Economy Since the End of Apartheid*, [Online], Available at: http://www.policyinnovations.org/ideas/policy library/data/01386/, (Accessed on: 27 January 2015).

Muzea, G., 2004, *The Vital Few vs. the Trivial Many: Invest with the Insiders, Not the Masses*, John Wiley & Sons, [Online], Available at: https://books.google.co.za/books?id=xP8ASOKiSVsC&pg=PA19&lpg=PA19&dq=pareto+rule+80+20+stock+exchange+returns&source=bl&ots=nJxy1esshT&sig=qFRxLLfc2XwyMPOxCJKmPFm0prU&hl=en&sa=X&ei=LmTDVJe7KcT6ULXigLgD&ved=0CE4Q6AEwCTgK#v=onepage&q=pareto%20rule%2080%2020%20stock%20exchange%20returns&f=false, (Accessed on: 21 January 2015).

Myers, S., 1984, *Capital Structure Puzzle*, Journal of Finance, vol. 39, no. 3, pp. 575-592.

Nieman, A., 2012, *Dividend Tax Replacing Secondary Tax on Companies*, PSG, [Online], Available at: http://news.psg.co.za/2012/02/dvidend-tax-replacing-secondary-tax-on-companies/, (Accessed on: 22 January 2015).

Nirajina, A. and Priya, K., 2013, *Impact of Capital Structure on Financial Performance of the Listed Trading Companies in Sri Lanka*, International Journal of Scientific and Research Publications, vol. 3, issue 5.

Nissim, D. and Ziv, A., 2002*, Dividend Changes and Subsequent Profitability,* The Journal of Finance, vol. 56, no. 6, pp. 2111 – 2133.

Parker, K., 2005, *Do Higher Dividends lead to Higher Earnings Growth?*, Simon Fraser University, [Online], Available at: http://summit.sfu.ca/item/10269, (Accessed on: 18 September 2014).

Parlour,C., 2006, *Corp_Intro*, [Online], Available at: http://faculty.haas.berkeley.edu/parlour/Teaching/corp_intro.pdf, (Accessed on: 05 September 2014).

Ping, Z., and Ruland, W., 2006, *Dividend Payout and Subsequent Earnings Growth*, Financial Analysts Journal, vol. 62, no. 3, pp. 58-69.

Purmessur, D., and Boodhoo, R., 2009*, Signalling Power of Dividend on Firm's Subsequent Profits: A Literature Review*, EvergreenEnergy – International Interdisciplinary Journal, New York, [Online], Available at: http://www.nyu.edu/classes/keefer/EvergreenEnergy/boodhoopurm.pdf, (Accessed on: 13 September 2014).

Ramorwa, B., 2011, *Corporate Payout Policy in South Africa: Have Share Repurchases Replaced Cash Dividends?*, Wired Space- The University of the Witwatersrand, [Online], Available at: http://wiredspace.wits.ac.za/bitstream/handle/10539/11078/BOTSANG_RAMORWA%20DISSERTATION%202011x.pdf?sequence=1, (Accessed on: 22 January 2015).

Shefrin, H. and Statman, M., 1984, *Explaining Investor Preference for Cash Dividends*, Journal of Financial Economics vol. 13, pp. 253-282.

Vermeulen, M., 2011*, Dividend Payout and Subsequent Earnings Growth: A South African Study*, SunScholar Research Repository, Stellenbosch University Library and Information Services, [Online], Available at: http://scholar.sun.ac.za/handle/10019.1/18876, (Accessed on: 03 January 2015).

Voogt, T. , 1996, *Dividend Rules and Accounting Issues Relating to the Payment of Dividends in South Africa*, UJ Library and Information Centre, [Online], Available at: https://ujdigispace.uj.ac.za/handle/10210/6561, (Accessed on 05 January 2015).

Appendix

Table 1: Summary of results from all previous studies conducted regarding the relationship between the payout ratio and subsequent earnings growth.

Year of study	Author	Country	Company or market level	Time Period of analysis	Results – relationship between payout ratio and subsequent earnings growth
2003	Arnott and Asness	United States	Market level	1871-1945	Positive
				1946-2001	Positive
				1871-2001	Positive
2005	Parker	Australia	Market level	1969-2005	Positive
		Canada	Market level	1956-2005	Positive
				1969-2005	Positive
				1976-2005	Positive
2006	Gwilym *et al.*	United States	Market level	1965-2004	Positive
				1973-2004	Positive
				1990-2004	Positive
		United Kingdom	Market level	1965-2004	Positive
				1973-2004	Positive
				1990-2004	Positive
		France	Market level	1973-2004	Positive
				1990-2004	Positive
		Germany	Market level	1973-2004	Positive
				1990-2004	Positive
		Japan	Market level	1973-2004	Positive
				1990-2004	Positive
		The Netherlands	Market level	1973-2004	Positive

				1990-2004	Positive
		Switzerland	Market level	1973-2004	Positive
				1990-2004	Positive
		Greece	Market level	1990-2004	Positive
		Italy	Market level	1990-2004	Negative
		Portugal	Market level	1990-2004	Positive
		Spain	Market level	1990-2004	Positive
2010	Lee	Singapore	Markel level	1990-2007	Positive
2006	Ping and Ruland	United States	Company level	1950-2003	Positive
2010	Flint	Australia	Company level	1989-2008	Positive
2007	Al-Twaijry	Malaysia	Company level	2001-2005	Negative
2011	Vermeulen	South Africa	Company level	1973-2009	Positive

Table 2: Summary of Regression Results of South African Study and Parker's (2005) Study: 1969-2005, 1976-2005

1969-2005	10 YR Earnings Growth	5 YR Earnings Growth
South African Study		
Co-efficient of b (PR)	-0,06	0,07
T-statistic	-1,98	1,66
Parker – Canadian Stock Exchange		
Co-efficient of b (PR)	0.10	0.21
T-statistic	15.6	12.2
Parker – Australian Stock Exchange		
Co-efficient of b (PR)	0.07	0.13
T-statistic	4.4	2.2
1976-2005	10 YR Earnings Growth	5 YR Earnings Growth
South African Study		
Co-efficient of b (PR)	-0.54	-0.28
T-statistic	-15.08	-4.11
Parker – Canadian Stock Exchange		
Co-efficient of b (PR)	0.10	0.22
T-statistic	15.3	11.9

Table 3: Summary of Regression Results of South African Study and Gwilym *et al.*'s (2006) Study: 1965-2004, 1973-2004 and 1990-2004

1965-2004	10 YR Earnings Growth	5 YR Earnings Growth
South African Study		
Co-efficient of b (PR)	-0.04	-0.02
T-statistic	-1.50	-0.66
Gwilym *et al.* – United Kingdom		
Co-efficient of b (PR)	0.03	0.13
T-statistic	2.31	3.70
Gwilym *et al.* – United States		
Co-efficient of b (PR)	0.19	0.45
T-statistic	4.07	6.22
1973-2004	5 YR Earnings Growth	
South African Study		
Co-efficient of b (PR)	-0.08	
T-statistic	-1.56	
Gwilym *et al.*- France		
Co-efficient of b (PR)	0.42	
T-statistic	5.95	
Gwilym *et al.* – Germany		
Co-efficient of b (PR)	0.06	
T-statistic	0.88	
Gwilym *et al.* – Japan		
Co-efficient of b (PR)	0.52	
T-statistic	5.18	
Gwilym *et al.* – The Netherlands		
Co-efficient of b (PR)	0.16	
T-statistic	2.01	
Gwilym *et al.* – Switzerland		
Co-efficient of b (PR)	0.57	
T-statistic	3.80	
Gwilym *et al.* – United Kingdom		
Co-efficient of b (PR)	0.15	

T-statistic	3.49
Gwilym *et al.* – United States	
Co-efficient of b (PR)	0.51
T-statistic	8.25
1990-2004	1 YR Earnings Growth
South African Study	
Co-efficient of b (PR)	-0.09
T-statistic	-0.29
Gwilym *et al.* - France	
Co-efficient of b (PR)	2.15
T-statistic	7.96
Gwilym *et al.* - Germany	
Co-efficient of b (PR)	0.36
T-statistic	0.57
Gwilym *et al.* - Greece	
Co-efficient of b (PR)	0.08
T-statistic	0.23
Gwilym *et al.* – Italy	
Co-efficient of b (PR)	-0.09
T-statistic	-0.38
Gwilym *et al.* - Japan	
Co-efficient of b (PR)	1.01
T-statistic	4.02
Gwilym *et al.* – The Netherlands	
Co-efficient of b (PR)	1.34
T-statistic	2.81
Gwilym *et al.* – Portugal	
Co-efficient of b (PR)	1.46
T-statistic	4.63
Gwilym *et al.* - Spain	
Co-efficient of b (PR)	0.48
T-statistic	1.36
Gwilym *et al.* - Switzerland	

Co-efficient of b (PR)	1.49
T-statistic	1.65
Gwilym *et al.* – United Kingdom	
Co-efficient of b (PR)	0.45
T-statistic	2.59
Gwilym *et al.* – United States	
Co-efficient of b (PR)	0.88
T-statistic	2.84