Determinants of dividend payout policy: Evidence from the New York Stock Exchange

Master Thesis

Name:	F.F. (Fabio Frederik) Kuipers
Student number:	S1790358
Faculty:	Faculty of Behavioural, Management and Social Sciences
Program:	Master Business Administration
Track:	Financial Management
First supervisor:	Prof. dr. ir. A. Bruggink
Second supervisor:	H. Kroon
Date:	31-07-2024

Acknowledgments

As a final part of completing my Master of Business Administration at the University of Twente, this thesis was written. The specialization chosen was in Financial Management. Before getting into the main study, I would like to take a moment to thank a few people who assisted me in the process of completing my master's thesis. First and foremost, I would like to express my gratitude to my first supervisor prof. Dr. ir. A. Bruggink. His insightful guidance and feedback have helped me throughout this journey. Secondly, I would like to thank my second supervisor H. Kroon for being my second supervisor in the first place and for his insightful feedback on my paper. Lastly, I would like to thank my family, friends, and in particular my girlfriend, for their support while completing my master's thesis.

Abstract

The dividend payout policy has been studied in this study. This has been done by looking at the determinants of firms listed on the New York Stock Exchange from 2018 to 2022. A contribution has been made to solving the dividend puzzle in doing so. Determinants for the level of dividend payout as well as the likelihood of dividend payout were found and are taken into account. This study shows that firms listed on the NYSE are more likely to pay dividends when they are more profitable, more mature, larger, and have a low free cash flow. The level of dividend payout is also higher for firms listed on the NYSE for the same determinants as mentioned before with the addition of a lower debt ratio.

Table of contents

1. Introduction

Within corporate finance, the determination of dividend policy has long been a subject of academic discussion and practical significance, where Black (1976) even called it a difficult puzzle. The struggle between firms' financial decisions and their implications for shareholder value remains a focal point of academic research and industry practice. Amidst this backdrop, the American' dynamic and robust listed companies offer an intriguing avenue for exploration into dividend policy dynamics.

The exploration of dividend policy in American listed companies on the New York Stock Exchange (NYSE) is particularly pertinent given the evolving landscape of global financial markets and the unique characteristics of the corporate sector. With a rich history of economic stability and a thriving business environment, firms navigate a complex interplay of factors when crafting their dividend policies.

This research takes a deep dive into the determinants of dividend policy in American listed companies on the NYSE, focusing on variables such as profitability, growth and investment opportunities, firm size, firm age, and free cash flow. By examining these factors within the context of the American corporate landscape, this study aims to contribute to both theoretical understanding and practical insights into dividend policy decisions.

Motivated by the enduring relevance of dividend policy in corporate finance and the distinct features of the American corporate sector, this research is looking to address the following research question: What are the determinants of dividend policy in firms listed on the NYSE, and how do they influence dividend payout decisions?

By situating the research question within the broader academic literature on dividend policy theories, including information asymmetry (Bhattacharya, 1979) and agency problems (Jensen & Meckling, 1976), and drawing insights from empirical studies on firm characteristics and dividend policy (Patra et al., 2012; Schafer & Talavera, 2007), this study aims to contribute to the understanding of dividend policy dynamics in the American context. Furthermore, by leveraging empirical evidence and data-driven analysis, this research seeks to provide actionable insights for practitioners and policymakers navigating the intricacies of dividend policy in American-listed companies on the NYSE.

2. Literature review

Within this section two theories regarding dividend policy will be discussed, the information asymmetry theory and the agency problem theory. These theories will form the base of the variables used in this study. Furthermore, the dividend payout policy will be explained. This section will end with a formulation of the hypothesis.

2.1 Dividend payout policy

Dividend policy theory found its origin with Modigliani and Miller in 1961 who derived the dividend irrelevance theorem. This paper is considered one of the main works in the field of finance, particularly in the area of corporate finance and dividend policy. It states that in perfect capital markets, the dividend policy of a firm is not relevant to its value. Miller and Modigliani (1961) argue that investors are indifferent between receiving dividends and capital gains because they can sell their shares to create their own sort of dividends if they want to. Concluding, that changes in dividend policy should not affect a firm's stock price. Perfect capital markets are characterized by the following assumptions. Firstly, every trader has costless and equal access to information about all relevant data points of shares. Secondly, brokerage fees, taxes, or other transaction costs are nonexistent when purchasing, selling, or issuing securities. Thirdly, no buyer or seller of securities can have an impact on the price of a security. Finally, dividend gains and capital gains are not taxed differently from one another.

Research on determinants of dividend payout policy started in the United States of America. Fama and French (2001) found that the amount of companies paying cash dividends decreased starting at 66,50 % in 1978 to 20,80 % in 1999, partially caused by a change in the characteristics of publicly traded firms. Firms with high investment opportunities, small size, and low profitability are less likely to pay dividends. The decline in dividend payouts is not primarily explained by changes in firm characteristics. In the study done by Fama and French (2001), a significant decline in the likelihood of firms paying dividends was observed across various industries. This suggests a broader shift in corporate finance practices. A few years later another discovery was made by DeAngelo et al. (2006). The dividend payout policy was examined in relation to the different life cycles stages of firms. They found that the relationship between dividends and firm value varies across different life cycle stages.

Dividend payout policy has also been examined outside of the United States. Denis and Osobov (2008) observed that firms with high profitability, greater growth opportunities, and larger firms have a higher likelihood to pay dividends. Other studies from outside the United States showed the same results. Studies done by Schafer and Talavera (2007) and O'Hara et al. (2005) found similar results as shown by the Fama and French (2001) study regarding profitability, firm size, and investment options.

When looking into dividend policy within the European Union, a study by Von Eije and Megginson (2008) provided insights into the factors of dividend policy across EU countries using cross-country comparisons. The findings on firm-specific determinants are, yet again, supported by research done by Fama and Fench (2001).

2.2 Information asymmetry theory

There are multiple theories concerning the determinants of dividend payout policy, the first theory that will be discussed is the information asymmetry theory. In the perfect markets described by Modigliani and Miller (1961) there will not be information asymmetry between the different shareholders of a firm. This is of course an assumption and is not applicable in reality. Looking into the information asymmetry theory there are two important frameworks for this theory named: the Signaling theory and the pecking order theory. The signaling theory was developed in theoretical models by Bhattacharaya (1979) and Miller and Rock (1985). The signaling theory suggests that firms use signals or actions that can be observed by external parties. With the Issuing of dividends, the firm signals its confidence in future earnings (Bhattacharya, 1979). Support has been found in empirical studies for the signaling theory, implying that dividend payments are a signal of a firm's quality and profitability (Baker & Wurgler, 2004) (Bhattacharya, 1979). The pecking order theory found its origin in a study by Myers and Majluf in 1984. It proposes the idea that firms have a hierarchy of financing options based on information asymmetry and cost of capital. Firms have a strong proposition towards internal financing, after that through debt, and equity issuance for the final option. The theory argues that internal funds are less likely to be affected by adverse selection problems when comparing it to external financing (Myers & Majluf, 1984). Studies by Rajan and Zingales (1995) and Myers and Majluf (1984) have found confirmation in favor of the pecking order theory in the propensity to prioritize internal over external funding and prefer debt over equity issuance.

2.2.1 The Signaling Theory

The signaling theory found its origin within the concept of information asymmetry, where one party possesses more information than the other party in a certain transaction. Placing this in the context of corporate finance, firms often have private information about their future prospects, profitability, or risk profile. Which may not be fully known to external investors. The signaling theory suggests that firms strategically use observable actions, such as dividend payments, investment decisions, or capital structure choices, to transfer credible information about their underlying fundamentals to external stakeholders (Bhattacharya, 1979).

One of the most studied signaling mechanisms is dividend policy. According to the signaling theory, firms may use dividend payments as a signal of their financial health, profitability, and growth prospects. Firms initiate or increase dividends that are perceived to have confidence in their future earnings stability and ability to generate cash flows (Baker & Wurgler, 2004). On the other hand, firms that cut or omit dividends may signal a weaker financial position or unfavorable prospects.

Signaling theory suggests that firms' investment decisions can also serve as signals to investors. Firms that undertake growth investment projects or capital expenditures may signal confidence in their growth opportunities and future profitability (Brennan & Hughes, 1991). In addition, firms that reduce investments or delay projects may signal uncertainty about their future prospects.

Capital structure decisions, such as debt issuance or equity repurchases, can also send information to investors. Firms that use leverage by issuing debt may signal confidence in their ability to produce adequate cash flows to meet obligations regarding debt and capitalize on growth opportunities (Myers, 1984). Hence, firms that reduce leverage or repurchase shares may signal undervaluation or excess cash reserves.

Different empirical studies have provided support and evidence for the effectiveness of the signaling theory in explaining corporate financial decisions. While some studies find support for the signaling hypothesis, some have alternative explanations, such as agency costs or tax considerations which can also influence the action of firms (Baker & Powell, 2005). However, numerous studies have documented associations between signaling actions, such as dividend changes, investment decisions, or capital structure choices, and subsequent firm performance or stock returns (Bhattacharya, 1979; Baker & Wurgler, 2004).

2.2.2 Pecking Order Theory

In line with the pecking order theory, companies prioritize funding through internal cash flow, then through debt issuance, and finally resort to equity issuance as a last measure. This hierarchical approach finds its origin in the belief that internal funding is both more cost-effective and less likely to send negative signals to external parties compared to external funding. The decision-making process regarding internal versus external financing and the choice between debt and equity issuance is influenced by this asymmetry of information (Brealey et al., 2020).

Myers and Majluf (1984) introduced the idea that under conditions of information asymmetry, companies may tend to underinvest. This theory will not directly explain the factors that affect dividend policy, however the pecking order principle should have an impact on dividend decisions. A company's investment strategy can be seen as intertwined with its dividend payout choices (Arndt & Kučerová, 2019). The market to book ratio has been utilized by Patra et al. (2012) as a way to measure investment opportunities, interpreting it within the framework of the pecking order theory as a measure of profitability. This interpretation finds support within the findings of Fama and French (2002), who observed that firms that are more profitable with fewer investment opportunities tend to have higher dividend payouts.

However, empirical evidence on the validity of the pecking order theory presents a mixed picture. While studies like those conducted by De Haan and Hinloopen (2003) and Fama and French (2002) lend support to certain aspects of the pecking order theory, others, such as the research by Brounen, de Jong, and Koedijk (2006), challenge its significance in explaining dividend policy. Therefore, a consensus on the overall validity of the pecking order theory remains absent within the literature.

2.3 Agency problem theory

The agency problem is a concept within the field of corporate governance and financial economics, which is related to the conflict of interest between different stakeholders within a company. This theory found its origin when ownership and control started to be separated within firms, which was conceptualized by Berle and Means (1932). The separation lead to a discrepancy in the interests of shareholders, known within the theory as principles, and managers, known as agents. Jensen and Mackling formalized the agency theory in 1976, suggesting that agents would not always act in the best interests of shareholders. Thus, creating a conflict of interest which is known as the first type of the agency theory, the principle-agent problem. The second type of agency problem, type 2, the principle-principle problem, focusses on the conflicts between different type of shareholders.

2.3.1 Principle-agent problem (type 1)

The first type of agency problem, the principle-agent problem, is based around the conflict between shareholders and managers. Shareholders (principles) want to maximize their personal wealth and income by increasing the firm's stock price. However, managers (agents) can have other ambitions that can include higher compensation, job security, or power. A study done by Jensen and Meckling (1976) found that such a misalignment of interests can lead to agents that are not prioritizing maximizing shareholder value through suboptimal investment projects or pursuing personal goals. In order to mitigate this problem various methods are used including incentive-based compensation schemes and increased monitoring by the board of directors or activist investors. An example of a incentive-based compensation scheme is stock options, which align the managers interest with the shareholders (Jensen & Meckling, 1976).

Jensen (1986) proposed the free cash flow hypothesis, which suggests that excess free cash flow may cause agency problems, due to the fact that managers could invest in projects with a low return and that benefit themselves instead of the shareholders. To mitigate this issue, dividends are often paid to reduce free cash flow and to align the manager's interest with that of the shareholders (De Jong et al., 2019). Gill and Obradovich (2012) and De Jong et al. (2019) found support for this hypothesis, concluding that firms with an increased free cash flow are more likely to pay dividends to mitigate the agency problem and too reduce agency costs.

Debt can be used as an alternative control mechanism next to dividends, debt reduces free cash flow and imposes an obligation on firms, making it a substitute for dividends (Jensen, 1986). This in turn reduces the manager's incentive to use free cash flow for other purposes. Therefore, debt can be used as a principle-agent cost, known as the control hypothesis for debt creation. As debt levels increase, companies may opt for lower or no dividends to manage financial risk and transaction costs (Rozeff, 1982). Support for this study was found by Al-Najjar and Kilincarslan (2019) concluding that firms with higher debt levels tend to have lower dividend payouts.

2.3.2 Principle-principal problem (type 2)

Type II conflicts also known as principal-principal problems, arise among different shareholder types based on their size and concentration. This issue mostly arrises in firms with concentrated ownership structures. The controlling shareholders may act in actions to only benefit themselves at the expense of the minority shareholders. When compared to larger shareholders they have the means and incentives to observe managers closely, while minority shareholders often engage in free-riding, relying on others to monitor on their behalf (Aguilera & Crespi-Cladera, 2016).

In civil law countries like the Netherlands, where legal protection is weaker, ownership concentration is higher, enabling majority shareholders to exert control over dividend payouts (Gugler & Yurtoglu, 2003). Meanwhile in America, which uses common law offers better protection in comparison to civil law (Truong & Heaney, 2007). This difference in legal and institutional environments affects the relationship between free cash flow, debt, and dividend policies. Denis and Osobov (2008) found that firms are more inclined to use dividends to lower agency costs within countries with strong investor protection. Whereas, countries with a weaker investor protection debt is more important to mitigate agency costs (Dennis & Osobov, 2008).

Dividends play a crucial role in limiting rent extraction by majority shareholders and signaling a commitment to minority shareholder interests (Gugler & Yurtoglu, 2003). Concluding, the dividend policy of a firm has to have the perfect balance between aligning manager interests with the interests of the shareholders. As well as managing financial risk through debt, and navigating conflicts among shareholders of varying sizes and concentrations.

2.4 Life cycle theory

The life cycle theory finds its origin in the work of Franco Modigliani and co-authors around 1950. They described how one's consumption and savings evolve during his or her lifespan and this was an important concept within finance and economics. Evidence has been found which implies this theory is also applicable to corporate financial strategies (Modigliani & Brumberg, 1954).

The recent evolution of life-cycle theory shows a correlation between firm size, age, and dividend payments. When firms mature and grow, they reach a critical point within their market share dynamics. This crucial moment causes a decline in investment opportunities, which in turn leads to a reduction in capital expenditures. Therefore, these firms experience an increase in free cash flow, affording them the capacity to distribute more dividends (Brawn & Šević, 2018).

In earlier research, Fama and French (2001) highlighted the role of firm age and the effect on dividend policies. Building upon this, Grullon et al. (2002) introduced the maturity hypothesis, challenging the conventional signaling theory. Gurllon et al. (2002) analyzed NYSE and AMEX firms in a period from 1967 to 1993, they proposed that dividend increases may not necessarily signal future profitability or an increase in cash flow. Instead, such actions could signal a reduction in the firm's systematic risk or a forecast of lower future growth.

The studies regarding the life cycle theory continued and further validation came from DeAngelo et al. (2006). DeAngelo et al. (2006) investigated the relationship between dividend payments and retained earnings relative to total equity and total assets. Their findings suggested that companies with higher retained earnings to assets or equity are often more mature, which in turn causes higher profits. Due to this favorable financial position, it is more likely to pay dividends. In addition, they observed a positive correlation between dividend payments and the earned/contributed capital mix for NYSE firms.

Additional empirical support from Brawn and Šević (2018) emphasized the significance of age and firm size in determining dividend policies among U.S. firms. Collectively, these studies challenge conventional dividend theories by demonstrating that mature firms, contrary to expectations, are more inclined to distribute dividends. This finding deviates from signaling and pecking order theories, which typically associate dividend payments with smaller and younger firms characterized by greater information asymmetry.

Taking these studies into account, it becomes important to delve deeper into the nuances of dividend policies within the context of firm life cycles. Further exploration may result in valuable evidence supporting the life-cycle theory while shedding light on the complexity of dividend decision-making among different firms within different demographics.

2.5 Hypotheses

2.5.1 Profitability

Building upon the findings of Denis and Osobov (2008), who observed that firms with more profitability have a higher likelihood to pay dividends, we hypothesize that American-listed companies with higher levels of profitability will exhibit a stronger propensity to pay dividends. This relationship suggests that profitable firms have greater financial resources to distribute dividends to shareholders. To test this we have constructed the following hypothesis:

H1: A positive relationship exists between profitability and dividend policy for American firms listed on the NYSE.

2.5.2 Free cash flow

According to the free cash flow hypothesis by Jensen (1986), excessive free cash flow can lead to managers investing in projects that don't maximize shareholder value. Hence, firms with substantial free cash flow reserves may prefer retaining funds for future investments or to mitigate agency costs rather than paying dividends. The following hypothesis is formulated:

H2: A negative relationship exists between free cash flow and dividend policy for American firms listed on the NYSE.

2.5.3 Growth and Investment Opportunities

Drawing from the pecking order theory and the findings of Patra et al. (2012) and Fama and French (2002), we propose that American-listed companies with higher investment opportunities, which is indicated by market to book ratio, will have lower dividend payouts. This negative relationship suggests that firms with greater growth prospects prioritize retaining earnings for investment over distributing dividends to shareholders. The following hypothesis is formulated:

H3: A negative relationship exists between investment opportunities and dividend policy for American firms listed on the NYSE.

2.5.4 Size

Following the findings of Schafer and Talavera (2007) and O'Hara et al. (2005), we anticipate that larger American-listed companies will have a higher propensity to pay dividends. This positive relationship suggests that larger firms have greater financial stability and cash reserves, enabling them to consistently distribute dividends to shareholders. The following hypothesis is formulated:

H4: A positive relationship exists between firm size and dividend policy for American firms listed on the NYSE.

2.5.5 Leverage

According to the pecking order theory, firms prioritize internal financing over external financing, followed by debt issuance as a preferred funding option (Myers & Majluf, 1984). This hierarchy is influenced by information asymmetry and the cost of capital, with firms preferring internal funds compared to external financing (Myers & Majluf, 1984).

In addition, debt issuance can act as a substitute for dividends, serving as a mechanism to manage financial risk and transaction costs (Jensen, 1986). As firms increase their leverage, they may choose to lower dividends or pay no dividends at all in order to meet debt obligations and minimize the agency costs (Jensen, 1986; De Jong et al., 2019). The following hypothesis is formulated:

H5: A negative relationship exists between leverage and dividend policy for American firms listed on the NYSE.

2.5.6 Firm age

Based on the life-cycle theory and supported by empirical evidence from Brawn and Šević (2018), Grullon et al. (2002), DeAngelo et al. (2006), and Fama and French (2001). These studies collectively suggest that as firms mature, they tend to have fewer investment opportunities, more stable earnings, and higher free cash flow, leading to a greater propensity to pay dividends. The following hypothesis is formulated:

H6: A positive relationship exists between firm age and dividend policy for American firms listed on the NYSE.

3. Research methodology

Within this chapter, the research methodology will be discussed. Starting with the development of the model used for the dependent variable PAYOUT. Followed by the model for the propensity of payout and the measurement of the variables. And finally, the data collection will be discussed. The models will follow a study done by Kent Baker and Kilincarslan (2018) due to the resemblance between the hypotheses and the theories used. In order to perform a robustness check, for the level of payout model and the propensity of payout model, two additional models will be used.

3.1 Level of payout

To determine the impact of independent variables on the dependent variable PAYOUT an Ordinary Least Squares regression analysis is going to be used. As outlined by Henseler (2020), using a metric value for the dependent variable and explained by at minimum two independent metric variables, this method is appropriate for estimating the payout level. This aligns with the findings of prior research conducted by Von Eije and Megginson (2008), and De Jong et al. (2019). The Ordinary Least Squares regression model is constructed as shown below:

$$PAYOUT_{it} = \beta_0 + \beta_1 PROF_{i,t-1} + \beta_2 FCF_{i,t-1} + \beta_3 GROW_{i,t-1} + \beta_4 SIZE_{i,t-1} + \beta_5 LEV_{i,t-1} + \beta_6 AGE_{i,t-1} + \beta_x CONTROL_{i,t-1} + \epsilon_{i,t-1}$$

Where:

$PAYOUT_{it}$	= The dividend payout of firm i in year t.
$\beta_1 PROF_{i,t-1}$	= The profitability of firm i in year t-1.
$\beta_2 FCF_{i,t-1}$	= The free cash flow of firm i in year t-1.
$\beta_3 GROW_{i,t-1}$	= The growth and investment opportunities of firm i in year t-1.
$\beta_4 SIZE_{i,t-1}$	= The size of firm i in year t-1.
$\beta_5 LEV_{i,t-1}$	= The Leverage of firm i in year t-1.
$\beta_6 AGE_{i,t-1}$	= The age of firm i in year t-1.
$\beta_x CONTROL_{i,t-1}$	= The control variables of firm i in year t-1.
$\epsilon_{i,t-1}$	= The error term.

3.2 Propensity of payout

Next to the level of payout, the propensity of payout will also be examined. The likelihood of the dividend payout will be tested using a logit regression model. This aligns with the methodologies implemented by Von Eije and Megginson (2008), De Jong et al. (2019), and Denis and Osobov (2008), and Baker and Kilincarslan (2019). A dummy variable can be used in a logit regression model for the dependent variable. Due to the fact that a firm has two options regarding a dividend policy which is to pay dividends or not pay dividends. Therefore, this model suits the testing of these hypotheses. The logit model is formulated as is shown below:

$$DIVPAY_{it} = \beta_0 + \beta_1 PROF_{i,t-1} + \beta_2 FCF_{i,t-1} + \beta_3 GROW_{i,t-1} + \beta_4 SIZE_{i,t-1} + \beta_5 LEV_{i,t-1} + \beta_6 AGE_{i,t-1} + \beta_x CONTROL_{i,t-1} + \epsilon_{i,t-1}$$

Where:

$DIVPAY_{it}$ = Dividend payout choice of firm i in year t.

3.3 Measurement of variables

3.3.1 Dependent variables

Within this study two dependent variables are used: DIVPAY and PAYOUT. DIVPAY is a dummy variable and will show a value of zero if the firm does not pay dividends and one if the firm does pay dividends. This follows the study of Denis and Osobov (2008) and Kent Baker and Kilincarslan (2018). The next variable, PAYOUT, is determined using ordinary dividends divided by total assets, which is in line with the study by Alzahrani and Lasfer (2012). In order to test robustness the dividend payout is scaled by net income (PAYOUT_NINC) and Sales (PAYOUT_SALES) (Alzahrani & Lasfer, 2012) (Truong & Heaney, 2007).

3.3.2 Independent variables

The independent variables are explained within this paragraph. Starting with profitability, which is calculated as ROA ratio (return on assets ratio) (PROF) as used in studies by Patra et al. (2012) and Kent Baker and Kilincarslan (2018). Secondly, free cash flow (FCF) will be measured by earnings before depreciation and amortization minus taxes, interest expenditures, and dividends paid divided by total assets. This is according to the study by Feito-Ruiz and Renneboog (2017). Thirdly, total liabilities to total assets will result in leverage (LEV), corresponding with studies by De Jong et al. (2019), Patra et al. (2012), and Truong and Heaney (2007). Fourthly, the market-to-book ratio will be used to determine growth and investing opportunities (GROW), this follows Patra et al. (2012), Kent Baker and Kilincarslan (2018), and De Jong et al. (2019). Fifthly, the firm's age (AGE) is measured by the number of years since the founding date. Finally, the size (SIZE) of the firm is measured by the total assets following the study by Denis and Osobov (2008).

3.3.3 Control variables

Control variables will be used within the models within this study. To start a dummy variable will be added for the industry (INDUSTRY). Using this dummy variable will control for possible industry effects as mentioned by Kent Baker and Kilincarslan (2018). The variable is constructed by the first number of the SIC code. Secondly, liquidity (LIQUIDITY) will be added as a control variable, similar to different studies such as De Jong et al. (2019), and Denis and Osobov (2008). This will be measured using the firm's liquidity ratio. Thirdly, tangibility (TANG) will be added as a control variable. This variable is going to be measured by fixed assets scaled by total assets. Following a study by Xiao and Zou (2006) firms will use debt instead of equity if there aren't enough internal funds.

3.4 Data collection

The sample will be collected from the Orbis database. The factors of dividend policy are examined for firms listed on the NYSE for the years 2018-2022. Listed firms have been chosen because these firms have to oblige to strict reporting rules. For this study a period of four years is being used, these four years provide sufficient observations to be used. In order for the dataset to be useful some adjustments have to be made. Financial firms are subjected to different rules and regulations than non-financial firms. This in turn has an impact on their dividend policy (Denis & Osobov, 2008). Therefore, financial firms with the SIC codes 6000-6999 will be excluded from the dataset, corresponding with studies by De Jong et al. (2019), Chen et al. (2017), and Patra et al. (2012). Further, following Renneboog and Trojanowski (2011) firms that are involved in the utilities branch will be excluded from the dataset. Utility firms are subjected to different regulations regarding dividend payout policies, therefore firms with the SIC code between 4900-4949 will be excluded.

4. Results

Within this chapter, the results will be discussed which are derived from the analysis. First, the descriptive statistics will be discussed. This will be followed by Pearson's correlation matrix and finally, the results of the multiple regression will be discussed.

4.1 Descriptive statistics

The descriptive statistics are presented in Table 1 which includes all the variables used in this study. Winsoring has been used at the 1% and the 99% tail to mitigate the effect of extreme outliers in this study. The variables DIVPAY, INDUSTRY, and AGE are not winsorized. DIVPAY is considered a dummy variable and can only take the value of 1 or 0 and therefore can not have an extreme value. The variable INDUSTRY is not winsorized since it can only take a value from 1 to 9, no extreme values are possible here. Thirdly, AGE has not been winsorized, all data points have been examined and are found valid. To maximize the sample size the choice was made to use winsoring instead of deleting the outliers. Furthermore, the figures from the dependent variables are from the years 2018-2022, whereas the independent variables have been lagged by one year.

When examining the variables below starting with DIVPAY. This dependent variable has a value of 1 when a firm pays dividends and 0 when a firm does not pay cash dividends. The mean of 0,60 implies that from the 4585 observed data points, in 60% of the cases, firms have paid dividends from 2018 through 2022. In comparison, research by Kent Baker and Kilincarslan (2018) showed a mean of 0,406 meaning that NYSE-listed companies have a higher propensity to pay dividends.

PAYOUT is a dependent variable and is measured as ordinary dividends scaled by total assets. This variable had a minimum of 0, a maximum of 0,072, and a mean of 0,1620. The minimum of 0 can be explained by firms that do not pay dividends in a certain year and for those cases, PAYOUT will be calculated by dividing total assets with a zero amount. This will always lead to a zero outcome.

PAYOUT_SALES and PAYOUT_NINC are dependent variables that are used to test robustness. When examining these variables it stands out that these values differ. The variable PAYOUT_SALES shows a minimum of 0, a maximum of 0,308 with a mean of 0,02822. In comparison, the values of PAYOUT_NINC have a minimum of -2,990, a maximum of 3,690, and a mean of 0,23196. A noticeable difference between all dependent variables related to payout is that PAYOUT_NINC shows values below 0 and above 1. Indicating that firms have paid dividends exceeding their net income or even triple their net income.

Within this study, we examine 5 independent variables. Starting with PROF which has a mean of 0,03476 that varies between -0,373 and .294. Secondly, FCF shows values in a range of -0,205 and 0,404 with a mean of 0,09531. The negative value shown within the FCF variable indicates that firms have had a negative free cash flow during the examined period. Thirdly, values for the variable LEV range from 0,125 to 1,333 with a mean of 0,61981. From these figures, it can be concluded that, on average, around 62% of the total assets are debt. Fourthly, GROW is indicated by the market-to-book ratio. Values vary from -53,157 to 63,716 with a mean of 3,36051, indicating that, on average, firms listed on the NYSE are overvalued and are performing well. Fifthly, LN_SIZE which is the natural logarithm of total assets, has a mean of 6,61641 with values varying from 5,019 to 8,298. The last independent variable, AGE has a minimum value of 0 and a maximum value of 143 with a mean of 34,68. These figures show us that the youngest firm was established in the year of the observation and the oldest firm is 143 years old.

In this model, three control variables have been included along with both dependent and independent variables. The control variables are INDUSTRY, LIQUIDITY, and TANG. The variable INDUSTRY ranges from 1 to 9, with a mean of 3.81. LIQUIDITY has a mean of 1.52897 and ranges from 0.205 to 7.666. TANG has a minimum value of 0.007, a maximum of 0.924, and a mean of 0.30614. To address multicollinearity, the VIF values have been examined. All VIF values are below 5, indicating that for this study multicollinearity is not a problem.

Table 1. Descriptive statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
DIVPAY	4585	0	1	,60	,489
PAYOUT	4585	,000	,148	,01808	,027411
PAYOUT_SALES	4585	,000	,308	,02822	,050977
PAYOUT_NINC	4585	-2,990	3,690	,23196	,682441
PROF	4585	-,373	,294	,03476	,099709
FCF	4585	-,205	,404	,09531	,091434
LEV	4585	,125	1,333	,61981	,233291
GROW	4585	-53,157	63,716	3,36051	11,130998
LN_SIZE	4585	5,019	8,298	6,61641	,659219
INDUSTRY	4585	1	9	3,81	2,113
LIQUIDITY	4585	,205	7,666	1,52897	1,235065
TANG	4585	,007	,924	,30614	,252781
AGE	4585	0	143	34,68	31,499
Valid N (listwise)	4585				

Notes: This table shows the descriptive statistics for the variables within this study. Data of de dependent variables are based on the years 2018 – 2022. The data of the independent variables are lagged with one year and based on the years 2017-2021. In order to remove outliers, winsorizing of most variables has been used at the 1% and 99% tail. The variables DIVPAY, INDUSRTY and AGE have not been winsorized.

4.2 Pearson's correlation matrix

Another way to check multicollinearity is using the correlation matrix by Pearson, which can be found in Table 2. Pearson's correlation matrix is utilized to measure the strength of the correlation between variables. Values can range between -1 and 1. A value of -1 indicates a negative correlation, the opposite value of 1 indicates a positive correlation, and a value of 0 meaning no correlation. Within the range mentioned above, values between +/- 0,5 and +/- 1 indicate a high degree of correlation. When a correlation has a value between +/- 0,3 and +/- 0,49 it is considered a moderate correlation and values below +/- 0,29 imply a weak correlation.

When examining the high correlations within this study it can be noted that there are two positive correlations between dependent variables. Variables DIVPAY and PAYOUT show a strong positive correlation with a value of 0,534 and PAYOUT and PAYOUT_SALES show a value of 0,769. Due to the variables being dependent variables, they will not be used in the same model and therefore will not cause a multicollinearity problem within the regression analysis. The second highest correlation is the strong positive relationship between PROF and FCF with an amount of 0,720. Companies that have a higher profit could, as an effect, have more free cash flow, explaining this correlation.

The moderate correlations between different variables in this study will be checked for multicollinearity problems by using VIF tests. These VIF tests all show values below the critical value of 5.

Table 2. Pearson's correlation matrix

Correlations

		DIVPAY	PAYOUT	PAYOUT_SALES	PAYOUT_NINC	PROF	FCF	LEV	GROW	LN_SIZE	INDUSTRY	LIQUIDITY	TANG	AGE
DIVPAY	Pearson Correlation	1	,534**	,448**	,275**	,344**	,216**	,035*	-,008	,307**	-,219**	-,192**	,048**	,330**
	Sig. (2-tailed)		<,001	<,001	<,001	<,001	<,001	,018	,606	<,001	<,001	<,001	,001	<,001
	N	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585
PAYOUT	Pearson Correlation	,534**	1	,769**	,362**	,384**	,137**	,060**	,038*	,106**	-,121**	-,063**	,040**	,217**
	Sig. (2-tailed)	<,001		<,001	<,001	<,001	<,001	<,001	,011	<,001	<,001	<,001	,007	<,001
	N	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585
PAYOUT_SALES	Pearson Correlation	,448**	,769**	1	,330**	,208**	-,028	-,001	-,003	,195**	-,136**	-,010	,151**	,146**
	Sig. (2-tailed)	<,001	<,001		<,001	<,001	,062	,959	,822	<,001	<,001	,502	<,001	<,001
	N	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585
PAYOUT_NINC	Pearson Correlation	,275**	,362**	,330**	1	,148**	,003	,029	,021	,081**	-,035*	-,051**	,013	,116**
	Sig. (2-tailed)	<,001	<,001	<,001		<,001	,816	,052	,153	<,001	,019	<,001	,384	<,001
	N	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585
PROF	Pearson Correlation	,344**	,384**	,208**	,148**	1	,720**	-,037*	,039**	,152**	-,143**	-,094**	-,034*	,149**
	Sig. (2-tailed)	<,001	<,001	<,001	<,001		<,001	,012	,008	<,001	<,001	<,001	,022	<,001
	N	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585
FCF	Pearson Correlation	,216**	,137**	-,028	,003	,720**	1	,067**	-,012	,092**	-,215**	-,172**	,166**	,060**
	Sig. (2-tailed)	<,001	<,001	,062	,816	<,001		<,001	,426	<,001	<,001	<,001	<,001	<,001
	N	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585
LEV	Pearson Correlation	,035*	,060**	-,001	,029	-,037*	,067**	1	-,042**	,250**	,169**	-,454**	,013	-,054**
	Sig. (2-tailed)	,018	<,001	,959	,052	,012	<,001		,005	<,001	<,001	<,001	,365	<,001
	N	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585
GROW	Pearson Correlation	-,008	,038*	-,003	,021	,039**	-,012	-,042**	1	,016	,038*	,048**	-,084**	,039**
	Sig. (2-tailed)	,606	,011	,822	,153	,008	,426	,005		,279	,010	,001	<,001	,008
	N	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585
LN_SIZE	Pearson Correlation	,307**	,106**	,195**	,081**	,152**	,092**	,250**	,016	1	-,091**	-,313**	,028	,223**
	Sig. (2-tailed)	<,001	<,001	<,001	<,001	<,001	<,001	<,001	,279		<,001	<,001	,057	<,001
	N	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585
INDUSTRY	Pearson Correlation	-,219**	-,121**	-,136**	-,035*	-,143**	-,215**	,169**	,038*	-,091**	1	,052**	-,236**	-,196**
	Sig. (2-tailed)	<,001	<,001	<,001	,019	<,001	<,001	<,001	,010	<,001		<,001	<,001	<,001
	N	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585
LIQUIDITY	Pearson Correlation	-,192**	-,063**	-,010	-,051**	-,094**	-,172**	-,454**	,048**	-,313**	,052**	1	-,177**	-,103**
	Sig. (2-tailed)	<,001	<,001	,502	<,001	<,001	<,001	<,001	,001	<,001	<,001		<,001	<,001
	N	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585
TANG	Pearson Correlation	,048**	,040**	,151**	,013	-,034*	,166**	,013	-,084**	,028	-,236**	-,177**	1	-,030*
	Sig. (2-tailed)	,001	,007	<,001	,384	,022	<,001	,365	<,001	,057	<,001	<,001		,046
	N	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585
AGE	Pearson Correlation	,330**	,217**	,146**	,116**	,149**	,060**	-,054**	,039**	,223**	-,196**	-,103**	-,030*	1
	Sig. (2-tailed)	<,001	<,001	<,001	<,001	<,001	<,001	<,001	,008	<,001	<,001	<,001	,046	
	N	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585	4585

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

4.3 Regression results

4.3.1 Logistic regression

Within Table 3 the logistic regression findings can be found with DIVPAY as a dependent variable. The values that can be found in Table 3 are the unstandardized beta coefficients where the control and independent variables are lagged by one year.

Starting with variable PROF, PROF shows a positive correlation which is significant at the 1 percent tail, and therefore relationship, in model 2 and model 8. Meaning that the likelihood of a firm paying dividends is increased when a firm is profitable. This result is in line with results from previous research by Fama and French (2001), Denis and Osobov (2008), De Jong et al. (2019), and Kent Baker and Kilincarslan (2018). All previously mentioned studies found a significant positive relationship between the profitability of a firm and the propensity to pay dividends. When looking at the different theories this is supported by different theories such as the agency problem theory, the pecking order theory, and the signaling theory.

Free cash flow, depicted by the independent variable FCF has a positive significant relationship with the propensity of dividend payout in model 3 and shows a significant negative relationship in model 8. Both relationships are significant at the highest level. The positive relationship corresponds with studies done by Jensen (1986) and DeAngelo et al. (2006). Firms with high free cash flow tend to pay dividends to mitigate agency problems by minimizing the free cash flow that could be used for inefficient investments (Jensen, 1986). Another explanation for this positive relationship is that mature firms with a higher free cash flow pay dividends because they have fewer growth opportunities (DeAngelo et al., 2006). The negative correlation in model 8 is in line with Fama and French (2001) and Denis and Osobov (2008). Whereas Fama and French (2001) found that high-growth potential firms tend to retain earnings rather than pay dividends and Denis and Osobox (2008) argued that firms with strong growth opportunities and higher free cash flow are less likely to pay dividends.

Looking at debt, which is indicated by the leverage (LEV) variable, has a negative relationship in model 4, a positive one in the full model, and a negative one in models 9 and 10. From all those values only model 10 is significant, which indicates that firms with less debt are more likely to pay dividends.

The investment opportunities (GROW) results align with previous studies within model 8. It shows a negative relationship between investment opportunities and dividend payout at the 10 percent level. Firms with a lower market-to-book ratio have a lower probability of paying dividends. This confirms the pecking order theory and the findings of Patra et al. (2012) and Fama and French (2002).

Within models 7, 8, 9, and 10 a positive correlation can be found between firm age (AGE) and the propensity to pay dividends. In all models, this relationship is significant on the 1 percent level and supports the life-cycle theory where when firms age and mature fewer investment opportunities are available. Together with more stable earnings and higher free cash flow leads to a higher propensity to pay dividends.

In line with the findings of Schafer and Talavera (2007) and O'Hara et al. (2005) a positive correlation was found between the size of firms and the likelihood of paying dividends. The results from Table 3 show a significant positive relationship for models 7 through 10 which are significant on the 1 percent level.

The control variables LIQUIDITY and TANG show different results in all models used. There is a consistent negative correlation between liquidity and dividend payout, which is significant at the 1 percent level. For tangibility, there is a significant negative relationship for models 1, 3, 4, 5, and 7 and no significant result for the remaining models.

The adjusted R-squared has different values across the different models. The highest values can be found in model 8 (26,3 percent), model 9 (25,9 percent), and model 10 (21,5 percent). The lowest values can be found in model 1 (8,1 percent), model 3 (8,1 percent), and model 5 (8,1 percent). When looking at the adjusted R squared and comparing this with different studies the values are higher in comparison to this study. Studies by Kent Baker and Kilincarslan (2018) and De Jong et al. (2019)are examples of studies with a higher adjusted R-squared.

Table 3. Logistic regression results

Model	1	2	3	4	5	6	7	8	9	10
Constant	0,931	0,802	0,822	0,956	0,930	0,690	-0,407	-0,252	-0,314	-0,425
	<0,001***	<0,001***	<0,001***	<0,001***	<0,001***	<0,001***	<0,001***	<0,001***	<0,001***	<0,001***
PROF		0,015						0,016	0,013	
		<0,001***						<0,001***	<0,001***	
FCF			0,833					-0,530		0,791
			<0,001***					<0,001***		<0,001***
LEV				-0,037				0,001	-0,020	-0,077
				0,285				0,985	0,524	0,016**
GROW					0,000			-0,001	-0,001	-0,001
					0,643			0,091*	0,114	0,318
AGE						0,004		0,003	0,003	0,004
						<0,001***		<0,001***	<0,001***	<0,001***
LN_SIZE							0,191	0,133	0,137	0,157
							<0,001***	<0,001***	<0,001***	<0,001***
LIQUIDITY	-0,050	-0,039	-0,065	-0,078	-0,071	-0,062	-0,042	-0,035	-0,033	-0,035
	<0,001***	<0,001***	<0,001***	<0,001***	<0,001***	<0,001***	<0,001***	<0,001***	<0,001***	<0,001***
TANG	-0,072	-0,062	-0,101	-0,073	-0,071	-0,018	-0,048	0,059	0,029	-0,037
	0,012**	0,478	<0,001***	0,011**	0,013**	0,523	0,083*	0,026**	0,258	0,163
Industry dummy	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Adjusted R-Squared	0,081	0,171	0,104	0,081	0,081	0,157	0,140	0,263	0,259	0,215
N	4584	4584	4584	4584	4584	4584	4584	4584	4584	4584

Note: this table shows the unstanderdized beta coefficients for the logistic regression with the dependent variable DIVPAY.
*Significance is indicated by the following: *** 1% level, ** 5% level and, * 10% level.*

4.3.2 Ordinary Least Squares Regression

In the previous chapter, we have taken a look at why firms pay dividends and within this chapter, we will take a look at the level of dividends that firms pay in relation to the different variables. This is measured using ordinary dividends scaled by total assets, these results can be found in Table 4.

The first variable, regarding profitability, shows a positive significant relationship for models 2, 8, and 10 at the 1% tail. This is yet again in line with studies conducted by Fama and French (2001), Denis and Osobov (2008), De Jong et al. (2019), and Kent Baker and Kilincarslan (2018). Free cash flow shows the same results as previously mentioned. FCF has a positive relationship in models 3 and 10 which is significant at the 1 % tail and has a negative correlation in the full model. When looking at the independent variable leverage, indicated by LEV, the results show a positive relationship for models 4, 8, 9, and 10. All results are significant at the 1 percent level. Indicating that firms with higher leverage are more likely to pay dividends. The signaling theory shows that higher leverage could signal confidence in the firm's future. To reinforce this, firms may increase dividends to show that they are confident in meeting dividend and debt obligations (Myers, 1984). Continuing with investment opportunities (GROW) it can be seen that there is a relationship however the coefficient does not show a negative or positive relationship, it does seem to be significant at the 1 percent level. For the next variable, AGE we find the same result, significant results for models 6, 8, 9, and 10 but no relationship can be derived from the results. Finally, for the final independent variable, LN_SIZE models 7 and 10 result in a positive correlation at the 1 % tail. The full model shows an interesting result and that is a negative relationship between firm size and the level of dividend payout. Fama and French (2001) found similar results where larger firms tend to have lower dividend payouts as did Denis and Osobov (2008), due to larger firms having more investment opportunities and tend to reinvest earnings. This corresponds with the Pecking Order Theory.

Furthermore, the adjusted R-squared is highest in the full model (8) at 24 percent. The lowest value can be seen in model 1 which has a value of 1,7 percent. Comparing this to other studies it is again on the lower side.

Table 4. OLS regression results

Model	1	2	3	4	5	6	7	8	9	10
Constant	0,026	0,017	0,021	0,020	0,025	0,016	0,000	0,014	0,001	-0,004
	<0,001***	<0,001***	<0,001***	<0,001***	<0,001***	<0,001***	0,945	0,001***	0,765	0,332
PROF		0,001						0,002	0,001	
		<0,001***						<0,001***	<0,001***	
FCF			0,033					-0,107		0,031
			<0,001***					<0,001***		<0,001***
LEV				0,008				0,018	0,013	0,009
				<0,001***				<0,001***	<0,001***	<0,001***
GROW					0,006			0,002	0,003	0,001
					0,002**			0,104	0,053	0,010
AGE						0,002		0,030	0,003	0,012
						<0,001***		<0,001***	<0,001***	<0,001***
LN_SIZE							0,004	-0,001	0,000	0,001
							<0,001***	0,052*	0,705	0,028**
LIQUIDITY	-0,001	0,000	-0,001	-0,001	-0,001	-0,001	-0,001	0,001	0,001	0,001
	<0,001***	0,179	0,007	0,173	<0,001***	0,018**	0,063*	0,039**	0,002***	0,107
TANG	0,000	0,004	-0,001	0,000	0,001	0,002	0,001	0,012	0,006	0,002
	0,889	0,013	0,574	0,795	0,720	0,145	0,677	<0,001***	<0,001***	0,232
Industry dummy	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Adjusted R-Squared	0,017	0,153	0,153	0,021	0,019	0,055	0,024	0,240	0,186	0,073
N	4584	4584	4584	4584	4584	4584	4584	4584	4584	4584

Note: this table shows the unstanderdized beta coefficients for the logistic regression with the dependent variable PAYOUT.
*Significance is indicated by the following: *** 1% level, ** 5% level and, * 10% level.*

4.3.3 Robustness of the study

To check the robustness of the results multiple dependent variables are used. PAYOUT_SALES is measured by ordinary dividends divided by sales and PAYOUT_NINC is measured by ordinary dividends scaled by net income. Results from the OLS analysis are shown in Tables 5 and 6. First, the results will be discussed for each dependent variable followed by the adjusted R-squared.

Starting by examining the full model from the dependent variable PAYOUT_SALES. The differences can be found when comparing this model to the main full model. The effect of firm size (SIZE) on the level of dividend payout changes from negative to positive and is significant on a much higher level. Growth and investment opportunities (GROW) remain insignificant and liquidity (LIQ) becomes even more significant. The other variables remain to have the same significant correlation. The R-squared for the main model is slightly higher with a value of 0,24 compared to 0,203 of the model using PAYOUT_SALES as the dependent variable.

Secondly, the regression results from the dependent variable PAYOUT_NINC. Within this model there are a lot of similarities but also some differences. It can be seen that the relationship between profitability (PROF) and level of payout is equal as well as the level of significance. The same can be said for the dependent variables leverage (LEV), age (AGE), and tangibility (TANG). All are positively correlated at the same significance level as in the main regression model. Free cash flow (FCF) shows a significant negative relationship which is, again, in line with the main model. Furthermore, growth and investment opportunities (GROW) remain insignificant with the same positive relationship. The differences arise when looking at the variables firm size (SIZE) and liquidity (LIQ). As can be seen in Table 6, firm size becomes insignificant while showing a positive value, this differs from the significant positive value that is shown in the full model. Liquidity also becomes insignificant and portrays a negative value. Finally, looking at the R-squared it has the lowest value of all full models examined, meaning it has the lowest predicting value.

Taking all this into account the conclusion can be made that all models used for the robustness check show very similar results when compared to the main full model.

Table 5. OLS regression results, robustness PAYOUT_SALES

Model	1	2	3	4	5	6	7	8	9	10
Constant	0,029	0,020	0,034	0,024	0,029	0,017	-0,085	-0,052	-0,082	-0,080
	<0,001***	<0,001***	<0,001***	<0,001***	<0,001***	<0,001***	<0,001***	<0,001***	<0,001***	<0,001***
PROF		0,001						0,003	0,001	
		<0,001***						<0,001***	<0,001***	
FCF			-0,042					-0,260		-0,046
			<0,001***					<0,001***		<0,001***
LEV				0,007				0,016	0,006	0,003
				,058*				<0,001***	0,117	0,401
GROW					0,021			0,003	0,008	0,001
					0,457			0,383	0,711	0,911
AGE						0,006		0,004	0,001	0,002
						<0,001***		<0,001***	<0,001***	<0,001***
LN_SIZE							0,016	0,011	0,013	0,015
							<0,001***	<0,001***	<0,001***	<0,001***
LIQUIDITY	0,001	0,002	0,000	0,001	0,001	0,001	0,004	0,004	0,005	0,004
	0,208	0,007***	0,605	0,045**	0,217	,022**	<0,001***	<0,001***	<0,001***	<0,001***
TANG	0,026	0,030	0,028	0,026	0,026	0,029	0,028	0,047	0,033	0,032
	<0,001***	<0,001***	<0,001***	<0,001***	<0,001***	<0,001***	<0,001***	<0,001***	<0,001***	<0,001***
Industry dummy	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Adjusted R-Squared	0,033	0,074	0,038	0,034	0,033	0,051	0,072	0,203	0,112	0,088
N	4584	4584	4584	4584	4584	4584	4584	4584	4584	4584

Note: this table shows the unstanderdized beta coefficients for the logistic regression with the dependent variable PAYOUT_SALES.
*Significance is indicated by the following: *** 1% level, ** 5% level and, * 10% level.*

Table 6. OLS regression results, robustness PAYOUT_NINC

Model	1	2	3	4	5	6	7	8	9	10
Constant	0,318	0,233	0,330	0,287	0,312	0,186	-0,193	0,047	-0,164	-0,177
	<0,001***	<0,001***	<0,001***	<0,001***	<0,001***	<0,001***	,099*	0,686	0,160	0,135
PROF		0,010						0,021	0,009	
		<0,001***						<0,001***	<0,001***	
FCF			-0,094					-0,183		0,053
			0,412					<0,001***		0,294
LEV				0,045				0,154	0,083	0,001
				0,366				0,002***	0,097*	0,190
GROW					0,002			0,001	0,001	0,002
					0,096*			0,428	0,312	<0,001***
AGE						0,002		0,002	0,002	0,050
						<0,001***		<0,001***	<0,001***	0,003***
LN_SIZE							0,073	0,018	0,034	0,05
							<0,001***	0,274	0,042**	0,003***
LIQUIDITY	-0,028	-0,020	-0,029	-0,024	-0,028	-0,021	-0,015	-0,009	-0,002	-0,01
	<0,001***	0,017**	<0,001***	0,012**	<0,001***	0,012**	0,079*	0,349	0,830	0,298
TANG	-0,010	0,024	-0,007	-0,009	-0,005	0,020	-0,001	0,158	0,055	0,033
	0,807	0,555	0,870	0,827	0,900	0,636	0,981	<0,001***	0,183	0,430
Industry dummy	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Adjusted R-Squared	0,003	0,023	0,003	0,003	0,003	0,014	0,007	0,058	0,032	0,017
N	4584	4584	4584	4584	4584	4584	4584	4584	4584	4584

Note: this table shows the unstanderdized beta coefficients for the logistic regression with the dependent variable PAYOUT_NINC.
*Significance is indicated by the following: *** 1% level, ** 5% level and, * 10% level.*

5. Discussion and conclusion

This section revolves around the main results of this study. First, the main results from the previous chapter will be discussed followed by a conclusion in order to answer the main research question. Finally, future research together with the limitations will be discussed.

5.1 Key findings

It has been proven that the dividend puzzle is difficult to solve. Miller and Modigliani (1961) started by introducing the dividend irrelevance theory and Black (1979) started calling it the dividend puzzle. Even to this day, there is still no definitive answer to which determinants are crucial for dividend policy. To contribute to this field of research the following research question has been formed: *"What are the determinants of dividend policy in firms listed on the NYSE, and how do they influence dividend payout decisions?".* This research question will be answered with the help of six hypotheses. Within this section, the key findings will be discussed together with evidence that supports the hypotheses.

Starting with the first hypothesis (H1) which states that there exists a positive correlation between profitability and dividend policy for firms listed on the NYSE. The results show that PROF has a significant positive correlation with the likelihood to payout cash dividends as well as the level of dividend payout. This can be found in the full models for PAYOUT and DIVPAY together with the robustness tests. These findings support the very first hypothesis formulated. Firms with a higher level of profitability are more likely to pay dividends since more profitable firms have greater financial resources to distribute dividends to shareholders. This is supported by different theories such as the agency problem theory, the pecking order theory, and the signaling theory. The signaling theory is based on the idea that dividend announcements are used as market signals and firms use dividends to signal a positive outlook for future earnings and financial health. Firms that can maintain profits can afford to increase dividends without harming their operations. Furthermore, higher dividends are a signal from firms to investors of their robust financial position. In addition, within more profitable firms, managers may be more likely to use excess cash for projects that do not maximize shareholder value. With higher dividends, the surplus cash is limited which reduces agency problems and is more in line with the interest of the shareholders. Profitable firms also generate substantial internal funds which reduces the need for external financing. If excess profits remain after funding the internal projects firms are more likely to pay dividends. Concluding that the results are robust and provide sufficient evidence to support the hypothesis.

Continuing with the next hypothesis (H2) envisions a negative relationship between free cash flow and dividend policy for NYSE-listed firms. A significant negative correlation can be seen for the level of dividend pay as well as the propensity to pay dividend pay in relation to free cash flow can be seen. This result has the same results as studies done by Fama and French (2001) and a more recent study by Denis and Osobov (2008). Both studies found that firms with high growth potential are more likely to retain excess earnings instead of paying dividends. Reinvestment opportunities are becoming more important in shaping the policies surrounding dividends. Another important finding is that this result does not support the signaling theory and the pecking order theory. The pecking order theory indicates that firms with high free cash flow do not have to use external financing and can use internal financing hence they are more likely to hand out dividend payments. In addition, the signaling theory states that free cash flow is used to pay dividends to signal the strong financial position of a firm. Concluding that there is evidence to support H2 and that free cash flow has a negative correlation with both the possibility of dividend payout and the level of the payout.

Next in line is hypothesis (H3) which suggests a negative relationship between growth and investment opportunities and dividend policy for firms listed on the NYSE which is negative. When looking at the results there is a small negative significant correlation between the possibility of dividend payout and investment opportunities. For the height of dividend payouts, no significant result can be found through all the models. Firms that have higher growth and investment opportunities will have a lower likelihood of a dividend payout. Furthermore, the results shown are in line with the pecking order theory, in order for firms to invest in growth and investment opportunities internal funds shall be used followed by external funds. Therefore, these firms are less likely to pay dividends due to the financial distress costs. Firms do not want to be dependent on funds that are acquired externally. Concluding that hypothesis 3 can not be fully supported, the negative correlation between growth and investment opportunities and the likelihood of dividend payout is supported. However, the negative correlation between growth and investment opportunities and the height of dividend payout can not be supported due to the lack of significant evidence.

The fourth hypothesis (H4) is formulated as follows: A positive relationship exists between firm size and dividend policy for American firms listed on the NYSE. Values that support this hypothesis can only be partly found. A positive significant correlation between age and the propensity of dividend payout is located within the tables. However, when looking at the relationship between the height of the dividend payout and firm size, both negative and positive significant correlations can be found. The positive relationship can be explained through the life cycle theory which states that younger firms tend to reinvest their earnings to grow. Whereas more mature firms have fewer growth opportunities and have cash flow to distribute as dividends. The negative relationship can have multiple explanations, Grullon et al. (2002) found that in some cases older firms can reduce dividends in order to reinvest or pursue restructuring strategies. Due to the evidence showing significant values but differing between both the dependent variables the hypothesis is rejected.

The fifth hypothesis (H5) suggests a negative correlation. This correlation is between leverage and dividend policy for firms listed on the NYSE. Looking at the results it can be seen that there is a positive relationship between leverage and dividend payout, however this correlation is not significant. When looking at the same relationship for the height of dividend payout a positive significant relationship can be found with leverage. To pay higher dividends firms may choose to issue debt to free up cash for dividend payments. This is supported by the signaling theory, which indicates that increasing leverage signals confidence in the firm's future prospects. This signal can be reinforced by maintaining or even increasing dividend payments, showing their ability to meet debt and dividend obligations. The agency theory also supports this finding, increased interest payments caused by debt can mitigate agency costs. By reducing the free cash flow available for managers, to even further reduce agency costs firms can pay higher dividends. Studies by La Porta et al. (2000) and Jiraporn et al. (2011) support these findings. Concluding that hypothesis H5 is rejected due to the evidence found.

The final hypothesis (H6) states that a positive correlation exists for firm age and dividend policy for American firms listed on the NYSE. Within the values, significant values can be found for this relationship for all models. These results indicate that there is a positive relationship between DIVPAY and age. For PAYOUT the value indicates a positive relationship between PAYOUT and age. The literature, through the life cycle theory, suggests that mature firms with fewer growth opportunities tend to pay more dividends. In line with studies from Grullon et al. (2002), DeAngelo et al. (2006), and Fama and French (2001) which all conclude that mature firms are more likely to pay or increase dividend payouts. Concluding that hypothesis H6 is supported by evidence found in the results.

Summarizing, a contribution has been made to solving the dividend puzzle through this study which examines a sample from the NYSE. This study has looked at the determinants of dividend payout policy for firms listed on the New York Stock Exchange for the time period of 2018-2022. From all variables used a number of these showed to be a determinant of dividend payout policy. After controlling for liquidity (LIQ), a variety of industries (INDUSTRY), and tangibility (TANG), four variables showed significant values within the main model. Starting with profitability (PROF), free cash flow (FCF), and firm age (AGE) all showed significant positive relationships, in line with the expectations stated in the hypotheses. Secondly, in line with the hypothesis leverage (LEV) exhibited a negative significant correlation with dividend payout policy. Variables regarding growth and investment opportunities (GROW) and firm size (SIZE) did not provide the expected results and both hypotheses were rejected. In conclusion, it can be said that firms listed on the NYSE that have high profitability, low free cash flow, low debt ratio, are large, and more mature have a higher likelihood and level of dividend payout.

5.2 Limitations and Future Research

As with most studies, this study also has its limitations. A problem that was discussed is multicollinearity between the dependent variables profitability and free cash flow. This issue arises since firms with a higher profitability have a higher free cash flow, this is inherent to one another. To address this multicollinearity problem it can be interesting to use another regression method. This study did look into multicollinearity by looking at the VIF values and all values were below the critical values.

The second limitation is the adjusted R-squared within the models. When comparing the adjusted R-squared to other similar studies it can be concluded that this value is mostly lower than in similar studies. To increase the adjusted R-squared more dependent and control variables can be added. However, it could also have a negative effect since adding too many variables can also lower the adjusted R-squared. For future research, more time should be spent investigating the ideal amount of variables to include in the study.

The third limitation regards the robustness checks. The robustness checks show different results in comparison to the main models. The dependent variables in the robustness tests used do have different characteristics, which may lead to different results. Future research could use different dependent variables in order to check robustness.

The fourth limitation, the period chosen includes the Covid-19 pandemic and this study does not take that into account. Covid-19 could have a significant effect on the dividend payout policy of firms and it would be interesting to look into the differences in results. For future research, the effect of the Corona pandemic should be taken into account by comparing two different periods, after the pandemic versus before the pandemic.

References

Aguilera, R.V., & Crespi-Cladera, R. (2016). Global corporate governance: On the relevance of firms' ownership structure. *Journal of World Business*, *51(1)*, 50-57.

Al-Najjar, B., & Kilincarslan, E. (2019). Dividend policy, agency costs, and information asymmetry: Evidence from the UK. *International Review of Financial Analysis*, *62*. 100382

Arndt, P., & Kučerová, Z. (2019). Determinants of the dividend payout policy of stock companies within the european union. *Acta Universitatis Agriculturae Et Silviculturae Mendelianae Brunensis*, *67(6)*, 1515-1524.

Baker, M., & Wurgler, J. (2004). A catering theory of dividends. *Journal of Finance*, *59(3)*, 1125-1165.

Berle, A. A., & Means, G. C. (1932). *The Modern Corporation and Private Property*. Transaction Publishers.

Bhattacharya, S. (1979). Imperfect information, dividend policy, and "the bird in the hand" fallacy. *The Bell Journal of Economics*, *10(1)*, 259-270.

Black, F. (1976). The Dividend Puzzle. *Journal of Portfolio Management*, *2(2)*, 5-8.

Brawn, D.A., & Šević, A. (2018). Firm size matters: Industry sector, firm age and volatility do too in determining which publicly-listed US firms pay a dividend. *Journal of Corporate Finance*, *52*, 267-287.

Brealey, R.A., Myers, S.C., & Allen, F. (2020). Principles of Corporate Finance. In. *Principles of corporate finance*, *(Vol. Thirteenth)*. New York: McGraw-Hill Education

Brennan, M.J., & Hughes, P.J. (1991). Stock prices and the supply of information. *Journal of Finance*, *46(5)*, 1665-1691.

Brounen, D., De Jong, A., & Koedijk, K. (2006). Capital structure policies in Europe: Survey evidence. *Journal of Banking and Finance*, *30(5)*, 1409-1442.

Chen, J., Leung, W.S., & Goergen, M. (2017). The impact of board gender composition on dividend payouts. *Journal of Corporate Finance 43*, 86-105.

DeAngelo, H., DeAngelo, L., & Skinner, D.J. (2008). Coporate Payout Policy. *Foundations and Trends in Finance*, *3(2-3)*, 95-287.

DeAngelo, H., DeAngelo, L., & Stulz, R.M. (2006). Dividend policy and the earned/contributed capital mix: a test of the life-cycle theory. . *Journal of Financial economics*, *81(2)*, 227-254.

De Haan, L., & Hinloopen, J. (2003). Preference hierarchies for internal finance, bank loans, bond, and share issues: evidence for Dutch firms. *Journal of Empirical Finance*, *10(5)*, 661-681.

De Jong, A., Fliers, P.T., & Van Beusichem, H.C. (2019). Catering and dividend policy: evidence from the Netherlands over the twentieth century. *Financial History Review*, *26(3)*, 321-358.

Denis, D.J., & Osobov, I. (2008). Why do firms pay dividends? International evidence on the determinants of dividend policy. *Journal of Financial economics*, *89(1)*, 62-82.

Fama, E.F., & French, K.R. (2001). Disappearing dividends: changing firm characteristics or lower propensity to pay? *Journal of Financial economics*, *60(1)*, 3-43.

Feito-Ruiz, I., & Renneboog, L. (2017). Takeovers and (excess) CEO compensation. *Journal of International Financial Markets, Institutions and Money*, *50*, 156-181.

Gill, A., & Obradovich, J. (2012). Corporate governance, institutional ownership, and the decision to pay the amount of dividends: Evidence from the USA. *International Research Journal of Finance and Economics*, *97*, 60-71.

Grullon, G., Michaely, R., & Swaminathan, B. (2002). Are dividend changes a sign of firm maturity? *The journal of Business*, *75(3)*, 387-424.

Gugler, K., & Yurtoglu, B.B. (2003). Corporate governance and dividend pay-out policy in Germany. *European Economic Review*, *47(4)*, 731-758.

Jensen, M.C. (1986). Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers. *The American Economic Review*, *76(2)*, 323-329.

Jensen, M.C., & Meckling, W.H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, *3(4)*, 306-360.

Jiraporn, P., Kim, J., & Kim, Y.S. (2011). Dividend Payouts and Corporate Governance Quality: An Empirical Investigation. *Financial Review*, *46(2)*, 251-279.

Kent Baker, H., & Kilincarslan, E. (2018). Why companies do not pay cash dividends: The Turkish experiment. *Global Finance Journal*, *42*.

Lambrecht, B., & Myers, S. (2012). A Lintner Model of Payout and Managerial Rents. *Journal of Finance*, *67 (5)*, 1761-1810.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. (2000). Agency Problems and Dividend Policies around the World. *Journal of Finance*, *55(1)*, 1-33.

Miller, M., & Modigliani, E. (1961). Dividend policy, growth and the valuation of shares. *Journal of Business*, *34*, 411-433.

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

Modigliani, F., & Brumberg, R. (1954). Utility analysis and the consumption function: An interpretation of cross-section data. In K. K. Kurihara (Ed.). *Post-Keynesian Economics*, 388-436. Rutgers University Press.

Myers, S.C., & Majluf, N.S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, *13(2)*, 187-221.

O'Hara, P.A., Newman, R.H., & Sampson, R.B. (2005). The dividend policy of European firms. *European Financial Management*, *11(4)*, 401-426.

Patra, T., Poshakwale, S., & Ow-Yong, K. (2012). Determinants of corporate dividend policy in Greece. *Applied Financial Economics*, *22(13)*, 1079-1087.

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

Renneboog, L., & Trojanowski, G. (2011). Patterns in payout policy and payout channel choice. *Journal of Banking & Finance*, *35 (6)*, 1477-1490.

Rozeff, M.S. (1982). Growth, beta, and agency costs as determinants of dividend payout ratios. *Journal of Financial Research*, *5(3)*, 249-259.

Schafer, D., & Talavera, O. (2007). Dividend policy in the large German firms: Dividend ratio, stability, and determinants. *Journal of Money, Credit and Banking*, *39(2-3)*, 367-394.

Truong, T., & Heaney, R. (2007). Largest shareholder and dividend policy around the world. *Review of Economics and Finance*, *47*, 667-687.

Von Eije, H., & Megginson, W.L. (2008). Dividend policy in the large German firms: Dividend ratio, stability, and determinants. *Journal of Money, Credit and Banking*, *39(2-3)*, 367-394.

Zou, H., & Xiao, J.Z. (2006). The Financing Behaviour of Listed Chinese Firms. *The British Accounting Review*, *38*, 239-258.