MASTER THESIS

Determinants of dividend policy in the Netherlands

MARTHA KAHRAMAN

FACULTY OF BEHAVIOURAL, MANAGEMENT, AND SOCIAL SCIENCES

MSC. IN BUSINESS ADMINISTRATION
TRACK: FINANCIAL MANAGEMENT

EXAMINATION COMMITTEE
1st SUPERVISOR: PROF. DR. R. GUTSCHE
2nd SUPERVISOR: MR. J.R.O. OSTERRIEDER

DATE: 12/07/2021

Acknowledgements

This thesis is written as completion to the master Business Administration with a specialization in Financial Management, at the university of Twente. Before going to the main text, I would like to acknowledge a few important people that helped me during this process.

First of all, I would like to thank my first supervisor Prof. Dr. R. Gutsche for providing me very insightful feedback on my master thesis. His knowledge, guidance and feedback have helped me a lot during my master thesis project. Secondly, I would like to thank my second supervisor Mr. J. Osterrieder. Last but not least, I would like to thank my family and friends for their unconditional support and encouragement during my study and master thesis project.

Martha Kahraman

Abstract

This study examines the determinants of dividend policy of 65 Dutch firms listed on the Euronext Amsterdam from 2016 to 2019. This study contributes to solving a piece of the dividend puzzle in a Dutch setting. Both the probability as well as the intensity of paying dividends are investigated. This study finds that there are different determinants for the probability of paying a dividend and for the payout intensity. Overall, the results show that, compared to non-dividend payers, dividend paying Dutch companies are more profitable, have a lower ownership concentration and are larger in size. Additionally, the dividend paying Dutch companies who payout a larger amount of dividend relative to their total assets, have a higher profitability, ownership concentration and growth/investment opportunities, and have lower levels of free cash flow and debt ratios compared to Dutch companies who payout lower levels of dividend relative to their total assets.

Table of contents

1. Introduction **6**

2. Literature review **8**

2.1 Corporate payout policy *8*

2.2 Agency cost theory *9*

2.2.1 Principal-agent problem (type I) 10

2.2.2 principal-principal problem (type II) 11

2.3 Information asymmetry theory *13*

2.3.1 Signaling theory 14

2.3.2 Pecking order theory 15

2.4 Hypotheses *16*

2.4.1 Profitability 16

2.4.2 Free cash flow 17

2.4.3 Leverage 17

2.4.4 Ownership concentration 18

2.4.5 Growth & investment opportunities 18

2.4.6 Company age & size 19

3. Methodology **20**

3.1 Methods & models *20*

3.1.1 The propensity to payout 21

3.1.2 The level of payout 22

3.2 Measurement of variables *23*

3.2.1 Dependent variables 23

3.2.2 Independent variables 23

3.2.3 Control variables 24

3.3 Data and sample *27*

4. Results **28**

4.1 Descriptive statistics *28*

4.2 Pearson's correlation matrix *31*

4.3 Regression analysis *33*

4.3.1 Logistic regression 33

4.3.2 OLS regression 36

4.1.3 Robustness checks 39

5. Conclusion **43**

5.1 Discussion of results *43*

5.2 Limitations and further research *46*

References **48**

Appendices **52**

1. Introduction

Why do companies pay dividends and why do inventors pay attention to dividends? Corporate dividend policy has been one of the most important and researched topics in corporate finance. The dividend policy of a company can be referred to the amount and time pattern of earnings a company pays out to its shareholders in dividends. There are a variety of reasons why a company would pay dividends: dividends may signal future cash flows, reduce agency costs, lower information asymmetries, etc. However, despite decades of research there is still no consensus about the determinants of dividend policy, Black (1979) calls this the dividend puzzle. Certainly, the dividend puzzle in the Netherlands has not been researched extensively in recent years.

The purpose of this study is to investigate the determinants of dividend policy, over the period 2016-2019, for Dutch listed companies. Therefore, the following research question has been formulated: *"What are the determinants of dividend policy of Dutch listed companies?"* The Netherlands is an interesting country to study, because compared to the Anglo-Saxion countries, the Netherlands is a civil law country, has a stakeholder-oriented governance system and a strong ownership concentration (Trotz, 2013). Corporate governance in the Netherlands can be defined as a 'polder model' this means that consensus is sought among the various stakeholders, mainly employers and employees, so not only among the shareholders (Lau, 2013). This is in contrast with common law countries, where the main priority is to maximize the wealth of shareholders (Lau, 2013). Dutch companies also have a two-tier board structure, they have two boards within the firm: the management board and the supervisory board. The supervisory board is comprised entirely of independent outsiders, whereas the management board is part of the company's management team and is responsible for accomplishing the company's objectives, strategy, and policy (De Jong, De Jong, Mertens & Wasley, 2005). Whereas one-tier board structures have only one board made up of both executive and non-executive directors, who are either insiders or outsiders. The management board members are appointed by the supervisory board. The supervisory board has the task to monitor the management board (Spoor, 2020). In addition, the Dutch economy is small and open and a price taker on global markets (De Jong, Fliers, & Van Beusichem, 2019). Lastly, there are limited studies available that investigate the dividend policy in the Netherlands in recent years and the availability of data for Dutch listed companies is good.

According to Benkert (2020) literature about corporate payout policy determinants are either studies conducting cross-country research focusing on country-level variables or single-

country studies primarily using firm-level variables. Results from cross-country studies provide similar results, whereas single-country studies provide mixed results (Chang, Dutta, Saadi, & Zhu, 2018). Therefore, results from single-country studies cannot be generalized to other countries, this underlines the need of examining the determinants of dividend payout policy for individual countries, as it appears that they differ per country. Additionally, this paper will build upon the paper of De Jong, Fliers and Van Beusichem (2019). In their paper they have studied the dividend policy in the Netherlands over the twentieth century, hence it would be interesting to investigate whether the results from their paper are still valid in more recent years, especially after the 2008 financial crisis.

The contributions of this study to the existing dividend policy literature and research are multi-fold. First, after decades of research there is still no consensus about the determinants of dividend policy. Therefore, this study contributes to solving the dividend puzzle by studying a single country with a civil law regime and a two-tier board structure, of which research is scarce. Secondly, this study extends the existing research and literature by investigating an individual country on which research on dividend payout policy determinants in recent years is scarce. Lastly, this paper will build upon the research of De Jong et al. (2019), by investigating the dividend policy of Dutch listed companies in more recent years, especially after the financial crisis of 2008. They distinguished between three different time periods and regimes, firstly, statutory formula regime from 1903-1938, secondly, the smoothing regime from 1948-1983 and lastly, the agency and signaling regime from 1988-2003. This paper will focus on the asymmetric information and agency cost theories, the agency and signaling regime mentioned in their paper has a link with these two theories, which is also the most recent regime described in their paper. Therefore, this study will build upon their study. Additionally, most studies use only one of the theories mentioned above, whereas this study uses multiple theories to explain companies' dividend policy and therefore multiple determinants of dividend policy will be used.

This paper is organized as follows: the second section provides a literature review. The literature review discusses the dividend policy theories, asymmetric information, agency costs theories and lastly hypotheses will be formulated. In the third section the research methodology will be described, and the sample and criteria employed for the sample selection will be elaborated. The research methodology discusses the methods and variables used in this study. The fourth section presents the results of the performed analyses. The last section contains the conclusions, limitations, and recommendations for future research.

2. Literature review

In this section the two main dividend policy theories, agency cost theory and the asymmetric information theory will be elaborated. In addition, the corporate payout policy will be explained. Lastly, the hypotheses used in this study will be formulated.

2.1 Corporate payout policy

Companies can distribute wealth to its shareholders in five major ways: regular cash dividends, open market repurchases, intrafirm tender offers, share repurchases and specially designated dividends (Barclay & Smith, 1988). The most common forms of corporate payout are cash dividends and share repurchases. Fama and French (2001) argue that the proportion of companies paying cash dividends has sharply declined for recent years. Furthermore, Von Eije and Megginson (2008) show that the likelihood of European companies paying cash dividends has consistently declined over time and the probability of share repurchases has increased. According to Benkert (2020), corporate payout policy behavior can be described across two dimensions: the propensity to pay and the payout intensity. The propensity to pay indicates how likely a company will pay out and the payout intensity indicates how much to pay out. This study will mainly focus on these two dimensions with regard to the companies' dividend policy.

The dividend policy is the time pattern of dividend payout, it deals with a company's decision about how much of its earnings to pay out in cash to its shareholders and when (Brealey, Myers, & Allen, 2020). There are different types of dividends, ordinary cash dividend is the most common form of dividend, and it is a direct cash payment form the company to its shareholders each quarter. However, companies can also choose to payout a one-off extra dividend or special dividend, for example when a company reaches a milestone of operating for fifty years. Ordinary cash dividends are typically denoted as dividends per share and the actual value a shareholder will receive is dependent on the number of shares the shareholder owns. Additionally, a company can choose to declare a stock dividend, a stock dividend is essentially the same as a stock split (Brealey et al., 2020). It increases the number of shares, but it does not affect the company's value. This study will mainly focus on ordinary cash dividends.

There have been numerous theories suggested about the determinants of dividend policy by researchers. Miller and Modigliani (1961, henceforth: MM) propose the dividend irrelevance proposition, their proposition proposes that dividend policy is irrelevant in

frictionless markets: information is equally available to everyone and every action is frictionless. If these assumptions were correct than a company's payout policy, thus the choice between dividends and share repurchases, would be irrelevant to its shareholders because it would not create wealth to the shareholder (Benkert, 2020). However, in the real-world, markets are not frictionless, information is not costless and equally available to everyone because of transaction costs, taxes, etc. Consequently, the dividend irrelevance proposition opened the door for further research into other theories about the determinants of dividend policy, such as the life-cycle theory, information asymmetry, signaling, agency costs, taxes and catering theory. Therefore, researchers try to study other determinants of dividend policy like country-level or firm-level variables, however the dividend puzzle still remains inconclusive after decades of research.

De Jong et al. (2019) examined dividend policy in the Netherlands over the twentieth century. They distinguished between three different time periods and regimes, firstly, statutory formula regime from 1903-1938, secondly, the smoothing regime from 1948-1983 and lastly, the agency and signaling regime from 1988-2003. This paper will build upon this research by investigating the dividend policy of Dutch companies in more recent years, especially after the financial crisis of 2008. In addition, Patra, Poshakwale and Ow-Yong (2012) investigated corporate dividend policy in Greece, where they researched the determinants of dividend policy of Greek companies based upon the asymmetric information and agency cost theories. This paper will build upon this research by extending into a different country, such as the Netherlands. In the paper of De Jong et al. (2019), the agency and signaling regime has a link with these two theories, which is also the most recent regime described in their paper. Therefore, this study will be limited to the asymmetric information theory and the agency costs theory.

2.2 Agency cost theory

One popular theory to explain why companies pay dividends is the agency cost theory, proposed by Jensen and Meckling (1976). Agency costs arise when ownership and the management of a company are divided. Jensen and Meckling (1976) define an agency relationship as an agreement under which one or more principals (the shareholders) engage the agent (the managers) to execute a service on their behalf which involves assigning some of the decision-making control to the agent. Therefore, managers are the agents of the shareholders, a relationship that consists out of conflicting interests. There are two types of

agency conflicts, namely type I principal-agent problems and type II principal-principal problems. Type I conflicts occur between the managers and shareholders and type II conflicts between the shareholders themselves.

2.2.1 Principal-agent problem (type I)

The principal-agent conflict underlines the conflicting interests between manager and shareholder. It occurs when managers try to maximize their own wealth by not acting in the best interest of the shareholders. Therefore, shareholders try to monitor the managers by incurring monitoring costs, such as auditing, budget restrictions, etc. which are designed to limit the activities of the managers (Jensen & Meckling, 1976). Monitoring costs are the most important and most popular costs related to agency costs, there are also two other types of agency costs described by Jensen and Meckling (1976): bonding costs by the agent and residual costs. Bonding costs are borne by the agent, instead of the principal and it is to guarantee that the agent will not take certain actions which pursue his own interests at the expense of the shareholders. Lastly, residual costs are associated by the divergence between the agent's decisions and the decisions that would maximize the wealth of the shareholders (Jensen & Meckling, 1976). In conclusion, there are three different types of agency costs in the manager-shareholder conflict: monitoring costs of the shareholder, bonding costs of the agent and residual costs.

The principal-agent conflict hypothesize that the payout of dividends will reduce the free cash flow available to managers and therefore tries to minimize the agency conflicts. Jensen (1986) proposes the free cash flow hypothesis: companies with a higher level of free cash flow have troubles with motivating managers to not waste the excess free cash flow to maximize their own wealth at the expense of the shareholders, such as investing in low-return projects or wasting it on organization inefficiencies (De Jong et al., 2019). Therefore, the conflict of interests between managers and shareholders are mostly severe when companies generate substantial free cash flow. In other words, too much free cash flow available to managers may result in overinvestments. Consequently, shareholders expect managers of highly profitable companies to pay a higher dividend than companies with a lower profitability (Patra et al., 2012). This has been researched by many researchers, Denis and Osobov (2008) find that larger more profitable companies are more likely to pay dividends, while the growth opportunities of those companies on the likelihood of paying a dividend are mixed. In accordance with Denis and Osobov (2008), Fama and French (2001) find that the

following characteristics affect the likelihood of companies paying a dividend: larger and more profitable companies are more likely to pay dividends, while high-growth companies are less likely to pay dividends. Additionally, Von Eije and Megginson (2008) find that older companies are more likely to pay dividends than younger companies. Companies who are older and larger have existed for a longer period of time and are in general generating a higher free cash flow than younger companies. However, these older and larger companies have a decreasing pattern of investment opportunities and growth and therefore they have excess cash. Consequently, those companies need to limit the wastage of this excess cash by paying it out in dividends. In conclusion, more profitable, older, larger, and low growth companies in mature industries are more likely to pay dividends to reduce agency costs and monitor managers.

Debt can also be a form of principal-agent costs, Jensen (1986) calls this the control hypothesis for debt creation. The control hypothesis for debt creation implies that debt can be an effective substitute for dividends. In addition, debt issuance also reduces the free cash managers have available, because the company must pay interest to debtholders. The more debt a company issues, the greater the risk of financial distress. If there is a default on the interest payments, the debtholders can take legal actions against the company to get their money back (Benkert, 2020). This is not possible for shareholders who receive dividends, because dividends are not legally required to be paid out. Therefore, companies with a higher debt level (higher leverage) are more likely to pay lower or no dividends to reduce the transactions costs of external financing and to retain their internal funds (Rozeff, 1982). Von Eije and Megginson (2008) found that debt has a significantly negative relationship with the probability of paying cash dividends as with the intensity of cash dividends, this result is supported by other studies, such as, Fama and French (2001) and Benito and Young (2003). Therefore, more leverage may require companies to hold on to more free cash flow rather than pay dividends. Thus, this suggests a negative relationship between debt and dividend payout.

2.2.2 principal-principal problem (type II)

Agency problems can also arise between different types of shareholders. This is also known as the principal-principal problem, they can be identified by their size and majority or minority shareholders. Large (concentrated) shareholders, have the incentive and ability to monitor and supervise managers properly, because they have larger benefits of control (Aguilera & Crespi-Cladera, 2016; Baker & Kilincarslan, 2019). Large shareholders are

expected to participate actively in managerial decision making (Kabir, Cantrijn, & Jeunink, 1997). Whereas minority (dispersed) shareholders have little incentives to monitor managers, they engage in what is called free-riding. Free-riding is the assumption of minority shareholders that the monitoring activities will be done by someone else and therefore act as followers (Aguilera & Crespi-Cladera, 2016). This principal-principal problem is most relevant in civil law countries, such as the Netherlands. Due to the weaker legal protection, companies will have a higher ownership concentration in civil law countries so that shareholders can control and monitor the managers of companies (Lau, 2013; Aguilera & Crespi-Cladera, 2016). Therefore, majority control gives the largest shareholder considerable power to make managerial decisions, like dividend payouts (Gugler & Yurtoglu, 2003). Gugler and Yurtoglu (2003) found that larger ownership concentration reduces the dividend payout, and that they could expropriate minority shareholders and extract rents, which is known as the rent extraction hypothesis.

Dividends are an absolute instrument for limiting rent extraction of minority shareholders. They offer a pro-rata payout to both the major and minor shareholders. Additionally, dividends also signal that the majority shareholder will not expropriate the minority shareholders (Gugler & Yurtoglu, 2003). By paying out a dividend, less money will be available to the majority shareholder for private benefits. When the majority shareholders have a relatively lower level of shareholding, they are more likely to protect their investment through more active monitoring, and therefore using dividends as a monitoring device becomes less important, and initially dividends may fall with increases in ownership concentration (Truong & Heaney, 2007). However, when the level of shareholding increases, the majority shareholders will receive considerable control and power to make managerial decisions and to expropriate wealth from minority shareholders. This implies that there is a higher need for dividend payouts to ensure effective monitoring and prevent tunneling when the level of shareholding increases. Truong and Heaney (2007) found a convex relationship between the largest shareholding and dividend payout. Additionally, Farinha (2003) also finds the same convex relationship between higher insider ownership concentration and dividend payout. Overall, this implies that there is a convex relationship between the level of shareholding by the largest shareholder and dividend payout.

2.3 Information asymmetry theory

The agency cost theory is not the only approach into understanding the determinants of dividend policy. The information asymmetry theory also has been one of the main theories used for companies' dividend policy determinants and is also a central concept in the agency theory. MM (1961) suggested that dividends might convey information about companies' prospects. One of the most prominent models within the information asymmetry theory is the signaling theory. The best-known developers of this signaling model are Bhattacharya (1979) and Miller and Rock (1985). Bhattacharya (1979) suggests that dividends function as a signal of future expected cash flows. Another model for information symmetry has been developed by Myers and Majluf (1984) known as the pecking order theory. The pecking order states that a company should finance itself first with internally generated cash flows rather than with external financing. This paper will be limited to these two different models of the information asymmetry theory. Patra et al. (2012) used these two models in their paper, therefore this paper will build upon those two theories. Signaling and pecking order theory will be further elaborated in the next two sections.

One of the problems that can arise from information asymmetry is adverse selection. Adverse selection is also known as the 'lemon problem.' It entails the problem that principals are unable to differentiate between 'good' agents and 'bad' agents. In general, shareholders miss out on information regarding the 'quality' of the stock and therefore prices will deviate from their fundamental value (Dekker, 2017). Some shareholders will have better information available to them about the value of the company than others, they will be able to take advantage of this information in the case of a share repurchase. The uninformed investors will receive only a portion of their order when the stock is undervalued and will receive the full amount when it is overvalued, while the informed investor will only bid for stocks which are worth more than the tender price (Allen & Michaely, 1995). This means that the uninformed investor is at a disadvantage in a share repurchase, however when free cash flow is paid out in the form of dividends this adverse selection is not present, because both the informed and uninformed investor receive the same amount per share. Managers can reduce this type of information asymmetry by bringing information in the market. This can be done by dividend announcements or share repurchases to send a signal to the market about future prospects of the company. Another solution to reduce information asymmetry is introducing information intermediaries, such as financial analyst. In general, larger companies are often better followed by financial analysts than smaller companies and have larger amounts of information available (Dekker, 2017).

2.3.1 Signaling theory

The signaling theory suggests that there is asymmetric information between shareholders and managers. The dividend payout policy may signal information to outsiders and is also used as a way to minimize information asymmetry between shareholders and managers (Patra et al., 2012). As mentioned above, MM (1961) suggested that dividends might convey information about companies' prospects. This is also known as the information content of dividends, it consists of the following three parts: (I) managers are reluctant to make dividend changes that may have to be reversed, (II) managers 'smooth' dividends, and (III) managers focus more on dividend changes than on absolute dividend levels (Brealey et al., 2020). Managers are more likely to increase dividends when expected future cash flows and earnings are less volatile and uncertain. Investors worry more about the change of dividends than the level of dividends, as this is an important indicator for future sustainable earnings and cash flows (Brealey et al., 2020). Additionally, dividends are more 'stickier' than share repurchases, an announcement of a share repurchase is not a commitment to continue repurchasing shares in the future. Therefore, dividends contain more information to outsiders than share repurchases.

As mentioned above, the signaling theory will also reduce the adverse selection of information asymmetry. Announcements of dividends are a way for managers to communicate insider information to the markets and signal future prospects of the company. A company can use its payout policy to signal companies' future cash flows to outsiders (Bhattacharya, 1979). Managers have more information about the future earnings and position of the company and may use its dividend policy to send signals about the future earnings and positions to shareholders (Bhattacharya, 1979). Brealey et al. (2020) observe that companies who announced an increase in regular dividend will see their stock price typically rise, because shareholders interpret this dividend increase as a sign of managers' confidence in future cash flows and this can only happen if the managers know more than the shareholders. A dividend increase can be seen as a way to convey information from managers to shareholders. However, cutting dividends will be interpreted negatively by the shareholders, because it is a signal that future cash flows will fall and therefore share price will fall.

Empirical evidence provides mixed results for dividends acting as a signal. Watts (1973) results support the information content of dividends, he found a positive relationship between current dividend changes and future earnings changes, however these earnings changes were very small. In addition, Amihud and Murgia (1997), found that dividends of German companies are important in providing information on companies' current earnings and therefore found an increase in stock prices. On the contrary, Denis and Osobov (2008) do

not find evidence for signaling as an important determinant for dividend policy. However, they do find that larger, older and more profitable companies have a higher likelihood of paying a dividend compared to younger, smaller and less profitable companies (Benkert, 2020). This could suggest that larger, older and more profitable companies exhibit more information asymmetry than younger, smaller and less profitable companies, whereas in theory the latter should be in more need of signaling information than big companies (Benkert, 2020). Furthermore, DeAngelo, DeAngelo and Skinner (1996) find that dividend increases do not convey information or are signals for future earnings, because managers may overestimate future earnings when growth prospects decline, they call this behavioral bias (overoptimism). In conclusion, there is no consensus in the literature about dividends functioning as a signal of future prospects.

2.3.2 Pecking order theory

The pecking order theory, just as the signaling theory, starts with information asymmetry between managers and outsiders and can be seen as a model of financial hierarchy. The pecking order theory hierarchy starts with that a company should finance itself first with internally generated cash, then by new issue of debt and as a last resort new issue of equity, therefore this leads to a pecking order. The choice between internal and external financing and between new issues of debt and equity are affected by asymmetric information (Brealey et al., 2020). Internal financing is cheaper and easier than external financing, due to information asymmetries and the risk-reward demand. The announcement of a stock issue drives down the price of a stock, because shareholders believe managers are more likely to issue new equity when shares are overpriced. Hence, internal financing is preferred by managers because funds can be raised without sending adverse signals to outsiders. Thus, the more profitable companies borrow less not because they have lower debt ratios but because they do not need external financing. Therefore, variations in a company's leverage are not driven by the benefits of debt, but rather by the company's free cash flow (Fama & French, 2002).

The pecking order has been suggested by Myers and Majluf (1984), they suggest that when asymmetric information is present a company may underinvest. Their theory does not explain the determinants of dividend policy, but it explains that if a company pays a dividend the pecking order should affect the dividend policy decision (Fama & French, 2002). The investment program of a company can therefore be considered as the counterpart of the dividend policy (Arndt & Kučerová, 2019). Patra et al. (2012) used the market-to-book ratio

(price-to-book) ratio to proxy investment opportunities; the pecking order theory interpret this ratio as just another measure of profitability. Consequently, in the paper of Fama and French (2002) they find evidence that more profitable companies and companies that have few investment opportunities, have a higher dividend payout. “Thus, more profitable firms generate more internal funds and have to resort less to forms of financing such as equity or debt financing” (Benkert, 2020, p. 16). Dividends are less attractive for companies with less profitable assets, large current and future investments, and high leverage, because it is expensive to finance investments with new risky debt or equity issues (Fama & French, 2002). Therefore, when a company chooses to pay a dividend, it needs to consider the pecking order. Truong and Heaney (2007) find that companies with high profitability, low debt and limited investment opportunities are more likely to pay a dividend. Thus, payout ratio is negatively related to investment opportunities and leverage.

Empirical evidence provides mixed results for the pecking order theory. Fama and French (2002) find that dividend payers follow the pecking order theory. They find that more profitable companies are less levered, companies with more investment opportunities have lower long-term dividend payouts. Additionally, De Haan and Hinloopen (2003) find that companies in the Netherlands have a preferred hierarchy that is in line with the pecking order theory. On the contrary, Brounen, de Jong and Koedijk (2006) find that asymmetric information does not cause the pecking order theory and that the pecking order theory is not the most important factor of dividend policy. In conclusion, there is no consensus in the literature about the pecking order theory.

2.4 Hypotheses

In order to answer the central research question of this paper: *“What are the determinants of dividend policy of Dutch listed companies?”* a couple of hypotheses will be formulated in the upcoming sections. The most relevant determinants in the above-mentioned sections will be used for the development of the hypotheses.

2.4.1 Profitability

As mentioned in the above sections, the positive relationship between profitability and dividend payout is strongly supported by the literature. In line with the agency theory and information asymmetry theories more profitable companies are more likely to accumulate retained earnings and are less likely to face financial distress costs. More profitable companies are more likely to pay a dividend so managers may use dividends as a signal for

future profitability as found by (Fama & French, 2001; Denis & Osobov, 2008). Therefore, the following hypothesis has been developed:

H1: There is a positive relationship between profitability and dividend policy for Dutch listed companies.

2.4.2 Free cash flow

The free cash flow hypothesis proposes that companies with higher levels of free cash flow have troubles with motivating managers to not waste the excess free cash flow to maximize their own wealth at the expense of the shareholders, such as investing in low-return projects or wasting it on organization inefficiencies (De Jong et al., 2019). Consequently, the free cash flow may be used to payout a dividend to monitor managers in order to reduce agency costs or dividends may be used to signal future prospects of the company to outsiders. In addition, companies with higher levels of free cash flow have more internal funds and have to resort less to forms of external financing and are therefore more likely to pay a dividend. Therefore, the following hypothesis has been developed:

H2: There is a positive relationship between free cash flow and dividend policy for Dutch listed companies.

2.4.3 Leverage

Dividend payouts are also related to the level of companies' debt. Fama and French (2002) find that dividend payers follow the pecking order theory. They find that more levered companies are less likely to pay out a dividend, because of the high external financing costs and costs of financial distress. A high level of debt could be related to the decision not to pay out dividends. Jensen (1986) describes that debt can also be an effective substitute for dividends, because it reduces the free cash flow available to managers, because the company has to pay interest to debtholders. Therefore, the following hypothesis has been developed:

H3: There is a negative relationship between leverage and dividend policy for Dutch listed companies.

2.4.4 Ownership concentration

The managerial entrenchment theory proposes that the relationship between ownership concentration and dividend payout may be convex, as mentioned in section 2.2.2. According to Farinha (2003), the prediction is that below a certain entrenchment level, ownership concentration and dividend payout may be seen as a substitute corporate governance instrument or to combat the agency problem and therefore there is an expected negative relationship between ownership concentration and dividend payout. However, when ownership concentration passes this entrenchment level, dividend payout will rise and will act as a compensating monitoring force, and therefore a positive relationship is expected (Farinha, 2003). Gugler and Yurtoglu (2003), Farinha (2003) and Truong and Heaney (2007) found this convex relationship between ownership concentration and dividend payout. Therefore, the following hypothesis has been developed:

H4: There is a convex relationship between ownership concentration and dividend policy for Dutch listed companies.

2.4.5 Growth & investment opportunities

Growth and investment opportunities also have a significant impact on the companies' dividend decisions. The pecking order theory proposes that growth companies with investment opportunities must use their retained earnings instead of paying a dividend. Companies should finance their investments first with internally generated earnings, then with a debt issue and as a last resort with new equity issues. Therefore, companies with high growth and investment opportunities are less likely to pay a dividend, because they want to reduce their dependency on external financing because of high transaction costs and financial distress costs. This has been supported by several studies (Fama & French, 2001, 2002; Denis & Osobov, 2008). To proxy investment and growth opportunities the market-to-book ratio will be used. Therefore, the following hypothesis has been developed:

H5: There is a negative relationship between growth/investment opportunities and dividend policy for Dutch listed companies.

2.4.6 Company age & size

Lastly, maturity and size also have a significant impact on the decision of paying a dividend by companies. Both the agency costs and information asymmetry theories suggest a positive relationship between older and larger companies with the dividend policy. Denis and Osobov (2008) find that larger and older companies have a higher probability of paying a dividend compared to younger and smaller companies. In accordance, Von Eije and Megginson (2008) also find that older companies are more likely to pay a dividend than younger companies. Companies who are older and larger have existed for a longer period of time and therefore investment and growth opportunities decrease. Consequently, companies who are older and larger should pay out excess cash as dividends to limit waste of free cash flow. Therefore, the following hypotheses have been developed:

H6: There is a positive relationship between company age and dividend policy for Dutch listed companies.

H7: There is a positive relationship between size and dividend policy for Dutch listed companies.

Table 1. Summary of hypothesized relationships between dividend policy and independent variables

Hypothesis	Prediction	Independent variable
H1	+	Profitability
H2	+	Free cash flow
H3	-	Leverage
H4	Convex	Ownership concentration
H5	-	Growth/investment opportunities
H6	+	Age
H7	+	Size

3. Methodology

In the following section the methods and models used in this study will be explained. Additionally, the independent and dependent variables will be described.

3.1 Methods & models

As mentioned before, the determinants of dividend policy have been researched extensively. Hence, several research methods have been used to conduct the analysis, two of the most used research methods are the ordinary least squared (OLS) and a logistic (logit) regression model. In the research of De Jong et al. (2019) an OLS method has been used to predict the level of dividend payout. The logit regression model has also been used in several studies, for example, Baker and Kilincarslan (2019), Von Eije and Megginson (2008), De Jong et al. (2019) and Denis and Osobov (2008). In the above-mentioned studies, a logit regression model has been used to estimate the probability/likelihood of a company paying a dividend. These two methods will be used to test the hypotheses formulated in section 2.4. However, there are also other methods used in other studies, for example, Patra et al. (2012) used the generalized method of moments (GMM) to research the determinants of corporate dividend policy of listed firms in Greece. In this study the OLS and a logit regression model will be used, because they are relatively easy to use, and it produces outcomes that are relatively easy to understand.

Before conducting a multiple or single regression the following statistical assumptions have to be met: the linearity of the phenomenon measured, constant variance of the residuals, independence of the residuals and normality of the residuals' distribution (Henseler, 2020). These assumptions can be checked via the descriptive statistics. Additionally, there are other conditions that have to be met, such as, a sample size of 50 to 100 is required to maintain a sufficient power (Henseler, 2020). In addition, all variables have to be metric, however if there are non-metric variables, this can be solved by turning them into dummy variables, so they become metric variables. Lastly, multicollinearity is also important to check before conducting a regression analysis. Multicollinearity can be checked by using the VIF values, these need to be below 10, however preferably below 5 (Benkert, 2020). Additionally, multicollinearity can be checked by looking for high correlations using the Pearson's correlation matrix. In case that these assumptions will not be met, appropriate adjustments to the dataset will be made.

In addition to the previous mentioned assumption, endogeneity problems may limit the results of the OLS regression analysis. This is also known as the reversed causality problem. In order to correct for these endogeneity problems, a one-year lag will be used in the independent and control variables, following studies of Benkert (2020) and Truong and Heaney (2007). This can also be justified by the fact that dividend payout decisions of this year will rely on last year's financial performance, managers make their decision on this year's dividend payout based on last year's financial performance and future prospects. Therefore, the length of the initial sampling period will be reduced by one year to 2017-2019. This assumes that the payout of 2019 (t) is predicted by the independent variables of 2018 (t-1). To conclude, endogeneity problems will be mitigated by using lagged variables.

In order to validate the results of the logistic and OLS regression analysis several robustness checks will be conducted. Following the study of Benkert (2020) different measures for the dependent variables will be used in order to test whether the results of the analysis remain the same under different circumstances. The payout ratio will be scaled by sales and net income instead of total assets, following the study of Alzahrani and Lasfer (2012) and Truong and Heaney (2007). Additionally, the payout ratio will also be scaled by free cash flow, following the study of De Jong et al. (2019). In conclusion, different measures for the dependent payout ratio variable will be used as robustness checks.

3.1.1 The propensity to payout

To test the hypotheses mentioned in section 2.4 this study will examine both the propensity to payout as well as the level of payout. Therefore, the hypotheses have to be tested twice. To examine the propensity of paying a dividend a logit regression model will be used, which is in line with the studies of: De Jong et al. (2019), Denis and Osobov (2008), Von Eije and Megginson (2008) and Baker and Kilincarslan (2019). In a logit regression model, it is possible to denote the dependent variable as a dummy variable. Therefore, the dependent variable in this model only has two options, because while making a dividend policy the company only has two options – to pay or not to pay dividends. Thus, a logit regression model is an appropriate model for estimating a binary variable. The corresponding logit model is formulated as follows:

$$DPAY_{it} = \beta_0 + \beta_1 PROF_{i,t-1} + \beta_2 FCF_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 OWN^2{}_{i,t-1} + \beta_5 GROW_{i,t-1} + \beta_6 AGE_{i,t-1} + \beta_7 SIZE_{i,t-1} + \beta_x CONTROL_{i,t-1} + \varepsilon_{i,t-1}$$

Where:

$DPAY_{it}$ = Payout decision of company i in year t.

$\beta_1 PROF_{i,t-1}$ = Profitability of company i in year t-1.

$\beta_2 FCF_{i,t-1}$ = Free cash flow of company i in year t-1.

$\beta_3 LEV_{i,t-1}$ = Leverage of company i in year t-1.

$\beta_4 OWN^2{}_{i,t-1}$ = The fraction of total number of shares of the largest shareholder of company i in year t-1, squared.

$\beta_5 GROW_{i,t-1}$ = Growth/investment opportunities of company i in year t-1.

$\beta_6 AGE_{i,t-1}$ = Age of company i in year t-1.

$\beta_7 SIZE_{i,t-1}$ = Size of company i in year t-1.

$\beta_x CONTROL_{i,t-1}$ = Diverse control variables will be included in the model.

$\varepsilon_{i,t-1}$ = Error term

3.1.2 The level of payout

An OLS multiple regression will be used to determine the level of dividend payout impacted by the independent variables. In this case the dependent variable is a metric variable and will be predicted by at least two independent, metric variables (Henseler, 2020). Therefore, this model will be appropriate for estimating the level of payout. This is in line with studies of: De Jong et al. (2019) and Von Eije and Megginson (2008). The corresponding OLS model will be formulated as follows, where only the new variable introduced in this model will be explained below:

$$PAYOUT\_TA_{it} = \beta_0 + \beta_1 PROF_{i,t-1} + \beta_2 FCF_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 OWN^2{}_{i,t-1} + \beta_5 GROW_{i,t-1} + \beta_6 AGE_{i,t-1} + \beta_7 SIZE_{i,t-1} + \beta_x CONTROL_{i,t-1} + \varepsilon_{i,t-1}$$

Where:

$Payout_{it}$ = Payout of company i in year t.

3.2 Measurement of variables

3.2.1 Dependent variables

In this section the measurement of the two dependent variables used in this study: DPAY and PAYOUT_TA will be described. A dummy variable is created for dividends payout, following other studies of: De Jong et al. (2019), Denis & Osobov (2008) and Baker and Kilincarslan (2019). The dummy variable for dividends (DPAY) will assign a value of one for a company that pays a cash dividend in a certain year and zero if otherwise. In this study, dividends will refer to ordinary cash dividends on common stocks (Benkert, 2020). The second dependent variable is the payout ratio. The payout ratio (PAYOUT_TA) is calculated as ordinary dividends scaled by total assets (Alzahrani & Lasfer, 2012). As a robustness check the payout ratio will also be scaled by sales (PAYOUT_SALES) and net income (PAYOUT_NI), following the study of Alzahrani and Lasfer (2012) and Truong and Heaney (2007). Additionally, the payout ratio (PAYOUT_FCF) will also be scaled by free cash flow, following the study of De Jong et al. (2019). In conclusion, different measures for the dependent variable payout ratio will be used as a robustness check.

3.2.2 Independent variables

In this section the measurement of the explanatory variables used in this study will be described. First, profitability will be measured as the return on assets ratio (ROA), following studies of Baker and Kilincarslan (2019) and Patra et al. (2012). The ROA is commonly calculated as the net income over book value of total assets (Benkert, 2020). Secondly, for free cash flow (FCF) the proxy introduced by Lehn and Poulsen (1989) will be used, which is defined as earnings before depreciation and amortization minus taxes, interest expenditures and dividends paid divided by total assets, following the study of Feito-Ruiz and Renneboog (2017). Thirdly, leverage (LEV) will be measured as total liabilities to total assets, following De Jong et al. (2019), Patra et al. (2012) and Truong and Heaney (2007). Fourthly, ownership concentration (OWN^2) will be measured as the fraction of total number of shares of the largest shareholder, following a similar approach as Truong and Heaney (2007) and Gugler and Yurtoglu (2003). However, in order to test the convexity of the relationship, meaning quadratic and thereby non-linear (Benkert, 2020). Therefore, the variable will be transformed by squaring it, following Truong and Heaney (2007) and Farinha (2003). Fifthly, growth/investment opportunities will be measured by the market-to-book ratio (GROW), following De Jong et al. (2019), Patra et al. (2012) and Baker and Kilincarslan (2019). The

market-to-book ratio is measured by the market value of the company to the book value of total assets. Sixthly, company age (AGE) is the total number of years since the firm's incorporation date (Baker & Kilincarslan, 2019). Lastly, company size (SIZE) will be measured by using the company's total assets, following De Jong et al. (2019) and Patra et al. (2012). To adjust for skewness and non-normality, the size variable will be transformed using a natural logarithm, following studies of Baker and Kilincarslan (2019) and Patra et al. (2012). In conclusion, the independent variables in this study are ROA, OWN^2, FCF, LEV, GROW, AGE and SIZE.

3.2.3 Control variables

Next to the independent variables mentioned above, the most commonly used control variables in the literature will also be added to the research models. Firstly, an industry (INDUSTRY) dummy control variable will be added. This dummy variable will be based on the first digit of the SIC-code, this will control for possible industry effects (Benkert, 2020). Additionally, following Patra et al. (2012) and De Jong et al. (2019) a liquidity (LIQ) control variable will be added due to the fact that less liquid companies tend to pay lower dividends due to scarcity of cash. Liquidity will be measured by the company's liquidity ratio. Furthermore, Denis and Osobov (2008) used a ratio of retained earnings to total equity as a control variable. DeAngelo, DeAngelo and Stulz (2006) found that companies with negative or lower retained earnings have a lower propensity to pay dividends, whereas those with positive or higher retained earnings have a higher propensity to pay dividends. Therefore, this variable will also be used as a control variable in this study (RE/TE). Additionally, an asset tangibility control variable will be added. Under the pecking order theory, when internal funds are not sufficient a company will use debt rather than equity. If a company's tangible assets are high, then these assets can be used as collateral to debtholders and therefore decrease the costs of debt, however this will increase the leverage of a company (Xiao & Zou, 2006). Tangibility (TANG) will be measured as the ratio of fixed assets to total assets.

Corporate governance structures may also affect a company's dividend policy and as described in the introduction the Netherlands uses a two-tier board structure and is a civil law country; therefore, some corporate governance control variables will be added to the research models. Following De Jong et al. (2019) a dummy control variable for companies with preferred shares will be included, where preferred shares equal one for companies with preferred shares, and zero otherwise (PREF). Companies with preferred shares pay dividends

to both ordinary and preferred shareholders (De Jong et al., 2019). De Jong et al. (2019) describe that dividend payouts may be increased by the expectations of preferred shareholders. Additionally, a board size control variable will be added and is measured as the sum of the members of both the management and supervisory board (B_SIZE), following the study of Chang, Dutta, Saadi and Zhu (2018) who found a significant positive relationship between board size and dividend payouts and following the study of De Jong et al. (2019). Another important corporate governance control variable is the independence of the board. Chang et al. (2018) found a significant positive relationship between board independence and dividend payouts. However, Chang et al. (2018) used a sample with one-tier board structures, whereas this study will use a two-tier board structure sample. Moreover, it is also questionable to what extent the supervisory board members are actually independent, because they often fulfil other board positions in other companies or are past members of the management (Spoor, 2020). Therefore, instead of including an independent board size control variable, a control variable for the relative size of the supervisory board will be included. De Jong et al. (2001) described that the relative size of the supervisory board affects the effectiveness of the members of the supervisory board (Spoor, 2020). For that reason, the relative size of the supervisory board will be included as a control variable and will be measured by dividing the number of members of the supervisory board by the sum of both the supervisory and management board members (REL_SUP_SIZE).

Table 2. Variable definitions

Variable	Definition
Dependent variables	
DPAY	One if the company pays a dividend, and zero otherwise
PAYOUT_TA	Ordinary cash dividends paid divided by total assets
LN_PAYOUT_TA	Natural logarithm of PAYOUT_TA
PAYOUT_FCF	Ordinary cash dividends paid divided by free cash flow
LN_PAYOUT_FCF	Natural logarithm of PAYOUT_FCF
PAYOUT_NI	Ordinary cash dividends paid divided by net income
LN_PAYOUT_NI	Natural logarithm of PAYOUT_NI
PAYOUT_SALES	Ordinary cash dividends paid divided by sales
LN_PAYOUT_SALES	Natural logarithm of PAYOUT_SALES
Independent variables	
ROA	Net income over book value of total assets
FCF	Earnings before depreciation and amortization minus taxes, interest expenditures and dividends paid scaled by total assets
LEV	Total liabilities to total assets
OWN2	Fraction of total number of shares of the largest shareholders to the power of two
GROW	Market-to-book ratio
AGE	Total numbers of years since the firm's incorporation date
LN_SIZE	Natural logarithm of company's total assets
Control variables	
LIQ	Current assets minus inventories divided by current liabilities
RE_TE	Retained earnings divided by total equity
TANG	Fixed assets divided by total assets
PREF	One if the company has preferred shares, and zero otherwise
B_SIZE	Number of members of both the management and supervisory board
REL_SUP_SIZE	Number of members of the supervisory board divided by board size

3.3 Data and sample

In this study the determinants of dividend policy will be investigated for Dutch listed companies between 2016-2019. Therefore, the initial sample includes companies that are listed on Amsterdam Euronext. The choice for listed companies has been made because listed companies are subjected to stricter reporting rules in comparison to private companies. Additionally, a period of four years will be used, in this case it will be from 2016 to 2019. The choice has been made to use 2016 as a starting year, because the used database would provide a sufficient number of observations. The financial data will be obtained from the database ORBIS and annual reports of companies. Several adjustments have to be made to reach the ultimate sample. First of all, financial companies will be excluded based on their SIC codes, therefore companies with SIC code 6000-6999 will be excluded. This is because financial companies are subjected to different regulations than non-financial companies which affects their dividend policy, following studies of De Jong et al. (2019), Patra et al. (2012) and Denis and Osobov (2008). Additionally, only companies which are domiciled in the Netherlands will be included. Lastly, following Benkert (2020) if a company had missing data for a given year the company will be dropped from the sample. The total sample which will be used in this study contains 65 Dutch non-financial companies listed on the Amsterdam Euronext.

4. Results

In this section the results of the performed analyses will be discussed. First, the descriptive statistics of the sample will be presented. After that, the main results will be presented and lastly the robustness tests will be presented.

4.1 Descriptive statistics

The descriptive statistics of the variables used in this study are presented in table 3. In order to mitigate the effect of extreme outliers, all metric variables are winsorized at the 1 percent and 99 percent tail, except for the age variable which has been winsorized at the 2,5 percent and 97,5 percent tail, due to extreme outliers. The reason for using winsorization as opposed to deleting outliers, is due to the already relatively small sample size. The data of the dependent variables are based on the years 2017, 2018 and 2019. The data of the independent and control variables are one-year lagged and based on the years 2016, 2017 and 2018. Table 3 presents the descriptive statistics adjusted for outliers by using winsorization.

When examining the dependent variables, it can be seen that the mean of DPAY (0,667) indicates that 66,7 percent of the companies from the sample paid ordinary cash dividends. When inspecting the different measures of payout ratios, it can be seen that the payout variables scaled by total assets and by sales show very different characteristics in comparison to net income and free cash flow, with a range of 0 to 0,262 and a mean of 0,025 and the ratio scaled by sales with a range of 0 to 4,210 and a mean of 0,098. In addition, the payout ratios scaled by free cash flow and net income exhibit negative values, which indicates that a company has had a year of negative free cash flow or net income but still paid out dividends. Also, companies with a payout ratio above one indicate that the company has a larger cash outflow than cash inflow (Benkert, 2020). The high maximum values of the payout ratios may be attributable to extraordinary or one-off events. However, this is not always the occasion, because high payout ratios are not only driven by some cases in the sample, but by many more. However, as can be seen in table 3, all the payout variables are highly skewed. This can be expected because the companies in the sample differ from each other, some are only public for a few years whereas others are large global players that have been public for decades (Benkert, 2020). To adjust for this skewness and non-normality, the payout ratios will be transformed using a natural logarithm, following the study of Goyal and

Muckley (2013). Consequently, some observations will be lost, because the natural logarithm is only defined for variables above zero.

Inspecting the independent variables, ROA has a mean of 0,019 and a range of -0,459 to 0,246, which again could indicate the difference between the companies in the sample. Free cash flow has a mean of 0,037 and a range of -0,515 to 0,210, which means that some companies had a negative free cash flow. In addition, the leverage variable has a mean of 0,547 and a range of 0,065 to 1,039, which is in line with the leverage of De Jong et al. (2019). Examining the squared ownership variable reveals that the companies of the sample have a mean of 0,146 and a range of 0,002 to 0,977, which indicates that the largest shareholder has an average of about 29,53 percent of the shares, when not considering the squared variable. The GROW variable shows good prospects of growth opportunities for the companies of the sample, with a mean market-to-book ratio of 3,088. It can be seen that the age variable has a large range of values, with a range of 1 to 181 and a mean of 58,097, which again indicates the difference between companies in the sample, some companies only have been incorporated since 2016 and others since 1837. Lastly, size has been transformed by using a natural logarithm, in order to mitigate skewness and non-normality, with a mean of 13,409 and a range of 6,428 and 17,530.

Next to the independent variables, control variables will also be added to the models. Firstly, the variables which control for firm characteristics are LIQ, RE_TE and TANG. The sample companies have a mean liquidity ratio of 1,400 and a mean retained earnings scaled by total equity of -0,472. Lastly, tangibility has a mean of 0,575 and a range of 0,088 to 0,991. The other control variables, control for corporate governance characteristics. In line with De Jong (2002), the relative size of supervisory board is about 66,3 percent and the board of the sample companies consists out of about 7,749 members. Lastly about 53,8 percent of the companies in the sample have preference shares. Controlling for potential multicollinearity, the VIF-values revealed that all VIF-values remain clearly below the critical range of 5-10. Therefore, it can be concluded that multicollinearity appears to be no problem within the research model.

Table 3. Descriptive statistics

Variables	Mean	Minimum	Maximum	Std. Deviation	N
Dependent variables					
DPAY	0,667	0,000	1,000	0,473	195
PAYOUT_TA	0,025	0,000	0,262	0,041	195
LN_PAYOUT_TA	-3,626	-5,215	-1,338	0,757	129
PAYOUT_FCF	0,292	-8,918	9,501	1,536	195
LN_PAYOUT_FCF	-0,791	-2,477	2,251	0,869	115
PAYOUT_NI	0,463	-1,544	4,053	0,786	195
LN_PAYOUT_NI	-0,554	-2,902	1,400	0,745	122
PAYOUT_SALES	0,098	0,000	4,210	0,482	195
LN_PAYOUT_SALES	-3,324	-5,259	1,437	1,249	129
Independent variables					
ROA	0,019	-0,459	0,246	0,116	195
FCF	0,037	-0,515	0,210	0,109	195
LEV	0,547	0,065	1,039	0,173	195
OWN2	0,146	0,002	0,977	0,228	195
GROW	3,088	0,301	21,498	3,597	195
AGE	58,097	1,000	181,000	49,138	195
LN_SIZE	13,409	6,428	17,530	2,426	195
Control variables					
LIQ	1,400	0,086	11,520	1,615	195
RE_TE	-0,472	-11,939	1,107	2,385	195
TANG	0,575	0,088	0,991	0,219	195
PREF	0,538	0,000	1,000	0,500	195
B_SIZE	7,749	3,000	16,000	2,473	195
REL_SUP_SIZE	0,663	0,250	0,833	0,100	195

Notes: This table reports the descriptive statistics for each variable included in this study. The data of the dependent variables are based on the years 2017, 2018 and 2019. The data of the independent and control variables are one-year lagged and based on the years 2016, 2017 and 2018. Outliers have been removed by winsorizing all variables at the 1% and 99% tail. Age is winsorized at the 2.5% and 97.5%.

4.2 Pearson's correlation matrix

For the bivariate analysis, Pearson's correlation matrix has been used. The most important correlations will be discussed, correlation values above 0,7 or below -0,7 may cause collinearity problems when they are used in the same regression. Only two correlations can be found that exceed this threshold. Firstly, B_SIZE and LN_SIZE are significantly positive correlated with each other, with a value of 0,758**. Benkert (2020), found the same significant correlation between board size and company size, the reason for this is that larger firms are more likely in need of larger boards. However, because B_SIZE is a control variable and the VIF values are below the threshold this does not seems to be a problem within the research model and therefore no modifications will be made. The second significantly positive correlation is between FCF and ROA with a value of 0,774**. It could be argued that this is not a surprise, because companies with a higher return on assets are more profitable and therefore may have a higher level of free cash flow available, due to the efficient use of their assets to generate their earnings. However, to mitigate potential multicollinearity issues, the full models will be repeated, but in one model FCF is omitted (model 10) and in the other model ROA is omitted (model 11). Additionally, the VIF values of all the above discussed variables are below the threshold of 5, which would indicate that multicollinearity seems to be no problem within the research model. Furthermore, no other significant correlations exceed the threshold.

Table 4. Pearson's correlation matrix

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	**DPS**	1	0,109	0,139	0,024	0,108	0,509**	0,277**	-0,143*	-0,208**	-0,244**	0,145*	0,494**	-0,113	0,443**	0,106	0,218**	0,290**	0,172*
2	**LN_PAYOUT_TA**	0,109	1	0,684**	0,366**	0,553**	0,495**	-0,083	-0,238**	0,341**	0,298**	-0,037	-0,106	0,127	-0,017	-0,176*	0,092	-0,163	0,165
3	**LN_PAYOUT_FCF**	0,139	0,684**	1	0,234*	0,410**	0,291**	-0,329**	-0,172	-0,081	0,165	-0,063	-0,103	0,254**	-0,099	-0,365**	0,085	-0,169	-0,006
4	**PAYOUT_NI**	0,024	0,366**	0,234*	1	0,215*	-0,008	-0,332**	0,056	0,358**	0,149	-0,049	-0,033	-0,021	-0,250**	-0,110	0,029	-0,138	-0,011
5	**LN_PAYOUT_SALE**	0,108	0,553**	0,410**	0,215*	1	0,143	-0,438**	-0,242**	0,386**	-0,033	-0,135	0,188*	0,176*	-0,013	0,522**	0,040	-0,084	0,181*
6	**ROA**	0,509**	0,495**	0,291**	-0,008	0,143	1	0,774**	-0,082	-0,053	-0,408**	0,129	0,434**	-0,296**	0,474**	0,097	0,005	0,174*	0,265**
7	**FCF**	0,277**	-0,083	-0,329**	-0,332**	-0,438**	0,774**	1	0,107	-0,095	-0,296**	0,144*	0,404**	-0,453**	0,250**	0,161*	-0,071	0,245**	0,251**
8	**LEV**	-0,143*	-0,238**	-0,172	0,056	-0,242**	-0,082	0,107	1	-0,021	0,150*	-0,016	0,225**	-0,439**	-0,264**	0,059	0,070	0,197**	0,205**
9	**OWN2**	-0,208**	0,341**	-0,081	0,358**	0,386**	-0,053	-0,095	-0,021	1	-0,126	-0,064	-0,022	-0,016	0,164*	0,016	-0,120	-0,092	-0,012
10	**GROW**	-0,244**	0,298**	0,165	0,149	-0,033	-0,408**	-0,296**	0,150*	-0,126	1	-0,157*	-0,231**	0,127	-0,414**	-0,176*	0,043	-0,120	-0,069
11	**AGE**	0,145*	-0,037	-0,063	-0,049	-0,135	0,129	0,144*	-0,016	-0,064	-0,157*	1	0,122	-0,156*	0,275**	-0,057	0,128	0,103	0,145*
12	**LN_SIZE**	0,494**	-0,106	-0,103	-0,033	0,188*	0,434**	0,404**	0,225**	-0,022	-0,231**	0,122	1	-0,289**	0,334**	0,318**	0,297**	0,758**	0,348**
13	**LIQ**	-0,113	0,127	0,254**	-0,021	0,176*	-0,296**	-0,453**	-0,439**	-0,016	0,127	-0,156*	-0,289**	1	-0,156*	-0,360**	0,029	-0,142*	-0,100
14	**RE_TE**	0,443**	-0,017	-0,099	-0,250**	-0,013	0,474**	0,250**	-0,264**	0,164*	-0,414**	0,275**	0,334**	-0,156*	1	0,069	0,149*	0,126	0,108
15	**TANG**	0,106	-0,176*	-0,365**	-0,110	0,522**	0,097	0,161*	0,059	0,016	-0,176*	-0,057	0,318**	-0,360**	0,069	1	-0,062	0,168*	0,011
16	**PREF**	0,218**	0,092	0,085	0,029	0,040	0,005	-0,071	0,070	-0,120	0,043	0,128	0,297**	0,029	0,149*	-0,062	1	0,344**	0,030
17	**B_SIZE**	0,290**	-0,163	-0,169	-0,138	-0,084	0,174*	0,245**	0,197**	-0,092	-0,120	0,103	0,758**	-0,142*	0,126	0,168*	0,344**	1	0,212**
18	**REL_SUP_SIZE**	0,172*	0,165	-0,006	-0,011	0,181*	0,265**	0,251**	0,205**	-0,012	-0,069	0,145*	0,348**	-0,100	0,108	0,011	0,030	0,212**	1

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

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

4.3 Regression analysis

4.3.1 Logistic regression

The results for the logistic regression with the dependent variable DPAY are presented in table 5. The independent and control variables are lagged with one-year. Table 5 reports the coefficients estimates for the determinants of the decision to pay dividends. The results in the full model 9 and model 2 reveals a significantly positive relationship between ROA and the likelihood of paying a cash dividend. Therefore, as expected it can be concluded that the profitability of a company has a positive relationship with the probability of paying a cash dividend, at the 1 percent level with a coefficient of 21,285. This shows that a one unit increase in ROA will lead to an expected increase of 21,872 in the likelihood of a company paying a cash dividend, keeping all other variables constant. This finding is consistent with studies of Baker and Kilincarslan (2019), De Jong et al. (2019), Fama and French (2001) and Denis and Osobov (2008), who all found the same significant positive relationship between profitability and the likelihood of paying dividends. The free cash flow variable (FCF) is only significantly positive in model 3, however in the full model 9 free cash flow becomes insignificant. Therefore, the results show that a higher free cash flow does not increase the likelihood of paying a dividend, which is in line with the study of De Jong et al. (2019) who found in the most recent period no significant relationship between free cash flow and the probability of paying a cash dividend. However, this contradicts the pecking order theory, where companies with a higher level of free cash flow, thus a higher level of internal funds available, do not have a higher probability of paying a cash dividend. Additionally, this also contradicts the agency conflict between principal and agent, where companies with higher free cash flow may use dividends to monitor managers to reduce agency costs and they may also use dividends to signal future prospects of the company to outsiders, according to the signaling theory. Furthermore, it is important to note that the alternative models 10 and 11 did not have a significant impact on the main results. In the full model 9 FCF was insignificant and stays insignificant in model 11 where ROA has been omitted. In addition, ROA is significant in the full model 9 and stays significant in model 10. Overall, the results show that there seems to be no multicollinearity problem between ROA and FCF.

Companies that are more levered are less likely to pay out a dividend, because of the high external financing costs and costs of financial distress. The leverage variable (LEV) in all models has a negative coefficient, which could indicate that companies with less leverage have a higher likelihood of paying a dividend, however the leverage variable is not significant

for all models. Ownership concentration (OWN2) appears to have a concave rather than a convex relationship with the likelihood of paying a dividend. This is represented by the negative and significant relationship between squared ownership concentration and the likelihood of paying a dividend in all models at the 1 percent and 5 percent level. Benkert (2020) found the same convex relationship between the likelihood of a share repurchase and squared ownership concentration, which would indicate that the likelihood of paying a dividend increases with an increase in ownership concentration at low levels, however at high levels, dividends would become less likely.

Companies with high growth and investment opportunities are less likely to pay a dividend. Fama and French (2001) and Denis and Osobov (2008) found that companies with higher growth opportunities are less likely to pay dividends. However, this finding has not been found by the results of this study, the variable for growth and investment opportunities (GROW) has a negative coefficient in model 6 and a positive coefficient in models 9, 10 and 11 and all coefficients are insignificant. Furthermore, it can be observed that the age (AGE) variable is insignificant in all models. Additionally, the company size variable (LN_SIZE) is significantly positive in all models and therefore size positively influences the likelihood of paying dividends, which is in line with the studies of Denis and Osobov (2008), Fama and French (2001) and Baker and Kilincarslan (2019).

Considering the control variables, it can be observed that RE_TE and BOARD_SIZE have a significantly positive relationship in all models, except board size in models 9 and 10. The propensity to pay dividends is higher among companies for which retained earnings comprise a larger fraction of total equity, which is in line with the study of Denis and Osobov (2008). Additionally, board size positively influences the likelihood of paying dividends, which is in line with the study of Chang et al. (2018). Additionally, tangibility (TANG) is also significantly positive related to the likelihood of paying dividends in models 8, 9, 10 and 11. Which is in line with the pecking order theory, when internal funds are not sufficient the company will use debt rather than equity, a company with more tangible assets can use these assets as collateral to debtholders and therefore decrease the cost of debt and therefore leverage will increase. Looking at the pseudo R-squared the highest value can be found in models 9 and 10, with a value of 80,3 percent and the lowest value can be found in model 4 and 6, with a value of 53,7 percent. Comparing the pseudo R-squared with other studies like De Jong et al. (2019) and Baker and Kilincarslan (2019) their values are either at the same level or lower than the values of this study. Therefore, it can be concluded that the models have a reasonably well fit.

In conclusion, the likelihood of paying a dividend has no relationship with leverage, growth and age. Whereas ROA and size have a significant positive relationship with the likelihood of paying dividends. Ownership concentration has a concave relationship rather than the predicted convex relationship with the likelihood of paying a dividend.

Table 5. Logistic regression results

Model	1	2	3	4	5	6	7	8	9	10	11
Constant	-43,903	-43,797	-45,219	-43,557	-44,886	-43,714	-43,616	-57,462	-53,447	-54,031	-58,251
	(0,998)	(0,998)	(0,998)	(0,998)	(0,998)	(0,998)	(0,998)	(0,997)	(0,998)	(0,998)	(0,997)
ROA		21,872							21,285	19,917	
		(0,000)***							(0,008)***	(0,002)***	
FCF			9,652						-2,981		10,771
			(0,008)***						(0,758)		(0,102)
LEV				-0,923					-3,925	-4,086	-3,840
				(0,567)					(0,194)	(0,173)	(0,164)
OWN2					-4,444				-3,621	-3,614	-4,079
					(0,000)***				(0,039)**	(0,035)**	(0,005)***
GROW						-0,037			0,043	0,047	0,031
						(0,602)			(0,673)	(0,644)	(0,739)
AGE							-0,003		0,009	0,009	0,007
							(0,542)		(0,323)	(0,318)	(0,448)
LN_SIZE								1,558	1,780	1,830	1,923
								(0,000)***	(0,001)***	(0,000)***	(0,000)***
LIQ	-0,041	0,057	0,113	-0,089	-0,015	-0,036	-0,054	-0,247	-0,263	-0,256	-0,310
	(0,794)	(0,808)	(0,593)	(0,601)	(0,937)	(0,821)	(0,733)	(0,290)	(0,361)	(0,370)	(0,223)
RE_TE	0,927	0,749	0,856	0,858	1,158	0,887	0,975	1,459	1,256	1,282	1,519
	(0,000)***	(0,001)***	(0,000)***	(0,001)***	(0,000)***	(0,000)***	(0,000)***	(0,000)***	(0,013)**	(0,010)**	(0,002)***
TANG	-0,222	-0,092	-0,814	-0,295	0,257	-0,427	-0,277	-5,608	-6,144	-6,643	-8,217
	(0,849)	(0,948)	(0,518)	(0,803)	(0,840)	(0,730)	(0,814)	(0,004)***	(0,069)*	(0,029)**	(0,005)***
PREF	-0,390	0,007	-0,237	-0,358	-0,314	-0,406	-0,376	-1,437	-1,254	-1,281	-1,447
	(0,447)	(0,991)	(0,660)	(0,488)	(0,567)	(0,433)	(0,465)	(0,036)**	(0,166)	(0,153)	(0,067)*
B_SIZE	0,379	0,395	0,304	0,389	0,392	0,375	0,375	-0,455	-0,415	-0,443	-0,577
	(0,004)***	(0,019)**	(0,028)**	(0,003)***	(0,009)***	(0,004)***	(0,004)***	(0,018)**	(0,174)	(0,125)	(0,016)**
REL_SUP_SIZE	3,375	-0,175	2,032	3,542	4,167	3,261	3,532	1,583	-2,080	-2,363	0,522
	(0,118)	(0,948)	(0,387)	(0,105)	(0,081)*	(0,134)	(0,106)	(0,603)	(0,623)	(0,572)	(0,896)
Industry Dummy	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Pseudo R-squared	0,536	0,683	0,574	0,537	0,609	0,537	0,538	0,710	0,803	0,803	0,770
Observations	195	195	195	195	195	195	195	195	195	195	195

*Notes: this table reports the unstandardized beta coefficients for the logistic regressions with the dependent variable DPAY. The definitions of variables can be found in table 2. ***, **, * indicate significance at the 1%, 5% and 10% levels, respectively.*

4.3.2 OLS regression

Aside from the question on why companies pay dividends, dividends are also explained by the level of dividend, so how much dividends to pay. Table 6 reports the OLS regression results for the payout ratio scaled by total assets. The profitability variable (ROA) presented in models 2, 9 and 10 all show a significant positive relationship at the 1 percent level, which is in line with studies of Alzahrana and Lasfer (2012) and Baker and Kilincarslan (2019). Suggesting that profitable firms have a higher dividend payout. Additionally, the leverage variable (LEV) shows a significant negative relationship in all models, suggesting that a higher leverage reduces dividend payout ratios due to high external financing costs and costs of financial distress. In contrast to the decision whether or not to pay dividends, free cash flow (FCF) shows a negative relationship with the dividend payout ratio, however this relationship is only significant in the full model, whereas on its own free cash flow does not has a significant relationship with the level of dividends payouts. An increase in free cash flow may result in paying a lower dividend. Furthermore, looking at the alternative models 10 and 11, it can be seen that the results are robust and there seems to be no multicollinearity problem between FCF and ROA.

Squared ownership concentration (OWN2) appears to have a convex relationship with the dividend payout ratio, the coefficient is positive and significant in all models at the 1 percent level. Suggesting that at a lower level of shareholding by the largest shareholder will lead to a decrease in the dividend payout ratio, however when the level of shareholding increases the company will payout more dividends (Truong & Heaney, 2007). Furthermore, companies with higher growth and investment opportunities (GROW) have a higher dividend payout ratio, the coefficient is positive and significant across all models. This is in contrast with the prediction of the agency theory, that more growth-oriented companies would exhibit lower dividend payouts. However, this is in line with the signaling theory that growth-oriented companies are in more need of signaling future prospects to outsiders, in order to minimize information asymmetries and therefore have higher dividend payout ratios (Bhattacharya, 1979). Age only shows a positive relationship in model 9, however this relationship is insignificant, indicating that age does not has a relationship with the level of dividend payout. Furthermore, the company size variable shows no significant relationship with the dividend payout ratio across all models.

Considering the control variables, it can be seen that the relative supervisory size has a positive coefficient and is significant in all models except for models 2, 6, 9 and 10, varying at the 1 and 5 percent level. Suggesting that companies with a relatively larger supervisory

board size to management board size exhibit higher dividend payouts. The preference shares variable (PREF) shows a positive coefficient and is significant in model 6, however the significance is barely present at the 10 percent level. Tangibility only shows a significantly negative relationship in models 4 and 5, indicating that companies with more tangible assets have lower dividend payout ratios. The last control variable that exhibits a significant relationship is RE_TE in models 4 and 6. However, this variable exhibits a positive relationship in model 6 and a negative relationship in model 4. Regarding the adjusted R-squared, the lowest value of 21,2 percent can be found in model 7 and 8 and the highest value can be found in model 9 with a value of 49,4 percent. Comparing the adjusted R-squared with other studies, it can be concluded that these results are in line with the other studies (De Jong et al., 2019; Alzahrani & Lasfer, 2012).

Table 6. OLS regression results

Model	1	2	3	4	5	6	7	8	9	10	11
Constant	-4,379	-4,339	-4,400	-3,678	-4,646	-4,322	-4,420	-4,591	-3,874	-3,948	-3,691
	(0,000)***	(0,000)***	(0,000)***	(0,000)***	(0,000)***	(0,000)***	(0,000)***	(0,000)***	(0,000)***	(0,000)***	(0,000)***
ROA		5,865							5,587	4,941	
		(0,000)***							(0,000)***	(0,000)***	
FCF			-1,216						-3,360		-2,254
			(0,396)						(0,009)***		(0,095)*
LEV				-1,849					-1,208	-1,249	-1,761
				(0,001)***					(0,014)**	(0,013)**	(0,001)***
OWN2					1,418				1,406	1,497	1,134
					(0,000)***				(0,000)***	(0,000)***	(0,007)***
GROW						0,155			0,096	0,073	0,148
						(0,000)***			(0,019)**	(0,071)*	(0,001)***
AGE							-0,001		0,002	0,002	0,001
							(0,529)		(0,141)	(0,105)	(0,539)
LN_SIZE								0,041	-0,047	-0,016	-0,035
								(0,530)	(0,417)	(0,786)	(0,578)
LIQ	0,022	-0,002	0,017	-0,040	0,032	0,022	0,015	0,016	-0,024	-0,009	-0,027
	(0,649)	(0,964)	(0,734)	(0,423)	(0,482)	(0,626)	(0,767)	(0,748)	(0,607)	(0,841)	(0,595)
RE_TE	-0,046	-0,056	-0,053	-0,187	-0,092	0,239	-0,030	-0,037	-0,082	-0,104	0,018
	(0,573)	(0,449)	(0,513)	(0,035)**	(0,237)	(0,030)**	(0,719)	(0,648)	(0,453)	(0,352)	(0,873)
TANG	-0,567	-0,298	-0,603	-0,764	-0,651	-0,261	-0,603	-0,710	-0,194	-0,275	-0,442
	(0,145)	(0,409)	(0,124)	(0,044)**	(0,079)*	(0,490)	(0,126)	(0,117)	(0,624)	(0,499)	(0,301)
PREF	0,202	0,213	0,188	0,177	0,206	0,266	0,210	0,183	0,206	0,216	0,226
	(0,201)	(0,142)	(0,235)	(0,242)	(0,170)	(0,079)*	(0,186)	(0,254)	(0,116)	(0,109)	(0,113)
B_SIZE	-0,056	-0,040	-0,053	-0,023	-0,047	-0,062	-0,053	-0,076	0,011	-0,012	-0,003
	(0,073)*	(0,160)	(0,091)*	(0,470)	(0,112)	(0,037)**	(0,089)*	(0,091)*	(0,765)	(0,759)	(0,945)
REL_SUP_SIZE	1,976	1,168	2,063	2,279	2,041	1,288	2,127	1,868	1,090	0,924	1,771
	(0,026)**	(0,158)	(0,021)**	(0,008)***	(0,016)**	(0,134)	(0,021)**	(0,039)**	(0,164)	(0,249)	(0,035)**
Industry Dummy	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Adjusted R-squared	0,216	0,340	0,214	0,281	0,293	0,376	0,212	0,212	0,494	0,465	0,403
Observations	129	129	129	129	129	129	129	129	129	129	129

*Notes: this table reports the unstandardized beta coefficients for the OLS regressions with the dependent variable LN_PAYOUT_TA. The definitions of variables can be found in table 2. ***, **, * indicate significance at the 1%, 5% and 10% levels, respectively.*

4.1.3 Robustness checks

To test the robustness of the results discussed above, several robustness checks have been executed. Different measures will be used for the dividend payout ratio. Firstly, the dividends will be scaled by total sales. Table 7 presents the results based on the new dependent variable LN_PAYOUT_SALES. It can be seen that the main full model results are mostly similar to table 6, however some results deviate from the main results. Leverage (LEV) and growth/investment opportunities (GROW) on their own keep their significance, however they become insignificant within the full model of table 7, whereas in table 6 they are significant in the full model. Additionally, size of the company becomes significant with a positive coefficient in the full model 9, however the significance is barely present at the 10 percent level.

Secondly, table 8 presents the results based on the new dependent variable LN_PAYOUT_NI, which is the ordinary cash dividends scaled by net income. It can be seen that some results from the full model deviate from the main results presented in table 6. ROA and LEV become insignificant, whereas AGE becomes significant. Additionally, the sign of GROW changes from positive to negative, which is more in favor of the agency theory instead of the signaling theory as discussed in section 4.1.2, however this significance is barely present at the 10 percent level. Benkert (2020) describes one of the reasons for these changes may be due to the fact that net income exhibits very different characteristics from the variables that use total assets or sales as the denominator, which can be seen in the descriptive statistics, and therefore the deviations from the main results may be explained by this change in characteristics. It can also be seen that the adjusted R-squared is relatively low compared to the other regressions. Additionally, another reason for the changes in results may be accounted to the lower number of observations in this research model.

Lastly, table 9 presents the results based on the new dependent variable LN_PAYOUT_FCF, which is the ordinary cash dividends scaled by free cash flow. It can be seen that the full model results are mostly similar to the main results in table 6. However, some results deviate from the main results, LEV, OWN2 and GROW become insignificant in table 9. Again, this may be due to the fact that free cash flow exhibits very different characteristics from the variables that are scaled by total assets and sales and therefore the deviations from the main results may be explained by this change in characteristics. Additionally, the adjusted R-squared appears to be very low compared to the other regressions and a lower number of observations is used in this model.

Overall, it can be concluded that all the robustness checks yield almost qualitatively similar results to the main results of the full model. Considering that the payout variable scaled by sales has very similar characteristics to the payout variable scaled by total assets, it can be seen that the overall results exhibit similar results to the main results. However, in all robustness checks leverage (LEV) has no significant relationship with the amount of dividend payouts, and this may indicate no or partial support for hypothesis 3.

Table 7. OLS regression results: robustness check

Model	1	2	3	4	5	6	7	8	9	10	11
Constant	-6,601	-6,570	-6,723	-6,074	-6,913	-6,561	-6,637	-7,969	-8,198	-7,524	-7,098
	(0,000)***	(0,000)***	(0,000)***	(0,000)***	(0,000)***	(0,000)***	(0,000)***	(0,000)***	(0,000)***	(0,000)***	(0,000)***
ROA		4,585							6,022	4,417	
		(0,008)***							(0,000)***	(0,014)**	
FCF			-7,006						-8,351		-7,158
			(0,000)***						(0,000)***		(0,000)***
LEV				-1,388					-1,000	-1,102	-1,596
				(0,062)*					(0,117)	(0,119)	(0,015)**
OWN2					1,656				1,141	1,366	0,848
					(0,001)***				(0,025)**	(0,016)**	(0,110)
GROW						0,109			0,068	0,013	0,125
						(0,059)*			(0,195)	(0,814)	(0,020)**
AGE							-0,001		0,001	0,001	-0,001
							(0,664)		(0,749)	(0,539)	(0,731)
LN_SIZE								0,263	0,148	0,225	0,161
								(0,001)***	(0,052)*	(0,007)***	(0,045)**
LIQ	0,236	0,217	0,204	0,189	0,248	0,236	0,229	0,196	0,131	0,166	0,128
	(0,000)***	(0,001)***	(0,001)***	(0,005)***	(0,000)***	(0,000)***	(0,001)***	(0,002)***	(0,031)**	(0,013)**	(0,047)**
RE_TE	0,037	0,029	-0,007	-0,069	-0,017	0,236	0,050	0,089	0,005	-0,051	0,113
	(0,724)	(0,778)	(0,941)	(0,555)	(0,863)	(0,110)	(0,644)	(0,380)	(0,973)	(0,748)	(0,444)
TANG	2,944	3,155	2,733	2,796	2,846	3,159	2,912	2,018	2,430	2,229	2,163
	(0,000)***	(0,000)***	(0,000)***	(0,000)***	(0,000)***	(0,000)***	(0,000)***	(0,000)***	(0,000)***	(0,000)***	(0,000)***
PREF	0,261	0,270	0,184	0,243	0,266	0,306	0,269	0,143	0,127	0,152	0,148
	(0,200)	(0,175)	(0,339)	(0,230)	(0,175)	(0,132)	(0,191)	(0,472)	(0,458)	(0,421)	(0,413)
B_SIZE	-0,064	-0,052	-0,048	-0,039	-0,054	-0,068	-0,062	-0,193	-0,080	-0,138	-0,096
	(0,111)	(0,187)	(0,209)	(0,350)	(0,164)	(0,087)*	(0,127)	(0,001)***	(0,112)	(0,012)**	(0,072)*
REL_SUP_SIZE	3,089	2,457	3,591	3,316	3,165	2,607	3,223	2,395	2,290	1,879	3,024
	(0,007)***	(0,031)**	(0,001)***	(0,004)***	(0,004)***	(0,025)**	(0,007)***	(0,033)**	(0,027)**	(0,098)*	(0,005)***
Industry Dummy	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Adjusted R-squared	0,518	0,543	0,576	0,529	0,556	0,529	0,515	0,556	0,681	0,608	0,643
Observations	129	129	129	129	129	129	129	129	129	129	129

*Notes: this table reports the unstandardized beta coefficients for the OLS regressions with the dependent variable LN_PAYOUT_SALES. The definitions of variables can be found in table 2. ***, **, * indicate significance at the 1%, 5% and 10% levels, respectively.*

Table 8. OLS regression results: robustness check

Model	1	2	3	4	5	6	7	8	9	10	11
Constant	-0,330	-0,333	-0,387	-0,334	-0,573	-0,243	-0,241	-1,181	-0,946	-1,011	-0,887
	(0,607)	(0,606)	(0,533)	(0,621)	(0,358)	(0,702)	(0,707)	(0,093)*	(0,184)	(0,141)	(0,191)
ROA		-0,614							1,558	1,044	
		(0,637)							(0,241)	(0,430)	
FCF			-3,938						-2,751		-2,452
			(0,004)***						(0,043)**		(0,066)*
LEV				0,011					0,057	0,020	-0,106
				(0,985)					(0,915)	(0,971)	(0,839)
OWN2					1,180				1,532	1,601	1,458
					(0,002)***				(0,000)***	(0,000)***	(0,001)***
GROW						-0,043			-0,073	-0,091	-0,058
						(0,319)			(0,093)*	(0,036)**	(0,161)
AGE							0,002		0,004	0,004	0,004
							(0,113)		(0,009)***	(0,008)***	(0,015)**
LN_SIZE								0,166	0,072	0,097	0,076
								(0,008)***	(0,248)	(0,121)	(0,223)
LIQ	-0,084	-0,082	-0,103	-0,084	-0,076	-0,084	-0,067	-0,111	-0,075	-0,063	-0,076
	(0,072)*	(0,083)*	(0,024)**	(0,098)*	(0,091)*	(0,071)*	(0,158)	(0,018)**	(0,132)	(0,207)	(0,126)
RE_TE	-0,168	-0,167	-0,192	-0,167	-0,207	-0,247	-0,204	-0,136	-0,414	-0,432	-0,387
	(0,030)**	(0,032)**	(0,011)**	(0,062)*	(0,006)***	(0,026)**	(0,012)**	(0,074)*	(0,001)***	(0,000)***	(0,001)***
TANG	-0,864	-0,891	-0,977	-0,864	-0,913	-0,957	-0,757	-1,443	-1,164	-1,231	-1,227
	(0,027)**	(0,024)**	(0,010)**	(0,028)**	(0,015)**	(0,017)**	(0,054)*	(0,001)***	(0,009)***	(0,007)***	(0,006)***
PREF	0,385	0,386	0,353	0,385	0,389	0,370	0,370	0,322	0,288	0,294	0,295
	(0,015)**	(0,015)**	(0,021)**	(0,015)**	(0,011)**	(0,020)**	(0,018)**	(0,037)**	(0,047)**	(0,046)**	(0,042)**
B_SIZE	-0,066	-0,068	-0,058	-0,066	-0,061	-0,064	-0,072	-0,150	-0,094	-0,112	-0,099
	(0,031)**	(0,028)**	(0,048)**	(0,039)**	(0,039)**	(0,035)**	(0,019)**	(0,001)***	(0,028)**	(0,009)***	(0,021)**
REL_SUP_SIZE	1,331	1,417	1,627	1,329	1,432	1,513	0,971	0,920	0,962	0,832	1,157
	(0,118)	(0,105)	(0,050)*	(0,124)	(0,081)*	(0,083)*	(0,266)	(0,273)	(0,254)	(0,330)	(0,163)
Industry Dummy	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Adjusted R-squared	0,266	0,321	0,265	0,131	0,327	0,271	0,282	0,313	0,410	0,391	0,407
Observations	122	122	122	122	122	122	122	122	122	122	122

*Notes: this table reports the unstandardized beta coefficients for the OLS regressions with the dependent variable LN_PAYOUT_NI. The definitions of variables can be found in table 2. ***, **, * indicate significance at the 1%, 5% and 10% levels, respectively.*

Table 9. OLS regression results: robustness check

Model	1	2	3	4	5	6	7	8	9	10	11
Constant	-0,507	-0,619	-0,153	-0,201	-0,412	-0,647	-0,479	-1,272	-0,326	-1,130	-0,280
	(0,526)	(0,426)	(0,845)	(0,811)	(0,614)	(0,417)	(0,553)	(0,187)	(0,719)	(0,244)	(0,768)
ROA		4,439							5,617	3,484	
		(0,009)***							(0,002)***	(0,063)*	
FCF			-6,881						-10,555		-8,377
			(0,005)***						(0,000)***		(0,001)***
LEV				-0,871					-1,103	-0,721	-1,488
				(0,243)					(0,115)	(0,339)	(0,040)**
OWN2					-0,401				-0,231	-0,834	-0,815
					(0,539)				(0,753)	(0,289)	(0,274)
GROW						0,093			0,087	0,069	0,140
						(0,094)*			(0,127)	(0,264)	(0,015)**
AGE							0,001		0,001	0,000	-0,001
							(0,751)		(0,704)	(0,967)	(0,736)
LN_SIZE								0,118	0,087	0,137	0,104
								(0,156)	(0,277)	(0,116)	(0,215)
LIQ	0,100	0,081	0,059	0,070	0,100	0,100	0,105	0,080	-0,036	0,036	-0,026
	(0,096)*	(0,170)	(0,327)	(0,283)	(0,099)*	(0,093)*	(0,092)*	(0,191)	(0,576)	(0,593)	(0,704)
RE_TE	-0,133	-0,138	-0,170	-0,198	-0,121	0,039	-0,142	-0,107	-0,103	-0,010	0,028
	(0,178)	(0,152)	(0,079)*	(0,081)*	(0,231)	(0,782)	(0,169)	(0,283)	(0,521)	(0,953)	(0,863)
TANG	-0,941	-0,725	-1,022	-1,001	-0,955	-0,739	-0,911	-1,314	-0,929	-1,130	-1,233
	(0,063)*	(0,144)	(0,037)**	(0,049)**	(0,060)*	(0,150)	(0,078)*	(0,021)**	(0,103)	(0,068)*	(0,037)**
PREF	0,261	0,246	0,216	0,244	0,239	0,292	0,257	0,224	0,132	0,166	0,147
	(0,216)	(0,230)	(0,291)	(0,249)	(0,267)	(0,165)	(0,226)	(0,289)	(0,495)	(0,431)	(0,469)
B_SIZE	-0,080	-0,069	-0,062	-0,065	-0,079	-0,085	-0,082	-0,140	-0,069	-0,130	-0,089
	(0,046)**	(0,080)*	(0,114)	(0,120)	(0,049)**	(0,034)**	(0,044)**	(0,017)**	(0,206)	(0,025)**	(0,119)
REL_SUP_SIZE	0,957	0,345	1,186	1,116	0,874	0,580	0,868	0,672	0,010	-0,189	0,618
	(0,387)	(0,753)	(0,270)	(0,317)	(0,435)	(0,604)	(0,450)	(0,548)	(0,992)	(0,872)	(0,579)
Industry Dummy	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Adjusted R-squared	0,127	0,177	0,185	0,131	0,122	0,143	0,119	0,136	0,308	0,179	0,241
Observations	115	115	115	115	115	115	115	115	115	115	115

*Notes: this table reports the unstandardized beta coefficients for the OLS regressions with the dependent variable LN_PAYOUT_FCF. The definitions of variables can be found in table 2. ***, **, * indicate significance at the 1%, 5% and 10% levels, respectively.*

5. Conclusion

In this section the main results presented in section four will be discussed. After that, a conclusion will be formulated and an answer to the main research question will be given. Lastly, the limitations and future research of this study will be discussed.

5.1 Discussion of results

Despite decades of research there is still no consensus about the determinants of dividend policy, also known as the dividend puzzle (Black, 1979). Therefore, the following central research question has been formulated for this study: *"What are the determinants of dividend policy of Dutch listed companies?"* In order to answer this research question seven hypotheses have been formulated. This section will provide a discussion of the main results and whether there is evidence to support the hypotheses.

The first hypothesis (H1) predicts a positive relationship between profitability and dividend policy for Dutch listed companies. The results of both models and the robustness checks show that ROA has a significant positive relationship with both the probability of paying a cash dividend and the dividend payout intensity, this provides support for the first hypothesis. More profitable companies have a higher probability and intensity of paying dividends. This is in line with the agency theory that suggests that companies with a higher profitability, payout more dividends than less profitable companies in order to limit waste of excess cash available to managers. Additionally, companies with a higher profitability will payout dividends in order to minimize information asymmetries and to signal future prospects of the company to outsiders. Thus, more profitable companies are more vulnerable to agency problems and are therefore more likely to pay dividends in order to mitigate those agency problems. In addition, this result supports the pecking order theory, that more profitable companies generate more internal funds and therefore have to resort less to forms of external financing and are therefore more likely to pay a dividend. Overall, the results provide robust evidence to support hypothesis 1.

The second hypothesis (H2) predicts a positive relationship between free cash flow and dividend policy for Dutch listed companies. When considering the full specification, the results show an insignificant relationship between the probability of paying a cash dividend and free cash flow. This result does not support the pecking order theory, which proposes that companies with higher free cash flows have higher internal funds available and have to resort less to forms of external financing and are therefore more likely to pay a dividend.

Additionally, the results show a significantly negative relationship between free cash flow and the dividend payout ratio. Which indicates that companies with a higher level of free cash flow have a lower dividend payout ratio, this contradicts the agency theory, where excess free cash flow will be used in order to reduce agency conflicts and to monitor managers. This also contradicts the signaling theory, that companies use their free cash flow to payout dividends in order to signal future prospects. However, this is in line with the pecking order theory, that suggests that companies should first use their internally generated cash to finance investment opportunities instead of paying a higher dividend. In conclusion, there is no evidence to support hypothesis 2, thus free cash flow does not have an influence on the likelihood but has a negative relationship with the intensity of dividend payout.

The third hypothesis (H3) predicts a negative relationship between leverage and dividend policy for Dutch listed companies. Taking into account the full specification of both the models, a negative relationship exists between leverage and the likelihood and intensity of dividend payouts, however the likelihood of paying a dividend has an insignificant relationship whereas the intensity of payout does have a significant negative relationship. This result provide evidence for the pecking order theory, where more levered companies pay lower dividends, which is in line with the study of Fama and French (2002). Overall, the results provide partial evidence to support hypothesis 3, leverage only has a negative relationship with the dividend payout ratio and not the likelihood of paying a dividend. Thus, debt may be an effective substitute for dividends as suggested by Jensen (1986), more leverage may require companies to hold on to more free cash flow rather than paying dividends. However, it needs to be considered that all the robustness checks provide insignificant relationships between leverage and the dividend payout ratio.

The fourth hypothesis (H4) predicts a convex relationship between ownership concentration and dividend policy for Dutch listed companies. Although a convex relationship was expected, the results show a concave relationship between ownership concentration and the likelihood of paying a dividend. Which indicates that the likelihood of paying dividends increases with an increase in ownership concentration at low levels, however the likelihood of paying dividends becomes less likely at high levels. However, when considering the intensity of dividend payments, there is a robust convex relationship between ownership concentration and the intensity of dividend payments, which supports the studies of Farinha (2003) and Truong and Heaney (2007). Suggesting, that at low levels of ownership concentration this will lead to a decrease in dividend payouts, however at high levels of ownership concentration the dividend payout intensity will be higher (Benkert, 2020). When the largest shareholder

has a relatively lower level of shareholding, they want to protect their investment through active monitoring, and therefore using dividends as a monitoring device becomes less important and therefore initially dividend payments may fall as the largest shareholding increases (Truong & Heaney, 2007). However, as the level of shareholding of the largest shareholder increases, the largest shareholder will receive considerable control and power to make managerial decisions and to expropriate wealth from minority shareholders. Therefore, companies pay a larger dividend to offset the increasing agency costs due to the concentrated shareholding (Benkert, 2020). Therefore, hypothesis 4 can only be partially supported, ownership concentration has a convex relationship with the dividend payout ratio and a concave relationship with the likelihood of paying a dividend.

The fifth hypothesis (H5) predicts a negative relationship between growth/investment opportunities and dividend policy for Dutch listed companies. Growth opportunities has no significant relationship with the likelihood of paying a dividend. However, it does have a significant positive relationship with the dividend payout ratio. Companies with higher growth and investment opportunities have a higher dividend payout ratio. This is in contrast with the pecking order theory, which suggests that growth companies need to finance their investment opportunities first with internal funds and then with external funds. Therefore, growth companies are less likely to pay a dividend, because they want to reduce their dependency on external funds because of financial distress costs. However, this is in line with the information asymmetry and signaling theory, where growth-oriented companies are in more need of signaling future prospects to outsiders, in order to minimize information asymmetries and therefore may have higher dividend payout ratios. Therefore, hypothesis 5 cannot be supported, a negative relationship was expected, however the results provide a positive relationship between growth/investment opportunities and the dividend payout ratio.

The sixth hypothesis (H6) predicts a positive relationship between company age and dividend policy for Dutch listed companies. The results exhibit a robust insignificant relationship between age and the likelihood and intensity of paying a dividend. Therefore, no evidence can be found to support hypothesis 6.

The last hypothesis (H7) predicts a positive relationship between size and dividend policy for Dutch listed companies. Only the relationship between company size and the likelihood of paying a dividend has a significant positive coefficient. Companies who are larger will see a decrease in investment and growth opportunities, consequently they should payout excess cash as dividends in order to limit waste of free cash flows. This result shows that larger companies have bigger agency and information asymmetry problems and hence are

more likely to payout dividends in order to minimize those problems and in order to signal future prospects to outsiders. However, the dividend payout ratio has an insignificant relationship with company size. Therefore, hypothesis 7 can only be partially supported, evidence was only found for the likelihood of paying a dividend and not the payout intensity.

In conclusion, this study contributes to solving the dividend puzzle by studying a Dutch sample. The answer to the research question is two-fold, after controlling for several firm specific and corporate governance control variables, different determinants of the probability and intensity of dividend payouts exist. Firstly, the determinants of the probability of paying a dividend found in this study are profitability measured by return on assets, ownership concentration and company size. Secondly, the determinants of the intensity of dividend payouts are profitability measured by return on assets, free cash flow, leverage, ownership concentration and growth/investment opportunities measured by the market-to-book ratio. Overall, the results show that, compared to non-dividend payers, dividend paying Dutch companies are more profitable, have a lower ownership concentration and are larger in size. Additionally, the dividend paying companies who payout a larger amount of dividend relative to their total assets, have a higher profitability, ownership concentration and growth/investment opportunities, and have lower levels of free cash flow and debt ratios compared to companies who payout lower levels of dividend relative to their total assets. This study contributes to the literature by using different types of dividend policy theories in a Dutch setting, and therefore using multiple determinants of dividend policy. Additionally, this study contributes to the limited Dutch evidence on dividend policy in recent years. Other studies focused their studies on countries like the United States, Germany and United Kingdom.

5.2 Limitations and further research

This study faces a few limitations. As mentioned in the results section, multicollinearity could be a problem between return on assets and free cash flow. multicollinearity may occur due to the fact that companies with a higher return on assets are more profitable and therefore may have a higher free cash flow available, due to the efficient use of their assets to generate earnings. This study uses alternative specifications to mitigate this multicollinearity problem, because this study uses an OLS-regression which does not account for multicollinearity problems. However, when looking at the VIF values of ROA and FCF they were well below the recommended threshold and the alternative specifications show robust evidence for the

main results. Nevertheless, in order to mitigate this problem in further research, it may be recommended to use a different regression method, which takes multicollinearity and endogeneity problems into account.

A second limitation regarding the sample, a larger sample size could possibly provide better and more robust results. This would also result in a higher reliability and validity of the study. Additionally, this study focuses only on listed companies on the Euronext Amsterdam, which are mostly large companies. It would be interesting to also study the same relationships for private companies, in order to see if the results will hold for smaller companies. Also, a longer timeframe could be used, this study only comprises of three years, due to the lagged variables to take endogeneity problems into account. Using a longer timeframe would be beneficial in order to see how the results hold up over time and therefore increase the validity of the results.

Lastly, some of the robustness checks exhibit deviating results from the main results. This may be due to the different characteristics of the dependent variables used and the lower number of observations. This can also be seen in the descriptive statistics, where total assets and sales have almost the same characteristics and provide almost similar results, whereas net income and free cash flow have very different characteristics. Therefore, comparing the results may be difficult and other variables or denominators could be used in order to measure the intensity of dividend payouts.

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. https://doi.org/10.1016/j.jwb.2015.10.003.

Allen, F., & Michaely, R. (1995). Dividend policy. *Handbooks in Operations Research and Management Science*(9), 793-838.

Alzahrani, M., & Lasfer, M. (2012). Investor protection, taxation, and dividends. *Journal of Corporate Finance, 18*(4), 751-762.

Amihud, Y., & Murgia, M. (1997). Dividends, Taxes, and Signaling: Evidence from Germany. *The Journal of Finance, 52*(1), 397-408.

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, H. K., & Kilincarslan, E. (2019). Why companies do not pay cash dividends: the Turkish experience. *Global Finance Journal, 42*, 1-18. https://doi.org/10.1016/j.gfj.2018.02.005.

Banyi, M. L., & Kahle, K. M. (2014). Declining propensity to pay? A re-examination of the lifecycle theory. *Journal of Corporate Finance, 27*, 345-366. https://doi.org/10.1016/j.jcorpfin.2014.06.001.

Barclay, M. J., & Smith, C. W. (1988). Corporate payout policy. *Journal of Financial economics, 22*(1), 61-82. https://doi.org/10.1016/0304-405X(88)90022-0.

Benito, A., & Young, G. (2003). Hard times of great expectations? Dividend omissions and dividend cuts by UK firms. *Oxford Bulletin of Economics & Statistics, 65*(5), 531-555.

Benkert, C. L. (2020). *Ownership concentration & agency theory : Investigating the effect of large shareholders on corporate payout policy in Danish publicly listed companies.* Retrieved from http://essay.utwente.nl/85284/1/Benkert_MA_BMS.pdf

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. *The Journal of Portfolio Management, 2*(2), 5-8.

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.

Brounen, D., de Jong, A., & Koedijk, K. (2006). Capital structure policies in Europe: Survey evidence. *Journal of Banking and Finance, 30*(5), 1409–1442. https://doi.org/10.1016/j.jbankfin.2005.02.010.

Chang, B., Dutta, S., Saadi, S., & Zhu, P. C. (2018). Corporate Governance and Dividend Payout Policy: Beyond country-level governance. *Journal of Financial Research, 41*(4), 5-484. https://doi.org/10.1111/jfir.12159.

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. https://doi.org/10.1016/S0927-5398(03)00010-0.

De Jong, A. (2002). The Disciplining Role of Leverage in Dutch Firms. *European Finance Review, 6*(1), 31-62.

de Jong, A., de Jong, D. V., Mertens, G., & Wasley, C. E. (2005). The role of self-regulation in corporate governance: evidence and implications from The Netherlands. *Journal of Corporate Finance, 11*(3), 473-503. https://doi.org/10.1016/j.jcorpfin.2004.01.002.

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.

de Jong, D., de Jong, A. M., & Wasley, C. (2001). Corporate governance in Nederland: Governance en financiële prestaties. *Maandblad Voor Accountancy en Bedrijfseconomie, 75*, 103-116.

De Jong, D., De Jong, A., Mertens, G., & Wasley, C. (2001). Corporate governance in Nederland: governance en financiële prestaties. *Maandblad Voor Accountancy en Bedrijfseconomie, 75*, 103-116.

DeAngelo, H., DeAngelo, L., & Skinner, D. J. (1996). Reversal of fortune - Dividend signaling and the disappearance of sustained earnings growth. *Journal of Financial Economics, 40*(3), 341-371.

DeAngelo, H., DeAngelo, L., & Stulz, R. (2006). Dividend policy and the earned/contributed capital mix: a test of the life-cycle theory. *Journal of Financial Economics, 81*(2), 227-254. https://doi.org/10.1016/j.jfineco.2005.07.005.

Dekker, K. J. (2017). *Dividend & Repurchase Disclosures and their Effect on Cumulative Abnormal Returns.* Retrieved from https://essay.utwente.nl/72533/1/Dekker_BA_BMS.pdf

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. https://doi.org/10.1016/j.jfineco.2007.06.006.

Fama, E. F., & French, K. R. (2001). Disappearing dividends: changing firm characteristics or lower propensity to pay? *Journal of Applied Corporate Finance, 14*(1), 67–79. https://doi.org/10.1111/j.1745-6622.2001.tb00321.x.

Fama, E. F., & French, K. R. (2002). Testing trade-off and pecking order predictions about dividends and debt. *Review of Financial Studies, 15*(1), 1-33.

Farinha, J. (2003). Dividend Policy, Corporate Governance and the Managerial Entrenchment Hypothesis: An Empirical Analysis. *Journal of Business Finance and Accounting, 30*(9-10), 1173-1209.

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

Goyal, A., & Muckley, C. (2013). Cash dividends and investor protection in Asia. *International Review of Financial Analysis, 29*, 31–43. https://doi.org/10.1016/j.irfa.2013.03.009.

Gugler, K., & Yurtoglu, B. B. (2003). Corporate governance and dividend pay-out policy in Germany. *European Economic Review, 47*(4), 731-758. https://doi.org/10.1016/S0014-2921(02)00291-X.

Henseler, J. (2020). *Videos on Regression Analysis*. Retrieved January 2021, from https://canvas.utwente.nl/courses/6566/pages/videos-on-regression-analysis

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.

Kabir, R., Cantrijn, D., & Jeunink, A. (1997). Takeover defenses, ownership structure and stock returns in the netherlands: an empirical analysis. *Strategic Management Journal, 18*(2), 97-109.

Lau, A. (2013). *Agency theory and the dividend payout ratio of Dutch publicly listed firms.* Retrieved from https://essay.utwente.nl/63286/1/Alexander_Lau.pdf

Lehn, K., & Poulsen, A. (1989). Free cash flow and stockholder gains in going private transactions. *The Journal of Finance, 44*(3), 771-787.

Linck, J. S., Netter, J. M., & Yang, T. (2008). The determinants of board structure. *Journal of Financial Economics, 87*(2), 308-328. https://doi.org/10.1016/j.jfineco.2007.03.004.

Miller, M. H., & Modigliani, F. (1961). Dividend policy, growth, and the valuation of shares. *The Journal of Business, 34*(4), 411-433.

Miller, M. H., & Rock, K. (1985). Dividend Policy under Asymmetric Information. *The Journal of Finance, 40*(4), 1031-1051.

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. https://doi.org/10.1016/0304-405X(84)90023-0.

Patra, T., Poshakwale, S., & Ow-Yong, K. (2012). Determinants of corporate dividend policy in Greece. *Applied Financial Economics, 22*(13), 1079–1087. https://doi.org/10.1080/09603107.2011.639734.

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

Spoor, T. (2020, april). *To what extent does the compensation of CEOs of Dutch listed firms depend on firm performance?* Retrieved from https://essay.utwente.nl/81064/1/Spoor_MA_BMS.pdf

Trotz, K. (2013). *Comparing dividend policies between Germany and the Netherlands: a test of the life-cycle theory.* Retrieved from https://essay.utwente.nl/63736/1/Bachelor_Thesis_Kerstin_Trotz.pdf

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). Dividends and share repurchases in the European Union. *Journal of Financial Economics, 89*(2), 347–374. https://doi.org/10.1016/j.jfineco.2007.11.002.

Watts, R. (1973). The information content of dividends. *The Journal of Business, 46*(2), 191-211.

Xiao, J. Z., & Zou, H. (2006). The financing behaviour of listed Chinese firms. *The British Accounting Review, 38*(3), 239-258. https://doi.org/10.1016/j.bar.2006.04.008.

Appendices

Appendix A: Overview sample firms

ROYAL AHOLD DELHAIZE N.V.	AMSTERDAM COMMODITIES NV
RANDSTAD N.V.	INTERTRUST N.V.
HEINEKEN NV	TOM TOM NV
KONINKLIJKE PHILIPS N.V.	NEWAYS ELECTRONICS INTERNATIONAL NV
ASML HOLDING N.V.	BE SEMICONDUCTOR INDUSTRIES NV
KONINKLIJKE DSM N.V	KENDRION NV
AKZO NOBEL NV	BASIC-FIT N.V.
KONINKLIJKE BAM GROEP NV	ORDINA NV
SIGNIFY N.V.	EUROCOMMERCIAL PROPERTIES N.V.
KONINKLIJKE KPN NV	SIF HOLDING N.V.
WOLTERS KLUWER NV	WERELDHAVE NV
GRANDVISION N.V	AFC AJAX NV
POSTNL N.V.	BETER BED HOLDING NV
ARCADIS NV	HYDRATEC INDUSTRIES NV
OCI N.V	NEDERLANDSCHE APPARATENFABRIEK 'NEDAP' N.V.
IMCD N.V.	PHARMING GROUP NV
AALBERTS NV	ICT GROUP N.V.
KONINKLIJKE BOSKALIS WESTMINSTER NV	DPA GROUP N.V.
SBM OFFSHORE N.V.	HOLLAND COLOURS NV
FORFARMERS N.V.	C/TAC NV
ORANJEWOUD N.V.	NSI NV
JUST EAT TAKEAWAY.COM N.V	LUCAS BOLS N.V
SLIGRO FOOD GROUP N.V.	VASTNED RETAIL N.V.
HEIJMANS NV	KONINKLIJKE BRILL NV
FUGRO NV	TIE KINETIX N.V.
ASM INTERNATIONAL NV	DGB GROUP N.V.
ACCELL GROUP NV	ROODMICROTEC N.V.

TKH GROUP NV	N.V. KONINKLIJKE PORCELEYNE FLES
KONINKLIJKE VOPAK NV	IEX GROUP N.V.
CORBION N.V.	ALUMEXX NV
STERN GROEP NV	EASE2PAY NV
BRUNEL INTERNATIONAL NV	KIADIS PHARMA N.V.
AMG ADVANCED METALLURGICAL GROUP N.V.	