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BRUSSELS MANAGEMENT SCHOOL

Higher Education of the Long Type at University Level

What is the impact of the dividend policy on share price volatility ?

Thesis presented by :

Jamal BOUALLA

For the attainment of the diploma of :

Master's degree in business management –

Triple degree ICHEC - UCL - ULB

Promoter :

Professor Mathilde FOX

Academic year : **2024-2025**

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General Introduction

In corporate finance, one of the topics that was and is still discussed through the different academic articles throughout the years is the impact of the dividend policy on the volatility of share price. Furthermore, this topic still provokes debates and raises important questions. Why do some companies distribute dividends? Why do others choose not to?

Moreover, the modern academic debate on the dividend policy and how it affects the investor started with the academic article written by Modigliani and Miller (1961) as it was considered to be the first formal and mathematical model of dividend policy. This model was based on the assumption that the markets are perfect. Consequently, this article generated an extensive academic debate over the decades until now.

Even though the academic debate on the dividend policy started in the last century, the question is still valid to pose in the current times we live in. A considerable number of academic articles tried to tackle this issue, but no definite answer was found and these articles had contradicting results and recommendations.

In fact, some academic papers refer to this debate as "the dividend puzzle" highlighting the apparent contradiction between theory and practice. From a theoretical standpoint, the dividends are considered an inefficient way of distributing value to the shareholders but in practice, numerous companies pay regular dividends (Black, 1976). This thesis will aim to engage with the debate by examining the relationship between dividend policy and share price volatility using a new set of data.

Dividend policy refers to the strategic approach undertaken by a company in determining the proportion of the net earnings to distribute to the shareholders as dividends and the proportion of the net earnings to keep as retained earnings to invest in new projects.

At the first glance, this seems rather trivial. However, a more in-depth analysis would conclude that the topic is more nuanced and more complex. In fact, the company's dividend distribution policy says a lot about the company.

It is important to note that the information investors are getting is significantly better than before thanks to the developments of accounting practices all around the world. To cite one of the most global and widespread accounting frameworks, the IFRS Accounting Standards increased the quality and the comparability of the financial information in reporting. This means that the information that the investors get now

is far more qualitative and is thus, more useful for valuation and investment purposes. Consequently, it is worthwhile to consider how this increase in the quality of financial information may influence the debate on corporate dividend policy.

The choice of this thesis comes from a strong interest in corporate finance and equity markets. The question of dividend policy continues to generate debate among scholars and practitioners. Through my research, I aim to make a modest contribution to the literature by engaging with this issue using empirical market data.

This thesis also provides an opportunity to explore the theoretical and practical aspects of dividend decisions, deepening my understanding of both financial theory and real-world market behaviour.

In Part 1, we will examine in detail the different academic articles that will be the theoretical basis of this study. Moreover, through the multiple academic papers developed on this topic, it seems clear that there are two contradicting sets of theories that are the relevance of dividend policy and the irrelevance of dividend policy. Different researchers defended or criticised one side or the other and that will give us an interesting background of our practical case study. In other words, we will analyse in-depth the so-called "dividend puzzle" and all its complexity that researchers allocated and will still allocate time and resources to (Black, 1976).

In Part 2, we will carry out an in-depth case study analysis in which we will explore based on the literature review which variables are really influencing the company's share price volatility. This part is divided into two sections. In the first section, we will conduct multiple regression models using time-series data incorporating independent and control variables. For the second part, reading through Gordon (1959) article on dividends, earnings and stock prices and specifically on the limitations around the multi-year data sets (Gordon, 1959), the decision was to add Gordon's Cross-Sectional Model to strengthen the analysis and to enrich the results.

Part 1: Literature review

Introduction

The dividend policy and its impact on the company's share price has sparked extensive academic debate over the years. A wide range of academic articles were developed to address this issue but no consensus has been found yet. The findings of these studies were diverse and contradictory. Consequently, it was referred to this issue as "dividend puzzle" which is still not yet solved despite decades of intensive research (Black, 1976).

This literature review aims to present the most influential theoretical contributions that helped to shape our understanding of the dividend policy and its impact on share price. Consequently, we will present two contradicting sets of theories that tried to address this issue.

The first set of theories is the irrelevance theory of the dividend policy. The foundational theory of this set was first brought to the debate in 1961 by Modigliani and Miller through their seminal work that was based on the assumption of perfect markets. Modigliani and Miller (1961) argue that the dividend policy is not relevant to the investors as they get the same value from their investment in the company either through distributed dividend or through the increase of the share price that would be a result of an increase of the retained earnings.

On the other hand, the second set of theories is the relevance theory of the dividend policy. This was first initiated by Gordon (1959) through his academic article that explored the relationship between a firm's dividend policy and its share price.

In chapter 1, we will analyse in-depth the dividend irrelevance theory. In fact, we will summarise some of the most influential papers related to it and discuss their findings and recommendations.

In chapter 2, we will explore the dividend relevance theory. Furthermore, we will discuss multiple theories namely the bird-in-the-hand theory, the signalling theory, the agency cost theory, tax preference and clientele effects.

In chapter 3, we will explore some modern extensions of the theories mentioned above and review the global evidence in the real world.

Chapter 1: Dividend irrelevance theory

The dividend irrelevance set of theories first emerged thanks to the very influential work done by Modigliani and Miller (1961) that explained that the dividend policy does not create nor destroy shareholder value as the payout ratio is irrelevant in perfect market conditions which is characterised by no differences between taxes on dividends and capital gains, no transaction costs, symmetric information and rational investor behaviour.

Many other academic articles came to support this irrelevance proposition, several of them will be analysed in depth in this section.

1.1 The foundation: Modigliani and Miller (1961)

Before addressing the seminal work done by Modigliani and Miller (1961), it is worth mentioning that a previous academic article they did in 1958 laid the foundation for this article. Modigliani and Miller (1958) academic article was titled "*The Cost of Capital, Corporation Finance and the Theory of Investment*" .

Modigliani and Miller (1958) concluded that, in a perfect market, the value of a firm is determined solely by the earning power and the risks of the underlying assets and thus, that the capital structure does not have any impact on that.

This was later known as "the capital structure irrelevance proposition". This conclusion was later extended to the dividend policy which became the main focus of their 1961's article (Modigliani and Miller, 1961).

In their 1961 academic article titled "*Dividend Policy, Growth, and the Valuation of Shares"*, Modigliani & Miller (1961) advanced one of the most influential and controversial propositions in corporate finance which was the dividend irrelevance theory.

The study by Modigliani and Miller (1961) introduced a formal and consistent framework for analysing dividend policy. This study was based on three main assumptions. The first assumption was that markets were perfect meaning that no player in the market is large enough for his transactions to influence the market. Furthermore, this assumption also means that there are no differences between taxes on dividends and capital gains, no transaction costs and the information is symmetrical. The second assumption was the rational behaviour which implies that

the investor always prefers more wealth and he or she is indifferent if the increase of their wealth comes from the dividends or the capital gains. The third assumption of this study was the perfect certainty indicating that the future investment program and the future earnings of every corporation are known and certain. Within that idealized environment, Modigliani and Miller (1961) argued that what truly determines a firm value is its investment policy and not the dividend distribution policy.

Modigliani and Miller (1961) supported their proposition with mathematical modelling constructing a valuation model through which they demonstrated that a firm's dividend policy has no effect on its market valuation under the assumptions previously presented. In other words, dividend policy is a residual decision, subordinate to the investment strategy of the firm.

Modigliani and Miller (1961) developed a proof to support their argument based on an arbitrage logic and showed that any change in dividend policy could be exactly offset by the actions of the investor in the market. That is, if a firm reduces the dividend payout, the investor who is seeking to balance the loss of dividend can sell a proportion of their shares. On the other hand, if a firm increases the dividend payout, investors can invest the excess cash to maintain their desired portfolio value.

Modigliani and Miller (1961) acknowledged that the dividend irrelevance propositions were based on rather unrealistic assumptions. Their intention was to establish a theoretical benchmark from which deviations could be meaningfully analysed. In addition, this study can be a baseline against which real-world complexities can be measured.

Modigliani and Miller (1961) faced many critiques. One major critique was related to taxes as, in most jurisdictions, the tax on dividends is higher than the tax on capital gains and thus, the investors might have a preference to the retained earnings and capital gains (Brennan, 1970). This challenged directly the assumption of the investor indifference to the form of returns.

Another critique was the existence of information asymmetries between corporate managers and outside investors (Bhattacharya, 1979). When the manager possesses superior knowledge about the firm's future prospects, dividend policy could become a signalling device to the outside world (Bhattacharya, 1979).

Consequently, a stable or increasing dividend might signal confidence in the firm's future prospects and any cut might be considered as a negative signal (Bhattacharya, 1979). This critique challenges the irrelevance proposition of dividend policy by

introducing the informational content that is embedded into the payout decision. This critique will be examined in Chapter 2.

Agency costs can also be considered to be a challenge to the irrelevance proposition as managers do not always act in the best interests of the shareholders and paying dividends can help mitigate these agency costs by reducing the amount of free cash flow available to the managers reducing potentially wasteful expenditures (Jensen, 1986). This critique will also be examined in Chapter 2.

The clientele effect was also another area of contention. According to Farrar and Selwyn (1967), different investors have different preferences and tax situations, leading them to favour firms with a particular dividend policy. These differences are inconsistent with Modigliani and Miller (1961) assumption of homogeneous investor base. This critique will be examined in Chapter 2.

In sum, Modigliani and Miller (1961) article stands as an achievement in corporate finance. By providing a clear framework for understanding when dividends are irrelevant, they laid the ground for a more rigorous and insightful exploration of corporate finance behaviour.

1.2 Effect of dividend policy on the share price and returns

In their 1974 paper titled "*the effects of dividend yield and dividend policy on common stock prices and returns*", Fischer Black and Myron Scholes (1974) conducted a more empirically grounded study investigating whether dividend yields materially impact the stock price performance. Their study presented a series of statistical analyses designed to test whether dividend yield and payout policy are associated with differences in stock returns.

Black and Scholes (1974) began their analysis by examining the theoretical foundations related to dividend policy and firm value. Black and Scholes acknowledged the foundational work of Modigliani and Miller (1961) and accepted as a point of departure the hypothesis whereby the dividend policy is irrelevant to the firm's valuation in a world without differences between taxes on dividends and capital gains, transaction costs and with symmetric information for all the investors.

However, Black and Scholes (1974) noted that these simplifying assumptions do not hold in the real world and thus they emphasised the need for rigorous empirical testing to determine whether dividend yield has any relationship with stock returns.

Black and Scholes (1974) constructed 25 portfolios based on dividend yields and examined their returns on numerous periods adjusting for market risk using the Capital Asset Pricing Model (CAPM). The portfolios ranged from high-dividend yield to low-dividend yield. Black and Scholes (1974) tracked their performances to test for any systematic relationship between dividend yield and risk-adjusted returns across the full range of yield levels.

One of the main empirical findings of the Black and Scholes (1974) article is that they observed that high-dividend portfolios earned higher raw returns than the low-dividend portfolios. However, these differences were not statistically significant after adjusting for risk using the Capital Asset Pricing Model (CAPM).

Regarding this empirical relationship found in their article, Black and Scholes (1974) noted that tax-related effects might be an explanation as tax policy might make the dividends less attractive for investors, especially those in high tax brackets. They also discuss the clientele effect suggesting that investors might prefer different dividend policies based on their own income needs and tax situation.

It is important to note that Black and Scholes (1974) mentioned that dividends might convey information about the firm's future prospects and that's a potential reason for the empirical correlation they observed between dividend yield and raw stock price performance. This would later be explored and framed by other authors as "the signalling model".

In sum, Black and Scholes (1974) article represented a pivotal moment in the development of our understanding of how the dividend and dividend policies influence the share price performance. The findings suggest that the dividend yield is a variable of interest for both theorists and practitioners engaged in portfolio construction and investment strategies.

1.3 Dividend and taxes: an extension of the irrelevance proposition

Miller and Scholes (1978) represent a critical extension of the theoretical debate surrounding dividend policy. This article focuses on the role of taxation in the investor decision-making process and its implications on the valuation of the dividend-paying firms. This article extends Modigliani and Miller's (1961) irrelevance proposition by addressing one of its most contested assumptions which is the absence of differences

in taxes between dividends and capital gains and argued that under certain conditions, the irrelevance still holds.

The logic presented in Miller and Scholes (1978) builds directly upon the tax-based equilibrium framework developed by Miller (1977) in which he argued that the tax advantages of corporate debt are neutralised in equilibrium by personal tax differences among investors making capital structure largely irrelevant to the firm's value. In their article, Miller and Scholes (1978) extend this reasoning to dividend policy.

Miller and Scholes (1978) seek to demonstrate that in a world with different taxation schemes for dividends and for capital gains, the investor could structure their affairs in such a way that taxation effects on dividends and capital gains are neutralised.

Miller and Scholes (1978) stated that in most tax regimes, dividends are taxed at higher rates than the capital gains and argue that there is an incentive for the firms to retain the earnings or repurchase shares rather than distribute dividends.

One of the key contributions of Miller and Scholes (1978) article is their nuanced analysis of how investors, especially those with access to tax planning strategies, can neutralise the tax disadvantages related to the dividends. To achieve that goal, Miller and Scholes (1978) proposed the use of financial instruments, income shifting and leverage.

Consequently, high-income investors can avoid the punitive taxation of dividends by investing only in firms that retain all earnings and finance their consumption by borrowing or portfolio balancing. Thus, the theoretical insight provided by Miller and Scholes (1978) is that the observed prevalence of dividend payments may not necessarily contradict the irrelevance theory when taking into consideration the different types of investors and tax avoidance strategies.

Miller and Scholes (1978) addressed the implications of institutional investors and tax-exempt entities and argue that the presence of such types of investors might neutralise the tax inefficiency that comes with dividend payments.

Miller and Scholes (1978) add that these entities are agnostic to the form in which returns are received making them the natural holders of dividend-paying stocks. Their demand can sustain the valuation of the firms in the market despite the tax inefficiency related to the dividend payments. Miller and Scholes (1978) make an interesting conclusion that the tax-induced preference for capital gains over dividends does not apply uniformly across all types of investors.

To sum up, Miller and Scholes (1978) article remains a foundational work in relation to dividend policy and taxes and it provides another alternative explanation as to why the prevalence of dividends in the real world may still be consistent with the dividend irrelevance proposition under certain conditions. Their findings have had lasting influence on the theoretical studies by inspiring other researchers to examine in depth the tax characteristics of the investors and the behaviour of institutional investors.

1.4 Synthesis of the Dividend Irrelevance Framework

In conclusion, the dividend irrelevance theory has established itself as a landmark of modern corporate finance. Introduced by Modigliani and Miller (1961), the proposition that dividend policy would not have any impact on the firm's value and by extension on the volatility of share price under conditions of perfect capital markets laid the foundation for decades of theoretical and empirical studies.

Modigliani and Miller (1961) framework offered a consistent model as benchmark against more realistic settings. Subsequent theoretical developments sought to explore whether the irrelevance proposition holds under less restrictive conditions.

A notable empirical contribution came from Black and Scholes (1974) who investigated whether the dividend yield had an impact on the stock return. They observed higher raw returns for high-dividend portfolios and that the higher raw returns lost statistical significance once risk adjustments were made.

Similarly, Miller and Scholes (1978) argued that investors can effectively neutralise the taxation of dividend payments preserving the idea that dividend policy has no impact on firm valuation in equilibrium.

Collectively, the findings of these academic articles form a coherent theoretical school that dividend decisions are of secondary importance to the firm value and that implies that they have no impact on the volatility of the share price.

Chapter 2: Relevance of dividend policy

While the dividend irrelevance theory introduced by Modigliani and Miller (1961) had a lot of influence in corporate finance, it was also met with various criticisms for relying on assumptions that are not possible to hold in a real world setting and thus, a growing body of literature has argued the dividend policy can, in fact, influence firm value under conditions of uncertainty, information asymmetry and agency conflicts.

This Chapter delves into key perspectives within the dividend relevance framework.

2.1 Relevance of dividend policy based on uncertainty of future returns

Myron J. Gordon (1959) article titled "*Dividends, Earnings, and Stock Prices*" is one of the first and most influential earlier research that presented arguments in favour of the relevance of dividend policy to the valuation of a firm.

Gordon (1959) laid out the foundation for what would later be known as the "bird-in-the-hand" theory of dividends. Gordon (1959) argued that investors place a higher importance on the dividend payments they generate more than the capital gains because the latter is seen as uncertain by investors.

In addition, Gordon (1959) indicates that the retained earnings reinvested into the firm may or may not produce the investors' desired returns. On the other hand, dividend payments offer a tangible return providing immediate income and reduce the reliance on future earnings and market conditions.

Gordon (1959) adds that the investor preference to own dividend-paying stocks leads to a higher valuation of these types of firms even though it impacts the retained earnings and thus, limits the investment potential of the firm.

In an earlier article, Gordon and Shapiro (1956) developed what is commonly referred to as the Gordon Growth Model. This formalises the relationship between the firm's dividend policy and its market valuation under certain assumptions.

$$P = \frac{D_1}{r - g}$$

Where:

- P is the **current stock price**
- D_1 is the **dividend expected next year**
- r is the **required rate of return** (discount rate)
- g is the **constant growth rate** of dividends

Gordon and Shapiro (1956) made critical assumptions to come up with this valuation model. Two assumptions are worth mentioning. First assumption is that dividends grow at a constant rate (g) indefinitely. The second assumption is that the required rate of return (r) is greater than the dividend growth rate.

This equation captures the earlier belief of Gordon that dividends are not just passive outputs but that they are determinants of the value of a firm. Indeed, when the growth rate g is low or uncertain, D_1 becomes increasingly significant in determining the value of a firm.

Contrary to Modigliani and Miller (1961) that assumed that in perfect markets with rational investors and no differences between taxes on dividends and capital gains, the dividend is irrelevant in determining the value of a firm, Gordon (1959) presents a nuanced perspective injecting risk-aversion of the investors in the debate.

Indeed, Gordon (1959) argues that investors, being risk-averse, prefer certain returns in the form of dividends (bird-in-the-hand) which provides certainty in a way that retained earnings and reinvested capital cannot.

2.2 Relevance of dividend policy based on information content of dividend

Bhattacharya (1979) article titled "*Imperfect Information, Dividend Policy, and 'The Bird in the Hand' Fallacy"* represents a major theoretical development in the literature of the dividend policy.

Bhattacharya (1979) offered one of the earliest and most rigorous signalling models in which dividend payments serve as signals to the firm's quality in an asymmetric information setting.

At the heart of Bhattacharya (1979) theory is the fact that managers have more information on the health and future prospects of the firm and that the outside investors are significantly less informed. Under the conditions of asymmetric information whereby the performance of the firm is not observable by the market players, the dividend payments play a crucial role in conveying that information (Bhattacharya, 1979).

Bhattacharya (1979) argues that the dividend payments fulfil the signalling role because it imposes a cost to the firm. In fact, it is because shareholders face higher taxes on them. Additionally, paying dividends reduces the firm's internal funds available for investments which may oblige the firm to use external financing.

The logic of Bhattacharya (1979) is that only high-quality firms can afford to bear such costs. Consequently, the decision to pay dividends can distinguish between high-quality firms and low-quality firms, thereby reducing information asymmetry.

Contrary to Gordon (1959) whereby the dividend is valued for its consumption value, Bhattacharya (1979) values the dividend payments as a costly signalling mechanism that the firm uses to inform the outside investors that are less informed than the management.

One of the innovative features of the Bhattacharya (1979) model is the introduction of capital market frictions especially those related to external financing. In fact, firms that distribute dividends might need to raise substantial funds externally which consequently make the dividends more expensive for the firm.

Bhattacharya (1979) offers a theoretical justification as to why markets often react positively to dividend increases and negatively to dividend cuts. Bhattacharya (1979) explains that these reactions are not necessary due to a preference of dividend payments but rather due to the information embedded in dividend announcements.

Building on Bhattacharya (1979) model, subsequent research has further developed the signalling theory of dividends by introducing alternative mechanisms and market frictions.

Miller and Rock (1985) advanced the debate by showing how the dividend announcements can provide important information on the firm's current earnings. In their model, investors do not have access to information on current financial details of the firm, so managers use the dividend announcements as signalling mechanisms for the firm's current financial performance.

According to Miller and Rock (1985), this approach makes it clear that dividend policy can help reduce uncertainty for investors not just about future prospects but also current financial performance.

John and Williams (1985) further enrich the discussion on signalling theory by incorporating effects of taxes and share dilution into their model.

John and Williams (1985) demonstrate that even when dividends are taxed less favourably than capital gains, managers keep using dividends as signalling device if the cost of doing so enables the distinction between high-value firms from others.

A key element in John and Williams (1985) model is the possibility of share dilution: when a firm pays out dividends and needs additional funds, it can issue new shares, increasing the number of shares outstanding.

However, issuing additional shares reduces each existing shareholder's ownership percentage and can lower the earnings per share and thus making dilution a real cost to current shareholders (John and Williams, 1985).

According to John and Williams (1985), only high-quality firms can afford to bear both the tax burden on dividend payout and the dilution cost to sustain dividend payments, making the signal to the market more credible.

2.4 Relevance of dividend policy based on agency cost

2.4.1 Jensen's Free Cash Flow Hypothesis and Easterbrook's Agency Cost Explanations for Dividends

Michael C. Jensen wrote an article in 1986 titled "*Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers*" which is known as one of the main academic articles treating the agency problems within the firm.

Jensen (1986) brought a sharp focus on the specific issue of free cash flow and its potential to create conflicts between managers and shareholders. The free cash flow being the cash generated by the firm in excess to what it needed to fund all the projects with positive Net Present Value (NPV).

The central idea of Jensen (1986) is that free cash flow poses a significant agency problem especially in firms that have access to limited profitable investment

opportunities, this surplus can be a source of inefficiency and value destruction if not properly monitored.

Jensen (1986) specifies that the context of the agency costs relating to free cash flow emanate from the principal-agent relationship. Indeed, the shareholders (the principals) delegate the decision-making process to managers (the agents) that are expected to act in the best interests of the shareholders.

Jensen (1986) further explains that if the free cash flows are substantial, the managers might not act in the best interests of shareholders. They might pursue objectives such as growth, increased firm size or diversification not necessarily because they would maximise shareholder's value but because they enhance their compensation and job security.

In practice, these objectives translate into investing in negative NPV projects, undertaking acquisitions that do not create value for shareholders or to diversify into unrelated business areas (Jensen, 1986).

To address these issues, Jensen (1986) suggests the use of financial mechanisms to limit discretion of the management over the free cash flow and ensure that the surplus cash is returned to the shareholders when no value-creating projects exist.

Jensen (1986) emphasises two primary financial mechanisms which are debt and dividends. According to him, the use of debt imposes a contractual obligation on managers to make recurrent interest and principal payments and thus, reduces the free cash flow available to managers and forces them to prioritise investments with higher expected returns.

More importantly, Jensen (1986) mentioned that the debt puts the management at the scrutiny of external capital providers as additional funds require disclosure and justification of the need making this financial mechanism a bonding device that aligns managerial actions more closely with shareholder interests.

Jensen (1986) mentioned as a second financial mechanism to address the agency costs the distribution of dividend. Indeed, regular and substantial dividend payments limit the funds available to managers that might be invested in projects that do not create shareholder value.

Jensen (1986) specified that in some cases, debt is a better solution to the agency costs especially when stable dividend payouts cannot be sustained due to earnings volatility or other factors.

Jensen (1986) added that an optimal capital structure involves using debt strategically to limit free cash flow under the discretion of management but not to the extent that it increases the risks of financial distress.

Additionally, regular and substantial dividend payments are particularly effective for mature firms with few growth opportunities according to Jensen (1986). He added that the effectiveness of both financial mechanisms is subject to the strength of corporate governance, he argues that, in weak corporate governance environment, the use of debt and dividend becomes more important to mitigate the agency costs.

Jensen (1986) theory has a profound impact on both academic research and practical approaches to corporate governance, capital structure and payout policy. The free cash flow hypothesis shaped the way scholars and practitioners think about the relationship between managerial discretion, financial policy and firm value.

While Jensen (1986) free cash flow hypothesis has had profound impact on the understanding of agency costs in relation with dividend policy, Easterbrook (1984) also articulated the agency-cost explanation.

Easterbrook (1984) provides arguments that dividends play a disciplinary role by forcing firms to use external financing and thus, making managers monitored externally.

While Jensen (1986) focuses on the internal disciplinary role of reducing the free cashflow, Easterbrook (1984) analysis gives prominence to external governance mechanisms provided by capital markets scrutiny.

Together, these two perspectives have shaped the modern understanding of how dividend policy can mitigate agency problems within the firm.

2.4.2 La Porta et al.: Legal Protections and the Agency Model of Dividends

La Porta et al. (2000) present a study that examines the relationship between investor protection and corporate governance, with a particular focus on dividend policy. Their work builds on previous studies they did (La Porta et al. 1997, 1998, 1999), which established the importance of legal institutions in corporate finance.

In their academic article, La Porta et al. (2000) analyse deeply the mechanisms through which legal protection for minority shareholders influences the likelihood and the amount of the dividend payments, providing both theoretical and empirical evidence.

The foundation of La Porta et al. (2000) lays in their earlier research, which classified countries according to their legal origins, distinguishing between common law and civil law traditions (La Porta et al. ,1997, 1998).

La Porta et al. (2000) demonstrated that countries with common law origins provide a stronger legal protection compared to countries with civil law traditions. The difference in legal protection has profound implications for the development of financial markets, corporate ownership and the valuation of firms (La Porta et al, 1998, 1999).

La Porta et al. (2000) focused specifically on how investor protection affects dividend policy. They begin by outlining two theoretical models that are competing with one another which they called the outcome model and the substitute model.

According to La Porta et al. (2000), the outcome model puts forward the idea that in countries where minority shareholders are well protected by the law, these shareholders use this legal right to put pressure on the managers to pay dividend and thus protecting themselves from agency costs related to investing in projects that do not maximise shareholders value and related to the expropriation of funds.

According to La Porta et al. (2000), the outcome model predicts that stronger legal protection for minority shareholders will lead to higher dividend payouts not only in terms of probability but also in term of the proportion of the firm's earnings that are distributed to the shareholders.

On the other hand, and according to La Porta et al. (2000), the substitute model suggests that in countries with weak legal protection for investors, especially for minority investors, firms may voluntarily pay higher dividends as a way to build a reputation of fair treatment to minority investors. In other words, in the absence of reliable legal framework, dividends may serve as a substitute mechanism, signalling that the firm is trustworthy.

To test these competing models (i.e. the outcome model and the substitute model), La Porta et al. (2000) used a large cross-country dataset covering a wide range of legal and institutional environments. Furthermore, La Porta et al. (2000) also controls for firm-specific factors, such as profitability, growth opportunities and size. Moreover, La Porta et al. (2000) also controls for country-level variables, including indices of shareholders rights, creditor rights and the quality of law enforcement.

The results of La Porta et al. (2000) provide strong support for the outcome model as they demonstrated that firms in countries with stronger legal protection for minority shareholders are significantly more likely to pay dividends and tend to distribute a large proportion of their earnings.

On the other hand, La Porta et al. (2000) find evidence consistent with the substitute model, particularly in countries where the legal protection is weak, suggesting that the firms may voluntarily pay high dividends to give a signal of trustworthiness.

Overall, La Porta et al. (2000) results suggest that the outcome model provides a better explanation for cross-country differences in dividend policy meaning that the legal protection of investors is the primary driver of dividend payouts, with reputation-building playing the secondary role in the absence of legal protection for investors.

To sum up, La Porta et al. (2000) make a significant contribution to the understanding of how legal frameworks influence corporate governance and dividend policy as they provided a robust framework for analysing cross-country differences in dividend payouts by testing the outcome and the substitute models.

2.5 Relevance of dividend policy based on clientele effects

Farrar and Selwyn (1967) study is widely recognised as one of the earliest and most influential work with regards to clientele effects in dividend policy.

At the core of their study, Farrar and Selwyn (1967) observed that the fiscal treatment of dividends and capital gains is not uniform across all the investors as dividends have historically been taxed at a higher rate than the capital gains especially for individuals in high-income tax brackets.

Furthermore, Farrar and Selwyn (1967) argue that this incentivises the investor to choose one form of return over another, depending on their tax rate and personal financial goals and thus, leads to the formation of distinct clienteles of investors, each attracted to firms whom dividend policy matches best their preference and tax situations.

One of the main ideas in Farrar and Selwyn (1967) study is that companies are not under any obligation to distribute dividends and may adjust or eliminate them depending on financial conditions. However, they add that when the firm sets a certain dividend policy, the latter attract investors that share many characteristics. For

example, a company with a high dividend policy might attract retirees, low-income individuals or tax-exempt institutions. On the other hand, the investors in high-tax brackets might be attracted to firms that distribute little to no dividends.

Farrar and Selwyn (1967) work emphasises the demographic dimension of the clientele effect as they noted that age and income are important determinants of dividend preference. The authors further distinguish between institutional and retail investors as clienteles. They added that the institutional investors are subject to a lower tax rate on dividends than individual investors and thus, they are more willing to hold high-dividend stocks unlike retail investors who need to be more cognisant of their tax circumstances.

The clientele effect described by Farrar and Selwyn (1967) has observable consequences in the market: when a firm changes its dividend policy, the resulting shift in their shareholders base can lead to share price volatility as investors realign their portfolios to their preference. Thus, firms are reluctant to make sudden changes to their dividend policies.

In summary, the central insight of Farrar and Selwyn (1967) is that the existence of taxes and other market imperfections lead to the formation of investor clienteles, which influence corporate dividend policy and share price behaviour. Their work emphasises the importance of considering investor heterogeneity and tax policy in any analysis of payout decisions.

2.6 Synthesis of the Dividend relevance Framework

The dividend relevance theory challenges the dividend irrelevance propositions by emphasising that dividend policy does affect firm valuation and investor behaviour.

This framework gained a lot of attention and importance through the work of Gordon (1959) and Gordon and Shapiro (1956), who developed the Dividend Discount Model (DDM). Gordon (1959) argues that investors prefer dividends over future capital gains as the latter are uncertain, a concept referred to as “bird-in-the-hand” effect.

Building on that, Bhattacharya (1979) introduced a signalling model, suggesting that dividends serve as a signalling device which conveys the firm’s future profitability in the presence of information asymmetry and thus, influences the share prices.

Agency theories, notably by Easterbrook (1984) and Jensen (1986), argue that dividends help mitigate agency costs related to the separation between the ownership and the control of a firm. They propose debt and dividends as the mechanisms to do so. They explained that distributing dividends made sure to decrease the cash flow at management discretion and thus, forcing the firm to get funds from the external capital market made sure to put the management under the scrutiny of the external capital market players.

Earlier empirical studies such as Farrar and Selwyn (1967) emphasised the clientele effects whereby investors with different tax brackets and income preferences are attracted by a certain type of dividend policy. Consequently, firms tend to develop a shareholder base, or "dividend clientele" whose preferences are shaped in part by the relative tax advantages and disadvantages of dividend income versus capital gains.

To summarise, the dividend relevance theory argues that dividend policy matters because dividends reduce uncertainty (Gordon, 1959), signal firm quality (Bhattacharya, 1979; John and Williams, 1985), mitigate agency costs (Easterbrook, 1984; Jensen, 1986) and are shaped by the strength of the legal protections for minority shareholders (La Porta et al, 2000).

Chapter 3: Empirical Evidence and Market Behaviour

While the theoretical debate on dividend policy presents very different perspectives ranging from strict irrelevance propositions to strong relevance-based arguments, empirical studies offer a necessary bridge between theory and real-world.

This chapter explores how dividend policy interacts with market forces as observed in actual stock price behaviour and how the theoretical models hold against empirical scrutiny.

In other words, this chapter explores the robustness of the theoretical models while relieving the theoretical assumptions that helped shape them.

3.1 Managerial behaviour, determinants and market effects of dividend policy

Empirical research on dividend policy has long focused on understanding the motivations and constraints that guide corporate payout decisions. However, the following studies reveal that dividend policy is a dynamic process shaped by complex factors.

3.1.1 Lintner (1956)

John Lintner (1956) study on dividend policy is one of the influential empirical works done in the field of corporate finance. Lintner (1956) approach relied on direct interviews with senior managers from 28 large and publicly traded U.S. firms seeking to understand the actual motivations, constraints and behavioural patterns that guided their dividend decisions.

Lintner (1956) central finding was that managers are highly committed to maintaining stable and predictable dividend payments. Lintner (1956) observed that the managers were reluctant to make sudden changes to dividend payments especially their decrease. This tendency towards stability of dividend payments is referred to as "dividend smoothing".

According to Lintner (1956), senior managers would only increase dividend payments when they are confident that higher earnings would be sustainable and they would

avoid dividend cuts and use them as last resort in the face of persistent and significant declines in earnings.

According to Lintner (1956), the logic behind this cautious approach comes from the belief that dividends serve as a key signal to investors about a firm's financial health and future prospects as senior managers were aware of the informational content of dividend announcements. An increase in dividends was seen as a positive signal suggesting management's confidence in the firm's future earnings while a decrease in dividends was a sign of issues.

To formalise these insights, Lintner (1956) developed what is now known as the partial adjustment model of dividend policy. The model posits that firms set a long-run target payout ratio which is a desired proportion of earnings to be distributed as dividends and then they adjust their actual dividends only partially toward this target in any given period when the earnings figures change.

Mathematically, this model can be expressed as follows: the change in dividends from one period to the next is a function of the difference between target dividend and the dividend paid in the previous period multiplied by a speed of adjustment parameter. This parameter reflects the willingness of the firm to close the gap between actual and target dividends in a single period.

Lintner (1956) empirically found that firms only adjusted about 30% of the gap between actual and target dividend each year indicating a strong preference for smoothing. In other words, if a firm's target payout ratio implies a very high increase in the dividend based on the year's earnings, the firm will typically increase the dividend only modestly rather than all at once.

Lintner (1956) findings suggest that dividend policy is not simply a function of current earnings but instead, it is a dynamic process shaped by managerial judgement, historical precedent and concerns about the investors reaction.

Lintner (1956) model also explains why dividends tend to be less volatile than corporate earnings. Indeed, it is because firms are reluctant to cut dividends and only increase dividend gradually over time and this provides a measure to the investors about the stability and the predictability of the share returns (Lintner, 1956).

3.1.2 Baskin (1989)

Baskin (1989) study is widely seen as an influential contribution to the empirical literature on dividend policy and its effect on stock price volatility. Baskin (1989) analysed a large number of U.S. stocks between 1967 and 1986 and focused on analysing the direct relationship between dividend policy and the volatility of share price.

Baskin (1989) presented three key mechanisms that fundamentally shaped the relationship between dividend policy and stock price volatility. These three mechanisms are the duration effect, the arbitrage effect and the rate of return effect.

According to Baskin (1989), the duration effect suggests that shares with higher dividend yields return a greater proportion of their value to the investors making the average duration of the investment short and thus, the present value of these shares is less sensitive to changes of the discount rate, which lowers their volatility.

The arbitrage effect emphasises that regular dividend payments provide predictable return which can reduce the speculative activity and mispricing related to these shares especially in markets that are not perfectly efficient (Baskin, 1989). According to Baskin (1989), this effect reduces the volatility of share prices.

The last effect presented by Baskin (1989) is the rate of return effect. This effect advances that firms with low payout ratios and low dividend yields are generally valued for their future growth prospects rather than immediate returns. Consequently, the share prices of these firms become more susceptible to shifts in investor sentiment and expectations making these share more volatile.

To empirically test these hypotheses, Baskin (1989) used a cross-sectional regression analysis using stock price volatility as the dependent variable. The main explanatory variables were dividend yield and dividend payout ratio with control variables including firm size, earnings volatility, leverage and asset growth.

Baskin (1989) findings provide strong evidence of a significant negative relationship between dividend yield and stock price volatility. This result is robust even after considering the effects of the control variables. The implication of Baskin (1989) results is that stocks with higher dividend yield tend to be less volatile supporting the notion that dividend policy can act as risk-reducing mechanism for shareholders.

Baskin (1989) found empirically that the payout ratio has also a negative relationship with the volatility of share price, although the inclusion of dividend yield has a negative impact on the statistical significance of the relationship.

Baskin (1989) empirical findings support Gordon (1959) "bird-in-the-hand" theory which argues that investors value certain and immediate returns from dividends more than uncertain future capital gains and that shares offering higher dividends are perceived as less risky. This is reflected in the negative and significant relationship between the dividend yield and the share price volatility.

The practical relevance of Baskin (1989) extends to corporate managers and investors. For managers, the evidence suggests that maintaining a stable and attractive dividend policy can help reduce the riskiness of their shares. For investors, dividend yield can be considered as useful metric to assess the risk profile of the shares complementing other risk measures like earnings volatility.

3.1.3 Baker and Powell (2000)

Baker and Powell (2000) provide a survey of managers from New York Stock Exchange (NYSE) listed firms regarding the factors that influence the decisions related to corporate dividends. Their study stands out for its empirical approach offering direct insight into managerial attitudes and the practical determinants of dividend policy.

The central finding of Baker and Powell (2000) is that the most important determinants of dividend policy according to managers are the level of current and expected future earnings alongside the pattern or continuity of past dividends.

According to Baker and Powell (2000), the criteria of the continuity of past dividends suggests strong adherence to the principle of dividend smoothing whereby firms are reluctant to make sudden changes to dividend payments preferring instead to adjust payouts gradually in response to changes in earnings.

Baker and Powell (2000) paper reveals that managers place considerable importance to the predictability and sustainability of the dividends, reflecting concerns about investor expectations and market reactions.

According to Baker and Powell (2000), the desire to avoid sending negative signals to the investors, which could rise from dividend cuts, reinforces the tendency towards conservative dividend policies. This finding aligns with the signalling role of

dividends whereby stable or increasing dividends are interpreted by the investors as indicators of the firm's financial health and future prospects.

Another finding of Baker and Powell (2000) study is that the fundamental determinants of dividend policy are broadly similar across sectors despite the persistence of industry-based variations.

Baker and Powell (2000) suggested that from a managerial perspective, the practical considerations of earnings stability, investor expectations and market perceptions outweigh the theoretical case for the dividend irrelevance school of thought as managers appear to view dividends as an essential part of their firm's financial strategy.

3.1.4 Rozeff (1982)

Michael S. Rozeff (1982) study addresses the determinants of dividend payout ratios and gives a contribution to the empirical literature on dividend policy.

Rozeff (1982) developed and tested a model in which a firm's dividend payout ratio is determined by the interplay of growth opportunities, systematic risk (Beta) and agency costs. The ground idea of Rozeff (1982) was that the dividend policy is not arbitrary and that it reflects instead a firm's effort to balance competing financial considerations and minimise the total costs associated with agency conflicts and external financing.

Rozeff (1982) begins by framing dividend policy within the context of agency theory related to the agency relationship between the shareholders and the managers. One way to mitigate these agency costs is through the distribution of dividends which reduces the cash at the discretion of the management and thus, limits wasteful expenditures.

Rozeff (1982) states that paying dividends also means that the firm might need to rely on external financing to fund future projects incurring transaction costs and the scrutiny from capital markets.

Rozeff (1982) argues that the optimal dividend payout policy is the one that minimises the sum of agency costs and the costs related to the external financing.

To empirically test this model, Rozeff (1982) conducted a cross-sectional analysis of U.S. firms examining how dividend payout ratios are related to several key variables:

the firm's growth rate, beta coefficient, insider ownership, and the number of common shareholders. Specifically, Rozeff (1982) methodology involves regressing the dividend payout on these variables to determine the direction and strength of their relationships.

One of the central findings of Rozeff (1982) is the negative relationship between a firm's growth opportunities and its dividend payout ratio. Additionally, he found that firms with high growth rates are more likely to retain earnings to finance future investments as external financing is costly and may not be available on favourable terms. Rozeff (1982) result supports the view that investment policy is a primary determinant of dividend policy.

Rozeff (1982) also found that there is a positive relationship between a firm's beta coefficient and its dividend payout ratio. Specifically, firms with higher betas face greater uncertainty in the future earnings and are perceived as riskier by the investors. According to Rozeff (1982), to compensate shareholders for bearing the additional risk, these are more likely to pay dividends.

Agency costs are another critical determinant of dividend policy identified by Rozeff (1982). In fact, the study used insider ownership and the number of common stockholders as proxies for agency costs. Rozeff (1982) found that firms with higher insider ownership are presumed to have lower agency costs, as managers interests are aligned with those of shareholders and thus, the need to use dividends for reducing agency costs is diminished and these firms tend to have lower payout ratios.

On the other hand, and according to Rozeff (1982), firms with a larger and more dispersed shareholder base face higher agency costs and are more likely to use dividends to mitigate these conflicts resulting in higher payout ratios.

Rozeff (1982) findings indicate that dividend policy is not solely a function of profitability or management discretion but is shaped by a complex set of factors related to growth prospects, risk, and governance structures.

3.2 Structural shifts and the evolution of payout mechanisms

This section reviews key studies that document the structural shifts that were observed in the dividend policies among U.S. publicly listed firms in the last quarter of the 20th century.

3.2.1 Fama and French (2001)

In their article titled "*Disappearing Dividends: Changing Firm Characteristics or Lower Propensity to Pay?*", Fama and French (2001) analysed a profound structural shift in the dividend-paying behaviour of U.S. firms over the last quarter of the 20th century.

Fama and French (2001) investigated the reasons behind this phenomenon through a time-series analysis of firm's data from 1926 to 1999. In doing so, this study brought critical empirical insight into the broader debate on the relevance of dividend policy in the firm's value.

Fama and French (2001) started their investigation by highlighting that despite the rising aggregate corporate profits and the increase in the number of listed firms during the late 20th century, the proportion of dividend-paying firms declined.

In fact, approximately 66% of U.S public firms distributed dividends in 1978 but by 1999, that proportion dropped to 20.8% of U.S. public firms. Fama and French (2001) added that this sharp change suggested a fundamental change in the dividend behaviour of U.S. publicly traded firms.

Fama and Frech (2001) tested empirically whether the observable decline in the number of U.S. publicly traded firms that distribute dividend is due to a change in the characteristics of the firms or it is due to a decline in propensity to pay.

Based on the data, Fama and French (2001) divided the firms into two main categories based on their dividend payment behaviour: payers, non-payers. In describing non-payers, they noted two types: the firms who never paid (never paid) and the firms who used to pay and are not paying anymore (former payers).

Their analysis revealed that the composition of publicly traded firms changed with an increase in the startups that are smaller, less profitable but with high growth potential especially during the tech boom (Fama and French ,2001).

However, Fama and French (2001) found statistically that this change in the aggregate characteristics of the U.S. publicly traded firms only explained partially the decline in

dividend payments. This finding implies a sharp decline in the propensity to pay dividends explains this decline in dividend distributions.

3.2.2 DeAngelo, DeAngelo & Skinner (2004)

DeAngelo, DeAngelo, and Skinner (2004) present an empirical analysis of dividend policy trends among publicly traded U.S. firms over the last quarter of the 20th century challenging the narrative that dividends are disappearing from the corporate landscape.

DeAngelo, DeAngelo, and Skinner (2004) study begins by documenting a dramatic decline in the proportion of dividend-paying firms, a trend that was highlighted by Fama and French (2001) whereby more than two-thirds of public industrial firms paid dividends in the late 1970s but by the end of 1990, this figure fall to one-fifth.

DeAngelo, DeAngelo, and Skinner (2004) demonstrate that this decline is not due to an overall reduction in the supply of dividends and that the aggregate real dividends paid by U.S. publicly traded firms increased steadily throughout the period.

According to DeAngelo, DeAngelo, and Skinner (2004), the key to resolving this contradiction lies in the distribution of dividend payments with the vast majority of the dividends being paid by a small group of larger and well-established firms, while most non-payers are small, young and unprofitable companies that have little impact on the aggregate supply of dividends.

A central argument advanced by DeAngelo, DeAngelo, and Skinner (2004) is that the decline in the proportion of dividend payers is primarily attributable to changes in the composition of publicly traded companies. In fact, the population of U.S. listed companies grown rapidly thanks to the introduction of new, small and often unprofitable companies and these firms tend to retain earnings to finance growth opportunities or lack the profitability to support regular dividend payment to the investors.

DeAngelo, DeAngelo, and Skinner (2004) provide compelling evidence that the propensity to pay dividends is strongly related to a firm's mix of retained earnings and the total equity. In fact, and according to DeAngelo, DeAngelo, and Skinner (2004), firms with high ratios of retained earnings to total equity are much more likely to pay dividends.

DeAngelo, DeAngelo, and Skinner (2004) also address the question of whether the rise of share repurchases as an alternative form of payout explain the decline in dividend payers. They found that while share repurchases became more common, this trend does not fully account for patterns observed in dividend policy.

DeAngelo, DeAngelo, and Skinner (2004) note that firms that pay substantial dividends also engage in share repurchases, using both financial mechanisms to distribute value to the shareholders. Additionally, they found that share repurchases have supplemented rather than replaced dividends for the largest firms.

3.2.3 Grullon and Michaely (2002)

Grullon and Michaely (2002) provide an analysis of corporate payout policy in the United States focusing on the dividends and share repurchases over the last quarter of the 20th century.

Grullon and Michaely (2002) study addresses the substitution hypothesis whereby firms use share repurchases as a substitute for cash dividends in distributing value to the shareholders.

Grullon and Michaely (2002) show that in the early 1980s, firms engaged increasingly in share repurchases programs. In fact, the proportion of firms that engaged in share repurchases increased from 31 percent in 1972 to 80 percent in 2000.

A key finding of Grullon and Michaely (2002) is that, despite a decline in dividend payout ratios, the overall payout ratio including both dividends and share repurchases remained relatively stable over the sample period. According to Grullon and Michaely (2002), this stability is explained by the fact that firms increasingly substitute dividends for share repurchases using funds that might otherwise be allocated to the dividend increases.

According to Grullon and Michaely (2002), this substitution is evident among large, well-established firms, which have chosen to increase their total payout ratio through share repurchases. On the other hand, young firms prefer to engage in share repurchases programs rather than distributing dividends to their shareholders.

Grullon and Michaely (2002) use an empirical methodology whereby firms are categorised into four groups based on their payout behaviour: those that pay neither dividends nor repurchase shares, those that pay the dividends only, those that

repurchase shares only, and those that do both. Furthermore, Grullon and Michaely (2002) analyse transition probabilities and use regression analysis to test the substitution of dividends and share repurchases.

Grullon and Michaely (2002) results indicate that the market views dividend and share repurchase as substitutes especially in the context of dividend cuts. In other words, the market reaction to dividend cuts is not significantly negative for firms that engage in share repurchase programs, suggesting that investors are less concerned about dividend cuts when accompanied by share repurchase activity.

Grullon and Michaely (2002) also explore the characteristics of firms that choose different payout strategies. They found that firms that pay dividends tend to be larger and more profitable with earnings being less volatile compared to those that do not pay dividends.

On the other hand, Grullon and Michaely (2002) found that firms that engaged in share repurchase programs are generally younger and have high earnings volatility. Furthermore, they found that firms that both pay dividends and repurchase shares account for the vast majority of aggregate repurchase activity and that they have intermediate levels of earnings volatility.

Grullon and Michaely (2002) concluded that this pattern supports the view that dividends are used to distribute permanent earnings while repurchases are generally used to return extraordinary earnings to the shareholders. In other words, the flexibility of share repurchases allows the firms to adjust their payout policies in response to changing financial conditions without committing to permanent increases in dividend payments.

Grullon and Michaely (2002) findings have important implications for the valuation of stocks and the modelling of payout policy whereby traditional valuation models that focus solely on dividends may underestimate the total cash returned to the shareholders because dividends and share repurchases are shown to be effective substitutes. In other words, Grullon and Michaely (2002) argue that analysts and investors should consider the total payout of the firm when assessing the attractiveness of its shares and the volatility of its earnings and their sustainability in the future.

Conclusion

Part 1 of this thesis examined the longstanding debate on whether dividend policy influences share price volatility. Starting from Modigliani and Miller (1961) irrelevance theory, we reviewed the proposition that dividend policy does not have any impact on firm value in perfect markets. This view was then extended by Black and Scholes (1974) and Miller and Scholes (1978).

Chapter 2 explored the dividend relevance perspective beginning with Gordon (1959) bird-in-the-hand theory whereby investors prefer certain dividends over uncertain capital gains. Bhattacharya (1979) introduced the signalling theory suggesting that dividend convey information about future prospects of the firm.

Agency costs theories such as Jensen (1986) and Easterbrook (1984) argued that dividends mitigate these costs and limit the wasteful expenditures. Furthermore, La Porta et al. (2000) emphasised the influence of investor protection laws on dividend payouts, while Farrar and Selwyn (1967) showed how taxes and investor preferences shape dividend clientele.

Chapter 3 focused on empirical research. Lintner (1956) found that managers prefer stable dividends to avoid negative market reactions. Baskin (1989) found that higher dividends are linked to lower share price volatility.

The remaining studies namely Rozeff (1982), Fama and French (2001) and Grullon and Michaely (2002) found that dividend behaviour is shaped by firm characteristics, agency concerns and the rise of share repurchases.

This literature review provides a solid theoretical and empirical basis for the case study analysis that will follow in Part 2.

Part 2: Empirical studies

Introduction

In Part 1, we investigated the relationship between dividend policy and share price volatility through the multiple academic papers on this subject that generated many debates and interested many researchers in the corporate finance field.

These debates continued to fuel the so-called "dividend puzzle" without any clear consensus between researchers. In fact, the impact of dividend policy can be explained in different ways such as the signalling theory, the agency costs and other perspectives that were explored by the researchers in the last century and the current one.

Many empirical studies came to investigate the so-called "dividend puzzle" but got different results and thus, issued different recommendations to the corporate managers, investors and regulators.

In Part 2, we will go through two empirical models and reconstruct them using a different dataset from a different geography and a different timeframe. These two models are the Hashemijoo et al. (2012) model and the Gordon (1959) cross-sectional model.

The choice of reconstructing two different models was motivated by the criticism of Gordon (1959) on the models that rely on time-series data such as the Hashemijoo et al. (2012) model. Gordon (1959) argued that this kind of data can face issues like autocorrelation which can impair the significance of regression coefficients for many variables. Gordon (1959) argued that in contrast, the cross-sectional approach employed in his article can allow for examination of differences across firms at a fixed point.

In Chapter 4, we will go through the Hashemijoo et al. (2012) model and reconstruct it using a set of 118 firms from Belgium, the Netherlands, Luxembourg and France and using a timeline of 7 years. We will conclude the chapter with the results and the interpretation of these results.

In Chapter 5, we will cover the Gordon (1959) cross-sectional model and reconstruct it using a dataset of firms from three different sectors and in two fixed timings (2022 and 2024). As done with Chapter 4, the results of this study will be displayed and interpreted.

Chapter 4: Hashemijoo et al. (2012) model

Dividend policy and its impact on share price volatility have long been subject to debate in corporate finance and among the various empirical studies to investigate this matter, Hashemijoo et al. (2012) offered a well-structured framework.

This chapter will attempt to reconstruct the Hashemijoo et al. (2012) model, using a different dataset and a more recent time period in order to assess if the findings still hold in this new context.

The Hashemijoo et al. (2012) model was directly inspired by the study of Baskin (1989) whereby Baskin investigated the relationship between dividend policy and the share price volatility using multiple regressions and control variables.

Building on the previous Baskin (1989) work, Hashemijoo et al. (2012) investigated the relationship between dividend policy and share price volatility by using a sample of 84 companies from 142 consumer product companies listed in the Malaysian stock exchange. The period of their study was six years from 2005 to 2010.

Hashemijoo et al. (2012) applied multiple regressions using control variables such as firm size, leverage, asset growth and earnings volatility. The results of the study showed a significant negative relationship between share price volatility with not only the dividend yield but also with the payout ratio.

Hashemijoo et al. (2012) findings were aligned with the dividend relevance school of thought as they suggest that higher and more consistent dividend payments contribute to reducing the uncertainty among investors and thus, make the share price more stable in time.

4.1 Hypothesis development

This section develops the research hypotheses for this first empirical model based on Hashemijoo et al. (2012).

As mentioned before, the Hashemijoo et al. (2012) model investigates the relationship between dividend policy and share price volatility, incorporating several firm-specific control variables.

The following hypotheses are formulated based on their empirical findings and the theoretical framework that constituted the basis of their research:

- H_0 : There is no significant relationship between dividend policy and share price volatility
- H_1: There is a significant relationship between dividend policy and share price volatility

Specifically:

- H_2: Dividend yield has a significant relationship with share price volatility.
- H_3: Dividend payout ratio has a significant relationship with share price volatility.
- H_4: Firm size has a significant relationship with share price volatility.
- H_5: Earnings volatility has a significant relationship with share price volatility.
- H_6: Financial leverage has a significant relationship with share price volatility.
- H_7: Asset growth has a significant relationship with share price volatility.

Each specific hypothesis above is tested against the corresponding null hypothesis that assumes no significant relationship between the examined variables.

4.2 Data and sample description

For this study, the sample consists of 118 firms from Belgium, the Netherlands, Luxembourg and France. These firms vary in size, financial leverage, earnings volatility and asset growth.

The financial and market data were obtained from Orbis database which provides comprehensive and standardised financial information on publicly listed companies. The data includes dividend payments, the prices of the shares in different relevant moments, total assets, long term debt and other key financial information for the selected period.

The period of the study goes from 2017 to 2024, a timeframe that allows to capture recent financial trends and ensure sufficient data for robust statistical analysis. Furthermore, the eight-year range helps smoothen the potential short-term anomalies resulting from an event that was faced by the companies in Europe.

The sample was selected based on the following criteria: all firms have issued dividends each year from 2017 to 2024 and their shares did not undergo any splits during the selected period.

The first criterion ensures that the firms in the sample include only those which have a sustainable dividend policy and the second criterion eliminates any distortions that might impair the results of the correlation and regressions.

The various analyses of the data retrieved from the Orbis database were conducted using the IBM SPSS statistics (version 31.0) software.

4.3 Variable description and model specification

This study examines the relationship between dividend policy and share price volatility taking into consideration several control variables identified in the literature review and specifically in Hashemijoo et al. (2012) model.

Each variable is described below:

- **Share price volatility (P.vol):** this variable is the dependent variable in this model. Consistent with Hashemijoo et al. (2012), the formula to compute it is the following:

$$P.vol = \sqrt[2]{\frac{\sum_{i=1}^{7}((H_i - L_i)/(\frac{H_i + L_i}{2}))^2}{7}}$$

  Where:

  P.vol : share price volatility

  H_i : highest share price for year i

  L_i : lowest share price for year i

  i (from 1 to 7) indicates years from 2018 to 2024

- **Dividend yield (D.yield):** this variable is one of two main independent variables in this model. Consistent with Hashemijoo et al. (2012), the formula to compute it is the following:

$$D.yield = \sum_{t=1}^{t=7} \left(\frac{D_i / MV_i}{7} \right)$$

Where:

D.yield : Dividend yield

D_i : The sum of annual cash dividend paid to common shareholders in year i

MV_i : Market value of the firm in the end of year i

i (from 1 to 7) indicates years from 2018 to 2024

- **Payout ratio (Payout):** this variable is the second main independent variable in this model. Consistent with Hashemijoo et al. (2012) model, the formula to compute it is the following:

$$Payout = \sum_{t=1}^{t=7} \frac{D_i / E_i}{7}$$

Where:

D_i : The sum of annual cash dividend paid to common shareholders in year i

E_i : Net income after tax for year i

i (from 1 to 7) indicates years from 2018 to 2024

- **Size (Size):** this variable is one of the control variables in this model. Consistent with Hashemijoo et al. (2012) model, the formula to compute it is the following:

$$Size = \ln \left(\sum_{t=1}^{t=7} MV_i / 7 \right)$$

Where:

MV_i : Market value of the firm in the end of year i

i (from 1 to 7) indicates years from 2018 to 2024

- **Earnings volatility (E.vol) :** this variable is one of the control variables in this model. Consistent with Hashemijoo et al. (2012) model, the formula to compute it is the following:

$$E.vol = \sqrt[2]{\frac{\sum_{t=1}^{t=7}(R_i - \bar{R})^2}{7}}$$

Where:

E.vol : Earnings volatility

R_i : the ratio of operating income to total assets for year i

$\bar{R}$: The firm average ratio of operating income to total assets in all the periods of the study

i (from 1 to 7) indicates years from 2018 to 2024

- **Long-term debt (Debt) :** this variable is one of the control variables in this model. Consistent with Hashemijoo et al. (2012) model, the formula to compute it is the following:

$$Debt = \sum_{t=1}^{t=7} \frac{LD_i / ASSET_i}{7}$$

Where:

LD_i: Long-term debt at the end of year i

$ASSET_i$: Total assets at the end of year i

i (from 1 to 7) indicates years from 2018 to 2024

- **Growth (Growth) :** this variable is one of the control variables in this model. Consistent with Hashemijoo et al. (2012) model, the formula to compute it is the following:

$$Growth = \frac{\sum_{t=1}^{t=7}(\frac{\Delta ASSET_i}{ASSET_i})}{7}$$

Where:

$\Delta ASSET_i$: change of total assets in year i

$ASSET_i$: total assets at the beginning of year i

i (from 1 to 7) indicates years from 2018 to 2024

A summary of key descriptive statistics for the sample firms is presented in Table 1 below:

Table 1

Descriptive statistics of the sample of 118 firms

Variable	Minimum	Maximum	Mean	Standard deviation	Variance
P.vol	0,142606987	1,059706987	0,494019692	0,134604068	0,018118255
D.yield	0,007639785	1,463850241	0,359139790	0,249235319	0,062118244
Payout	0,004489585	9,135576764	0,605034432	0,878646413	0,772019520
Size	14,659102565	23,804690427	19,036298874	1,984405497	3,937865177
E.vol	0,000548611	0,429067456	0,078611004	0,077985385	0,006081720
Debt	0	0,520686384	0,208966826	0,120545344	0,014531180
Growth	-0,126991610	6,791458592	0,110107230	0,622485452	0,387488137

Source: SPSS Statistics output

Note. P.vol is the share price volatility; D.yield is the dividend yield; E.vol is the earnings volatility.

As shown in table 1 above, the size of the firm variable has the highest mean with a value of 19,036298874 while earnings volatility has the lowest mean with a value 0,078611004.

Furthermore, the size of the firm has the highest standard deviation with a value of 1,984405497 while earnings volatility has the lowest standard deviation with a value of 0,077985385.

To examine the impact of the dividend policy on share price volatility, the following linear regression is specified:

$$P.vol_j = \beta_0 + \beta_1 \times D.yield_j + \beta_2 \times Payout_j + \beta_3 \times Size_j + \beta_4 \times E.vol_j + \beta_5 \times Debt_j + \beta_6 \times Growth_j + \epsilon_j$$

Where:

P.vol$_j$: share price volatility of the firm j

D.yield$_j$: Dividend yield of the firm j

Payout$_j$: Payout ratio of the firm j

Size$_j$: Size of the firm j

E.vol$_j$: Earnings volatility of the firm j

Debt$_j$: Long-term debt of the firm j

Growth$_j$: Growth of the assets of the firm j

The coefficient β_1 and β_2 are of particular interest as they capture the effect of dividend policy on share price volatility.

It is important to note that the linear regression equation above is the primary model, incorporating all the independent and the control variables. However, other alternative linear regression equations including subsets of these variables will also be explored to assess the isolated impact of specific variables without the presence of others. These regression models will be explained in section 4.5 of this chapter.

4.4 Correlation analysis

Prior to the regression analysis, a correlation matrix was computed to examine the relationship between the variables in this model. This is relevant to investigate any risk of multicollinearity between the variables of the model.

The correlation matrix is included in the table 2 below:

Table 2

The Pearson correlation matrix of Hashemijoo et al. (2012) model variables

		P.vol	D.yield	Payout	Size	E.vol	Debt	Growth
P.vol	Pearson correlation	1	-0,011	-0,007	0,002	**0,301****	-0,039	-0,068
	Sig. (2-tailed)		0,903	0,936	0,981	<0,001	0,677	0,463
D.yield	Pearson correlation		1	**0,322****	**-0,245****	-0,014	0,146	-0,080
	Sig. (2-tailed)			<0,001	0,007	0,878	0,116	0,392
Payout	Pearson correlation			1	0,028	-0,063	0,142	-0,030
	Sig. (2-tailed)				0,765	0,495	0,125	0,750
Size	Pearson correlation				1	-0,116	0,111	0,085
	Sig. (2-tailed)					0,211	0,230	0,360
E.vol	Pearson correlation					1	**- 0,312****	0,091
	Sig. (2-tailed)						<0,001	0,325
Debt	Pearson correlation						1	-0,023
	Sig. (2-tailed)							0,804
Growth	Pearson correlation							1
	Sig. (2-tailed)							

Source : SPSS Statistics output

Note. P.vol is the share price volatility; D.yield is the dividend yield; E.vol is the earnings volatility.

According to the Pearson correlation matrix (table 2) above, the following takeaways are of interest:

- Price volatility has a significant positive correlation with the earnings volatility (r=0,301) suggesting that firms with higher earnings volatility tend to experience higher share price volatility.
- Dividend yield has a significant positive correlation with the payout ratio (r=0,322) which is expected as both variables are related.
- Dividend yield has a significant negative correlation with the size of the firm (r=-0,245) suggesting that larger firms tend to offer a lower dividend yield.
- Earnings volatility has a significant negative correlation with the debt levels of a firm (r=-0,312) suggesting that firms with high financial leverage levels tend to experience lower volatility on their earnings.

Despite the statistical significance of these relationships, these correlations remain within acceptable limits, suggesting no critical multicollinearity issues.

4.5 Regression results and analysis

This section presents the results of the multiple linear regressions conducted to examine the relationship between the dividend policy and the share price volatility.

4.5.1 Model 1: impact of dividend policy and payout ratio on share price volatility

The first linear regression that will be computed will only explore the effects of the independent variables on the share price volatility without taking into consideration the control variables. The following is the mathematical expression of this linear regression:

$$P.vol_j = \beta_0 + \beta_1 \times D.yield_j + \beta_2 \times Payout_j \epsilon_j$$

Where:

P.vol$_j$: share price volatility of the firm j

D.yield$_j$: Dividend yield of the firm j

Payout$_j$: Payout ratio of the firm j

The regression results are summarized in table 3 below. The model reports both the estimated coefficients and their corresponding t-statistics and p-values allowing for the assessment of statistical significance.

Table 3

Model 1 regression results: impact of dividend policy and payout ratio on share price volatility

	B	SE	β	t	Sig.
Constant	0,496	0,022		22,342	<0,001
Dividend yield	-0,005	0,053	-0,010	-0,101	0,920
Payout ratio	-0,001	0,015	-0,004	-0,043	0,966

Note. B = unstandardised coefficient; SE = Standard error; β = Standardised coefficient; Sig. = significance level.

Model summary: R^2 = 0,000144; Adjusted R^2 = -0,017245; F(2,115) = 0,008; p = 0,992

Overall, the model does not explain a significant proportion of the variance in the share price volatility as indicated by the negligible value of R^2 and the negative value of adjusted R^2.

Furthermore, neither dividend yield nor payout ratio show a statistically significant effect on the share price volatility as the p-values retrieved from SPSS are higher than 0,90. These results suggest that neither of these two variables really explains the variation of the dependent variable which is the share price volatility.

Other alternative regression models will be explored to further investigate what really explains the variation in share price volatility.

4.5.2 Model 2: impact of dividend yield, the payout ratio and the controls variables on the share price volatility

Model 2 of the regression analysis explores the impact of the independent variables and the control variables on the variance of the share price volatility. Following is the mathematic formulation of it:

$$P.vol_j = \beta_0 + \beta_1 \times D.yield_j + \beta_2 \times Payout_j + \beta_3 \times Size_j + \beta_4 \times E.vol_j + \beta_5 \times Debt_j + \beta_6 \times Growth_j + \epsilon_j$$

Where:

P.vol$_j$: share price volatility of the firm j

D.yield$_j$: Dividend yield of the firm j

Payout$_j$: Payout ratio of the firm j

Size$_j$: Size of the firm j

E.vol$_j$: Earnings volatility of the firm j

Debt$_j$: Long-term debt of the firm j

Growth$_j$: Growth of the assets of the firm j

The regression analysis results are summarised in table 4 in a similar way used in the previous model.

Table 4

Model 2 regression results: impact of dividend yield, the payout ratio and the controls variables on the share price volatility

	B	SE	β	t	Sig.
Constant	0,389	0,130		3	0,003
Dividend yield	-0,009	0,054	-0,016	-0,159	0,874
Payout ratio	0,001	0,015	0,006	0,065	0,949
Size	0,003	0,006	0,039	0,410	0,683
Earnings volatility	0,576	0,165	0,334	3,5	<0,001
Debt	0,067	0,108	0,060	0,625	0,534
Growth	-0,022	0,020	-0,102	-1,122	0,264

Note. B = unstandardised coefficient; SE = Standard error; β = Standardised coefficient; Sig. = significance level.

Model summary: $R^2 = 0,105$; Adjusted $R^2 = 0,057$; $F(6,111) = 2,177$; $p = 0,05$

Overall, this model is statistically significant at the 5% level of p-value and is able to explain a meaningful way the variance of the share price volatility.

Among all the variables tested in this model, only the earnings volatility variable shows a significant positive relationship on share price volatility ($\beta = 0,334$, $p < 0,001$) suggesting that firms with higher earnings volatility are associated with higher share price volatility. This result empirically supports Hypothesis 5 (H_5) which anticipated that the earnings volatility has a significant positive relationship with the share price volatility.

On the other hand, dividend yield and payout ratio did not show statistically significant relationships with share price volatility. This was also the case for the remaining control variables.

These findings so far suggest that, within this sample, earnings volatility is the primary driver of share price volatility while the dividend policy variables and other control variables have little explanatory power.

4.5.3 Model 3 and 4

Model 3 of the linear regression analysis explores the impact of the dividend yield and the control variables on the variance of the share price volatility. The payout ratio is excluded from this model.

Model 4 of the linear regression explores the impact of the payout ratio and the control variables on the share price volatility. The dividend yield was excluded from this model.

Both Model 3 and Model 4 showed the same results exhibited by the model 2 of the regression (i.e. the regression analysis with all independent and control variables) and thus, the same conclusions apply for both model 3 and model 4 of the regression.

However, the only difference noted is the statistical significance of model 3 and model 4 of the regression are higher as the p-value dropped to 0,027 instead of the value of 0,05 found in model 2.

4.5.4 Synthesis of the model based on Hashemijoo et al. (2012)

The reconstruction of Hashemijoo et al. (2012) was conducted to investigate the empirical relationships identified in the academic paper applying a similar methodological approach to a more recent dataset.

The main finding of the reconstruction is that the earnings volatility is the main driver of the variance of the share price volatility and that it is the only variable that showed statistical significance when tested which supports Hypothesis 5 (H_5). This suggests that firms with high earnings volatility are associated with a higher share price volatility. This finding is consistent with Hashemijoo et al. (2012) findings.

On the other hand, the dividend variables did not show any significant relationship with the share price volatility within this sample. This outcome is not aligned with Hashemijoo et al. (2012) findings whereby they found a statistically significant negative relationship between both dividend policy and payout ratio with share price volatility. Consequently, this study failed to replicate those findings within this more recent dataset.

The divergence observed between this study and Hashemijoo et al. (2012) could be influenced by variations in sample composition, time period and market conditions.

Chapter 5: Gordon (1959) cross-sectional model

Among the contributions to the debate on the relevance or the irrelevance of the dividend policy, Gordon (1959) offers another empirical study to investigate the relationship between the dividend policy and the share price volatility. This chapter will attempt to reconstruct the Gordon (1959) model using a more recent dataset and explore whether his findings hold when tested.

Gordon (1959) is a contrasted view to Modigliani and Miller (1961) whereby Gordon (1959) argues that higher dividend payments reduce investor uncertainty and thus, enhances the firm market value.

This empirical reconstruction of Gordon (1959) offers a cross-sectional regression to try to explain the variance of the share price. This reconstruction is performed on three different samples from different sectors and in two different years. The selected sectors are based on the NAICS[1] 2022 classification and they are deliberately chosen to represent different sectors with different characteristics.

5.1 Variable description and model specification

This empirical study investigates the relationship between the dividend policy and the share price and this is based on Gordon (1959) models.

Gordon (1959) used three different regression models. However, for the sake of this study, we will focus on two models that are explained below:

- First model used by Gordon (1959) (hereafter Model A) can be summarised mathematically as follows:

$$P = \beta_0 + \beta_1 \times D + \beta_2 \times Y$$

Where:

P : the year-end share price

D : the year's dividend per share

Y : the year's earnings per share

[1] NAICS stands for the *North American Industry Classification System*, a standard used by governments and businesses to classify economic activities by sector. The classification referenced in this study is based on the 2022 version.

- The second Gordon (1959) model (hereafter Model B) that we will take into consideration for this empirical study can be summarized mathematically as follows:

$$P = \beta_0 + \beta_1 \times \bar{d} + \beta_2 \times \left(d - \bar{d}\right) + \beta_3 \times \bar{g} + \beta_4 \times (g - \bar{g})$$

Where:

P : the year-end share price divided by book value

$\bar{d}$: the average dividend per share for the prior five years divided by book value

d : current year's dividend per share divided by book value

$\bar{g}$: the average retained earnings per share for the prior five years divided by book value

g : current year's retained earnings per share divided by book value

5.2 Hypothesis development

This section develops the research hypothesis for this empirical reconstruction of Gordon (1959) models.

The following hypotheses are formulated based on their empirical findings and the theoretical framework that constituted the basis of his research:

- H_0 : There is no significant relationship between dividend policy and the share price
- H_1: There is a significant relationship between dividend policy and the share price

Specifically:

- H_2: Dividend yield has a significant relationship with the share price.
- H_3: Earnings per share have a significant relationship with the share price.
- H_4: Retained earnings have a significant relationship with the share price.

Each specific hypothesis above is tested against the corresponding null hypothesis that assumes no significant relationship between the examined variables.

5.3 Data and sample description

For this cross-sectional study, the total population consists of 89 firms operating in Belgium, the Netherlands, Luxembourg and France. These firms are categorised into three sectors that have different characteristics. The sector selection was based on NAICS 2022 codes.

The first sector includes the NAICS codes 23 (Construction), 31 (Manufacturing – food, textiles, etc.), 32 (Manufacturing – Wood, paper, etc.). The reason behind combining these three codes into one sector is that they have common characteristics such as being capital-intensive and requiring less Research & Development than other sectors. Through this study we will analyse 36 firms in this sector.

The second sector includes the NAICS code 33 (Manufacturing – Machinery, electronics, transportation equipment, etc.). While it is part of the manufacturing sector, the code 33 represents advanced manufacturing, often with higher technological intensity, longer research and development cycles compared to sectors 31 (Manufacturing – food, textiles, etc.) and 32 (Manufacturing – Wood, paper, etc.) taken into consideration in the first sample. The number of firms that will be analysed in this sector is 28 firms.

The third sector includes the NAICS code 53 (Real Estate, Rental and Leasing) which differs from the industrial and manufacturing sectors mentioned above. This sector is characterised by high capital intensity and very high leverage levels. The number of firms analysed under this sector are 25 firms.

Following Gordon (1959) model, this study relies on cross-sectional data that is firm-specific meaning that the data is mainly observed for a single point in time across different entities and sectors. This is different to what Hashemijoo et al. (2012) did using the time-series data which track firm or market variables across multiple periods. Gordon (1959) approach enables to use static observations to explore the relationship between dividend policy and share price volatility.

This study analysis will be conducted on two different years which are 2022 and 2024 for all the three sectors identified above and using the two regression models (Model A and Model B) described in the previous section 5.1.

A summary of key descriptive statistics for the sample firms related to the first sector and to the year 2022 is presented in Table 5 below:

Table 5

Descriptive statistics of the sample firms related to sector 1 and the year 2022

Variable	Minimum	Maximum	Mean	Standard deviation	Variance
Regression model A					
Year-end price	6,548921	355,817589	71,713127	69,239817	4794,152194
Dividend per share	0,062071	9,990037	2,082526	2,001603	4,006413
Earnings per share	-5,053548	19,191325	4,789361	4,781414	22,861923
Regression model B					
P	0,448506	6,567188	1,769027	1,263695	1,596926
$\bar{d}$	0,037281	0,524008	0,196439	0,111448	0,012421
$(d - \bar{d})$	-0,311965	-0,024674	-0,146777	0,083648	0,006997
$\bar{g}$	-1,859897	0,959929	0,246341	0,398435	0,158751
$(g - \bar{g})$	-0,917684	1,940379	-0,181135	0,413794	0,171225

Source: SPSS Statistics output

Note. P is the year-end share price divided by book value; $\bar{d}$ is the average dividend per share for the prior five years divided by book value; d is the current year's dividend per share divided by book value; $\bar{g}$ is the average retained earnings per share for the prior five years divided by book value; g is the current year's retained earnings per share divided by book value.

As shown in table 5 above and regarding regression model A, the year-end price variable has the highest mean with a value of 71,713127 while the dividend per share variable has the lowest mean with a value 2,082526.

Furthermore, the year-end price has the highest standard deviation with a value of 69,239817 while the dividend per share has the lowest standard deviation with a value of 2,001603.

Moreover, and regarding the regression model B, the year-end share price divided by book value variable has the highest mean with a value of 1,769027 while the $(g - \bar{g})$ variable has the lowest mean with a value -0,181135.

Additionally, the year-end share price divided by book value variable has the highest standard deviation with a value of 1,263695 while $\left(d - \bar{d}\right)$ variable has the lowest standard deviation with a value of 0,083648.

For the sake of simplicity, we will only include the descriptive statistics for the sector 1 and for the year 2022. The descriptive statistics of the other samples will be included in the appendix of this thesis.

5.5 Correlation analysis

Prior to the regression analysis, a correlation matrix was computed to examine the relationship between the variables in these two regression models. This is relevant to investigate any risk of multicollinearity between the variables.

5.5.1 Model A

The correlation matrix of model A that is related to sector 1 and to the year 2022 is included in the table 6 below:

Table 6

The Pearson correlation matrix of Gordon (1959) reconstruction (Model A) related to sector 1 and the year 2022

		Year-end price	Dividend per share	Earnings per share
Year-end price	Pearson correlation	1	**0,442****	**0,635****
	Sig. (2-tailed)		0,007	<0,001
Dividend per share	Pearson correlation		1	**0,535****
	Sig. (2-tailed)			<0,001
Earnings per share	Pearson correlation			1
	Sig. (2-tailed)			

Source : SPSS Statistics output

According to the Pearson correlation matrix (table 6) above, the following takeaways are of interest:

- The share price has a significant positive correlation with the dividend per share (r=0,442) suggesting that firms with higher dividend per share tend to experience higher share price.
- The share price has a significant positive correlation with the earnings per share (r=0,635) suggesting that firms with higher earnings per share tend to have a higher share price.
- The dividend per share has a significant positive correlation with the earnings per share (r=0,535) which is expected as both variables are related to each other.

Despite the statistical significance of these relationships, these correlations remain within acceptable limits, suggesting no critical multicollinearity issues.

For simplicity reason, only the correlation analysis related to this sub-sample is shown in the body of the thesis and the other tables can be found in the appendix.

For some of the sub-samples, the correlation was significant between the variables and the power of this correlation was higher than 0,8. Consequently, the variance inflation factor (VIF) analysis was conducted to further investigate the issue and the results showed that there are no multicollinearity issues as the VIF values were below 5.

5.5.2 Model B

The correlation matrix of model B that is related to sector 1 and to the year 2022 is included in the table 7 below:

Table 7

The Pearson correlation matrix of Gordon (1959) reconstruction (Model B) related to sector 1 and year 2022

		P	$\bar{d}$	$(d - \bar{d})$	$\bar{g}$	$(g - \bar{g})$
P	Pearson correlation	1	0,208	-0,176	0,063	0,014
	Sig. (2-tailed)		0,224	0,303	0,716	0,934
$\bar{d}$	Pearson correlation		1	**-0,953**	0,003	-0,047
	Sig. (2-tailed)			<0,001	0,986	0,783
$(d - \bar{d})$	Pearson correlation			1	0,089	-0,033
	Sig. (2-tailed)				0,604	0,847
$\bar{g}$	Pearson correlation				1	**-0,953****
	Sig. (2-tailed)					<0,001
$(g - \bar{g})$	Pearson correlation					1
	Sig. (2-tailed)					

Source : SPSS Statistics output

Note. P is the year-end share price divided by book value; $\bar{d}$ is the average dividend per share for the prior five years divided by book value; d is the current year's dividend per share divided by book value; $\bar{g}$ is the average retained earnings per share

for the prior five years divided by book value; g is the current year's retained earnings per share divided by book value.

According to the Pearson correlation matrix (table 7) above, only variables that are related to each other show a significant relationship (i.e., $(g - \bar{g})$ and $\bar{g}$ on one hand and $(d - \bar{d})$ and $\bar{d}$ on the other).

These correlations are significant and above the acceptable threshold of significance of r=0,8. However, this model is designed by Gordon (1959) and thus, the risk of multicollinearity is inherently within the model by design. Consequently, no further modifications will be performed to his model.

Additionally, and for simplicity reasons, only the sub-sample above will be displayed in the body of this thesis as the conclusions retrieved from this one are also true for the remaining sub-samples.

5.6 Regression results and analysis

This section presents the results of the linear regressions conducted to examine the relationship between the dividend policy and the share price.

5.6.1 Model A (2022 Analysis)

As a reminder, the following is the mathematical expression of this linear regression (Model A):

$$P = \beta_0 + \beta_1 \times D + \beta_2 \times Y$$

Where:

P : the year-end share price

D : the year's dividend per share

Y : the year's earnings per share

Regression results for Sector 1 (2022)

The regression results for sector 1 are summarized in table 8 below. The model reports both the estimated coefficients and their corresponding t-statistics and p-values allowing for the assessment of statistical significance.

Table 8

Regression results of Model A related to sector 1 and the year 2022

	B	SE	β	t	Sig.
Constant	22,656	14,127		1,604	0,118
Dividend per share	4,966	5,437	0,144	0,913	0,368
Earnings per share	8,084	2,276	0,558	3,552	0,001

Source : SPSS Statistics output

Note. B = unstandardised coefficient; SE = Standard error; β = Standardised coefficient; Sig. = significance level.

Model summary: R^2 = 0,418; Adjusted R^2 = 0,383; F(2,33) = 11,847; p = <0,001

Overall, the model is significant (F=11,847; p < 0,001) with a good $R^2 = 0{,}418$ meaning that model explains 41,8% of the variance in the share price explained by dividend per share and earnings per share.

Specifically, only the earnings per share variable shows a statistically significant effect on the share price (p=0,001) with a positive coefficient of β = 0,558 suggesting that higher earnings per share are generally associated with higher share price. On the other hand, the dividend per share is not significant in this model. These findings provide strong support for Hypothesis 3 (H_3) confirming that the earnings per share have a significant impact on the share price.

Comparative regression results across sectors in 2022

After presenting the detailed regression results of sector 1, this section provides a comparative overview of the regression results of Model A across all the analysed

sectors for 2022. Additionally, the detailed regression results will be included in the appendix.

Table 9

Regression results of Model A related to the year 2022 across all analysed sectors

	Sector 1	Sector 2	Sector 3
Dividend per share	β = 0,144 (p=0,368)	β =0,697 (p<0,001)	β = 0,460 (p=0,012)
Earnings per share	β = 0,558 (p=0,001)	β =0,132 (p=0,458)	β = 0,366 (p=0,040)
R^2	0,418	0,637	0,402
Adjusted R^2	0,383	0,608	0,348
F-statistic	11,847	21,957	7,397
F Sig.	<0,001	<0,001	0,003
Sample size	38	28	25

Source : SPSS Statistics output

In sector 1, only the earnings per share variable shows a statistically significant positive effect on the share price with a standardised coefficient of β = 0,558 (p=0,001). This suggests that in this sector, the firm profitability has a stronger explanatory power over the share price than the dividend policy, as the dividend per share variable is statistically insignificant (β = 0,144; p=0,368) and thus, provides support for Hypothesis 3 (H_3) for this specific sector. The model explains approximately 41,8% of the variance of the share price (R^2 = 0,418), and the regression is highly significant overall (F =11,847 ; p < 0,001).

In sector 2, the results are reversed. In fact, the dividend per share is highly significant with a positive standardised coefficient β = 0,697 (p<0,001), while earnings per share is found not significant (β = 0,132 ; p=0,458). This indicates that in this sector, investors place more weight on dividend payments. Furthermore, the model is significant overall with the highest explanatory power among the three sectors (R^2 = 0,637; F =21,957; p < 0,001). These findings provide strong support for Hypothesis 1 (H_1) and Hypothesis 2 (H_2) confirming that the dividend policy has a significant impact on the share price.

In sector 3, both the dividend per share (β = 0,460; p=0,012) and earnings per share (β = 0,366; p=0,040) exhibit a statistically significant positive effect on the share price. This result suggests that investors have a more balanced sensitivity to both the profitability of the firm and the dividend policy. Furthermore, the overall model is significant (F =7,397; p = 0,003) and explains a good part of the variance of the share price (R^2 = 0,402). These findings provide strong support for Hypothesis 1 (H_1), Hypothesis 2 (H_2) and Hypothesis 3 (H_3) confirming that the dividend policy and the earnings per share have a significant impact on the share price.

5.6.2 Model A (2024 Analysis)

Regression results for Sector 1 (2024)

The regression results for sector 1 are summarized in table 10 below. The model reports both the estimated coefficients and their corresponding t-statistics and p-values allowing for the assessment of statistical significance.

Table 10

Regression results of Model A related to sector 1 and the year 2024

	B	SE	β	t	Sig.
Constant	4,707	13,591		0,346	0,731
Dividend per share	6,906	5,938	0,146	1,163	0,253
Earnings per share	12,960	2,292	0,707	5,655	<0,001

Source : SPSS Statistics output

Note. B = unstandardised coefficient; SE = Standard error; β = Standardised coefficient; Sig. = significance level.

Model summary: R^2 = 0,632; Adjusted R^2 = 0,610; F(2,33) = 28,362; p = <0,001

Overall, the model is significant (F=28,362; p < 0,001) with a good $R^2 = 0{,}632$ meaning that model explains 63,2% of the variance in the share price explained by the dividend per share and earnings per share.

Specifically, only earnings per share show a statistically significant effect on the share price ($p<0,001$) with a positive coefficient of ($\beta = 0,707$) suggesting that higher earnings per share are associated with a higher share price. On the other hand, the dividend per share is not significant in this model. These findings provide strong support for Hypothesis 3 (H_3) confirming that the earnings per share have a significant impact on the share price.

Comparative regression results across sectors in 2024

After presenting the detailed regression results of sector 1, this section provides a comparative overview of the regression results across all the analysed sectors for 2024. Additionally, the detailed regression results will be included in the appendix.

Table 11

Regression results of Model A related to the year 2024 across all analysed sectors

	Sector 1	Sector 2	Sector 3
Dividend per share	$\beta = 0,146$ (p=0,253)	$\beta = 0,318$ (p=0,048)	$\beta = 0,205$ (p=0,267)
Earnings per share	$\beta = 0,707$ (p<0,001)	$\beta = 0,590$ (p<0,001)	$\beta = 0,587$ (p=0,004)
R^2	0,632	0,718	0,524
Adjusted R^2	0,610	0,695	0,481
F-statistic	28,362	31,764	12,123
F Sig.	<0,001	<0,001	<0,001
Sample size	38	28	25

Source : SPSS Statistics output

Across all sectors, the earnings per share exhibit a positive and statistically significant impact on the share price with the standardised coefficients ranging between 0,587 to 0,707 and p-values below 0,05. The strength of this relationship appears to be the strongest in sector 1 ($\beta = 0,707$) followed by sector 2 ($\beta = 0,590$) and sector 3 ($\beta = 0,587$).

These findings provide strong support for Hypothesis 3 (H_3) confirming that the earnings per share have a significant impact on the share price.

On the other hand, the dividends per share show a significant effect on the dependent variable only in sector 2 (β = 0,318; p = 0,048) suggesting that the influence of the dividends per share on the share price is rather sector-specific and thus, providing support for Hypothesis 1 (H_1) and Hypothesis 2 (H_2) confirming that the dividend policy has a significant impact on the share price for this specific sector.

The model explains a good amount of variance in all sectors, with R^2 values ranging from 0,524 to 0,718 with the latter related to sector 1, and the F-statistics are significant in all cases (p<0,001) and are ranging from 12,123 to 31,764 confirming the overall validity and strength of the model.

5.6.3 Model B (2022 Analysis)

As a reminder, the following is the mathematical expression of this linear regression (Model B):

$$P = \beta_0 + \beta_1 \times \bar{d} + \beta_2 \times (d - \bar{d}) + \beta_3 \times \bar{g} + \beta_4 \times (g - \bar{g})$$

Where:

P : the year-end share price divided by book value

$\bar{d}$: the average dividend per share for the prior five years divided by book value

d : current year's dividend per share divided by book value

$\bar{g}$: the average retained earnings per share for the prior five years divided by book value

g : current year's retained earnings per share divided by book value

Regression results for Sector 1 (2022)

The regression results for sector 1 are summarized in table 12 below. The model reports both the estimated coefficients and their corresponding t-statistics and p-values allowing for the assessment of statistical significance.

Table 12

Regression results of Model B related to sector 1 and the year 2022

	B	SE	β	t	Sig.
Constant	0,631	0,507		1,245	0,223
$\bar{d}$	2,372	6,254	0,209	0,379	0,707
$(d - \bar{d})$	-1,368	8,461	-0,091	-0,162	0,873
$\bar{g}$	6,359	2,504	2,005	2,540	0,016
$(g - \bar{g})$	6,047	2,380	1,980	2,541	0,016

Source : SPSS Statistics output

Note. P is the year-end share price divided by book value; $\bar{d}$ is the average dividend per share for the prior five years divided by book value; d is the current year's dividend per share divided by book value; $\bar{g}$ is the average retained earnings per share for the prior five years divided by book value; g is the current year's retained earnings per share divided by book value.

B = unstandardised coefficient; SE = Standard error; β = Standardised coefficient; Sig. = significance level.

Model summary: $R^2 = 0,214$; Adjusted $R^2 = 0,112$; $F(4,31) = 2,105$; $p = 0,104$

Among the independent variables, only the $\bar{g}$ variable with β = 2,005 and $(g - \bar{g})$ variable with β = 1,980 show a significant positive impact on the share price as p-values are below 0,05. This indicates that retained earnings play a significant role in explaining variations in the share price especially when the book value is taken into consideration and thus, provide strong support to Hypothesis 4 (H_4).

On the other hand, the other variables did not have any significant impact on the dependent variable which was shown by the high p-values.

The overall model only explains 21,4% of the variance in share price as the value of R^2 is 0,214 but the overall model is not significant ($F(4,31) = 2,105$; $p = 0,104$). This weakens the explanatory power of the model when considered as a whole.

Comparative regression results across sectors in 2022

After presenting the detailed regression results of sector 1, this section provides a comparative overview of the regression results across all the analysed sectors for 2022. Additionally, the detailed regression results will be included in the appendix.

Table 13

Regression results of Model B related to the year 2022 across all analysed sectors

	Sector 1	Sector 2	Sector 3
$\bar{d}$	β = 0,209 (p=0,707)	β = 2,290 (p=0,004)	β = 1,383 (p=0,204)
$(d - \bar{d})$	β = -0,091 (p=0,873)	β = 1,756 (p=0,021)	β = 1,302 (p=0,255)
$\bar{g}$	β = 2,005 (p=0,016)	β = 15,249 (p=0,095)	β = 2,281 (p=0,035)
$(g - \bar{g})$	β = 1,980 (p=0,016)	β = 15,252 (p=0,095)	β = 1,850 (p=0,070)
R^2	0,214	0,540	0,421
Adjusted R^2	0,112	0,460	0,305
F-statistic	2,105	6,757	3,635
F Sig.	0,104	<0,001	0,022
Sample size	38	28	25

Source : SPSS Statistics output

Note. P is the year-end share price divided by book value; $\bar{d}$ is the average dividend per share for the prior five years divided by book value; d is the current year's dividend per share divided by book value; $\bar{g}$ is the average retained earnings per share for the prior five years divided by book value; g is the current year's retained earnings per share divided by book value.

The results highlight a mixed pattern of significance with the dependent variable across sectors. More specifically:

- In sector 1, both the $\bar{g}$ variable (β = 2,005; p =0,016) and $(g - \bar{g})$ variable (β = 1,980; p = 0,016) show a significant positive impact on the share price. Conversely, the dividend variables did not exhibit significant relationships with the dependent variables as the related p-values were above 0,05. Thus, these findings provide support to Hypothesis 4 (H_4).

- In sector 2, the results are reversed. Both the $\bar{d}$ variable (β = 2,290; p =0,004) and the $(d - \bar{d})$ variable (β = 1,756; p = 0,021) show a significant positive impact on the share price. Conversely, the retained earnings variables did not exhibit significant relationships with the dependent variables as p-values were above 0,05. These findings provide support to Hypothesis 1 (H_1) and Hypothesis 2 (H_2).

- In sector 3, only the $\bar{g}$ variable (β = 2,281; p =0,035) shows a significant positive impact on the share price which gives partial support to Hypothesis 4 (H_4).

Furthermore, the explanatory power of the model, as indicated by R^2, ranges from 0,214 in sector 1 to 0,540 in sector 2 suggesting a moderate to strong fit in some sectors.

On the other hand, the significance of the model as a whole varies across the sectors with some sectors showing stronger significance than others (p-values ranging from below 0,001 in sector 2 to 0,104 in sector 1). Consequently, the model related to sector 1 is not significant and thus, the results for this sector may not reliably explain the relationship between the variables and the share price.

5.6.4 Model B (2024 Analysis)

Regression results for Sector 1 (2024)

The regression results for sector 1 are summarized in table 14 below. The model reports both the estimated coefficients and their corresponding t-statistics and p-values allowing for the assessment of statistical significance.

Table 14

Regression results of Model B related to sector 1 and the year 2024

	B	SE	β	t	Sig.
Constant	0,488	0,334		1,461	0,154
$\bar{d}$	25,044	8,955	6,129	2,797	0,009
$(d - \bar{d})$	28,009	10,418	6,042	2,689	0,011
$\bar{g}$	5,905	2,451	1,709	2,409	0,022
$(g - \bar{g})$	4,738	2,506	1,406	1,891	0,068

Source : SPSS Statistics output

Note. P is the year-end share price divided by book value; $\bar{d}$ is the average dividend per share for the prior five years divided by book value; d is the current year's dividend per share divided by book value; $\bar{g}$ is the average retained earnings per share for the prior five years divided by book value; g is the current year's retained earnings per share divided by book value.

B = unstandardised coefficient; SE = Standard error; β = Standardised coefficient; Sig. = significance level.

Model summary: $R^2 = 0,352$; Adjusted $R^2 = 0,268$; $F(4,31) = 4,201$; $p = 0,008$

Among the independent variables, only the $\bar{g}$ variable ($\beta = 1,709$), the $\bar{d}$ variable ($\beta = 6,129$) and the $(d - \bar{d})$ variable ($\beta = 6,042$) show a significant positive impact on the share price as p-values are below 0,05. This indicates that dividends and partially retained earnings play a significant role in explaining variations in the share price especially when the book value is taken into consideration and thus, provide support to Hypothesis 1 (H_1), Hypothesis 2 (H_2) and partially to Hypothesis 4 (H_4).

The overall model only explains 26,8% of the variance in share price as the value of R^2 is 0,268 and the overall model is significant ($F(4,31) = 4,201$; $p = 0,008$).

Comparative regression results across sectors in 2024

After presenting the detailed regression results of sector 1, this section provides a comparative overview of the regression results across all the analysed sectors for 2024. Additionally, the detailed regression results will be included in the appendix.

Table 15

Regression results of Model B related to the year 2024 across all analysed sectors

	Sector 1	Sector 2	Sector 3
$\bar{d}$	β = 6,129 (p=0,009)	β = 0,075 (p=0,973)	β = 1,671 (p=0,007)
$(d - \bar{d})$	β = 6,042 (p=0,011)	β = -0,691 (p=0,752)	β = 1,822 (p=0,006)
$\bar{g}$	β = 1,709 (p=0,022)	β = 5,846 (p=0,137)	β = 0,827 (p=0,286)
$(g - \bar{g})$	β = 1,406 (p=0,068)	β = 5,860 (p=0,136)	β = 0,400 (p=0,602)
R^2	0,352	0,610	0,497
Adjusted R^2	0,268	0,542	0,396
F-statistic	4,201	9,001	4,932
F Sig.	0,008	<0,001	0,006
Sample size	38	28	25

Source : SPSS Statistics output

Note. P is the year-end share price divided by book value; $\bar{d}$ is the average dividend per share for the prior five years divided by book value; d is the current year's dividend per share divided by book value; $\bar{g}$ is the average retained earnings per share for the prior five years divided by book value; g is the current year's retained earnings per share divided by book value.

The results highlight a mixed pattern of significance with the dependent variable across sectors. More specifically:

- In sector 1, the $\bar{g}$ variable ($\beta = 1{,}709$; p = 0,022), the $(d - \bar{d})$ variable ($\beta = 6{,}042$; p = 0,011) and the $\bar{d}$ variable ($\beta = 6{,}129$; p = 0,009) show a significant positive impact on the share price. This indicates that dividends and partially retained earnings play a significant role in explaining variations in the share price especially when the book value is taken into consideration and thus, provide support to Hypothesis 1 (H_1), Hypothesis 2 (H_2) and partially to Hypothesis 4 (H_4).

- In sector 2, none of the individual variables are statistically significant even though the model related to this sector has the strongest explanatory power among the sectors with $R^2 = 0{,}610$ and the strongest overall model significance (F Sig. <0,001). These findings mean that the model explains changes in the share price well but no single variable stands out as clearly responsible for the effect.

- In sector 3, both the $\bar{d}$ variable ($\beta = 1{,}671$; p=0,007) and the $\left(d - \bar{d}\right)$ variable ($\beta = 1{,}822$; p=0,006) show a significant positive impact on the share price. Conversely, the retained earnings variables did not exhibit significant relationships with the dependent variables as p-values were above 0,05. These findings provide support to Hypothesis 1 (H_1) and Hypothesis 2 (H_2).

Furthermore, the explanatory power of the model, as indicated by R^2, ranges from 0,352 in sector 1 to 0,610 in sector 2 suggesting a moderate to strong fit in some sectors.

Furthermore, the significance of the model as a whole varies slightly across the sectors with some sectors showing slightly stronger significance than others (p-values ranging from below 0,001 in sector 2 to 0,008 in sector 1).

5.7 Interpretation of the results

5.7.1 Model A

Across all sectors, R^2 and adjusted R^2 values increased from 2022 to 2024 and this indicates that Model A was able to explain a greater proportion of the variation of the share price in 2024 than in 2022.

Sector 2 consistently shows the highest R^2, adjusted R^2 values and F-statistics suggesting a strong and significant relationship between the independent variables and the dependent variable in this sector.

There was a change in significance for the dividend per share variable in relation to the dependent variable. In fact, this variable was significant in sector 2 ($p < 0,001$) and sector 3 ($p = 0,012$) in 2022 but lost significance in sector 3 in 2024 while remaining significant for sector 2 ($p=0,048$) for the same year. However, the strength of the relationship between the dividend per share and the share price weakened in sector 2 between 2022 and 2024 from $\beta = 0,697$ to $\beta = 0,318$. These findings suggest sector 1 is less sensitive to dividend variables within the two years of this study.

On the other hand, the earnings per share was only significant in sector 1 ($p < 0,001$) and in sector 3 in 2022 ($p=0,040$) but it gained significance in all sectors in 2024 (p-values ranging from below 0,001 to 0,004). Furthermore, the strength of the relationship between the earnings per share and the share price got stronger in 2024 for sector 1 and sector 3. These findings provide strong support to Hypothesis 4 (H_4) in 2024 and less strong support for 2022.

Overall, the model was significant as a whole as the related p-values were ranging from below 0,001 to 0,003. Furthermore, the F-statistics values increased in all sectors from 2022 to 2024 reflecting a stronger fit over time of the model.

5.7.2 Model B

Similar to Model A, R^2 and adjusted R^2 values increased from 2022 to 2024 across all sectors in Model B, and this indicates that it was able to explain a greater proportion of the variation of the share price in 2024 than in 2022.

Furthermore, Sector 2 consistently shows the highest R^2, adjusted R^2 values and F-statistics suggesting a strong and significant relationship between the independent variables and the dependent variable in this sector which is consistent with the findings of Model A.

In 2022, Sector 1 showed a weak model fit and significance (Adjusted $R^2= 0,112$; $p = 0,104$) but this changed in 2024 as the adjusted R^2 increased to 0,268 and the model became significant with the p-value decreasing to 0,008. This suggests that the independent variables became more important in sector 1 during 2024.

There were some changes in the significance of variables between 2022 and 2024:

- In sector 1 and sector 3, the $\bar{d}$ variable and the $(d - \bar{d})$ variable gained significance in 2024 after being insignificant in 2022 suggesting that the investor became sensitive to dividend patterns in 2024 and thus, provide support to Hypothesis 1 (H_1) and Hypothesis 2 (H_2). Conversely, the $\bar{d}$ variable and the $(d - \bar{d})$ variable lost significance in sector 2 in 2024 after being significant in 2022.

- Despite sector 2 having the strongest model overall (significant R^2 and F-statistics values), none of the variables were significant in 2024 suggesting that this sector is no longer responsive to dividends and retained earnings in 2024.

Conclusion

This part of the thesis has empirically examined the relationship between dividend policy and share price volatility using two distinct methodological approaches: a time-series regression inspired by Hashemijoo et al. (2012) and a cross-sectional regression inspired by Gordon (1959). These reconstructions were conducted using a recent dataset from firms operating in Belgium, the Netherlands, Luxembourg and France.

The reconstruction of Hashemijoo et al. (2012) using an eight-year data of 118 firms showed a divergence from the original study's findings. While the original study reported a significant negative relationship between both dividend yield and payout ratio with the share price volatility, the reconstruction found no statistical significance between these dividend variables and the share price volatility. Thus, the dividend policy appears to have limited explanatory power over share price volatility in the sample and timeframe used for the analysis.

Furthermore, the earnings of the firm were found to have a positive statistically significant relationship with the share price volatility suggesting that the firms with higher earnings volatility are generally associated with higher share price volatility.

In contrast, the cross-sectional reconstruction of Gordon (1959) model allowed us to assess firm-specific effects at two points in time (2022 and 2024) across three economic sectors. Model A, which regressed share price on dividends per share and earnings per share emphasised the evolving investor focus on earnings variables rather than on dividend distribution.

On the other hand, Model B, which included historical averages and deviations of dividends per share and earnings per share, showed that while the overall ability to explain changes in share price improved across sectors between 2022 and 2024, the importance of the independent variables varied depending on the sector analysed.

Overall, the results of Part 2 show the complex nature of the "dividend puzzle" and the complex relationship between dividend policy and share price volatility being far from uniform. The findings vary not only across models but also across the time periods and sectors.

General Conclusion

This thesis aimed to explore the impact of dividend policy on share price volatility through combining theoretical insights and empirical investigation. The literature review showed that the relevance of dividend policy is still debated and no clear solution was found to the "Dividend puzzle".

Various theories were developed either in favour of the relevance of the dividend policy or in favour of the irrelevance of the dividend policy and many perspectives were explored by researchers such as the information content of dividends, the fiscal considerations of the investors or agency costs and how the dividends might help mitigate those costs.

On the empirical side of this thesis, two distinct models were conducted using a recent dataset of firms operating in Belgium, the Netherlands, Luxembourg and France. The reconstructions were based on Hashemijoo et al. (2012) time-series data model and Gordon (1959) cross-sectional model.

Overall, the findings of the reconstruction of Hashemijoo et al. (2012) were different from the findings of the original study. The latter showed a negative significant relationship between dividend policy variables and share price volatility while the reconstruction did not find any significant relationship between them.

Regarding the reconstruction of Gordon (1959) model, two distinct models were conducted and the findings were that the investor sensitivity towards earnings variables was higher than towards dividend variables. Furthermore, the second model (Model B) found that despite the overall fit of the model increased between 2022 and 2024, the individual variables lost significance suggesting that share price might be driven by a combination of factors that are difficult to isolate.

Overall, this thesis contributes to the ongoing debate on the relevance of dividend policy in the valuation of the firms by reaffirming that this impact is nuanced rather than absolute and continues to be an important area of corporate finance research.

Like any empirical study, this study is subject to several limitations that should be acknowledged. First of them is that the sample is restricted to firms operating in Belgium, the Netherlands, Luxembourg and France which can limit the generalisation of the findings to other markets with different regulations.

Second limitation is the relatively short time frame which might overlook the long-term trends. It is also worth mentioning that the time frame of the two reconstructions

included data from the exceptional COVID-19 period which might have slightly distorted the results found.

Given the limitation mentioned, future research can consider different modifications mainly expanding the dataset to include additional countries and/or a longer time period which would help to capture long-term trends.

While this study offers some insight into the relationship between dividend policy and share price volatility, further research is needed to develop a more comprehensive understanding of this relationship.

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