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The trajectory and determinants of dividends on the Johannesburg stock exchange

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THE TRAJECTORY AND DETERMINANTS OF DIVIDENDS ON THE JOHANNESBURG STOCK EXCHANGE

By

Nomasonto Sekgosana
391065

MASTER OF COMMERCE (BUSINESS FINANCE)

in the

SCHOOL OF ECONOMICS AND FINANCE

at the

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Supervisor: Professor C. Chipeta

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Abstract

This study examines factors affecting the decisions of firms to pay dividends using non-financial firms listed on the Johannesburg Stock Exchange (JSE). The study uses 1) descriptive statistics to draw trends from the data, 2) logit regression using firm-specific factors as independent variables and a firm's decision to either pay or not pay dividends, 3) and portfolio analysis to check the robustness of the results. There is confirmation that firm-specific factors and propensity can explain the declining number of dividend-paying firms over the sample period. The South African stock market has seen a significant decline in the number of firms paying dividends from 1994 to 2020. Additionally, the pool of JSE firms declined from the late 1990s to the early 2000s. However, the overall number of firms on the JSE has remained stable since 2004 while that of dividend-paying firms continuously declined throughout the sample period. Thus, the shrunk market of the JSE does not seem to explain the drop in the number of firms paying dividends. In pursuit of specific reasons to explain the declining dividend payment trend, the study proposes five hypotheses based on the evidence from the literature. The first four predictions are based on firm-specific factors (profit, size, free cash flow and investment opportunities), while the last one is based on the propensity of firms to pay dividends over the sample period. All three methods of analysis used show either very strong or some evidence that profitability and size play a significant role in the decision of a firm to pay dividends. Although there is evidence regarding a firm's investment opportunities, the study shows that this would be subject to a particular time frame and the size of the firm. Additionally, the fifth prediction based on the firms 'propensity to pay dividends was supported by all three methods of analysis. Therefore, firms, in general, were less inclined to pay dividends over time during the sample period irrespective of firm-specific factors. Furthermore, the study incorporates the contribution of certain major economic and regulatory events in explaining the observed declining number of dividend-paying firms.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

This Chapter provides background and motivation for the study. It is structured as follows: Section 1.2 discusses the background and motivation. Section 1.3 presents the research problem Sections 1.4 and 1.5 outlines research objectives and questions respectively. Section 1.6 discusses the formulation of hypotheses. Section 1.7 presents additional factors that affect the number of dividend-paying firms. Section 1.8 presents the table of abbreviations. Section 1.9 outlines the structure of the study and Section 1.10 concludes.

1.2 Background and motivation

Despite extensive research, the distribution of shareholder wealth through dividends remains a puzzle considering the much-pronounced tax disadvantages attached to them. Generally, dividends are considered an overvalued form of distribution for firms when compared to alternative methods like repurchases. However, their proliferation in some economies is puzzling. Models have been developed and adjusted to capture the essence of dividends, and also to predict and quantify their influence on other meaningful variables like future earnings. Particularly, the alteration of dividends is mostly associated with the signaling theory about a firm's future earnings (DeAngelo, DeAngelo & Skinner, 2004). However, there have been mixed results and explanations as to what the meaning of dividend alterations in any direction means, hence, one can conclude that limited progress has been made in this regard. The study is motivated by the need to see how the South African market dividend trend turns out over the sample period considering some of the international trends that have been portrayed to date.

1.3 Research problem

The extant literature on dividend policy documents two general phenomena; a declining propensity to pay dividends and an increasing propensity to distribute equity through repurchases by firms over the last three decades (Grullon, Paye & Underwood, 2011). Therefore, this study draws inspiration from Fama and French (2001) who explore the cause of the decline in dividend-paying firms in the United States (US). Their study explores the decline in dividend payment incidences and points to declining propensity and changing characteristics as the justification for this phenomenon. Research

that is particularly consistent with this type of approach is prevalent around the world (Vieira & Raposo ,2007; Grullon et al., 2011) excluding the South African market (see Table 1). According to Grullon et al. (2011), the declining proportion of dividend-paying firms seems to be a predominant one. Furthermore, they state that the reasons for the decline are strongly accredited to an increasing number of firms that repurchase their stock to issue equity as an alternative to paying dividends (see, Grullon & Michaely,2002; Wesson, Bruwer & Hamman, 2015). Notwithstanding these contributions, there is a lack of clarity on the factors driving dividend payment patterns in emerging markets, as exemplified by the Johannesburg Stock Exchange (JSE). Additionally, the South African literature on dividends has focused on modeling dividend policy determinants (Wolmarans, 2003; Firer, Gilbert & Maytham, 2008; Nyere & Wesson, 2013). This study extends the evidence by focusing on firm-specific factors driving the trajectory of dividends in the South African market.

1.4 Research objectives

The main objective of this study is to identify the general trend of dividend payments derived from the number of dividend-paying firms over the sample period for non-financial firms listed on the JSE and to subsequently explore the:

- firm-specific factors that drive the declining proportion of dividend-paying firms.
- level of firms' propensity to pay dividends.

The sub-objectives of the study are to identify:

- specific economic and regulatory events that may have contributed to the declining dividend payment trend.
- dividend theories that may provide a suitable explanation for the observed results.

1.5 Research questions

This study aims to answer the following questions about the listed non-financial firms in the South African market: Over the sample period, what is the general trajectory of dividend payments in South Africa among non-financial firms, specifically:

- which firm-specific factors drive the observed dividend payment trend?
- how has the propensity of firms to pay dividends changed over time?

The sub-questions are as follows:

- Did economic and regulatory events play a part in the ongoing trend?
- Which dividend theory fits the observed results?

1.6 Research hypotheses

South Africa has advanced in trading with the world since 1994 following major economic growth. Also, the US is one of the biggest economies worldwide and one where this area of research has been extensively performed. Therefore, one would expect that, by now, South Africa nearly mirrors such economies in its stock market patterns. Further to this, regardless of the amount of research conducted to date on dividends, there remains a wide range of aspects recognised as the determining factors behind dividend policy decisions (Al-Malkawi, Rafferty & Pillai, R 2010). Baker and Weigand (2015) noted that the dividend policy for different firms cannot be consolidated into one general model due to a variety of specific factors affecting each entity. However, they noted that profit distributions are imperative and pivotal as they may affect the value of the company. Therefore, all the firm-specific factors selected in the study are dominant determinants of dividend policy (see Table 1).

Table 1: Main factors influencing the decision to pay dividends

Continent	Factor	Reference paper
North America	Size, Profitability, Investment opportunities, Retained earnings, Stock holdings (insider and Institutional), Leverage, Regulation, Company maturity, Debt to equity ratio, Sales growth, Corporate tax, Market to book value.	Fama and French (2001). Denis and Osobov (2008). Denis and Stepanyan (2009). Gill, Biger and Tibrewala (2010).
Europe	Retained earnings, Profitability, Size, Government ownership, Debt, Free Cash Flow, Risk, Growth opportunities	Denis and Osobov (2008). Al-Kuwari (2009). Hellström and Inagambaev (2012).

Continent	Factor	Reference paper
Asia	Retained earnings, Profitability, Company size, Company age, Cash flows, Investment opportunities, Capital expenditure, Risk, Earnings variability, Solvency, Price to earnings ratio, Debt ratio, Previous dividend per share, earnings per share, Sales growth.	Nizar Al-Malkawi (2007).Denis and Osobov (2008).Kapoor, Anil, and Misra (2010).Moradi, Salehi and Honarmand (2010).Imran (2011).Mehta (2012).Ahmed and Murtaza (2015)
South America	Company size, Returns, Market-to-book value, Liquidity, Control, Profit growth, Leverage, Corporate governance, Risk and Information asymmetry.	Forti, Peixoto and Alves (2015)
Africa	Previous dividend, Current earnings, Free cash flow, Financial performance, Company size, Board independence, Board composition, Board size, Chief executive officer duality, Institutional shareholding, Profitability, Investment Opportunities, Taxation, Leverage, Risk, Return on equity, Solvency, Maintaining smooth dividend pay-out, Corporate governance.	Firer, Gilbert and Maytham (2008). Musa (2009). Vermeulen and Smit (2011). Abor and Fiador (2013). Uwuigbe (2013). Abor and Fiador (2013). Arko, Abor, Adjasi and Amidu (2014). Baah, Tawiah and Opoku (2014). Mans-Kemp (2015). Sibanda (2016). Mtshali (2016). Wesson, Smit, Kidd and Hamman (2018). Nyere and Wesson (2019)

Below is a brief discussion of each hypothesis formulation. The selection of factors examined in the paper is inspired by Fama and French (2001), however, after a careful analysis of the extant literature, the commonness comprehended in the South African and international papers was the guiding blueprint behind the firm-specific factors.

1.6.1 Hypothesis one

The general consensus among researchers is that profit is a very important variable in the decision of firms to pay dividends (Fama & French, 2001; Baker & Smith, 2006; Baker & Weigand, 2015).

Accordingly, it has been noted that more profitable firms are likely to pay dividends since these are normally dispersed from leftover annual income that non-profitable companies do not achieve. Additionally, an increase in dividends has been associated with strong future earnings that are likely to remain stable. Thus, the increment is used as a signal by management as it is more informed about the company's performance (Miller & Rock, 1985; Baker & Weigand, 2015). Following the aforementioned arguments, hypothesis one is formulated as follows:

H1: Earnings are positively related to dividend payment decisions.

1.6.2 Hypothesis two

Size has been documented as one of the main factors influencing dividend payments in South Africa (Forti, Peixoto & Alves, 2015). Thus, larger and more developed firms normally have a higher payout ratio in comparison to smaller and rapidly growing firms (Fama & French, 2001; DeAngelo et al., 2004). This is because larger firms are usually in their matured state with fewer investment opportunities to expand. These firms are more likely to return the excess funds to shareholders, whereas smaller and growing firms plough back profits to expand further. Thus, previous research has extensively shown that firm size is predicted to be positively related to dividend payments. This leads to the formulation of the second hypothesis:

H 2: Size is positively related to dividend payment decisions.

1.6.3 Hypothesis three

The life cycle concept provides another explanation that adopts the fact that well-established firms normally have high dividend payout ratios, whereas those that are still in their developmental stages preserve their profits for anticipated investment prospects (Fama & French 2001; DeAngelo & DeAngelo, 2006). The rationale behind this theory is that developing firms are faced with numerous investment prospects and concurrently inadequate capital to fund these. Therefore, this constraint forces these firms to preserve earnings and forgo dividend payments. Myers and Majluf (1984) have advanced another theory further to the above statement that management has an order of preference when making financing decisions. As a consequence, managers will choose internal finances first when financing investments, and second on their list will be debt and the issuance of equity as the last option. Accordingly, small firms growing at a rapid rate will fund positive net present value investment opportunities through external sources if their need for funding cannot be accommodated

internally. Therefore, these firms are expected to pay relatively lower dividends or none at all. The above-mentioned arguments lead to the formulation of hypothesis three:

H 3: Growth opportunities are negatively related the dividend payment decisions.

1.6.4 Hypothesis four

Though not examined by Fama and French (2001), a significant amount of studies have identified free cash flow as an important factor influencing dividend payment decisions of firms (Abor & Fiador, 2013; Firer et al., 2008; Musa, 2009; Uwuigbe, 2013; Vermeulen & Smit, 2011. Free cash flow is a form of profitability and its inclusion in the analysis will either strengthen the earnings hypothesis or reveal the disconnection between these financial metrics for non-financial firms listed on the JSE. Additionally, there exist solid theories regarding free cash flow and dividends. The notable one is that of Jansen (1986) stating that a large amount of free cash flow left at the discretion of management may attract unnecessary spending that yields non-positive gains for the company. The above discussion leads to the formulation of hypothesis four.

H 4: Free Cash Flow is positively related to dividend payment decisions.

1.6.5 Hypothesis five

So far, the dynamics of dividend payments have been explained in terms of firm-specific factors like earnings, size, investment opportunities and free cash flow. However, Fama and French (2001) found that firms were generally less inclined to pay dividends over the examined sample period regardless of their characteristics. Hence, they refer to a tendency that fewer and fewer firms pay dividends over time as a propensity. Therefore, when paired with firms' specific factors, propensity became a significant piece of the puzzle that resulted in a complete picture of the results b Fama and Frech (2001). As a consequence, they found that the number of dividend-paying firms in the US was declining regardless of the firm characteristics. This study applies the same prediction regarding the observed dividend payment trend for non-financial listed firms in South Africa and this leads to the following hypothesis:

H 5: Firms display a declining propensity to pay dividends regardless of their earnings, investment opportunities, size and free cash flow.

1.7 Other factors affecting dividend payments

During the period 1994 to 2020, there have been several economic shocks, externalities and regulation changes/introductions to the South African economy. These events may have some major effect on the dividend payment trend that is observed during the analysis of the study. The aim of the study is to touch on these at different points of time during the sample period to assess if there are any noticeable or extreme differences in the observed findings to the rest of the pattern. In particular, these discussions will be around the dot-com bubble of the late 1990s; the introduction of repurchases during 1999; the 2007/2008 stock market crash; the 2010 FIFA world cup and the 2019/2020 economic downturn due to the covid-19 pandemic.

1.7.1 The internet bubble of the 1990s

The Internet bubble, also known as the dot com bubble was a result of investment based on fads or speculation, large funding available for start-up firms and the non-performance of the newly listed tech companies as expected. During the 1990s, the market invested a lot of money into start-up firms with the belief that these companies would be highly profitable. Since start-up firms in the technology sector realized that there was a lot of money thrown at them during this period, the race between the companies was more about getting big as quickly as possible. Firms that had not completed their product design and some were not even profitable had their share prices shoot off high on the first day of getting listed on the exchange. Eventually, this came to an end with the bubble bursting, while many investors lost out a lot of money and many of these firms also failed. During 1999, a year which is well within or at the end of the dot-com bubble, it also happened that the South African government introduce another way of wealth distribution.

1.7.2 Introduction of Repurchases in 1999

Shareholders could now be rewarded in two main ways, though of dividends or share repurchases. Buybacks are comparatively new to the South African market considering that they were only introduced in 1999. Though the examination of this area in the South African market is slowly picking up pace, Wesson, Smit, Kidd & Hamman (2017) present evidence that repurchases have become a general distribution technique. According to them, buybacks have become increasingly favoured worldwide while firms are losing interest in dividends as a pay-out method. Accordingly, share repurchases do not only carry the advantage of tax efficiency, but they also have a positive influence

on earnings-per-share. The second major similar event that caused the stock market to tumble is that of 2007/2008.

1.7.3 The global stock market crash of 2007/2008

The financial stock market crash of 2007/2008 that affected the globe was a result of defaults on the mortgaged back securities that were structured and consolidated carelessly by the Lehman Brothers. The banking sector was offering these products to just about everyone, including those that did not meet the credit requirements. This led to owners of the homes defaulting on their loans as the housing market in the US was falling. The entire financial industry that invested heavily in mortgage-backed securities was negatively affected by the defaults. As a result, all the financial entities that were connected to the failing banks through business were also heavily affected as their stock prices were also falling. The US stock market lost its standing due to the low confidence in the financial industry, causing the market to crash towards the end of 2008. The South African banking industry was also affected, and as such, the stock market as well, owing to the fact that the banking industry is the life of any economy.

1.7.4 FIFA World Cup of 2010

On the other hand, while other economies were dealing with the difficulties of the stock market crash, south Africa was looking forward to a big activity that was thought to bring only the positive into the life of the local economy. According to a newspaper article Mail and Guardian (2015), the 2010 FIFA world cup contributed 0,4% directly to the growth of the national economy, this translates to R38 Billion according to the finance minister's estimation. As the recession had fallen onto the rest of the world, South Africa was faced with an encouraging opportunity to revive its economy. During this period, the JSE was faced with numerous construction firms that entered the market. Additionally, the tourism sector experienced a boom and increased to 20% more than was usually recorded during the event. It is a common belief that there exists a one-to-one ratio between tourism and job creation in South Africa, meaning that employment opportunities were created as well in this regard.

As much as the world cup aided the South African economy while recovering from the global financial crash of 2008, there is still a considerate number of articles and studies dated 2018 that point out some of the actions that would need to be carried out by the country and other international markets to recover fully. Even so, the world is facing yet another crisis that had a significantly negative impact on the economies of many countries, the Covid-19 infection which was firstly

detected in Wuhan, the capital city of Hubei in China. As per the reports of the National Institute of Communicable Diseases (2020), the first covid-19 suspected case was confirmed in March of 2020 in South Africa. Due to the pandemic, the South African economy has contracted by a minimum of 5% to a maximum of at most 30% as noted by several 2020 GDP forecasts. Since the pandemic was identified, a number of governments including South Africa have confirmed this as a national state of disaster and consequently implemented safety actions like nationwide lockdowns. These measures have resulted in damaging effects on the economy globally.

All the above events have had an impact on the payment of dividends by firms either directly through influencing a firm's decision or through the contribution of reducing the number of firms paying dividends. Even though the impact of these events will not be rigorously unpacked and analysed in comparison to the financial variables, their discussion may shed light on some of the observed findings of the study.

1.8 List of abbreviations used in the study

TD	Total number of Dividends
BVS	Book Value per Share
CSP	Closing Share Price
DPS	Dividend Per Share
EBIT	Interest Before Interest and Taxes
FCF	Free Cash Flow
IE	Interest Expenses
L	Total Liabilities
JSE	Johannesburg Stock Exchange
MC	Market Capitalization
OI	Operating Income
OS	Outstanding Shares
P / B	Price to Book
T	Taxes
TA	Total Assets
US	United States

1.9 Structure of the study

The rest of the study continues as follows; Chapter two focuses on the theory and empirical evidence of dividend policy. Chapter three outlines the methodology that was undertaken to achieve the reported results. Chapter four presents the findings of the study together with the robustness check. Chapter five concludes with the findings and potential caveats against the results of the study.

1.10 Conclusion

This Chapter provided background and motivation for undertaking the study. The Chapter articulated the main research problem and outlined clear steps in resolving the problem by highlighting the research objectives and questions. The Chapter further formulated hypotheses drawn from the extant literature. The next chapter reviews the Literature.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

There have been several leading dividend theories proposed in the literature to date, which makes the density of the dividend enigma more intense (Frankfurter & Wood, 2002). This chapter reviews some of the major dividend theories and highlights some of the ideas that have sparked a debate that leads to divergent conclusions around the decision of firms to pay dividends. Sections 2.2, 2.3 and 2.4 discuss the dividend irrelevance theory, the catering theory and the signaling and agency theory respectively. Section 2.5 focuses on historical empirical evidence. Section 2.6 concludes the chapter

2.2 Dividend irrelevance theory

The dividend irrelevance proposition was advocated by Miller and Modigliani (1961). This proposition states that dividend policy decisions made by companies do not affect either the capital structure or the value of the firm. The irrelevance theory assumes that all investors are equally informed, there are no taxes or transactional costs and there are no leverage effects on the capital structure of a firm. Therefore, the theory can only be attained in perfect markets which do not hold in the real world. In the real world, all these assumptions do not hold and this has raised a debate against the dividend irrelevance theory

Therefore, following this idea, when investors know an investment policy of a company, they will not require further information about the past policies of dividend payments. Rendering the choice to invest in a company is a direct result of the investment instead of the dividend policy. The dividend irrelevance theorem is therefore a contradiction of the relevance theorem as sustained by Walter (1963) and Gordon (1963). The relevance theory proposes that firm value and dividend decisions are directly linked to each other. Furthermore, investors favor the payment of dividends. In the context of the irrelevance theory, one would predict a random path in the payment of dividends by companies as the choice of payment or non-payment will have no significant effect on the value of the company.

2.3 Catering theory

Baker and Wurgler (2004) propose the dividend catering theory which eases the notion of efficient markets made under the irrelevance theorem. The theory predicts that a stock price premium reckoned

as resulting from a dividend-paying company encourages other companies to initiate dividend payments. The theory consists of three elements. Firstly, the investors' demands for dividends are uninformed and not consistent through time due to either institutional or psychological reasons. Secondly, the stock price differences between dividend-paying and nonpaying firms cannot be corrected by arbitrage. Thirdly, demand for dividends dictates when management can initiate dividends, hence, dividends are paid when payers' stock prices are rated high by investors and vice versa. The catering theory assumes that investor emotions are the main drivers of demand for dividends while the clientele theory posits rational investor behavior regarding dividends.

2.4 Signaling and Agency theory

The dividend signaling hypothesis proposes that companies that announce dividend payment increments are indicating optimistic forecasts about the future of the company. This model is linked to the notion of game theory where management deemed to be confident about the prospects are expected to show signs in this manner while pessimistic managers hold back. By the same reasoning, the signaling hypothesis postulates that high dividend payments should be, or are distributed by profitable companies versus smaller pay-outs by relatively smaller counterparts. The dividend signaling model was originally presented by Bhattacharya (1979) where free cash flow reductions are a direct result of dividend payments, which may subject a company to sourcing external finance. In support of this model, it was argued that firm managers are better informed about the company's prospects over external parties, thus, may be encouraged to transfer this knowledge through dividend alterations (John & Williams, 1985; Miller & Rock, 1985).

The possession of added advantage by the management of the firm in the signaling theory is also linked to the agency costs as suggested by the agency theory developed by Jensen and Meckling (1976). The agency theory adopts the idea that retaining profits in large amounts may encourage management to behave adversely by acting in self-interest rather than the interest of the shareholders and, in turn, diminish the value of the company. Therefore, dividend distributions guard against company policies that may encourage company management to engage in investments that destroy company value (Easterbrook, 1984). According to the theory, large capital at the discretion of managers increases possible agency problems, whereas lower capital reduces them because a firm may seek outside financing which comes with continuous monitoring from the capital markets.

For this study, these two theories predict that well established and profitable firms (or at least those that anticipate positive future earnings) are likely to be paying dividends due to the need to 1) Signal

their confidence in the state of the company 2) Reduce free cash flow available to management. Therefore, focusing solely on the area of dividend distributions, the agency theory predictions are consistent with those of the signaling hypothesis when closely analysed via the pecking order theory reasoning advanced by Myers and Majluf (1984). The pecking order theory predicts that for larger and well-established firms that pay dividends, external financing is well within reach as opposed to smaller companies that cannot afford this type of funding.

2.5 Empirical Evidence

2.5.1 International evidence

When markets are perfect, the value of a firm is not altered by dividend policy decisions (Miller and Modigliani, 1961). Since then, there has been a number of propositions put forward in dispute with this idea leaning on the argument that the Miller Modigliani (MM) proposition is based on impractical assumptions (Brav, Graham, Harvey, Michaely, 2005). In light of these propositions, the framework by Miller and Modigliani (1961) could not fit the dividend policy decisions in the survey by Brav et al. (2005) which showed that dividend distributions were equally weighed against the increase in investments. Consequently, even though the dividends and earnings show a weaker association over time, dividend policies are still considered an important factor affecting the projected stability of a company which is relevant to company value. In an analysis of Roman firms, Anton (2016) found that firms that paid a high dividend in comparison to their counterparts were valued positively by management. Additionally, they noted that management could generate firm value through the increment of dividends to some level considered optimal. Although the MM proposition has been the cornerstone in the finance literature, DeAngelo and DeAngelo (2006) concluded that the mathematical evidence is inadequate since it merely applies to the scenario of the total distribution of free cash flow and disregards part or complete retention of it.

A seminal dividend pay-out policy model was presented by Lintner (1956) in support of the signaling hypothesis by emphasising that dividend increments by firms are a positive signal by management who believe that there is a permanent increase in earnings. Likewise, Benartzi, Michaely & Thaler (1997) report results that are in support of this model, with a lower probability of firms that made positive changes to dividends experiencing a decline in future profits in comparison to their counterparts that decreased or made no changes to their dividend payments. Furthermore, one of the main findings of a survey by Brav et al. (2005) showed that sustainable earnings are directly linked to dividend increments. Similar to Penman (1983) and DeAngelo, DeAngelo and Skinner (1996),

Grullon, Michaely, Benartzi and Thaler (2005) showed that there is no information content in dividend adjustments. They argue that prior studies on dividend policy did not account for the fact that earnings possess a nonlinear pattern. They further concluded that there is a negative relationship between future changes in earnings and dividend adjustments.

Even in the face of such contradictory evidence, Benartzi et al. (1997) noted that the content of information carried by dividends is a broadly held view in the finance literature. Brav et al. (2005) found that there is clear reluctance on the part of management to cut dividends as they believe that they influence firm value. Jensen, Lundstrum and Miller (2010) support the relevance of dividend decisions on firm value by providing compelling reasons as to why markets react so strongly to dividend reductions. They documented that the hesitation from management to cut dividends is inspired by the idea that the market will have a negative perception of management's expectations. Their results strongly suggest that decreasing dividends match the deteriorating value of the company's real options. Accordingly, the recovery of earnings after firms have effected dividend cuts is due to expired growth options that were not taken advantage of. Hence, investors can identify the diminishing value of a firm through dividend reductions.

In the context of the South African market, Auret and De Villiers (2000) showed that stock prices were explained mostly by earnings and not dividends. From these results, one may argue that the dividend irrelevance theory has some support considering that company value does not seem to be affected by dividend policy. However, Nell, Hemman & Smit (2001) uncovered that managers were unwilling to alter dividend payments, noting the adverse effects associated with cutting dividends as the main reason. Additionally, they also concluded that dividend increments may only be effected when there is assurance that company profitability is stable. These results were later confirmed by Clark (2007). However, there has not been enough evidence to conclude firmly that the signaling hypothesis holds in the South African market (Firer et al., 2008). Comparing their results using South African data to those of the US market, Firer et al. (2008) concluded that there is support for Lintner's (1965) model, the dividend payout ratio is set at a certain targeted level to ensure that there will be no upcoming decreases. Even though the nominal value of pay-outs in dividends was more important to managers in the US, they hold similar standards to those of the South African managers in the avoidance of dividend cuts in the future. Even so, firms that paid dividends consistently did not use this as a tool to convey some sort of information to the South African market (Wolff & Auret, 2009).

In light of the above evidence, the study may not be focusing on dividend alterations, initiations, or omissions, but on the trajectory of dividend payment tendencies by listed non-financial South African

firms over the period of 1994 to 2020. However, the vast majority of evidence already gathered in the literature is very important in this regard and in leading up to the results of the study, since another aim of this study is to identify which of the theories can be corroborated by the anticipated results. Furthermore, considering that the focus of the study is to uncover dividend payment tendencies of listed non-financial firms in the South African market, if dividends provide such valuable information in the market, it is interesting that there are fewer companies paying dividends in the US as per the results presented by Fama and French (2001). Their paper examines the frequency of firms paying dividends from the period of 1926 to 1999 paying particular focus on the period post-1972. They found that the proportion of dividend-paying firms sharply declined after 1978 from 66.5% to 20.8% in 1999.

To understand the forces that lead to this decline, they analyse the following: 1) The characteristics of firms paying dividends 2) Whether the declining number of firms paying dividends is a result of diminishing characteristics that are typical of dividend payers, or 3) Whether firms, in general, have lost appetite for dividend payments. They found that the declining number of dividend-paying firms was a result of changing characteristics towards firms that were typical of non-dividend payments. Therefore, the firms had enormous investment prospects, low profits and were smaller in size. These changes were motivated by a flow of newly listed firms post 1978 with characteristics of firms associated with the non-payment of dividends. Additionally, another contributing factor to the decline was the fact that firms were generally abandoning the payment of dividends irrespective of the characteristics they possess.

The findings of Fama and French (2001) are consistent with those of Grullon and Michaely (2002) and have received partial support from Brav et al. (2005) in concluding that the proportion of dividend-paying firms has declined. In the survey responses, Brav et al. (2005) observed that several firms that did pay dividends would cut or opt for a different distribution strategy given a second chance. By gathering international evidence from 25 countries from 1994 to 2007, Ferris, Sen & Unlu (2009) concluded similarly to findings obtained by Fama and French (2001). Therefore, they observe that the declining incidence of dividend payments is not just a US phenomenon but can also be identified in other markets. In contrast, Deangelo et al. (2004) concluded that there was an increase in real dividends collectively in twenty years despite the findings that there was a sharp decline in the proportion of dividend-paying firms by Fama and French (2001). They also found that smaller dividend payers were those that abandoned dividend payments while the larger payers make up the majority of the pool of dividend payers.

2.5.2 South African evidence

The question is whether a similar trend can be observed in the South African market. Alternatively, to uncover if the findings are completely in contrast to other results found in other markets. Viviers, Firer & Muller (2013) re-counted results that are in line with global practices in the South African market, concluding that the proportion of dividend-paying firms has decreased. However, Wesson et al. (2015) found results in contradiction to the pronounced trend internationally. From their research, the proportion of dividend-paying firms increased from just over 50% in 2000 to over 70% in 2009. Therefore, they concluded that the activities of the South African firms are not in sync with those of the globe when it comes to dividend payments. Conversely, as an emphasis that the South African market is not entirely out of touch with the world, the same study by Wesson et al. (2015), found that there was an increase in the aggregate growth rate of dividends where the concentration of payment incidences was among a few large firms showing regular firmness in dividend pay-outs. A study by Nyere and Wesson (2019) supports the observation of increasing dividend payments and concluded that the South African market is in contradiction to the proposed declining trend. Table 1 summarises some of the factors that were identified in other parts of the globe as the main contributors to dividend policy decisions.

2.6 Conclusion

This chapter summarized aligned several papers based on consensus and opposing views regarding the evidence on dividend theory and its policies. There is a vast amount of literature available on dividend policy and theories, however, the focus was placed on some of the main papers considered relevant for the study. The next chapter lays out the methodology undertaken to carry out the study.

CHAPTER 3

METHODOLOGY

3.1 Introduction

This Chapter presents the three methods used to analyse the selected data from 1994 to 2020. Section 3.2 discusses the data. Section 3.3 determines the variables used in the study. Section 3.4 focuses on estimation models. Section 3.5 concludes the chapter.

3.2 Data

The main important feature of the study is the financial statement data of listed non-financial South African companies which are obtained from the Bloomberg terminal and Iress platforms. South Africa is classified as an emerging market and most of its comprehensive information on companies dates back to the year 1993. However, the analysis considers data from 1994 until 2020. The 26-year sample period is considered best for the following reasons noted from the JSE (2010) article: 1) Financial information is reported consistently after 1993 on most platforms according, 2) Though the JSE existed in the late 1800s, a system to trade electronically was only effected in the 1990s, making the South African financial data easily accessible after this period. Additionally, the study only focuses on a dividend trend and does not consider other alternative stock distribution methods like repurchases for in-depth analysis. However, the effect of stock repurchase introduction is also noted as one of the factors affecting the observed pattern of dividend payments.

The number of companies analyzed on the JSE differs each year due to mergers, newly listed or delisting companies. Each year the number of firms ranged between 256 and 387 after the elimination of financial and utility companies. Financial and utility firms are excluded because they are highly leveraged which is an indication of distress for non-financial companies. Therefore, isolating non-financial and non-utility forms improves the reliability of the results since the financial statements and metrics are homogeneous.

Firms are grouped according to their dividend payment status each year (payer, non-payer, former payer). A firm is considered a payer each year if it has positive dividend per share (DPS) data on the system. Subsequently, all firms with no DPS each year are classified as non-payers: non-payers consist of firms that have never paid and former payers. A former payer is defined as a firm that was classified under a group of paying firms the previous year but appears under non-payers the following

consecutive year. Additionally, new lists are those firms that did not make the sample from the initial date of the sample period and appear later along the years, or, firms that may have been re-listed again during the sample period. By the same token, delisting firms are those that are lost each year from the sample period. Additionally, all firms must have the required financial information at least for three consecutive years. After applying the above criteria, the total number of firms examined is 8501 summed from 1994 to 2020.

3.3 Variables and definitions

In the spirit of Fama and French (2001), the following financial metrics proxy for specific variables as defined in Section 1.6;

The profit variable is represented by earnings scaled by total assets:

$$\frac{\text{EBIT}}{\text{Total Assets}} = \frac{\text{Operating Income (OI)+ Interest Expense(IE)+ Taxes(T)}}{\text{Total Assets}}$$

(1)

The growth rate of assets (GRA) and Price to Book (P/B) value are calculated as follows:

$$\text{The growth rate of Assets } (\Delta A) = \frac{[\text{Total assets in the previous year } (TA_{t-1}) - \text{ Total assets in the current year } (TA_t)]}{\text{Total assets in the previous year } (TA_{t-1})}$$

(2)

$$\text{Price to book ratio } \left(\frac{P}{B}\right) = \frac{\text{Closing Share Price(CSP)}}{\text{Book Value per Share(BVS)}}$$

(3)

These two variables proxy for investment opportunities. The size of the company is represented by the amount of market capitalization and is calculated as follows:

$$\text{Market Cap (MC)} = \text{ Share Price (SP)x Outstanding Shares (OS)}$$

(4)

The study incorporates an additional variable that is not considered by Fama and French (2001) which is the free cash flow variable. One of the sub-objectives of the study is to draw attention to dividend theories that are associated with the results. Therefore, free cash flow is added to the analysis because its effect can be explained in relation to dividend theory through the free cash flow theory proposed by Jansen (1986). Additionally, it may be considered as an alternative profitability measure to enhance the deductions made about profitability and dividend payment decisions. The free cash flow variable is calculated as follows:

$$\text{Free cash Flow} = \text{Operating Cash Flow (OCF)} - \text{Capital Expenditure (CE)}$$

(5)

3.4 Estimation models

The data is based on five variables (earnings, size, free cash flow, assets growth rate and price to book value) presented in regular intervals from 1994 to 2020. Thus the cross-sectional and time-series nature of the data would be best analysed using panel data methodologies. The study also opted for panel data analysis due to its exponential development in terms of tools and its use in the literature over the years. According to Hsiao (2007), less than 30 papers had "Panel data" as a keyword in 1986, which drastically increased to more than 700 studies by 2005. The continuous and extensive use of panel data is attributed to the following advantages; 1) widely available data, 2) human behavior modeling capabilities surpass that of time series and cross-sectional data, 3) analysis methods are challenging and stimulating (Hsiao, 2007). This study associates firm-specific factors and the decision of a firm to pay dividends, where the dependent variable is categorical and the independent variable is numerical. Therefore, the analysis is concerned with a classification problem that can be analysed using a logistic regression model on panel data.

3.4.1 Regression analysis

To achieve the main objective of the study, the following logistic regression model is used:

$$\log\left(\frac{P}{1-p}\right)_i = \beta_0 + \beta_1 \frac{E_t}{A_t} + \beta_2 \text{SIZE}_t + \beta_3 \frac{FCF_t}{A_t} + \beta_4 \frac{\Delta A_t}{A_t} + \beta_5 \frac{P_t}{B_t}$$

(6)

Where;

$\log(\frac{P}{1-p}) =$ The probability that a firm pays dividends.

$\beta_0 =$ The constant resulting from the regression.

$\beta_1 =$ The coefficient of total earnings.

$\beta_2 =$ The coefficient of size.

$\beta_3 =$ the coefficient of Free Cash Flow

$\beta_4 =$ the coefficient of asset growth rate.

$\beta_5 =$ The coefficient of price to book value.

The dependent variable is a binary; a value of 1 is assigned if firm *i* is a payer at time *t*, and 0 otherwise. The meaning of independent variables is explained in detail in Chapter 1, Section 1.6. Logistic regression does not make many of the key assumptions of linear regression and general linear models that are based on ordinary least squares algorithms – particularly regarding linearity, normality, homoscedasticity, and measurement level. Therefore, the model does not require an error term (Martin, 2021; Stats Community, 2021, October 8).

The regression model aims to examine the minimal contribution of each of the above variables to the decision-making of firms regarding the payment of dividends. Regressions are run on interval bases which contrast with yearly regressions performed by Fama and French (2001). Regressions are further used to examine the propensity of firms to pay dividends in the following manner. 1) The base period regression is used to estimate the proportion of firms expected to pay dividends, 2) The interval regression that covers a particular year is used to estimate the actual proportion of firms paying dividends, 3) the difference between the expected and the actual value represents the propensity to pay dividends.

3.4.2 Portfolio style analysis

The next method examines an analysis-based portfolio style where firms are grouped into portfolios each year according to the intersection of size, profitability and investment opportunities. Therefore, out of the five independent variables used in the regression model, the aim is to control for one variable and let the others vary.

27 portfolios are formed for each year from 1994 to 2020 based on Size, profitability and investment opportunities. Free cash flow and earnings both proxy for profitability while the assets growth rate and the price to book value measure investments opportunities. Therefore, the sorting of portfolios includes either of the measures per portfolio sorting strategy and not both. Firms are sorted according to equal groups of three per intersection of the variables earnings (EBIT/A), free cash flow and price to book. The size intersection is based on the 20^{th} and the 60^{th} percentile for the lower and the upper limit respectively. According to Fama and French (2001), the percentile method can accommodate the extreme or gradual variation in firm size caused by the type of firms entering or exiting the exchange at any point in time. Also, the selected cut-off intersections for size showed an approximately equal number of firms per group throughout the sample period. Portfolio sorting is done sequentially and independently, meaning that sorts are based on one variable at a time while others are kept constant.

Sorting portfolios is done sequentially and the first step is based on size where firms that have; the 20^{th} or lower percentile are classified as small; above 20^{th} and below 60^{th} percentile are classified as middle; 60^{th} and above percentile are classified as large. This sort results in 3 portfolios for each that it is performed on. The second sort is based on profitability and firms are split into an equal number of firms for low, medium and high profitability. Inevitably, one would have to sort the data into ascending or descending order for profit under each size group, thus, the second sort will result in nine portfolios. The final sort is based on investment opportunities where each of the previous nine portfolios are further divided into three equal firms based on low, medium and high price to book value ratios.

3.5 Conclusion

This Chapter discussed the data and methodology of the study. The key estimation models used are logit regressions and portfolio analysis. The next chapter presents the findings of the study together with the robustness check.

CHAPTER 4

RESULTS AND ROBUSTNESS CHECK

4.1. Introduction

This Chapter presents the findings of the study using descriptive statistics and logit regressions. Furthermore, the results of portfolio analysis are presented to further assess if the main findings are not by chance. Section 4.2 discusses the number of firms on the JSE over the sample period. Section 4.3 outlines the evolution of dividend payment patterns. Section 4.4 compares the old and existing firms. Sections 4.5 and 4.6 present descriptive statistics and logit regression findings respectively. Section 4.7 describes portfolio sorting. Sections 4.8 and 4.9 present the results based on characteristics and propensity respectively. Section 4.10 concludes the chapter.

4.2. The population of dividend-paying firms on the JSE

Before proceeding with the findings of the study, it is important that a step back is taken to observe another trend that may have a meaningful impact on the detected dividend payment trend. The total number of firms on the JSE over the sample period is a factor in this analysis since the percentage of dividend-paying firms is directly drawn from the overall sample of firms on the exchange. The declining number of firms on the JSE may have raised questions among investors and interested stakeholders (see Figure 1). This number has declined from 775 to 330 companies over the last three decades with at least 15 companies delisted each year on average. In addition, data obtained from Bloomberg shows that there have already been 21 companies delisted from the exchange within the first nine months of 2021.

Figure 1 shows that much of the increase in delisting companies in the past two decades transpired in the early 2000s. As such, the driving force behind this trend was a low number of new listings overpowered by a large number of delisting companies out of the market. Looking at the years 2004 through 2016, there has been some stability in the JSE market, although, this took a negative turn towards the end of the sample period. The growing market from 1994 towards the late 1990s and after 2007 does not come as a surprise because there was a rise in technology companies during the tech boom, followed by an increase in a new listing of construction companies for the World cup respectively. Subsequently, the downhills of the trend in Figure 1 are a result of delisting companies.

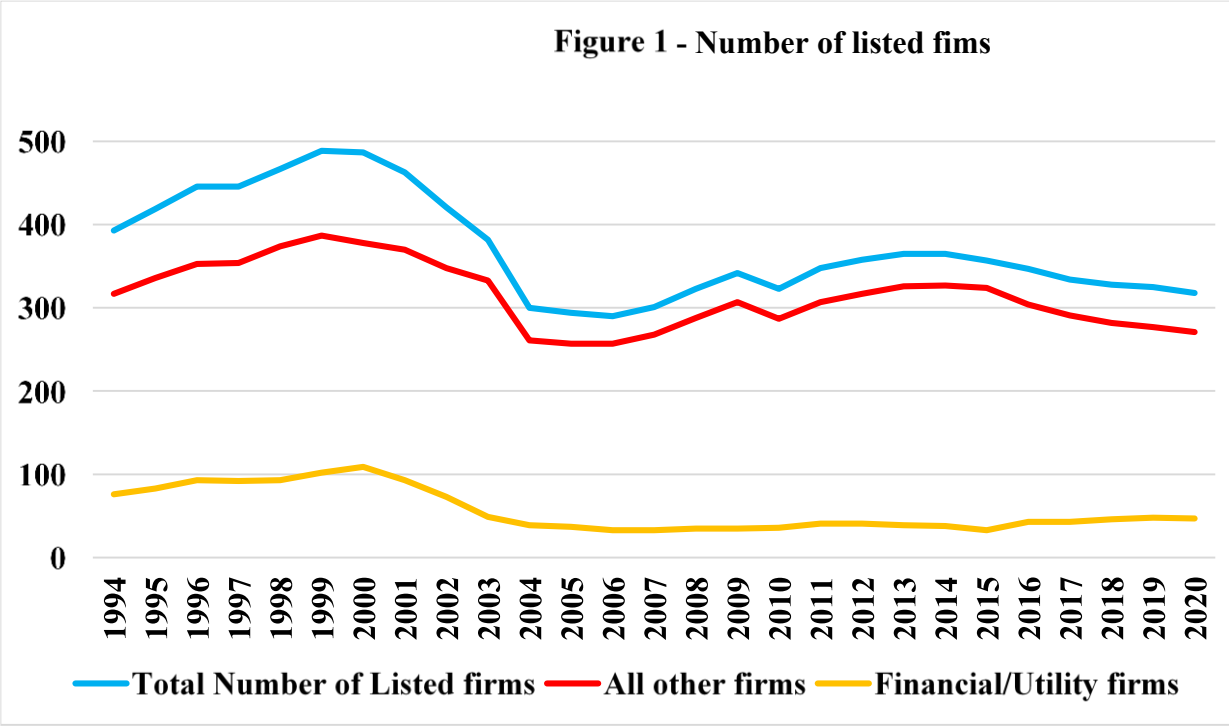


Figure 1 – Displays the total number of firms listed each year. "All other firms" is a result of subtracting financial and utility firms from the total data set.

However, according to Businesstech (2021), delisting companies have a considerably lower market capitalization than those that have been listed since 2008. Therefore, a large number of delists are attributed to the lower probability regarding prospective returns and not due to failing companies. Some of the main delists comprise Comair, Assore, Pioneer Foods and Clover. This information is valuable to the upcoming dividend trend analysis of the study, however, the decline in the number of firms on the JSE does not explain the lower number of dividend payers over the sample period, especially post 2003. The Covid-19 pandemic triggered a downturn in the economy since 2019 which led to a number of firms losing funding from investors and ultimately resulting in delists, especially those considered to have low market capitalization. Generally, smaller companies are more inclined to exit with cash-ins while bigger ones want to raise funds for larger investments (Businesstech, 2021).

Other reasons for the declining number of firms on the JSE can be attributed to a trend that is happening globally; smaller companies are generally consolidating to become large corporations. Therefore, the number of listed firms may have decreased, however, the remaining firms become meaningfully larger than was the case a couple of years or even decades ago. This can be seen through a significantly increased market capitalization of the listed firms over time. Therefore, it is reasonable

to conclude that the declining number of listed firms over the years is not an automatic sign of the weakening market resulting from non-profitable companies.

Figure 1 reveals other interesting insights about the stock market crash of 2008 resulting from poorly constructed mortgaged-backed securities which saw their holders defaulting. According to Verick (2010), the South African market was harshly affected by the global financial crisis due to its ties with the overall international market financially. Consequently, the economy was stumbling badly in the second half of 2008 as many jobs were lost and the number of discouraged individuals increased. However, it is quite evident from Figure 1 that the number of firms listed on the JSE did not seem to be negatively affected. Instead, there is a slight increase in the number of firm listings. Possibly, the optimism that drove the listings of the construction sector companies surpassed those that were delisting from the exchange, as the nearer future of the 2010 world cup seemed more positive than what was currently happening at that time of the crush.

Figure 2 is a confirmation of the above reasoning regarding the global stock market crash. Generally, the number of new lists has been declining since the late 1990s and early 2000s since all the peaks of the total number of listed companies have not been able to reach that of the 1990s. However, the downward trend is not close to a smooth one; the peaks and troughs of Figure 2 are very distinct and extreme. The rise of listing companies from 1994 to 1999 is in line with the increasing trend of the

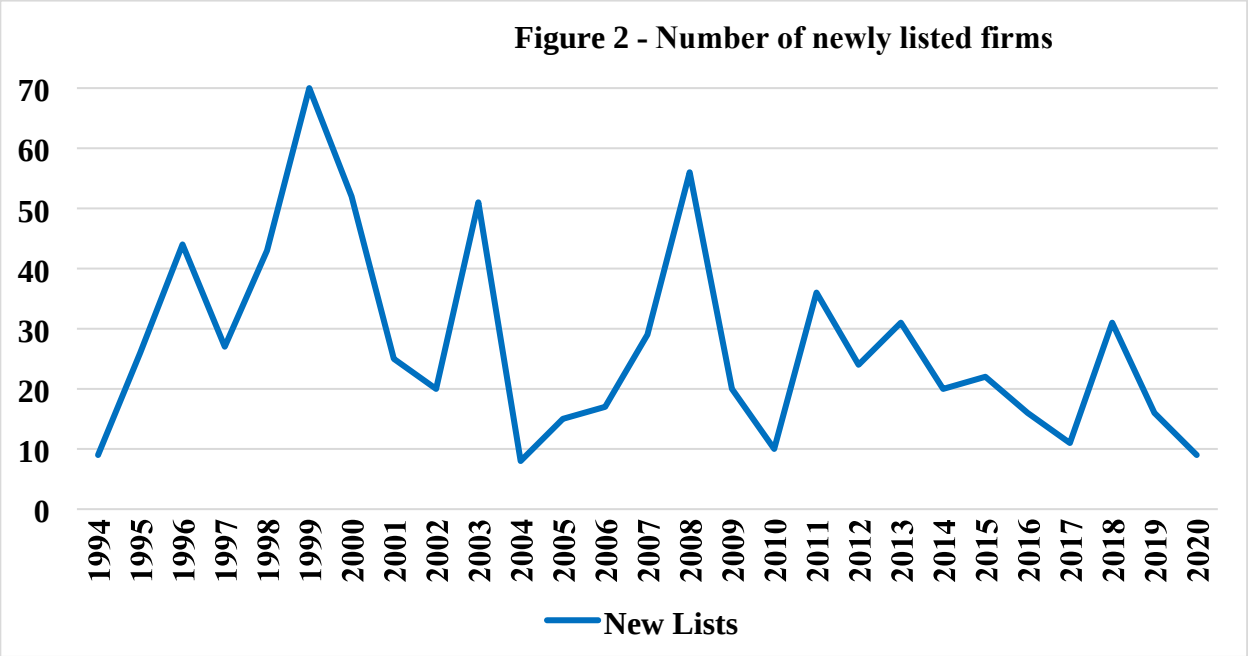


Figure 2 – Displays the number of newly listed firms each year, this number is extracted from the data set of 'All other firms" that does not include financial and utility firms. See Figure 1

total number of listed firms on the JSE market. However, after the second peak, newly listed firms show a distinct rhythm continuously throughout the sample period. From 2004 through to 2008, there is a clear and significant increase in the number of listing firms, and only after 2008 does the decline start the happen, even so, it peaks up again in 2010 to reflect the promising prospects of the 2010 FIFA world cup.

The evolution of the dividend payment trend The main goal of the paper is to firstly identify the trend of dividend payments on the JSE and to consequently identify the driving forces behind it. It is reasonable to begin by analysing how dividends payments have fared for the entire sample period of 1994 to 2020 using simple descriptive statistics to identify any patterns, before moving on to the regressions. All analyses of the study are based on the universe of companies that are non-financial and non-utility. Figure 3 displays the total number of companies on the JSE separated into groups according to those that pay dividends, do not pay dividends, previously paid dividends and have never paid dividends since inception.

The fraction of firms paying dividends decreases steadily from 71% in 1994 to a low 5% in 2020. The highest decline in the number of firms paying dividends is seen from 60% in 2003 to 5% in 2020.

Figure 3 - Dividend payment status

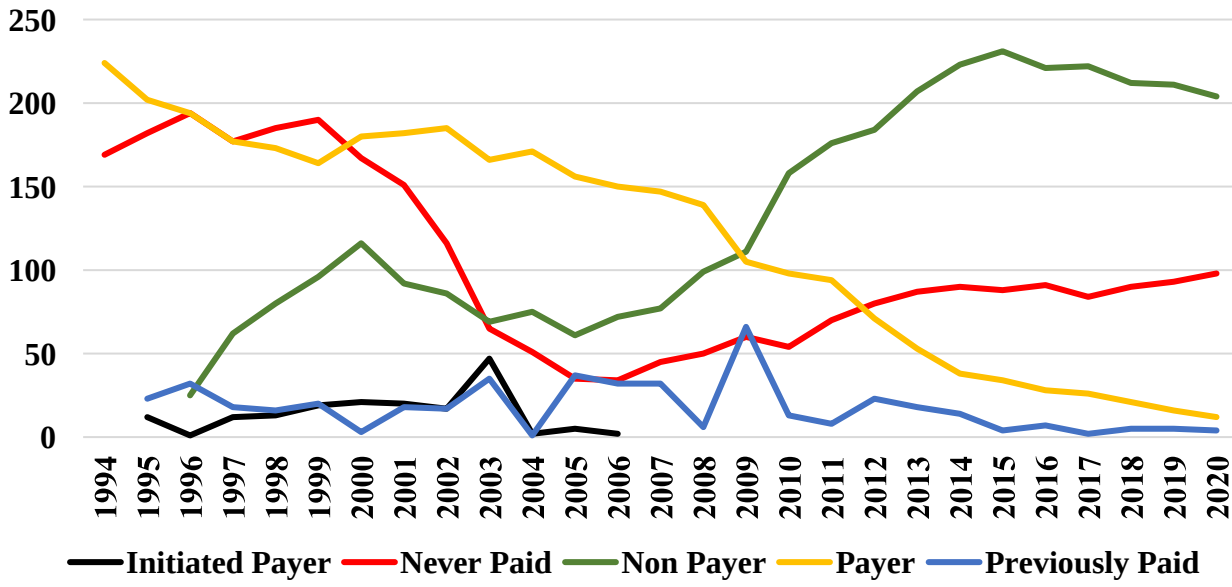


Figure 3 – Displays the number of JSE firms divided into groups according to their payment status. All the firms included in this figure have market data reported for each year. A Payer pays dividends each year; a Non-Payer does not. Payers consist of firms that have initiated dividend payments while non payers are firms that have never paid dividends during the sample period and those that were previously paying dividends.

At the beginning of the sample period, the numbers have been dropping steadily and not as drastic as seen from 2004. This is because there were new firms initiating dividends during this period and their numbers were able to offset the declining proportion of dividend-paying firms which kept numbers balanced for a short while. Specifically, there were 122 firms paying dividends in 1994 and 171 payers in 2004. However, from 2004 to 2020, the number of dividend-paying firms fell to as low as fewer than 10 firms. The number of firms initiating the payment of dividends is fewer than 50 firms from 1994 through to 2006, from 2007 there seem to be no firms paying dividends as the trend disappears from the figure through to the entire sample period. This contributes to a continuously decreasing number of dividend-paying firms and the reason why the decline is more pronounced after 2004. Accordingly, there were no firms initiating dividends that would offset the falling numbers of dividend-paying companies.

The proportion of firms that have never paid dividends averages 43% for the years 1994 to 1999. This number fell to a low of 12% during 2005 and remained below 20% for the duration of the sample period. However, it can be observed that there was a steady increase in the subsequent years. Just like the proportion of dividend-paying firms, firms that have never paid dividends are also affected by firms that initiate dividends. After the disappearance of newly initiating firms by 2006, the number of firms that have never paid dividends continues to pick up again through to 2020. The increase in the number of those that have never paid dividends is also an indication that fewer and fewer newly listed firms on the JSE were initiating dividends. Firms that paid dividends previously remain fewer than 50 from 1994 through 2008. This number spikes to slightly higher than 50 companies in 2009, but remains lower than 100. After the highest peak throughout the entire sample period, the fraction of former payers declines to 1% in 2020. This percentage is not surprising considering that it was lower for the most part ranging between 1% and 19% before reaching its peak in 2009.

Figure 4 is a consolidated version of Figure 3 where payers and non-payers are the only groups displayed in the figure. Payers consist of firms that were found to have been paying dividends each year and those that have initiated payments for the first time since the beginning of the sample period. There is no distinction between firms that newly initiate dividend payments for the first time, and those that reinstate dividend payments after abandoning them during the sample period. Non-payers consist of firms that have never paid dividends and those that did but stopped somewhere during the sample period.

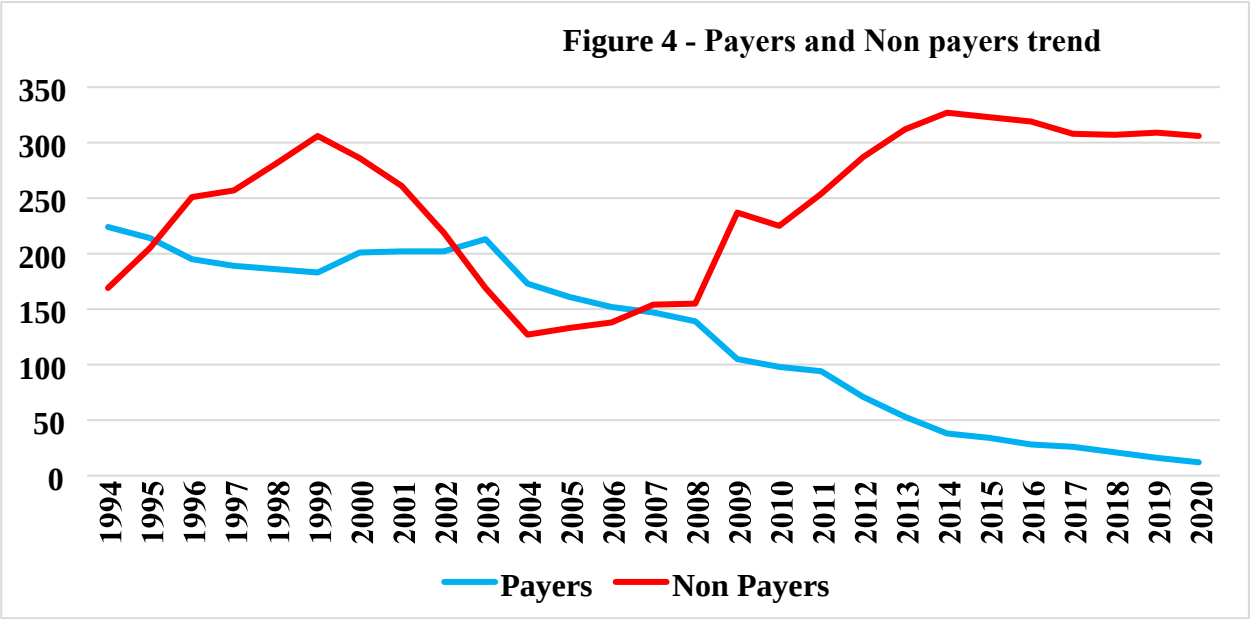


Figure 4 – Displays the overall path overview of payers and non-payers. Payers consist of firms that have initiated dividend payments while non payers are firms that have never paid dividends during the sample period and those that we previously paying dividends.

Notice that the stability of the number of firms paying dividends during the period of 1994 to 2003 comes out clearer in figure 4. Subsequently, the sharp decline in the proportion of dividend-paying firms is also observed in this Figure. The pattern displayed by the proportion of non-paying firms starts as a cycle rather than a clear trend like that of dividend-paying firms. The fraction of non-paying firms starts at 43% in 1994 and increased to 63% in 1999. This brings back some insight into an earlier discussion around the type of listing companies during this time frame. This period covers the dot-com bubble where most of the rising firms were in the technology sector. Firms in the technology sector are very popular for choosing to plow back their earnings into the firm for expansion or better growth prospects. As such, these companies will not pay any dividends. This explanation is a reasonable fit for the rising number of listing companies during this time frame while it also coincides with the rationale for non-dividend-paying firms in the tech industry.

The number of non-paying firms peaked at 63% in 1999 and declined to 42% in 2004. However, the decline did not visibly affect the trend that depicts the proportion of dividend-paying companies as it remained steady. The decline in the number of non-paying firms can be attributed to the overall decline in the number of firms listed on the JSE during this period (See Figure 1). The declining number of non-payers observed with a concurrent non-increasing number of payers may be attributed to the issue of repurchases. Wesson et al (2017) present evidence that repurchases have become a general distribution technique. Accordingly, buybacks have become increasingly favoured worldwide, while firms are losing interest in dividends as a pay-out method. Thus, share repurchases

do not only carry the advantage of tax efficiency, but they also have a positive influence on earnings-per-share. Therefore, the declining proportion of non-paying firms may have become part of the firms that distribute shareholder wealth through buybacks since the number of dividend-paying firms did not see any recognisable increase during this decline.

Since 2004, the number of firms not paying dividends has been rising from a peak of over 90% in 2015 where it remained steady until 2020. The increase in the proportion of non-payers coincides with the declining proportion of dividend-paying firms. As soon as the percentage of dividend-paying firms started to decline in the period after 2003, there was a simultaneous increase in the proportion of non-payers. In summary, Figures 3 and 4 display the evolution of dividend payment patterns of the firms listed on the JSE over the past 26 years. From the analysis, the number of firms paying dividends declines due to several reasons outlined as follows: Firstly, due to the type of companies that enter the market. Secondly, due to a perishing number of firms initiating dividends over those that stopped paying dividends., Thirdly, due to an alternative wealth distribution method of buybacks, finally, due to the overall deteriorating JSE market. However, other nonobvious specific reasons causing the observed trend are revealed by further analysis of the data.

4.3. Existing firms vs new lists

Table 3 presents information on three groups, All firms, Existing firms and New lists for the duration of the sample period. All firms are a combination of existing and new lists, new lists are those that are new to the sample each year and there is no record of them in the years before the one in which they are listed for the first time. Existing firms became part of the sample period from 1994. Companies that are listed more than once during the sample period will only count as new lists for the first time and as existing on repeat. By the same token, an existing company in a year (t) must be part of the list in the years before from (t-1). For all three groups, the table shows a breakdown of payers, non-payers, never paid and previously paid groups of firms. Definitions of these groups remain consistent throughout the paper. The values presented in the table are averages of each variable over three years for the entire sample period.

All three groups follow a similar pattern generally, the number of firms on the JSE peaked during the period 1997 to 999 with 372,325 and 47 companies for All firms, Existing and New lists respectively. However, the lowest number of firms in each group occurred in different periods. The All firms group hit an all-time low average of 277 during the period 2018 to 2020, the Existing firms group had 237 firms from 2006 to 2008 and New lists were at 16 from 2015 to 2017. The values are in support of

Table 3

Displays the total number of firms grouped into existing (these are all firms that exist in the data set each year and are not new lists) and new lists (these are firms that are added to the existing list that did not appear in the previous year (t-1). All the values in the table are averaged from annual totals over a period of three years. Payers are firms that pay dividends each year totaled with initiated payers, initiated payers are either new lists or firms that were not previously part of the list of dividend payers. Non-paying firms consist of firms that previously paid dividends and have stopped and those that have never paid dividends

	1994-1996	**1997-999**	**2000-2002**	**2003-2005**	**2006-2008**	**2009-2011**	**2012-2014**	**2015-2017**	**2018-2020**
Total Number of firms	335	372	365	284	271	300	323	306	277
Existing	309	325	333	259	237	278	298	290	258
New List	26	47	32	25	34	22	25	16	19
All firms	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
Payer	63,6%	50,0%	55,2%	64,3%	54,4%	33,0%	16,7%	9,6%	5,9%
Initiated payer	1,9%	3,9%	5,3%	6,3%	0,7%	0,0%	0,0%	0,0%	0,0%
Non payer	36,4%	50,0%	44,8%	35,7%	45,6%	67,0%	83,3%	90,4%	94,1%
Never Paid	28,2%	45,1%	41,3%	27,1%	37,0%	57,4%	77,6%	89,0%	92,4%
Previously Paid	8,2%	4,8%	3,5%	8,6%	8,6%	9,7%	5,7%	1,4%	1,7%
New List	7,7%	12,4%	8,8%	8,1%	12,3%	7,2%	7,7%	5,3%	6,7%
Payer	24,7%	3,6%	13,9%	28,4%	21,6%	9,1%	0,0%	0,0%	0,0%
Initiated payer	0,0%	1,4%	4,6%	12,2%	2,9%	0,0%	0,0%	0,0%	0,0%
Non Payer	75,3%	96,4%	86,1%	71,6%	78,4%	90,9%	100,0%	100,0%	100,0%
Never Paid	67,7%	93,2%	86,1%	71,6%	66,7%	86,4%	100,0%	100,0%	100,0%
Previously Paid	7,6%	3,2%	0,0%	0,0%	11,8%	4,5%	0,0%	0,0%	0,0%
Existing	92,3%	87,6%	91,2%	91,9%	87,7%	92,8%	92,3%	94,7%	93,3%
Payer	67,6%	57,0%	60,0%	68,5%	59,1%	35,2%	18,4%	10,5%	6,7%
Initiated payer	2,1%	4,3%	5,5%	6,6%	0,4%	0,4%	0,3%	0,3%	0,4%
Non Payer	32,4%	43,0%	40,0%	31,5%	40,9%	64,8%	81,6%	89,5%	93,3%
Never Paid	24,2%	37,7%	36,2%	22,1%	31,6%	54,6%	75,4%	84,0%	89,5%
Previously Paid	8,3%	5,2%	3,8%	9,4%	9,3%	10,2%	6,1%	5,5%	3,8%

the previous discussions regarding the declining number of dividend-paying firms. Focusing on the Newly listed firms group, the pattern mimics that of the overall number of listed firms in the JSE market. The number of dividend-paying firms among newly listed firms declines from an average of 24.7% in 1994 to 0% by the end of 2014. Since 2014, new firms continue to enter the market though at a much lower rate than before, however, none of these are initiating dividend payments.

Additionally, newly listed firms that initiate dividends start as late as 1997 and stop as early as 2008. This is an indication that for the entire number of firms that initiated dividends, new lists were slow in joining in and also quick to opt out. The numbers also reveal that newly listed firms gradually became the largest contributor to the entire number of firms initiating dividends. During the period 2003 to 2005, the initiated payer group peaks at 12.2% under the New list group, while it is only 6.6% under the Existing firms group. Firms initiating dividends comprise of an average 86,2% of newly listed firms, this is 2,9% vs o 0.4% of new lists and existing firms under the initiating group respectively for the period 2005 to 2008. Therefore, it can be concluded that the decision of newly listed firms to stop paying dividends post-2008 is the main driver of the disappearance of firms initiating dividends. Existing firms did initiate the payment of dividends from the beginning of the sample period, however, these numbers dropped and the initiating group was mainly carried by the newly listed firms.

Interesting to highlight from Table 3 under the new list group is the number of firms that do not pay dividends. Newly listed non-payers are mainly driven by the firms that have never paid dividends, this number averaged around 67.7% during the period 1994 to 1996 and reached 93.2% from 1997 to 999. Thus, this is consistent with the idea that listing firms were mainly those in the technology sector and popular for not paying dividends due to wider growth prospects they would rather invest in than issue dividends. During the period 2000 to 2002, newly listed firms that have never paid dividends accounted for all the non-paying companies, these numbers seemed to lower over time. However, by 2014, none of the newly listed firms were paying out dividends and this trend continued until the end of the sample period in 2020. Existing firms display the same pattern discussed in Figures 1 and 2 previously.

In summary, firms that initiate the payment of dividends are clustered under the group of Newly lists and these firms are the main driver of dividend payment. Additionally, the newly listed firms disengaged from paying dividends completely before the end of the sample period, leaving the continuously declining number to be solely accounted for by old existing companies. The idea

presented in the table is that newly listed firms either adapt new equity distribution methods or have different characteristics from existing firms that do not accommodate the payment of dividends.

4.4. Descriptive statistics findings:

4.4.1. Characteristics of payers Vs non-payers

This section discusses the findings on firm characteristics placing specific focus on the financial variables: earnings, free cash flow, size, assets growth rate, and price to book value discussed under section 3. The aim is to assess whether there are particular differences between dividend-paying and non-paying firms.

Earnings

Table 4 provides information about companies in different groups as per their dividend payment status. For sake of consistency, the values presented in the table are averages of three years throughout the entire sample. Dividend-paying firms show a pattern of being more profitable than their non-paying counterparts. During the sample period, payers maintain a higher percentage of earnings (E/A) than the firms that do not pay dividends. From 1994 to 2020, earnings range from a low average of 3.01% to a high of 6.08% for dividend-paying firms. While the profitability for non-paying firms ranges from an average of -33,24% to a high of 3.05%. Over the sample period, at no point did the average earnings of dividend-paying firms get lower than that of the non-paying firms.

The profitability of dividend-paying firms does however seem to be generally deteriorating from where it began. During the period 1994 to 1996, this group had average profitability of 6.08% and landed to an average of 2.88% by the end of the sample period, this is a decline of 3.2%. Looking at the period that covers the global stock market crash between 2006 and 2011, it is evident that most of the listed firms during this period were not negatively affected as a collective since the focus is not on individual firms. Profitability picks up from an average of 3.01% to 3.77% during this period, which is consistent with the previous analysis of the JSE firms slightly increasing as opposed to decreasing. The optimism of the 2010 FIFA world cup is also receiving support from profitability values presented in the table.

Furthermore, the decline in profitability for dividend-paying firms did not happen consistently throughout the sample period. From the beginning of the sample period, profits fell to a low average of 2.55% during the period 2003 to 2005 which was post the internet bubble burst. The failure of tech companies to perform as expected and their consequent exit from the market may have caused the

Table 4

Displays some of the variables linked to the decision of firms to pay dividends. Payers are firms that pay dividends each year combining old and initiated payers, non-paying firms consist of firms that previously paid dividends and those that have never paid dividends. For each group TA = Total assets, L/A = Total Liabilities to Total Assets, FCF/Assets= Free Cash Flow to Total Assets, E/A= Earnings to Total Assets, Size = Market cap to Total Assets, P/B Price to book ratio and EQ/A= Total equity to Total Assets. These values are calculated annually and averaged out over 3 years.

	1994-1996	**1997-999**	**2000-2002**	**2003-2005**	**2006-2008**	**2009-2011**	**2012-2014**	**2015-2017**	**2018-2020**
T A									
Non Payer	13084,35	79765,01	409780,95	650580,33	986733,00	705384,46	248859,90	207051,12	195720,69
Payer	117620,10	785587,64	1579139,84	3163731,73	3403031,86	1906918,41	753171,65	429474,14	283162,07
∆A/A									
Non Payer	0,005	0,897	-0,350	0,284	0,172	-0,181	-0,567	0,000	0,000
Payer	0,099	0,355	0,375	2,971	0,087	-0,095	0,092	-0,050	-0,012
L/A									
Non Payer	31,99%	60,77%	53,77%	45,55%	70,00%	74,09%	84,58%	94,34%	95,01%
Payer	47,82%	63,34%	65,98%	65,03%	59,00%	55,04%	55,82%	52,09%	57,12%
FCF/A									
Non Payer	-1,74%	-1,24%	-1,08%	-0,41%	-1,95%	-5,26%	-12,62%	-10,80%	-16,28%
Payer	27,90%	13,31%	14,62%	8,63%	9,82%	11,64%	18,61%	16,27%	13,07%
E/A									
Non payer	2,71%	3,05%	1,78%	-1,90%	-7,28%	-0,29%	-23,05%	-33,24%	-19,52%
Payer	6,08%	4,34%	4,72%	2,55%	3,01%	3,77%	3,29%	3,91%	2,88%
Size									
Non Payer	916,14	1144,08	682,56	459,43	255,18	230,51	652,01	392,05	258,40
Payer	909 04,02	692 566,85	826 289,342	681 419,69	725 546,28	807 439,364	905 669,9	106 958,29	616 455,56
P/B									
Non Payer	2,59	5,04	3,90	2,38	7,69	2,81	2,86	1,97	2.04
Payer	1,84	4,52	6,99	2,15	2,34	2,51	2,61	2,40	2.54
EQ/A									
Non Payer	67,87%	36,75%	46,23%	54,45%	30,00%	25,91%	15,42%	13,56%	9,28%
	46,40%	36,63%	34,01%	34,96%	41,02%	44,98%	44,18%	47,91%	42,88%

low average value of profits. However, profits were steadily picking up again post 2005 and reached an average of 3.91% by the end of 2017. The all-time low recorded average profitability of 2.88% since 2005 during the period 2018 to 2020 can be attributed to the disastrous impact of Covid-19 that took all financial markets globally by storm.

Non-paying companies also display a generally declining trend of profitability. The analysis of the different economic shocks can also be fitted to the profitability trend shown by firms that do not pay dividends. For non-payers, profitability increased from an average of 2,71% to 3,05% during the period 1994 to1996 and 1997 to 1997 respectively. Most of the firms that were entering the market during this period are those firms in the technology sector that are mostly known for not distributing dividends. Between 2006 and 2011, non-payers experienced an improvement in earnings from an average of 7,28% to 0,29%. Although these firms were making losses, this was an optimistic period for the country due to the 2010 FIFA World Cup and as such, losses were lower than usual. Alternatively, most of the unprofitable firms were likely delisting from the exchange which may have reduced the actual losses, rather than a direct increase in profitability.

These findings are in line with the signaling theory of dividends about the future profitability of the firm, which postulates that companies announce dividend payments or increments when indicating optimistic forecasts about the future of the company. This theory directly predicts that dividend payments should be, or are distributed by profitable companies. This is some form of confirmation that firm managers are better informed about the company's prospects over external parties, thus, may be encouraged to transfer this knowledge through the payment of dividends, since they know that the firm is likely to sustain the distributions. Generally, the depicted trend shows that the number of dividend-paying firms is largely made up of profitable companies than non-profitable ones.

Size

Table 4 shows that dividend-paying firms are significantly larger than those that do not pay dividends in terms of assets. During the period 1994 to 1996, dividend-paying firms have nine times more assets as a collective than non-payers. This number falls to an average of 4 in the late 1990s and 2000s and it is in line with the idea that most firms that were entering the market at the time were non-payers. Post-2005, this number averaged around 3 for the most part and dropped to 1.5 by the end of the sample period. These numbers could easily mislead one into thinking that the assets of payers were shrinking while non-payers are accumulating more and more. However,

these numbers are a result of the shrinking number of dividend-paying firms rather than the loss of wealth by these firms. Also, the differences in the asset values may be misleading owing to the fact that there is no information presented on the types of firms under each group. Some firms hold tangible assets while others do not, and the table does not present the type of firms that the paying group comprises, like wise for the non-payers.

Therefore, the reduction in asset values of the payers is mainly due to displacement, either due to payers reversing or changing their distribution method and joining the non-paying group, or entities have delisted from the exchange due to a general trend of the reduction in the number of JSE firms. Subsequently, the remaining companies that pay dividends may have not lost the value of their assets but their number may have been reduced so drastically that their combined assets no longer add to what they used to be. Additionally, considering that 94% of firms no longer pay dividends by 2020, it is surprising that payers as a collective maintain assets that are almost equal in value to those of their counterparts. Thus, according to the asset value presented in Table 4, larger firms are more likely to pay dividends than smaller ones measured in assets.

The size as per market capitalization is consistent with the trend observed under assets. However, the interpretation of these values might not be as simple as that of assets. Based on the numbers only, the market capitalization of dividend-paying firms is higher than that of non-payers. However, market capitalization is made up of two factors, the price of a share and the number of outstanding shares. Since non-payers are popular for ploughing back to the expansion of the company and are mainly considered growth companies, their share price might be high, signaling their growth potential. Consequently, non-payers are popular for issuing equity, meaning the high number of shares multiplied by the high market price should amount to a much higher market capitalization value. Subsequently, dividend payers are likely to issue less equity. Therefore, these values do not present a clear-cut explanation. Even so, the market capitalisation values conform to the idea that larger companies are likely to pay dividends.

Further analysis of Table 4 reveals interesting information that is in support of the previous discussion regarding market capitalization values. The equity ratio (EQ/A) is an indication of how the company's assets are funded between debt and equity. Thus, the values indicate that fewer assets of the firms that do not pay dividends were funded through equity over time. For non-payers, this value dropped from an average of 67,87% during the period 1994 to1996 to a low of 9.28% from 2018 to 2020. Conversely, dividend-paying companies steadily kept their residual claim over assets to an average value of 40% throughout the entire sample period. This partly explains the

low value of market capitalization observed for non-dividend paying firms. Additionally, though not perfectly matched, the direction of the equity ratio for dividend-paying firms is consistent with that of the market capitalization values.

Shifting the focus of the analysis to the solvency (L/A) ratio, it conveys a similar story to that of the equity ratio. This ratio is used to scrutinize the number of company assets that are made up of liabilities. For the period 1994 to 1996 this ratio amounted to 31,99% and continued to increase throughout the entire sample period to reach an average of 95,01% during the period 2018-2020 for all firms that did not pay dividends. Therefore, the assets of non-payers were funded consistently through debt for the duration of the sample period. On the contrary, dividend-paying firms kept their solvency ratio steady at an average of 60% for the entire sample period. This analysis leads to the same conclusion as that of the equity ratio regarding the low observed market capitalisation of firms that do not pay dividends. Thus, market capitalisation, the equity ratio and the solvency ratio present consistent information that cannot easily be translated to the decision of a company to pay dividends.

In summary, discussing the findings from the perspective of assets, these are in line with the notion that large companies are likely to distribute dividends to shareholders as opposed to their smaller counterparts. Likewise, the profitability matrix presents findings that are consistent with the idea that larger and more profitable companies are more likely to pay dividends in comparison to smaller non-profitable entities. The findings also highlight some alignment with the agency theory which predicts that larger profitable firms are likely to engage in wasteful expenditures that are not fruitful to the firm. Thus, because shareholders are aware of this behaviour, it is likely that they insist on the distribution of dividends to prevent management from embarking on wasteful activities at the expense of the shareholders.

Free cash Flow

The free cash flow measure reveals how much remains after the payment of all firm expenses and the expenditure of the remaining funds is at a company's discretion. Firms that do not pay dividends show negative free cash flow throughout the entire sample period. From 1994 to 2020, the free cash flow of non-paying firms generally leans towards the negative side. Generally, high amounts of free cash flow mean that the firm's financial position is well off, however, negative values do not automatically declare failure. The negative free cash flow could be a result of capital expenditure exceeding the amount generated by the business, on the other hand, negative profits

could also be the cause of this. The previous earnings analysis reveals that the negative values observed could be the results of poor performance by non-payers. Therefore, as much as negative free cash flows could be a sign of success, it would be a challenge to defend these numbers considering the previous analysis based on the profitability of non-payers.

Subsequently, dividends-paying firms start with an average free cash flow to assets ratio of 27.9% during the period 1994-1996 and land at an average of 13.07% by the end of 2020. This is a significant decline in free cash flow during the sample period, however, it has been positive throughout. Also, the decline of this variable over time could reasonably be attributed to the declining proportion of dividend payers as in Section 5.2. These findings are not surprising because dividend payments are made out of free cash flow. Therefore, the logical explanation is that dividend-paying firms remain with a reasonable amount of funds after the payment of expenses and distribute part of these funds as dividends. Conversely, non-payers find themselves with less cash available to initiate dividend payments.

These findings are somehow in agreement with the solvency and equity ratio narration presented previously. Equity financing is generally not easier for smaller companies to attain, while this is the usual source of funding for well-established companies. This is in line with Jansen's (1986) free cash flow theory that shareholders will revise stock prices downwards to reveal their concerns about agency costs because management may be induced to use excess funds for their benefit at the detriment of the shareholders. Mann and Sicherman (1991) explore the extension of this reasoning by noting that shareholders' response to firms issuing equity will be based on their history of how they handled the free cash flow. They note that investors have a good reason to believe that the funds raised from equity issues have no binding commitment. Therefore, raising funds through creditors and preferred stock is safer since the firm will be held accountable through agreements, while money raised from equity has none of these properties attached to it. Thus, smaller companies are bound to prove their creditworthiness for a start before receiving support in the form of equity at a later stage of the firm's life when they can show stability.

Therefore, it would be logical to note that most of the smaller companies are funded through debt due to the accountability attachment that comes with it. While larger companies are easily trusted by investors who buy shares since they believe that it is unlikely that the entity will fail. Thus, the adversities that are attached to the build-up of free cash flow are curbed through dividend payments. This is in line with the notion that smaller developing firms are likely to engage in more

investments in pursuit of expanding the company, while larger firms are likely to distribute the funds to shareholders.

Investment growth opportunities

The two types of investment opportunities are presented below

- **The price to book ratio**

Focusing on the price to book ratio (P/B) for non-paying firms from 1994 to 1999 in Table 4, the averages start as positive and increase, however, the variable remains stable for the duration of the sample period at an average of 2. The increase in the book-to-market values during the period 1997-1999 is in line with the idea that growth companies were entering the market in numbers during this period. These companies were trading at a premium as they were expected to perform above average in comparison to other companies. Therefore, the market placed a higher price on them due to these growth prospects. Also, the decline in the average price to book value from 5,04% during 1997-1999 to 3.90% during the period 2000-2002 likely indicates the bursting of the bubble and the realisation of the market that some of the companies may have been unnecessarily overpriced, and in turn, investors revising predictions.

Also, the price to book value remains above the average of 2 for all the three-year intervals during the sample period excluding the years 2015-2017 at 1.97, any value above one is generally regarded as good. High price to book values and price to earnings ratios are usually found amongst growth companies that are expected to outperform the market. However, high values of these variables could also mean the stocks are overvalued and are worth less than they are trading for. Just like all other financial measures, it would be flawed to use this ratio in isolation to evaluate the performance of firms that do not pay dividends. In addition, it is a challenge to determine a standardized and acceptable ratio for companies as a collective since these values vary by industry. Thus, the higher share price for these companies may mean that much of the positive news about the entity is already incorporated into the price of the stock.

For dividend-paying firms, the price to book value variable mimics the pattern seen in non-paying firms. The variable increases from 1,84 to 4,52 between the first two intervals of the sample period, however, the variable continues to increase to 6,99 for the period 2000 to 2002. This is perhaps an indication that when the market realized that they had wrongfully priced most of the non-paying new incoming companies during this period, they revised their predictions and repriced large,

stable, and, more profitable companies that were in the market paying dividends. Also, the variable maintains the average value that is just above 2 after the year1996 to the end of the sample period. Considering that other metrics like profits, size and free cash flow of dividend-paying companies have positive findings, it is reasonable to believe that dividend-paying firms are trading at a premium for the reasons that are related to their positive performance.

- **The growth rate of assets**

The growth rate of assets represents the speed at which the entity is growing its assets and a higher value is normally regarded as good. For both groups, there is no clear pattern to be drawn from Table 4. For instance, during the period 1994-1999, this value increased from an average rate of 0,005 to 0,897 for non-paying firms. However, this is not in line with what was happening during this period since most companies in the technology sector have limited tangible assets which would lead to an expected decrease in this rate. Also, the period that incorporates the FIFA world cup between 2006 and 2011 does not seem to provide any meaningful information in terms of the growth rate of assets for firms that do not pay dividends. From 2009 to 2020, the assets of non-payers have either declined or not changed and the rate ranges from an average rate of -0,181 to 0.

The growth rate of assets is equally challenging to interpret for firms that pay dividends as there is also no general pattern detected. Unlike the market-to-book-to-market ratio, this variable is not necessarily expected to be higher for firms that do not pay dividends in comparison to those that do. Even so, the comparison does not provide much insight since the average values alternate between an increase and a decrease for consecutive interval periods. Therefore, under the descriptive statistic, this variable is challenging to make sense of.

4.4.2. Payers' contribution to the sample

Table 5 outlines the contribution made by dividend-paying firms to the entire sample for certain variables, some of which are discussed already. It is quite evident that dividend-paying firms are much more profitable and larger in terms of assets and market capitalisation. The contribution of profit made by dividend-paying firms ranges from an average of at least 50% to a high of 90%. Taking a closer look at the 50% that only prevailed during the period 2018-2020, it is surprising that dividend-paying firms contribute such a large amount to the overall profits of the sample while the number of these companies has declined. Without disputing the fact that dividend-paying firms are generally much larger than their non-paying counterparts, the values

Table 5

Displays the aggregate annual values averaged over a three-year (3) period for each variable. These are the values accounted for by dividend-paying firms only. EBIT= Earnings Before Interest and Taxes, TA= Total Assets, TL= Total Liabilities, FCF= Free cash Flow, Size= Market Capitalisation, and TE= Total Equity.

	1994-1996	1997-999	2000-2002	2003-2005	2006-2008	2009-2011	2012-2014	2015-2017	2018-2020
TA	66,30%	87,58%	90,04%	90,58%	91,20%	90,38%	92,59%	88,78%	71,00%
EBIT	86,52%	92,51%	93,85%	91,48%	91,31%	82,43%	67,00%	54,61%	56,50%
TL	78,87%	88,10%	86,58%	76,21%	87,11%	89,89%	86,78%	72,54%	73,12%
FCF	83,72%	91,15%	97,86%	91,74%	95,64%	97,43%	92,29%	94,61%	66,50%
Size	41,90%	96,03%	96,85%	93,23%	95,13%	96,13%	94,23%	87,87%	66,42%
TE	49,55%	66,84%	75,56%	74,89%	87,41%	86,38%	83,22%	72,63%	62,52%

presented in the Table are too extreme and not realistic. Therefore, Fama and French (2001) were faced with a similar challenge and they carefully noted that the high values are a result of negative values that are found especially among the smaller firms that were not paying dividends.

4.4.3. Propensity

Figure 5 shows the path of total earnings (as measured by EBIT) and free cash flow of all firms on the JSE for the duration of the sample period. The pattern observed is not surprising considering the analysis of the number of firms entering and exiting the JSE. In the early 2000s, the prevailing pattern shows a decline in total earnings, this is consistent with the fact that there were a lot of firms from the technology sector that failed as the internet bubble burst during this period. After reaching the highest peak in 2007, total earnings dropped rapidly signalling the fact that this was the recession period brought about by the stock market crash of 2008. The decline in earnings continues till the end of the sample period. However, the slope of the earnings decline is lower during the 2010 FIFA world cup, indicating that the event eased some of the pressure faced during that time.

The free cash flow shows a pattern that is typical of the earnings one, though its curves are much

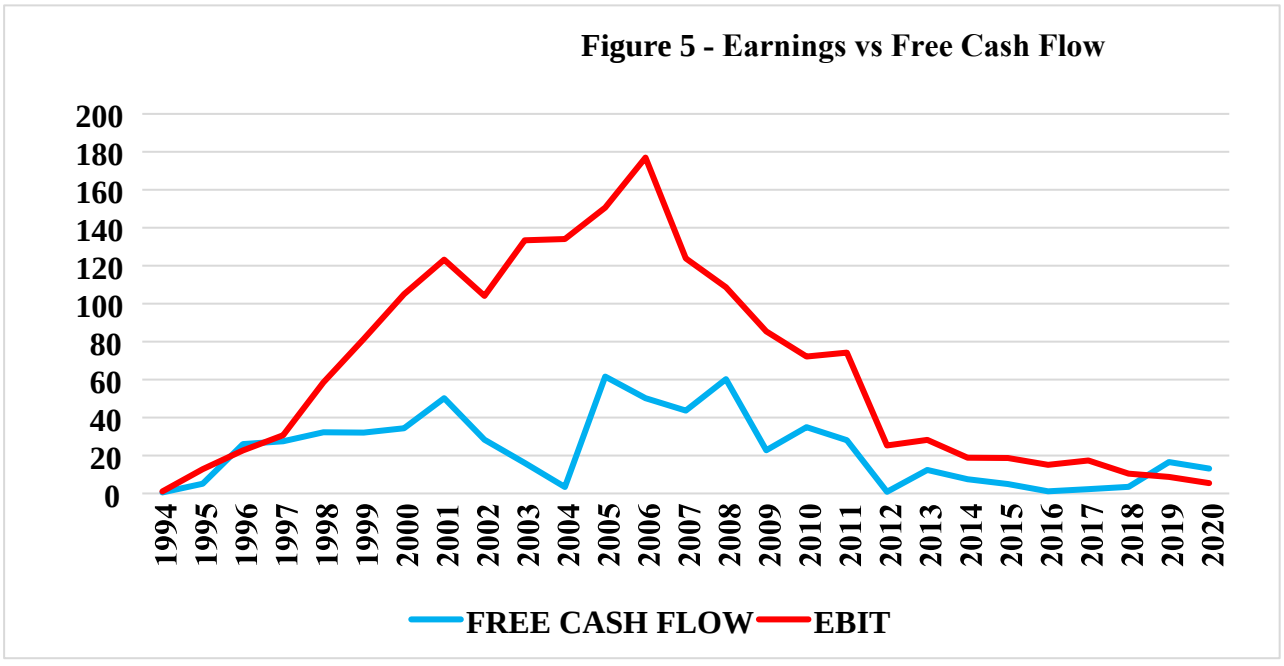


Figure 5 – Displays the earnings and free cash flow path during the sample period for all firms listed on the JSE excluding financial utility firms. Values in the y-axis are in millions.

more extreme considering that this variable nearly reached 0 in 2004. There is also a decline in free cash flow post-2008 after the stock market crash and some stability in the variable reflecting

the relief brought about by the FIFA world cup. Figure 5 does not address the number of dividend-paying firms, however, it is crucial to keep this in mind for the upcoming analysis in figure 6. It is important to get a picture of the earnings for the entire number of firms on the JSE in general for the concept of propensity as well. As defined by Fama and French (2000), the propensity to pay dividends refers to the interest or the eagerness of firms to pay dividends regardless of the prevailing circumstances at any point in time.

Our main interest, however, is in Figure 6 showing only the number of dividend-paying firms grouped per positive and negative values for the variables earnings and free cash flow. Until 2002, the number of firms paying dividends for profitable firms was on the rise. The pattern is consistent with that of Figure 1 from 1994 to 2004. Showing that many of the dividend-paying firms could have been driven by the overall number of firms listed on the exchange, instead of reasoning only the loss of interest in dividend payments. Post-2004, the number of dividend-paying firms was continuously declining to the end of the sample period, while the number of JSE firms number remained reasonably steady. This means that post-2004, the number of dividend-paying firms was

Figure 6 - Profiable vs. Non -profitable firms

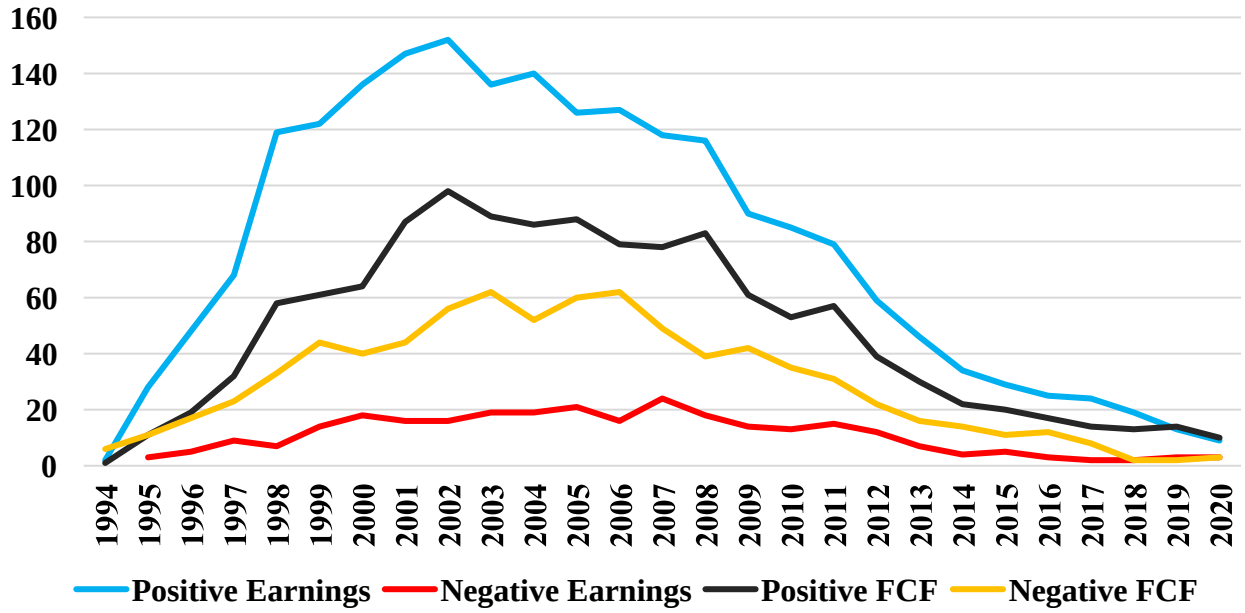


Figure 6 – Displays the number of firms that pay dividends under two groups (positive and negative) of Earnings(EBIT) and Free Cash Flow.

declining while that of non-payers increased due to the stability observed in the overall market from Figure 1. On the other hand, dividend-paying firms that reported profit losses during the sample period were generally increasing in numbers to 2007, though at a much lower rate than their counterparts with positive earnings. Post-2007 there was a continuous decline in the number of firms paying dividends to the end of the sample period. This shows that both profitable and non-profitable firms lost interest in paying dividends after a certain period. By the same token, both profitable and non-profitable dividend-paying firms were concurrently increasing at some point during the sample period.

Focusing on the free cash flow trend, it is evident that both groups share similar interests in terms of dividend payments. From the beginning of the sample period to the early 2000s, both groups had an increasing number of dividend-paying firms before the pattern could overturn negatively. Figure 6 also shows that the proportion of dividend-paying firms was much larger for those with positive earnings and free cash flow, but smaller for the negative values of the variables. These findings are consistent with predictions of hypotheses 1 and 4. As seen, an increase in earnings from Figure 5 is consistent with an increase in the number of dividend-paying firms from Figure 6, more so for firms with positive earnings. Also, it is expected that companies with large Free Cash flow will pay dividends as an attempt by shareholders to prevent management from engaging in unfruitful expenditure.

To further investigate the propensity matter, the study looks at size as measured by market capitalisation in Figure 7. The proportion of dividend-paying firms is on the rise from the beginning of the sample period in 1994 to 2004 for large firms. The declining trend is halted between 2009 and 2010 and continues to decline, an indication of an increased or stagnant dividend-paying firm number that is offset by an increased JSE market number due to the 2010 FIFA world cup. The possibility that new lists that pay dividends entered the market is ruled out because of the previous finding that all firms had already stopped initiating dividends by 2009. The small companies' trend is very much in line with the idea that most firms that entered the market during the late 1990s were small growth firms. However, this is in contrast with the idea that these were non-dividend-paying firms as the red line was higher than the blue one at the beginning of the internet bubble around the year 1996.

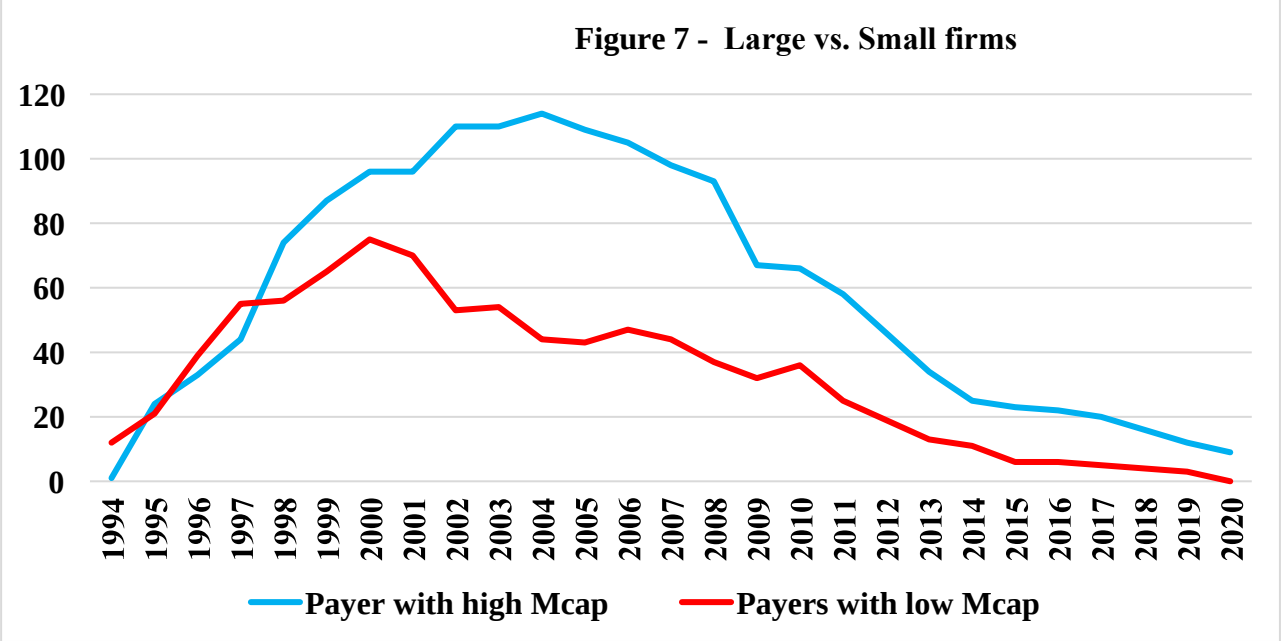


Figure 7 – Displays the number of firms that pay dividends under two groups of small and large Market capitalisation. The Market capitalisation of 10 billion rand splits the data into equal halves. Therefore, small or mid-sized companies have a Market capitalisation of less than 10 billion rand, while large companies have a Market capitalisation of 10 Billion rand and above.

By the early 2000s, small companies that paid dividends started disappearing from the pool of payers, the earlier turning point for this group in comparison to the larger group also confirms the failure of small companies when the bubble eventually burst in 2000. The number of smaller companies also increases in 2010 showing the obvious positive prospects of the world cup event. As much as Figure 7 shows that small-sized companies paid dividends, there is stronger evidence that the number of dividend payers increases much more with size. These findings are in line with hypothesis two: The proportion of dividend-paying firms is positively related to firm size. Therefore, If the proportion of dividend-paying companies in South Africa is increasing, this would mean that most of the dividend-paying firms are large.

Figure 8 shows two financial ratios, the Price-to-Earnings and Book-to-Market ratios that are both commonly associated with investment opportunities. Accordingly, firms with large investment opportunities are expected to engage less in dividend payments, while those with low investment opportunities are expected to pay dividends. As observed in Figure 8, all the groups have consistent patterns for payers' proportions throughout the entire sample period. Before the year 2001, all groups show similar interest in paying dividends, while they switch to not paying dividends as signalled by the declining proportion post this period. Figure 9 is presented separately from Figure 8 as it would have clattered the image of the other curves that are much smoother. The information presented is of the same reasoning related to growth opportunities. Larger $\Delta A/A$'s represent firms

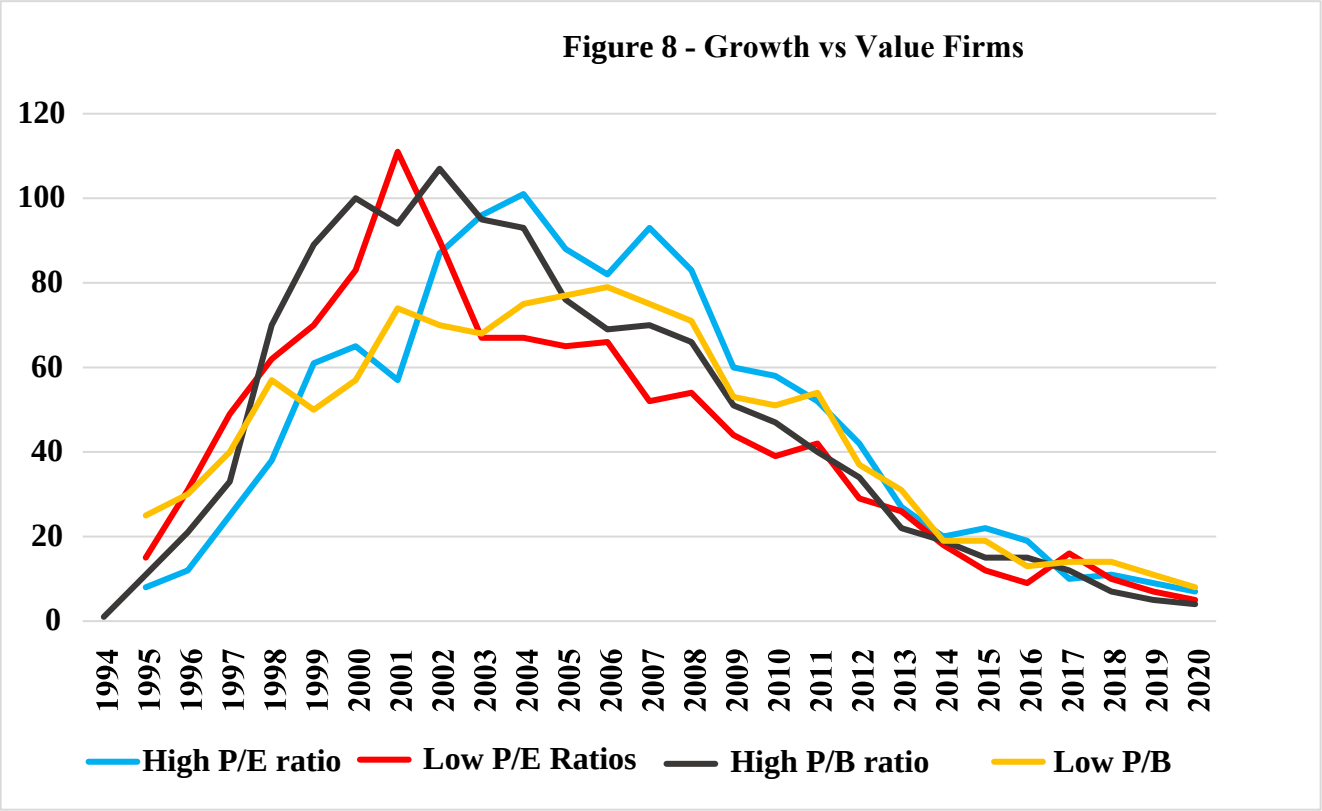


Figure 8 – Displays the number of firms that pay dividends under two groups (high and low) of P/E ratios and P/B ratios. P/E ratio of 11 splits the data into equal halves, therefore, High P/E ratio companies are all those with values equal to or higher than 11, low PE ratios are below this threshold. A P/B value ratio of 1.4 spits the data into equal halves, therefore, High P/B value firms have values above from 1.4 and above, while low P/B value firms have values lower than this.

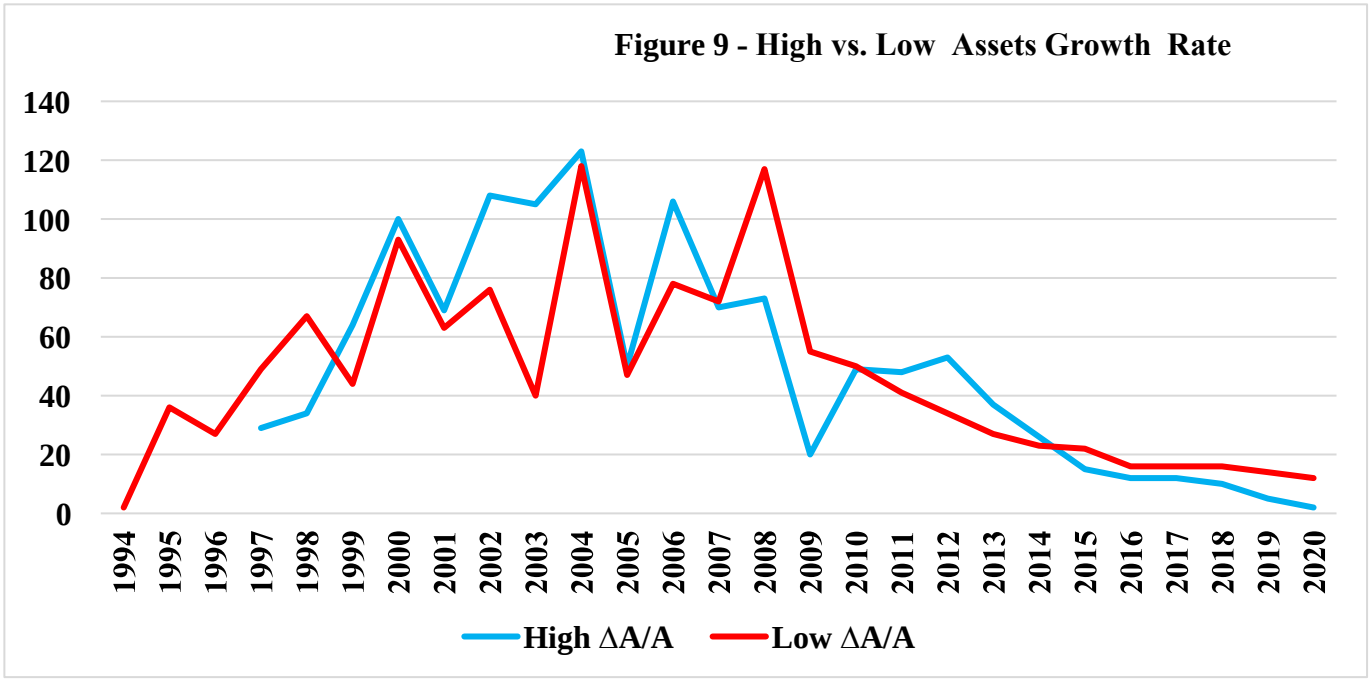


Figure 9 – Displays the number of firms that pay dividends under two groups (high and low) Growth Rate(ΔA/A). ΔA/A of 6.5% splits the data into equal halves, therefore, High ΔA/A companies are all those with values equal to or higher than 6,5%, while low ΔA/A firms have a smaller value than the thresh hold.

with a wide range of prospects and lower values are for those with limited growth opportunities but much more mature and stable. Figure 9 follows the same trend as that of Figure 8 in terms of the number of firms increasing and decreasing regardless of the level of ΔA/A.

These results reinforce the idea that financial attributes may not be the sole driver behind the decision for companies to pay or not pay dividends in the South African market. Instead, the determining factor is mainly attributed to the period as most of these firms reveal a similar dividend payment pattern, regardless of financial standing or characteristics at any point during the sample period. The introduction of repurchases during the year 1999 cannot be ruled out as one of the factors that drive the observed pattern because most of the evidence presented so far shows either no change or a reduction in the number of firms paying dividends after this period.

Figures 8 and 9 reveal surprising information about the payment decisions of the JSE firms. These results are in contrast with hypothesis 3. Both groups will either pay or not pay dividends regardless of their growth prospects. According to the descriptive stats, firms display similar interest in the area of dividend payments regardless of earnings, investment opportunities, size and free cash flow. Therefore, if the proportion of dividend-paying firms in South Africa has increased(decreased), generally, all firms have inclined interest to pay (not pay) dividends.

4.5. Logistic regression results

The logistic regression results are separated into two; results for all firms included in the computation and results for firms depending on their dividend payment status.

4.6.1 Regressions for all firms

Table 6A presents Spearman's correlation matrix of variables used in the regression analysis to follow. Some of the variables like size and earnings have a linear correlation of approximately 8%. However, this is not a cause for concern as the rule of thumb normally specifies a linear correlation of at least 10%. Table 6B displays the summary of three-year interval regressions for the entire sample period to estimate the official effects of the financial variables. Table 6C displays the corresponding statistics. The aim is to see the contribution that size, earnings, free cash flow and price-to-book make to the probability that a firm pays dividends.

For each of the intervals analysed are two regression models, the first model contains both proxies, while the second is based on just one which is the assets growth rate. Fama and French (2001)

Table 6A
Displays the Spearman's correlation for the variables

	Assets Growth Rate	Free Cash Flow	EBIT	Price to Book	Size
Assets Growth Rate	1	-0,00110	0,0011	0,00159	0,00403
Free Cash Flow	-0,00110	1	0,0167	0,00096	0,03875
EBIT	0,00117	0,01675	1	-0,07080	0,08114
Price to Book	0,00159	0,00096	-0,070	1	-0,06226
Size	0,00403	0,03875	0,081	-0,06225	1

have noted that using one measure of investment opportunities would be an injustice to any model estimation because many metric ratios are considered valid to proxy for this factor in the literature. The intercept of the model is negative, which means that if all other variables were zero (0), the probability that a firm pays dividends is affected negatively on average. This is in line with the findings of the descriptive statistics that generally, the propensity and the proportion of firms paying dividends has decreased over time.

The coefficient of earnings, size and free cash flow are consistent with the predictions that these variables contribute positively to the probability that a firm pays dividends. Therefore, the full period slopes for these variables are consistent with H1, H2 and H4. The proxies for investment opportunities conflict with each other. For instance, the growth rate of assets is negative and in support of the initial prediction stated in H3, while the price to book is positive. Dropping the growth rate of assets from the model estimation does not change the results in any significant way. The intercept and the coefficient of earning and size are significant for both models. However, the contribution of both investment proxies is non-significant for both models as well. For the full sample period, firms that are more profitable, large and generate enough free cash flow are most likely to pay dividends. This is not surprising since these types of firms are expected to reward shareholders in the form of dividends due to the availability of funds from high profits and free cash flow coupled with limited investment opportunities that management can invest in. Nothing significant can be deduced from the investment proxies looking at the full sample period model.

Table 6B

Displays logit regression results. Logit regressions are estimated for intervals of three years in the entire sample period, for the overall sample period from 1994 to 2020, and for the period 1994 to 2000 which is then used to forecast the expected proportion of dividend-paying firms for each year. The dependent variable takes the value of one (1) if a firm pays dividends and zero (0) for other groups. The first term of the regression results represents the intercept, independent variables are earnings (E/A), the Size of the firm which is a percentage of the total number of firms that are equal to or below it, the Free Cash Flow (FCF/A), assets growth rate (ΔA/A) and the Price-to-Book ratio (P/B). On the right side of the table are the p-Values of each

	Int	EBIT/A	Size	FCF/A	ΔA	P/B
1994-2020	***-1,5556	**0,4424	***3,1113	0,0000	-0,0003	0,0007
	***-1,5509	**0,4166	***3,1090	0,0000	-0,0003	
1994-2000	***-1,7388	***1,0109	***2,8137	**-0,0001	**-0,1129	0,0026
	***-1,7227	***0,9490	***2,8040	**-0,0001	**-0,1113	
1994-1996	***-2,1117	0,3623	***3,6264	-0,0003	-0,1871	-0,0332
	***-2,1729	0,4082	***3,6179	-0,0003	-0,2142	
1997-1999	***-1,0642	*0,8465	***2,0682	**-0,0003	*-0,0885	0,0032
	***-1,0414	*0,7701	***2,0523	**-0,0003	*-0,0886	
2000-2002	***-1,2156	**1,1273	***2,3662	-0,0001	0,0000	0,0038
	***-1,1774	*0,6563	***2,3631	-0,0001	-0,0001	
2003-2005	***-1,0577	***2,8320	***1,8424	0,0000	0,0288	***-0,0651
	***-1,1664	***2,5575	***1,8083	0,0000	0,0240	
2006-2008	***-1,9446	0,8101	***3,8757	0,0000	***-0,6327	*-0,0393
	***-2,0808	*0,8291	***3,9425	0,0000	***-0,6279	
2009-2011	***-2,4420	-0,0646	***6,3559	0,0000	***-0,8732	***-0,1353
	***-2,8025	-0,0026	***6,3408	0,0000	***-0,8991	
2012-2014	***-2,2789	**-0,3280	***8,2496	-3,7689	***-0,0003	***-0,3280
	***-3,1138	*-1,7888	***7,2104	0,0001	***-2,4668	
2015-2017	***-4,2826	-0,0091	***9,2434	0,0007	***-3,0937	***-0,3232
	***-4,8086	0,1474	***8,7116	0,0002	***-3,2928	
2018-2020	***-3,2778	0,2010	***10,339	***0,0010	***-2,7692	***-0,9140
	***-3,3222	0,2687	***8,9979	0,0002	***-3,0168	

10% , **5%,1% level of**

Table 6 C

Displays the statistic for the results presented in Table 6B, the first results reported for each year are for a model with both investment proxies, whereas the one below it is one variable of the same year. The reported number of observations are those used by the SAS system to run the regression which may be different from the read observation upon input. The Wald test is the is from testing the global null hypothesis that the model coefficients are jointly zero (0) and will have no effect on the decisions of a firm to pay dividends. The presented pseudo-R-squares are based on the McFadden formula.

	No Observations	Wald Test	Pr > ChiSq	Pseudo R-square
1994- 2020	5605	97,7446	<,0001	0,22401
	5605	97,8085	<,0001	0,22396
1994- 2000	1944	39,8317	<,0001	0,09848
	1944	39,0869	<,0001	0,09806
1994-1996	880	20,3221	<,0001	0,14741
	880	20,4135	<,0001	0,1461
1997-1999	952	63,9769	<,0001	0,53882
	952	62,9372	<,0001	0,54193
2000-2002	901	113,7905	<,0001	0,59908
	901	110,6929	<,0001	0,57621
2003-2005	851	25,464	<,0001	0,13381
	851	28,437	<,0001	0,12845
2006-2008	795	71,4371	<,0001	0,20084
	795	75,1913	<,0001	0,205
2009-2011	812	73,6398	<,0001	0,32719
	812	75,1123	<,0001	0,34651
2012-2014	773	46,8919	<,0001	0,44999
	773	47,2243	<,0001	0,3988
2015-2017	799	80,4781	<,0001	0,51104
	799	82,0488	<,0001	0,48775
2018-2020	728	50,8845	<,0001	0,64157
	728	40,6559	<,0001	0,50763

The second model covering the period 1994 to 2000 is specifically crucial for the next analysis presented in Tables 8 and 9. However, the estimated model is presented in Table 6B for consistency and clarity as Tables 8 and 9 present other information and not model estimates. This

period is specifically looked at because it covers much of the years when the number of dividend-paying firms was on the rapid rise regardless of the characteristics they possessed. Generally, the turning point in the pattern of dividend payments happens post-2000 as reflected in Figure 4. When grouped according to their characteristics, these turning points are at different positions in time during the sample period for different groups (see Figures 6,7,8 and 9). Therefore, to avoid bias, the cut-off is 2000 since none of the specific group trends change their dividend payment trends before then. The model from 1994 to 2000 also has a negative intercept which is in line with the general trend that in a pool, a firm is more likely not to pay dividends when all other variables are zero. The coefficient of earnings and size are significant and consistent with the initial predictions made in H1 and H2. For this period, the coefficient of the free cash flow is negative and contradicts the idea that generating enough cash flow will influence positively the decision of a firm to pay dividends. Again, the coefficients on the proxies for investment opportunities are in conflict and insignificant.

The other regression models are based on a three-year interval from 1994 to 2020. For the most part, the coefficients of earnings, size and the intercept are significant and consistent with the initial predictions. However, during the period 2009 to 2017, the coefficient of earnings takes a negative sign, but only at one point in the interval period 2012 to 2014 does its marginal effect becomes significant. The free cash flow coefficient is negative four out of five times and insignificant for the most part but not entirely. For the three-year intervals, the investment opportunity proxies are consistent with each other and negative, which is in line with H3 which predicts that the more growth opportunities a firm has, the less likely it will pay dividends. The investment proxies are mostly insignificant for the period 1994-2005, however, they overturn to significant from 2006 to the end of the sample period. The sudden contribution of growth opportunities to dividend-making decisions may be influenced by the number of firms following a similar pattern.

More firms with growth prospects opportunities may have abandoned the payment of dividends as they gradually become aware of other wealth distribution alternatives. The insignificant results for the growth opportunity factors are not surprising considering that descriptive statistic results were also in conflict with the initial predictions. In summary, the full period and intervals regression results support the idea that profitable firms that are larger are more likely to pay dividends. While the full period model supports the free cash flow hypothesis, the interval models present the inconsistency of the coefficient throughout the entire sample period. Conversely, the full sample period displays a disconnection between the investment proxies while the intervals present consistency between them. The intercept, earnings and size coefficient are shown to have stronger

marginal effects than the free cash flow and investment proxies as per the strength and persistence in their significance as per their p-values.

4.6.2 Regressions per payment status

Tables 7A and 7B display the summary of three-year interval regressions for the entire sample period to estimate the official effects of the variables for the group of paying and non-paying firms and corresponding statistics respectively. The aim is to see the contribution that size, earnings, free cash flow and price to book make to the probability that a firm pays dividends when payers and non-payer are separated. The measurement of earnings, size, free cash flow and investment opportunities is the same as outlined in the previous sub-section. Regrettably, further breaking down the group of payers into "Initiated" and "existing", and non-payers into "Former payers" and "Never paid" was not feasible for this study as the JSE pool of firms is already subjected to the criticism of being too small in comparison to other markets. One of the major guidelines for a logistic regression model is that the sample size must be large, with at least a minimum of 10 observations. Breaking down the groups violates this requirement and might produce spurious findings.

For both the full and interval periods, the intercepts are positive for payers and negative for non-payers. This means that among a group of payers, there is a higher chance that a firm will continue paying dividends, while non-payers will not pay or initiate dividends when all other variables are held constant. The earnings coefficient is positive for both groups under the full sample period and it changes signs for interval models, even so, it is positive more times than it is observed as negative. The size effect is positive both for firms that pay dividends and those that do not. The free cash flow variable is observed as negative for most of the intervals under both groups. This re-enforces a contradiction against H4 with the idea that free cash flow does not influence the decision to pay dividends positively as predicted. Surprisingly, both investment opportunity proxies are entirely consistent and positive for payers, while they are negative for non-payers. The consistency in investment opportunities is observed for both the full and all interval periods. This means that payers with large investment opportunities will probably continue to pay dividends, while non-payers with large investment opportunities will not likely initiate dividends.

Table 7A

Displays logit regression results for two groups, payers and non-payers (this group is a combination of firms that have never paid and those that have stopped paying dividends). Logit regressions are estimated for intervals of three years in the entire sample period, for the overall sample period from 1994 to 2020, and from 1994 through 2000. The dependent variable takes the value of one (1) if a firm pays dividends and zero (0) for other cases. The first term of the regression results represents the intercept, independent variables are earnings (E/A), the size of the firm which is calculated as a percentage of the total number of firms that are equal to or below each firm, the free cash flow (FCF/A), assets growth rate (ΔA/A) and the Price-to-Book ratio (P/B). On the right side of the table are the p-Values of each co-efficient estimated using the Wald test.

Payers	**Int**	**EBIT**	**Size**	**FCF**	**ΔA/A**	**P/B**
1994-2020	**3,7385	0,0293	28,8998	-0,0020	6,5017	4,3739
1994-2000	6,2322	3,2772	12,0824	-0,0062	7,4228	8,6086
1994-1996	6,2183	-56,8674	15,0605	0,0084	20,5357	4,7188
1997-1999	5,3660	2,8268	9,6812	-0,0055	6,4454	7,8169
2000-2002	4,5958	0,3589	18,6873	-0,0070	8,8066	5,8763
2003-2005	3,1385	17,3953	10,5143	-0,0015	1,2527	9,8634
2006-2008	4,6059	20,2115	12,1548	-0,0018	6,8906	8,3289
2009-2011	6,2846	4,1059	10,9753	-0,0015	11,0423	8,1594
2012-2014	5,0279	0,1048	6,1950	0,0010	5,8529	9,5209
2015-2017	11,9452	-23,7034	5,2779	-0,0045	32,4413	2,7972
2018-2020	9,3858	-48,8139	8,7985	-0,0005	29,3581	2,6639
Non-payers						
1994-2020	-32,1582	2,3638	29,3248	0,0000	-0,0095	-0,2219
1994-2000	-26,4243	2,7370	25,0542	-0,0002	-3,2244	-0,0355
1994-1996	-68,3505	49,852	65,6494	-0,0009	-3,1091	2,1279
1997-1999	-45,4053	7,2980	46,8457	-0,0011	-7,3629	-0,0227
2000-2002	-35,7936	5,1862	35,1819	-0,0002	0,0000	-0,3159
2003-2005	-32,2942	-0,9385	30,9146	0,0002	-8,6017	-0,1690
2006-2008	-22,6000	-0,0749	131,8000	-0,0034	-3,3349	-1,1531
2009-2011	-32,8797	39,0936	31,3616	-0,0003	-2,0707	0,1925
2012-2014	-21,7785	21,8379	21,0313	0,0013	-0,4898	0,1148
2015-2017	-20,4250	-0,9857	17,6616	0,0066	0,0964	0,0492
2018-2020	-19,6575	-0,5287	26,1089	0,0009	-0,1586	0,0089

10% , **5%,1% level of significance**

Table 7 B

Displays the statistic for the results presented in Table 7A, the first results reported for each year are for a model with both investment proxies, whereas the one below it is one variable of the same year. The reported number of observations are those used by the SAS system to run the regression which may be different from the read observation upon input. The Wald test is computed from testing the global null hypothesis that the model coefficients are jointly zero (0) and will have no effect on the decisions of a firm to pay dividends. The presented pseudo-R-squares are based on the McFadden formula.

Period	No Observation	Wald Test	Pr > ChiSq	Pseudo R-square
1994- 2020	2079,455	4,8448	0,4351	90,41%
	3525,545	1,3979	0,245	41,81%
1994- 2000	1263,6	1,2983	0,9351	78,99%
	680,4	1,8606	0,8681	57,88%
1994-1996	598,4	0,3193	0,9973	69,83%
	281,6	1,6296	0,8976	87,17%
1997-1999	437,92	1,444	0,9194	88,79%
	514,08	1,5556	0,9066	69,84%
2000-2002	441,49	1,5614	0,9059	91,45%
	459,51	1,5594	0,9061	53,38%
2003-2005	493,58	0,6261	0,9868	90,70%
	357,42	1,4509	0,9187	81,63%
2006-2008	421,35	0,5291	0,991	84,75%
	373,65	1,4064	0,9236	81,53%
2009-2011	259,84	0,5321	0,9909	93,72%
	552,16	1,1437	0,9502	80,06%
2012-2014	123,68	0,5399	0,9906	86,70%
	649,32	1,9247	0,8595	91,54%
2015-2017	79,9	0,235	0,9987	89,88%
	719,1	1,3629	0,9283	97,21%
2018-2020	36,4	0,2145	0,999	83,88%
	691,6	0,3499	0,9966	92,56%

In summary, separating the groups into payers and non-payers reveals consistent evidence for the effect of the intercept, size and investment opportunities. The earnings and free cash flow coefficients do not have a solid direction in terms of signs. Of crucial importance to note is that when the groups are analysed separately, none of the p-values is less than 5%, rendering all of the model slopes insignificant. It should be noted though, that p-values are vulnerable to sample sizes.

4.6.3 Characteristics and propensity effects for all firms

To estimate the contribution of propensity and change in characteristics in the JSE market, the use of previously estimated logistic regressions comes in handy for this section. Substituting the variables into the equation model shown in Table 8 for each firm produces the probability that a firm pays dividends. Therefore, if each firm is weighted against its probability for each sample size annually, this will provide the estimated probability of dividends payers for any sample, which can be converted to percentages when multiplied by 100. Since the study estimates interval models, applying this model to annual data that falls under that interval produces actual probabilities. The differences in actual probabilities over the years show the effect of changing characteristics for firms. Therefore, if the characteristics of firms remain constant over the years, their regression models would also remain the same.

The concept of expected probability is slightly different from that of the actual only by the model applied. As already noted in the previous sub-section, the peak of dividend payers was generally in 2000, thus, the appropriate model to estimate the expected probability after the peak is that which covers the 7 years from 1994 to 2000. Therefore, the application of this model annually beyond the year 2000 simply states that, if the trend continued, then the resulting model for the period 2000 to 2020 would remain the same. Therefore, inputting the data into the same model throughout the sample period shows "what could have been". The difference between "what could have been" and what happened is the difference between the expected values and the actual values that result in the propensity of firms to pay dividends each year. If the difference between the expected and the actual is positive, it means that firms have lost eagerness to pay dividends because their actual percentage of payers is lower than that provided by the predicting model.

Table 8 presents the results in percentages for the expected and actual probabilities, and the difference. The application of the models for the results on the far right is the same procedure as previously explained above, the only difference between the two samples is that one model includes both proxies for growth opportunities while the other only includes the asset growth rate variable as marked in the column headers. The calculation of probabilities begins in 2001 which is the first year outside of the base period since the prior years yield almost similar results due to the same model application for both expected and actual values. From 2001 to 2020, the change in the number of firms that pay dividends due to changes in characteristics decreased by 22.39% from 51,17% to 28,78%.

Table 8

Displays the proportions of dividend-paying firms for two groups, one with two variables for growth opportunities (B/M and ΔA/A), on the right-hand side the B/M is dropped. The proportions are estimated annually for the entire sample period of 1994-2020. Annual expected proportions of dividend-paying firms are estimated from the logit regression of 1994-2000. Annual actual proportions of dividend-paying firms are estimated from interval regressions that cover a specific year. The first term of the regression results represents the intercept, independent variables are Earnings (E/A), the Size of the firm which is a percentage of the total number of firms that are equal to or below each firm, the Free Cash flow to the total assets (FCF/A), Assets Growth Rate (ΔA/A) and the Price-to-Book ratio (P/B). On the right side of the table are the p-Values of each co-efficient estimated using the Wald test. The proportion of dividend-paying firms annually can be computed from the below formula and averaging the results for each sample.

Proportion = Probability x 100 = $\frac{e^{(\beta_0 + \beta_1 \frac{E_t}{A_t} + \beta_2 SIZE_t + \beta_3 \frac{FCF_t}{A_t} + \beta_4 \frac{\Delta A_t}{A_t} + \beta_5 \frac{P_t}{B_t})}}{(1 + e^{(\beta_0 + \beta_1 \frac{E_t}{A_t} + \beta_2 SIZE_t + \beta_3 \frac{FCF_t}{A_t} + \beta_4 \frac{\Delta A_t}{A_t} + \beta_5 \frac{P_t}{B_t})})}$ x 100

		B/M and ΔA/A			ΔA/A		
	No. of Firms	**Expected**	**Actual**	**Exp - Act**	**Expected**	**Actual**	**Exp - Act**
2001	370	51,17%	48,19%	2,98%	52,16%	50,18%	1,98%
2002	348	53,15%	52,16%	0,99%	52,32%	50,51%	1,82%
2003	333	51,50%	48,85%	2,65%	55,41%	56,68%	-1,27%
2004	261	59,33%	64,52%	-5,19%	58,13%	62,11%	-3,98%
2005	257	56,92%	59,70%	-2,78%	56,34%	58,53%	-2,20%
2006	257	55,75%	57,37%	-1,61%	54,87%	55,61%	-0,73%
2007	268	54,00%	53,85%	0,15%	52,35%	50,56%	1,79%
2008	288	50,70%	47,26%	3,44%	47,19%	40,23%	6,95%
2009	307	43,67%	33,20%	10,47%	43,66%	33,17%	10,48%
2010	287	43,64%	33,15%	10,50%	42,76%	31,38%	11,38%
2011	307	41,88%	29,62%	12,26%	39,82%	25,51%	14,32%
2012	317	37,77%	21,40%	16,37%	36,23%	18,33%	17,91%
2013	326	34,70%	15,26%	19,44%	33,54%	12,94%	20,60%
2014	327	32,38%	10,62%	21,76%	32,10%	10,06%	22,04%
2015	324	31,82%	9,49%	22,32%	31,50%	8,85%	22,64%
2016	304	31,18%	8,21%	22,97%	31,11%	8,07%	23,03%
2017	291	31,04%	7,93%	23,10%	30,67%	7,19%	23,48%
2018	282	30,29%	6,45%	23,85%	29,88%	5,61%	24,27%
2019	277	29,46%	4,78%	24,68%	29,12%	4,70%	24,42%
2020	271	28,78%	3,43%	25,36%	28,25%	4,03%	24,23%

Moving down column 3 from 2001 to 2020 shows the effect of changes in characteristics because the same model is applied but produces different proportions. Put differently, If the characteristics of the data remain the same within a given sample period, the resulting estimation model will be the same regardless of the length of the interval within that period. Therefore, the differences in the values for column 3 reflect that there were changes in firms' characteristics for the duration of the sample period.

Column 4 shows the estimated percentages of dividend-paying firms from 2001 to 2020 as per the actual regression models that involve the annual data in its estimation. The difference between the expected and the actual in 2001 is only 2,98% compared to 25,36% in 2020. Therefore, moving down the years in column 5 reflects the effect of the propensity to pay dividends and how it has increased over the years. Since 2001, firms have been generally less eager to pay dividends, signaling the increased propensity to abandon the payment of dividends over the years. The period 2004 to 2006 shows that companies were eager to pay dividends instead as the results are negative, this is surprising and there is no logical answer provided in the study. Even so, these results are based on an estimated model and it would not be reasonable to expect perfect outcomes, apart from that, only three out of twenty outcomes are slightly off.

The results on the far right are also interpreted similarly for columns 6 to 8 as in columns 3 to 5. The exclusion of the price to book value factor variable does not seem to have any effect on the observed results. This does not come as a surprise considering that the estimated regression models did not differ much when both investment proxies were included together or with the estimation of only one variable. The change in the proportion of firms that pay dividends due to changes in characteristics becomes 23.91% vs 22.39% when both investment proxies were included in the model. The propensity to pay dividends widens by 22.25% when only the change in assets is included in the model in comparison to 22.38% when both variables are used to estimate the model. Generally, the characteristics of the non-financial/non-utility companies of JSE market firms have gradually changed from 1994 to 2020, firms also display a reduced propensity to pay dividends over the sample period.

4.6.4 Characteristics and propensity effects per dividend status

The previous analysis does not separate the contribution of dividend-paying firms from non-payers, thus, Table 9 provides details in this regard. Fama and French (2000) leave out a minor detail in their methodology about how the logistic regressions were performed for separate groups. For clarity, it is highly unlikely that their paper considered other types of logistic regression models like the ordinal and multinomial. The most logical deduction is that they used a binary logistic

Table 9

Displays the proportions of dividend-paying firms for two groups, payers and non-payers (this group is a combination of firms that have never paid and those that have stopped paying dividends). The proportions are estimated annually for the entire sample period of 1994 to 2020. Annual expected proportions of dividend-paying firms are estimated from the logit regression of 1994-2000. Annual actual proportions of dividend-paying firms are estimated from interval regressions that cover a specific year. The dependent variable takes the value of one (1) if a firm pays dividends at time t and zero (0) for other cases. The first term of the regression results represents the intercept, independent variables are Earnings (E/A), the Size of the firm which is a percentage of the total number of firms that are equal to or below each firm, the Free Cash flow to the total assets (FCF/A), Assets Growth Rate (ΔA/A) and the Price-to-Book ratio (P/B). On the right side of the table are the p-Values of each co-efficient estimated using the Wald test. The proportion of dividend-paying firms annually can be computed from the below formula and averaging the results for each sample.

$$\textbf{Proportion} = \text{Probability} \times 100 = \frac{e^{(\beta_0 + \beta_1 \frac{E_t}{A_t} + \beta_2 \text{SIZE}_t + \beta_3 \frac{FCF_t}{A_t} + \beta_4 \frac{\Delta A_t}{A_t} + \beta_5 \frac{P_t}{B_t})}}{(1 + e^{(\beta_0 + \beta_1 \frac{E_t}{A_t} + \beta_2 \text{SIZE}_t + \beta_3 \frac{FCF_t}{A_t} + \beta_4 \frac{\Delta A_t}{A_t} + \beta_5 \frac{P_t}{B_t})})} \times 100$$

Payers				**Non-payers**		
	Expected	**Actual**	**Exp - Act**	**Expected**	**Actual**	**Exp - Act**
2001	98,35%	98,17%	0,18%	5,32%	5,73%	-0,41%
2002	98,38%	98,10%	0,28%	6,13%	6,06%	0,07%
2003	98,19%	97,92%	0,27%	5,99%	8,55%	-2,56%
2004	98,25%	97,74%	0,50%	11,11%	10,51%	0,61%
2005	98,08%	97,54%	0,54%	9,90%	9,62%	0,28%
2006	98,00%	97,21%	0,79%	9,35%	8,81%	0,54%
2007	97,96%	97,65%	0,31%	8,26%	7,49%	0,78%
2008	97,84%	97,31%	0,53%	6,71%	5,83%	0,88%
2009	97,14%	96,96%	0,18%	4,95%	5,12%	-0,17%
2010	96,94%	96,51%	0,43%	5,29%	4,99%	0,30%
2011	96,81%	95,64%	1,17%	4,69%	4,38%	0,31%
2012	95,77%	94,07%	1,70%	4,07%	3,86%	0,20%
2013	94,34%	92,54%	1,80%	3,66%	3,56%	0,10%
2014	92,11%	90,86%	1,25%	3,46%	3,45%	0,01%
2015	91,18%	89,64%	1,54%	3,45%	3,54%	-0,09%
2016	89,29%	87,82%	1,47%	3,62%	3,70%	-0,08%
2017	88,46%	85,14%	3,32%	3,77%	3,80%	-0,03%
2018	85,71%	80,83%	4,88%	3,82%	2,93%	0,89%
2019	81,25%	78,39%	2,86%	3,23%	2,65%	0,58%
2020	75,53%	72,18%	3,35%	3,86%	2,31%	1,55%

regression model which strictly requires that the dependent variable take 2 values. Therefore, if groups are separated into payers or non-payers, there is only one possible value for the dependent variable and that is either 0 or 1 for both groups. Performing a binary logistic regression model on SAS enterprise with only one value for the dependent variable is impossible. The paper deals with this challenge by adding one observation from the non-paying group when regressing the payer data and vice versa. The results are surprisingly logical, the smaller the sample becomes, the more weight each observation carries, this is seen in columns 2 and 3. For non-paying firms, the larger the sample becomes, the less weight is carried by the observation from the paying group. This was a reasonable way to estimate regressions for Table 7A to produce Table 9 because ultimately, the majority of observations in any sample provide the best estimation for any population.

The results are nothing out of the ordinary considering the previous analysis. What is evident from Table 9 is that payers were more eager to abandon the payment over the years. The effect of changes in characteristics is also prevalent among firms that pay dividends. Changing characteristics caused the decrease in the number of dividend-paying firms by 22.82% dropping from 98,35% in 2001 to 75.53% in 2020. This figure is close to 22.39% which was the effect of changing characteristics estimated from the entire pool of firms. These results reinforce the idea that the declining number of dividend-paying firms was more generally a result of the payers' changing characteristics and generally losing interest in the payment of dividends regardless of their characteristics. Characteristics of non-paying firms do not change much as the decline is from 5.32% in 2001 to 3,86% in 2020 resulting in a change of only 1.46%. Also, the propensity to pay dividends from this group has shifted very little over the sample period.

4.6. Portfolio sorting

The next method focuses on a portfolio-based analysis where firms are grouped into portfolios to assess the effect of one variable while holding another constant. Fama and French (2001) noted that this approach is superior to that based on regressions because the latter involves the prediction of a model which has some form of specification error to some extent. On the contrary, the base period probabilities from the portfolio approach differ across different firm characteristics without this limitation.

Table 10 displays the setting in two parts distinguished by the type of profitability measure. Notice that both parts A and B of Table 10 are based on the measure of price to book for investment proxies. Upon analysis, it was discovered that a greater number of firms had more data available

for the P/B ratio compared to assets growth rate, hence, the decision for the choice of the investment proxy. The lower number of data points for assets growth rate in comparison to the price to book measure resulted in a much more volatile curve for the former vs the smother one for the latter over the years, which may distort the results. Therefore, smoother data provided by the price to book variable is preferred to paint a clearer picture of the prevailing trend.

4.7. Portfolio analysis findings: Characteristics

Focusing only on part A of Table 10, the proportion of dividend-paying firms is mainly occupied by larger firms in comparison to smaller ones. This can be seen by comparing block A and block G for the period 2000 to 2002 and 2018 to 2020, the small firms' group has a lower percentage of dividend-paying firms for both periods in comparison to the large firms' group. Block ABC vs GHI also reveal that larger dividend-paying firms disappear at a higher rate than the small ones, the difference between the period 2018 to 2020 and 2000 to 2002 is larger for large firms than for small ones. This is confirmation that the declining proportion of dividend-paying firms is driven by larger firms abandoning this department more so than smaller ones. Furthermore, by 2020, the proportion of dividend-paying firms under the small group range from a low 0,50% to a high 14,96% when compared to 16,77% and 45,72% for larger firms respectively. This is additional evidence that the payment of dividends is mainly the area of large firms.

The effect of profit can be seen by holding both size and investment opportunities constant. Focusing on the smaller firms and a specific level of price to book value column under Table 10A, it can be deduced that a larger proportion of dividend-paying firms is clustered under those with higher profits relative to lower profits. To clarify, block C has generally higher percentage numbers than block B which also has higher values than block A when comparing matching columns of the price to book value ratio levels. For medium firms, the effect of profits is not as obvious as seen under the small group firms, however, large firms present a much stronger case than the other two groups. Therefore, firms that have higher profits relative to those with lower profits are more likely to pay dividends, more so if they are classified as larger when compared to their counterparts.

Table 10

Displays the average proportion of dividend-paying firms in 27 portfolios for the whole sample period (1994-2020), the base period (1994-2000) and three-year sub-periods from 2000. The number of firms is split evenly for the variables EBIT, FCF, and P/B. The intersection of the 20th and the 60th percentile approximately split the number of firms evenly for the small, medium and larger size firms.

Part A			**Small Firms**								
A	**L-Profit**			**B**	**M-Profit**			**C**	**H-Profit**		
	L-P/B	**M-P/B**	**H-P/B**		**L-P/B**	**M-P/B**	**H-P/B**		**L-P/B**	**M-P/B**	**H-P/B**
1994-2020	35,26%	8,95%	5,79%		47,89%	37,37%	9,47%		41,20%	23,68%	10,53%
1994-2000	**57,83%**	**37,59%**	**24,43%**		**61,80%**	**63,02%**	**39,91%**		**72,17%**	**67,81%**	**44,08%**
2000-2002	39,15%	26,57%	15,29%		43,51%	39,76%	28,88%		42,68%	37,14%	31,57%
2003-2005	32,15%	23,86%	15,14%		38,31%	33,73%	21,29%		39,66%	7,78%	20,11%
2006-2008	29,26%	18,77%	13,12%		32,68%	29,79%	17,43%		38,35%	3,77%	12,88%
2009-2011	23,25%	13,96%	7,58%		26,90%	20,96%	13,28%		35,96%	0,38%	7,13%
2012-2014	16,11%	7,62%	4,32%		20,11%	13,02%	6,20%		25,53%	1,00%	1,80%
2015-2017	15,23%	5,18%	1,23%		16,66%	8,20%	4,13%		23,31%	0,67%	0,86%
2018-2020	12,58%	4,94%	0,00%		14,96%	9,14%	3,95%		22,52%	0,51%	0,50%
			Medium Firms								
D	**L-Profit**			**E**	**M-Profit**			**F**	**H-Profit**		
	L-P/B	**M-P/B**	**H-P/B**		**L-P/B**	**M-P/B**	**H-P/B**		**L-P/B**	**M-P/B**	**H-P/B**
1994-2020	51,71%	47,01%	11,11%		50,85%	40,60%	29,91%		44,44%	27,35%	45,30%
1994-2000	**55,82%**	**36,28%**	**23,58%**		**56,28%**	**33,06%**	**26,53%**		**52,44%**	**45,59%**	**29,63%**
2000-2002	36,57%	27,86%	19,93%		39,08%	25,14%	22,26%		38,69%	26,34%	22,17%
2003-2005	34,29%	23,57%	16,23%		33,04%	22,03%	17,81%		35,39%	23,36%	19,34%
2006-2008	28,19%	19,09%	15,11%		28,14%	18,64%	14,18%		35,53%	19,65%	16,68%
2009-2011	21,96%	13,41%	11,01%		22,93%	13,93%	9,69%		30,24%	15,46%	10,53%
2012-2014	18,43%	8,11%	4,42%		14,54%	6,96%	7,20%		23,07%	7,81%	5,96%
2015-2017	15,46%	6,20%	4,13%		12,24%	5,65%	4,06%		18,91%	7,13%	3,40%
2018-2020	14,22%	7,01%	3,41%		9,51%	4,70%	2,58%		13,66%	4,64%	3,37%
			Large Firms								
G	**L-Profit**			**H**	**M-Profit**			**I**	**H-Profit**		
	L-P/B	**M-P/B**	**H-P/B**		**L-P/B**	**M-P/B**	**H-P/B**		**L-P/B**	**M-P/B**	**H-P/B**

1994-2020	65,26%	71,05%	58,42%	59,47%	78,95%	79,47%	69,47%	79,81%	80,00%
1994-2000	**62,71%**	**68,49%**	**70,27%**	**64,64%**	**62,97%**	**65,65%**	**70,63%**	**65,17%**	**72,69%**
2000-2002	51,72%	46,46%	46,71%	57,25%	59,83%	60,17%	58,82%	63,40%	68,51%
2003-2005	46,44%	44,30%	42,86%	50,26%	56,60%	47,34%	57,45%	60,07%	65,92%
2006-2008	42,75%	43,56%	45,64%	47,54%	51,75%	48,89%	55,13%	58,30%	62,74%
2009-2011	39,53%	36,75%	39,87%	44,00%	40,19%	44,47%	44,63%	56,05%	58,60%
2012-2014	28,16%	22,81%	26,08%	33,42%	29,34%	35,52%	36,38%	44,38%	48,83%
2015-2017	24,50%	20,32%	26,07%	29,58%	28,94%	31,40%	33,37%	43,05%	46,96%
2018-2020	23,93%	16,77%	20,91%	28,63%	29,71%	28,22%	31,31%	42,50%	45,72%
Part B			**Small Firms**						
A	**L-FCF**			**B**	**M-FCF**			**C**	**H-FCF**		
	L-P/B	**M-P/B**	**H-P/B**		**L-P/B**	**M-P/B**	**H-P/B**		**L-P/B**	**M-P/B**	**H-P/B**
1994-2020	33,98%	7,04%	5,13%		46,16%	36,70%	8,69%		39,37%	23,40%	9,71%
1994-2000	**56,22%**	**37,28%**	**24,16%**		**60,35%**	**61,09%**	**38,40%**		**71,80%**	**66,59%**	**43,28%**
2000-2002	38,58%	24,69%	14,46%		43,09%	38,69%	28,03%		42,03%	36,60%	29,97%
2003-2005	31,49%	22,06%	14,00%		37,20%	33,72%	19,72%		38,59%	7,59%	18,98%
2006-2008	29,08%	17,06%	12,93%		31,97%	28,00%	15,44%		37,23%	2,31%	12,03%
2009-2011	22,47%	12,73%	7,21%		25,03%	20,49%	11,37%		34,50%	1,08%	6,48%
2012-2014	15,76%	6,19%	2,65%		18,22%	11,04%	4,87%		24,24%	0,77%	1,27%
2015-2017	13,39%	3,63%	1,04%		14,76%	7,72%	2,17%		23,18%	0,00%	0,76%
2018-2020	12,16%	3,90%	0,67%		13,57%	7,17%	3,03%		21,37%	0,00%	0,05%
			Medium Firms						
D	**L-FCF**			**E**	**M-FCF**			**F**	**H-FCF**		
	L-P/B	**M-P/B**	**H-P/B**		**L-P/B**	**M-P/B**	**H-P/B**		**L-P/B**	**M-P/B**	**H-P/B**
1994-2020	51,41%	46,45%	9,59%		50,73%	38,71%	27,95%		43,61%	27,12%	44,28%
1994-2000	**54,02%**	**35,02%**	**23,21%**		**54,50%**	**32,17%**	**25,07%**		**51,88%**	**44,80%**	**27,67%**
2000-2002	36,05%	26,66%	18,91%		37,63%	23,40%	20,34%		37,04%	25,86%	20,54%
2003-2005	34,16%	23,51%	15,47%		32,81%	21,68%	17,37%		34,30%	22,41%	18,23%
2006-2008	28,14%	18,22%	14,06%		26,96%	16,78%	13,40%		35,41%	17,82%	14,96%
2009-2011	21,44%	11,99%	10,58%		22,87%	13,93%	9,60%		28,84%	14,19%	8,78%
2012-2014	16,71%	6,18%	2,66%		13,40%	6,13%	6,45%		21,39%	6,10%	4,99%

2015-2017	14,08%	4,79%	2,38%	11,11%	4,69%	3,74%	18,09%	6,00%	2,09%
2018-2020	12,62%	6,46%	1,77%	8,51%	3,15%	1,08%	12,64%	4,41%	2,67%
			Large Firms						
G	**L-FCF**			**H**	**M-FCF**		**I**	**H-FCF**	
	L-P/B	**M-P/B**	**H-P/B**	**L-P/B**	**M-P/B**	**H-P/B**	**L-P/B**	**M-P/B**	**H-P/B**
1994-2020	66,01%	71,46%	59,13%	60,11%	79,26%	80,19%	69,97%	79,93%	80,91%
1994-2000	**63,52%**	**68,77%**	**74,44%**	**64,79%**	**63,45%**	**65,81%**	**71,50%**	**65,74%**	**72,95%**
2000-2002	52,46%	46,97%	46,78%	57,72%	60,81%	60,62%	61,95%	64,21%	67,04%
2003-2005	46,44%	44,73%	43,46%	50,74%	57,15%	48,01%	57,97%	60,87%	63,63%
2006-2008	43,13%	44,40%	46,33%	46,48%	51,91%	45,92%	55,15%	59,14%	62,85%
2009-2011	39,68%	37,75%	40,35%	44,82%	41,09%	44,73%	49,15%	57,00%	58,71%
2012-2014	28,86%	23,64%	26,22%	33,49%	29,75%	35,95%	45,57%	44,90%	48,91%
2015-2017	25,46%	20,48%	26,45%	30,37%	29,57%	31,42%	39,06%	43,23%	47,37%
2018-2020	24,49%	17,54%	21,01%	29,50%	29,86%	28,89%	37,06%	43,03%	46,05%

To gauge the effect of investment opportunities under part A of Table 10, size and profits are held constant. Generally, for blocks A to F, the proportion of dividend-paying firms is larger for firms with low investment opportunities than those with high ones as per the price to book measure. However, this effect takes an opposite turn when the analysis is based on block GHI. Larger firms with larger investment opportunities are more likely to pay dividends than larger firms with higher investment opportunities. Put differently, block A to F generally shows declining percentages of dividend-paying firms as investment opportunities grow, while block G to I generally see an increasing number of dividend-paying firms as firms acquire increasing growth prospects. Therefore, it can be concluded that when it comes to investment opportunities, the inclination of dividend payments is not consistent across all sizes. Additionally, the period 1994 to 2000 has a higher number of dividend-paying firms in comparison to all periods, this is not surprising because the turning point for the increasing proportion of dividend-paying firms happened right after 2000.

Part B of Table 10 presents results that are consistent with part A using a different profitability measure which is the free cash flow. For size and profitability, part B may be interpreted the same way as part A, larger and more profitable firms are more likely to pay dividends than their smaller and less profitable counterparts. The period 1994 to 2020 also presents a similar story for both parts A and B, the percentage values for these periods are higher than for all other sub-periods in all instances. The book to market value effect for larger firms under part B is not the same is that for part A, there is no clear pattern of an increasing or decreasing proportion of dividend-paying firms for the former part as there is for the latter. However, for the smaller and medium firms under part B, the proportion of dividend-paying firms declines as firms achieve increasing investment opportunities.

4.8. Portfolio analysis findings: Propensity

As in the earlier sections, the actual and the expected proportion of dividend-paying firms is required to attain the propensity to pay dividends. For Table 11, The actual proportion of dividend-paying firms is computed as the number of payers to the total number of firms in year t. Since all the data is presented in sub-period forms, the values are averages of the years in each period. Similar to the prediction period used in regressions, the proportions computed for 1994 to 2000 are used to calculate the expected values. Below, this study presents a slightly different formula to that presented by Fama and French (2001) for the computation of expected values to accommodate the averaging due to sub-periods.

Average = $\left(\frac{\sum_1^{27} n.p}{27} \quad .\frac{1}{N}\right) 100$

Where ***n*** is the number of firms per portfolio each year, ***p*** is the base period probability of the portfolio from 1994 to 2000, and **N** is the total number of firms each year. Therefore, the values presented in Table 11 are averages for each sub-period. The information presented uses the base period estimates from both parts A and B in Table 10 to achieve estimates for parts A and B of Table 11 respectively.

Table 11
Displays the total average of actual and expected proportion of dividend-paying firms for the three-year sub-period using the portfolio approach as presented in Table 10. The difference represents the propensity of firms to pay dividends over the sample period. Part A shows the effect of grouping the firms based on profits and part B based on the free cash flow.

Part A – Profit Average No of	**Period**	**Expected**	**Actual**	**Difference**
365	2000-2002	67,45%	52,30%	15,15%
284	2003-2005	59,76%	59,83%	-0,07%
271	2006-2008	55,22%	54,98%	0,24%
300	2009-2011	46,62%	34,16%	12,46%
323	2012-2014	33,89%	17,94%	15,94%
306	2015-2017	30,19%	10,75%	19,44%
277	2018-2020	27,72%	7,10%	20,62%
Part B - Free Cash Flow				
365	2000-2002	68,46%	52,30%	16,16%
284	2003-2005	62,80%	59,83%	2,98%
271	2006-2008	57,38%	54,98%	2,40%
300	2009-2011	48,08%	34,16%	13,92%
323	2012-2014	33,79%	17,94%	15,85%
306	2015-2017	30,01%	10,75%	19,26%
277	2018-2020	25,59%	7,10%	18,49%

As expected, Table 11 shows that the propensity to pay dividends has generally been declining over the years during the sample period. The rapid declining actual proportion of dividend-paying firms vs the expected is visible after the sub-period 2003 to 2005. These results are consistent with those obtained via logit regressions, even though the values are slightly lower by a couple of

percentages. By the end of the sample period, logit repressions predict that firms were approximately 24% less inclined to pay dividends in comparison to the 20% produced by the portfolio analysis. However, for both portfolio and regression analysis, firms have been losing interest to pay dividends progressively throughout the sample period.

4.9. Conclusion.

Both the descriptive and logit regression methods show evidence that the characteristics of firms contribute to their dividend payment decisions. However, this is not the only driving factor behind the observed pattern. Time is consistently revealed as another important factor that explains the observed results. Furthermore, throughout the entire sample period, the findings of this section are in line with hypothesis five when considering descriptive statistics or the logit regression method. Portfolio analysis confirms results from descriptive and regression analysis and this method is especially consistent with hypotheses one and five. The next chapter concludes the study with the summary findings and discusses the limitations of the study.

CHAPTER 5

CONCLUSION AND LIMITATIONS

5.1. Conclusion

During the decade 1994 to 2004, the percentage of dividend-paying firms ranged from 45% to 70% of the overall JSE market of non-financial and non-utility firms. During that period, there was no clear pattern as to the direction of how the number of dividend-paying firms was standing. Post-2004, the pool of JSE firms saw a rapid decline in the number of dividend-paying firms until the end of the sample period by 2020. On the contrary, the overall non-financial and non-utility number of firms on the JSE was steady between 1994 and 2020. The steadiness of the number of firms on the JSE was followed by a peak that prevailed in 2000 during the period 1994 and 2004 as the number of firms in the exchange initially increased dramatically and subsequently declined until 1994. Therefore, the number of firms on the JSE may have had an impact on the number of dividend-paying firms before 2004, however, it does not justify the rapidly declining numbers of payers post this period.

The study acknowledges that certain notable economic and regulatory events occurred during the sample period of 1994 to 2020 which are; the dot-com bubble during the late 1990s, the introduction of repurchases as an alternative wealth distribution method for companies in 1999, the global financial stock market crash of 2007/2008 and the 2010 FIFA world cup in 2010. These events may have had a considerable effect on the number of dividend-paying firms, even so, an in-depth analysis of the driving forces behind the observed trend is based on a selected few firm-specific factors which are company earnings, free cash flow, growth or investment opportunities and the size. There are two proxies for investment or growth opportunities, namely the growth rate of assets and the price to book value measure. The use of two variables for one factor is due to several variables that are said to capture the growth aspect of a firm as debated in the literature. Therefore, using one variable to quantify or measure this factor may be biased and unjust.

The study proposes five hypotheses drawing support from the literature regarding the decision of a firm to pay dividends; hypothesis one states that companies with high profits are more likely to pay dividends when compared to those that have low or negative profits; hypothesis two states that larger firms are more likely to pay dividends than smaller ones; hypothesis three states that as companies are faced with more growth or investment opportunities, they are likely to disengage

in dividend payments and the reverse is predicted to be true; hypothesis four states that companies with more free cash flow are likely to distribute it to shareholders in the form of dividend payments more so than those with less or negative free cash flows; hypothesis five states that over the sample period from 1994 to 2020, firms have generally lost interest in the payment of dividends. To get evidence for or against the hypotheses, the study uses descriptive statistics, logit regressions, and portfolio-based analysis.

Hypotheses two and five were supported by descriptive statistics, logit regression and the portfolio analysis method. Therefore, larger firms were generally the main composition of the number of dividend-paying firms. Equally so, all firms, regardless of their characteristics, were generally growing out of dividend payment tendencies. Hypothesis 1 is backed up by descriptive statistics and portfolio analysis, even so, the logit regression analysis shows some support for it although, is not as solid as the other two methods. For logit regressions, the profit coefficient was negative and insignificant for some periods, where a negative co-efficient goes against the predictions of hypothesis one. Hypotheses three and four did not achieve any solid backing from all three methods of analysis. In particular, it was a challenge to interpret the meaning of the results presented by the descriptive statistic. However, the regression and portfolio analysis showed that this variable was influenced by time and characteristics. The investment opportunities logit regression coefficients were mainly significant with a relevant sign after the year 2006. While the coefficients were mainly in conflict with each other before this year. Subsequently, the portfolio analysis method revealed that smaller firms were unlikely to pay dividends as investment opportunities increased, while larger firms were even more likely to pay dividends as growth opportunities increased.

Overall, the solid evidence for Hypothesis five is confirmation that dividends have become unattractive for firms no matter what state they are in, in light of the firm-specific factors examined in the study. Consequently, the deteriorating state of the South African economy, which may be a large contributing factor to the declining number of firms on the JSE combined with other alternative wealth distribution methods seems a convincing enough reason behind the trend. However, following international trends and herding behavior cannot be ruled out as part of contributing factors. It would be interesting to follow in the footsteps of Brav et al. (2005) to get an insight into the observed results from the management of some of the large payers.

5.2. Limitations.

Post data collection and the regression analysis, some of the firms in the sample did not have all the requirements, which in turn, posed a challenge. Therefore, a few of the regressions had observations as low as eleven 11. This challenge presented itself during the separation of firms according to their payment status. Therefore, spurious relationships are likely when dealing with small sample sizes. Therefore, all these challenges are to be kept in mind when considering the results.

Furthermore, the sample period considered in the study comes with some changes in the South African regulation which may affect the robustness of the results. In 1999, there was an introduction of share repurchases which is a different form of stock distribution that can substitute for dividends. Additionally, the late 1990s internet bubble and 2008 stock market crash may influence the findings as they also had their toll on the stock market globally. The 2019/2020 Covid-19 pandemic could not be accounted for much in the discussions as the other events since the sample period ended in 2020 right after the start of the pandemic in South Africa. This made it impossible to tell whether the declining proportion of dividend-paying firms in 2020 could have changed soon after that as the study does not look beyond this year. It should also be of note that the study only focuses on major factors that are generally considered familiar to company management when making dividend decisions, there may be other company-specific factors of significance that are omitted.

In an attempt to smoothen the analysis and make the results more presentable over the complete sample period, the study averages some of the calculations to an interval of three years from 1994 to 2020. One of the challenges that come with averaging is that it is vulnerable to extreme values and the resulting average may not be a good representation of the information within that three-year interval. Therefore, some of these averages are either ballooned or shrank due to outlies.

Appendix.

Table of symbols.

Symbols and subscripts	Full name
(t)	The period in years
(t-1)	One year lagged period
Δ	Change
i	Ith number of a firm

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