

# Which determinants affect the choice on dividend payment in the Netherlands

*Master thesis*

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# 1. Introduction

The reason why firms pay dividend is a subject area that has been studied for a long time, they also call it “the dividend puzzle”. What indicates that despite many researchers from all over the world performed their research on this topic, the answer to the overall dividend theory is still not complete. Over the last few decades a new capital distribution method came to the horizon, namely share repurchases. This method became so popular in a relatively short period that share repurchases have become the most popular capital distribution method (Skinner, 2008). Whereas dividends are still relevant because Eije and Megginson(2008) showed in their research that although the number of firms that pay dividends declined, the total amount of dividend payments increased. The total amount of dividend payments in their study still doubles the total amount of share repurchases. Therefore, get to know what are the determinants of a firm’s capital distribution with dividends or share repurchases is quite important, so that you can predict certain patterns.

This topic is something that Wesson, et al(2018) examined in South-Africa, however in The Netherlands very little research has been published on the determinants of dividend payment and share repurchases. This raises the question why to choose The Netherlands for this study, well if you especially look at numbers in Europe regarding share repurchases there is one thing that stands out about those numbers. As The Netherlands is a relatively small country, obviously you might expect a low amount of share repurchases. Though, in the study of Eije and Megginson(2008) is noted that the total value of repurchases is way more than countries like Italy and Spain. The value is at the level of a big country like Germany.

There is not much research to be found on the influence of determinants on dividend payments and share repurchases in the Netherlands, which is why the Netherlands is still an interesting research area. However because of expected problems with data on repurchases in The Netherlands, this paper will focus on dividend payments in The Netherlands. In the next chapter some background on share repurchases will be included in our literature review. As it can still be an important and therefore relevant distribution method in a firm’s payout policy. The research question formulated is:

**“To what extent do the determinants of Dutch listed firms affect the choice on dividend payout?”**

## 2. Theoretical Framework

### 2.1. What do we already know about dividend policy

Dividend payment and share repurchases are part of the corporate governance that a firm wants to manage. Barros, et al(2020) said that a firm's corporate governance is based on three main decisions that has to be made by firms: the investment decision, the financing decision and the dividend policy decision. As dividend policy regards the amount of profit a firm wants to distribute to their shareholders, and to know which amount needs to be reinvested.

In prior research on dividend policy Miller & Modigliani(1961) argued for the dividend policy irrelevance on firm value. That in a world where markets are 'perfect', there are no taxes or bankruptcy costs. They proposed that the dividend policy of a company has no effect on stock price or the firm's capital structure. And in this case investors are also irrelevant of their dividend policy because they can create their own cash flows. Other studies in dividend policy are based on the asymmetric information and the agency problems.

Past research on share repurchase and dividend payment has shown several important findings. First Fama and French(2001) stated that US firms paying cash dividend has dropped a decent amount, from 66,5% in 1978 to 20,8% in 1998. The reasons that Fama and French give for this huge shift, is that the firms characteristics changed. As from 1978 the financial characteristics of these listed firms changed toward characteristics of firms that have never paid dividend. These firms also have low earnings, strong investments, small size and high asset growth rates. Furthermore in these years there has been an overall declining propensity to pay dividends.

Similar trend showing the decline of dividends is discussed by Floyd et al.(2015) where they noted that from a historic low point in 2002 of 15% industrials paying dividend. However from that point in time the number of firm's(in this case industrials) started to increase to 28% in 2012. Obviously the financial crisis in 2007 and 2008 has caused a slight setback in that growth, but in the years after the crisis this number got back to its pre-crisis level.

As firms are less likely to payout dividend to their shareholders, a well known substitute is doing a share repurchase (Skinner, 2008). But only from the late 1990s that share repurchases gained increasingly popularity in Europe (Eije & Megginson, 2008). In general, share repurchases are value enhancing as Comment and Jarrell(1991) find positive abnormal returns associated with share repurchases. Which they interpret as a sign of undervaluation for the repurchasing firms.

However, even though many studies suggest that repurchases enhance value, repurchasing firms could suffer from reduced corporate liquidity following share repurchases (Chen & Wang, 2012). As well when firms are financially constraint before a buyback, dampened corporate liquidity

can be harmful. In addition Brockman, et al(2008) found that the size of the repurchase increases significantly with the stock market liquidity of the repurchasing firm.

Jain, et al (2009) investigated what drives a firm's choice in case of following up on their IPO. They find that the drivers to choose between doing a share repurchases or dividend payout are completely different. Factors like stock price performance and excess cash on the balance sheet drive repurchases. Also life cycle factors like profitability, maturity, size and leverage tend to favor dividends. Overall Skinner(2008) his evidence is strongly consistent with his substitution hypothesis, and therefore suggests that share repurchases are now the dominant form of payout.

The choice between share repurchases and dividend payment is expected to be influenced by firm specific characteristics. Although both methods are infrequent and discrete events, the two methods are not perfect substitutes(Wesson, et al, 2018). Therefore it could be important to know to what extend determinants or firm-specific factors influence the choice between share repurchases and dividends.

Past research that has been done which focused on determinants of the choice between dividend and share repurchases, only focused on one determinant (Ofer & Thakor, 1987) or they have other payout options.

Summarized, after going through all related studies thoroughly, we came to the conclusion that not enough studies can be found that include both share repurchases and dividend policy in their research. Therefore, in the remainder of the study, we will focus only on the determinants of a firm's dividend policy.

## 2.2. Payout policy theories

In the dividend research field, there are some theories that are often used to explain why some relationships exist. In this section, we will go through the well-known and relevant theories for our study.

### 2.2.1 Agency theory

As we focus on listed firms in this study, there will also be agency problems when a firm has to make a decision about their dividend policy. Ngo, et al(2020) say that shareholders may request a dividend payout from the management, and in this way reduce agency problems. Thus, dividend policy could be an outcome of a firm's strong corporate governance. Furthermore large shareholders can help reducing the agency problem by mitigating the collective difficulty of taking action by shareholders.

These large shareholders can improve the firm's corporate governance by direct intervention. In this way large shareholders could suggest strategic changes or vote against managers. Secondly shareholders sometimes use the "Wallstreetrule", also known as threat of exit. When these large shareholders know that managers are engaging in value destroying projects, they may punish these managers by selling their shares and thereby punish down the stock(Ngo, Duong, Nguyen, & Nguyen, 2020).

Talking about firms with high director and officer ownership combined with high debt levels, these firms are less likely to do a share repurchase. Whereas firms with low director and officer ownership and low debt levels are more likely to do a share repurchase(Ofer & Thakor, 1987). When a firm does a share repurchase this leads to an increased director ownership of the people who already hold shares in the firm. Result is that the interests of all shareholders will be better aligned (Wesson, et al, 2018). And the agency problem could be summarized like Crutchley, et al(1999) stated: "Managers have a duty to maximize shareholder's wealth; however, managers' actual incentive may be to maximize their personal wealth".

### 2.2.2. What determines dividend payout and catering theory

In a firm and specifically in listed firms, there are numerous shareholders. These shareholders invest money in a firm, whereby the concerning firm have liquidity available to do value enhancing investments. However having many shareholders also means that you create many distribution preferences. Shareholders have many different preferences, like some investors want maybe no dividend payment because they will be taxed on their personal capital gains. And even these tax

rates are different between shareholders. Then smaller shareholders tend to prefer dividends, just because their tax rates are not too high (Brennan and Thakor, 1990).

For these shareholder preferences Brennan and Thakor (1990) performed a study to see when shareholders prefer a dividend payout, an open share repurchase or a tender offer repurchase. And they came to two important conclusions. First they focused on the amount of the distribution to check preferences. When they make small payouts then distribution is through dividends, an intermediate payout is made through open market repurchases, and a large payout through tender offer repurchases.

Secondly if the shareholders' personal income tax rate on dividends is not too high, shareholders with low ownership holdings will prefer dividends, whereas those with high ownership holdings (and no lower tax rates) will prefer repurchases.

Summarized companies with a high degree of diversity in shareholder valuations, like small firms with low institutional ownership and a small number of shareholders, these firms will select a fixed-price tender offer or a special dividend. As firms with a low degree of diversity in shareholder valuations, large firms with high institutional ownership and a large number of shareholders, will select either a Dutch auction self-tender offer or an open market share repurchase (Wesson, et al, 2018).

Now we know the different motives of investors as to why they would prefer a dividend payment or a share repurchase. Past studies have also compiled about these motives in what they call the catering theory. One of the most prominent studies in this research area is the one from Burger and Wurgler (2004), they stated that the essence of the catering theory is that managers give investors what they currently want. In the case of dividends, catering implies that managers tend to initiate dividends when investors put a relatively high stock price on dividend payers, and tend to omit dividends when investors prefer nonpayers. After running their models the conclusion confirms that managers apparently recognize and cater to shifts in investor demand for dividend payers.

### 2.3 Historic dividend payment

When searching for determinants of dividend and share repurchases, a good predictor could be last year's dividend payment. To see if there is a trend in the firm's dividend payment you could look at whether the firm is paying (cash) dividend for years now. And when this is the case it is more likely that the firm remains paying dividends.

Like Caudill (as cited in Wesson, et al, 2018) said: "firms already paying a high regular dividend are more likely to distribute excess cash to shareholders via a special dividend". However within firms, financial flexibility is also relevant, as companies can gain financial flexibility by

announcing the intention rather to utilise excess cash by repurchasing shares in the open market than to increase their dividend payments (Wesson, et al, 2018).

## 2.2 Hypotheses

In this section we will explain which relationship our determinants have on dividend policy. This, in order to answer our research question. In terms of hypotheses, we will use the research of Hübers(2022) as a guiding line for the set-up.

### 2.2.1 Firms age

When we talk about whether firm age has a relationship with dividend policy. We need to emphasize that the life cycle theory pretty much explains whether firm age has an impact on dividend policy. DeAngelo, et al(2006) proposed that the life cycle theory predicts, in their early years, that firms pay few dividends because their investment opportunities exceed their internally generated capital. And in later years, internal funds exceed investment opportunities so firms pay out the excess funds with dividend.

In other terms Eije and Megginson(2008) presented a study where they stated that older firms are more likely to pay cash dividends than younger firms, and older firms also payout higher cash dividends.

***H1: There is a positive relationship between Firm age and the likelihood to pay dividends by Dutch listed firms.***

### 2.2.2 Firm Size

To find out whether the size of a firm has an impact on dividend decision, we can look in particular at the study by Fama and French(2001). They stated that dividend payers are much larger than non-dividend payers. The results of their study show that from 1963 till 1998 dividend payers became larger relative to the group of non-payers. In this case a quite remarkable finding since the number of dividend payers decreased during this period. As dividend payers have only got larger, this implies that size positively influence dividend payment.

Though, in the research of Fama and French(2001) it is not directly formulated that firm size has positive relationship with dividend payment. However, the research of Hu and Kumar(2004) claimed that after controlling for firm size, they see a significant relationship between firm size and the likelihood to pay dividend.

Baker and Kilincarslan(2019) stated that their survey clearly shows that the main reasons for listed firms not paying cash dividends involve cash constraints, availability of profitable investment opportunities, poor profitability and earnings, and cost of raising external funds. These findings suggest that non dividend paying firms are likely to be smaller in size.

**H2: There is a positive relationship between firm size and the likelihood to pay dividends by Dutch listed firms.**

### 2.2.3. Firm Profitability

Denis and Osobov(2008) noted that dividends are concentrated among the largest, most profitable payers in all six countries of their research. On the basis of this fact they mentioned this concentration will casts further doubt on signaling as a first order determinant of dividends, in that dividends appear to be paid by precisely those firms that are least in need of signaling their profitability.

Although, Baker and Kilincarslan(2019) states the opposite that the signaling theory asserts that highly profitable firms are more likely to pay dividends to convey their better financial position and tend to distribute larger amounts of cash dividends as a good signal to the market. By contrast, their less or non-profitable counterparts cannot mimic such dividend payment behavior.

Also Fama and French(2001) concluded that dividend payers have higher measured profitability than non-dividend payers. However, even though there is a little doubt on the signaling effect of the profitability factor. We come to the following hypothesis:

**H3: There is a positive relationship between firm profitability and the likelihood to pay dividends by Dutch listed firms.**

### 2.2.4. Firm Growth

The growth variable is actually an exponent of the lifecycle theory. Where Denis and Osobov(2008) said that in their early years, firms pay few dividends because their investment opportunities exceed their internally generated capital. When, they are at a later stage in the lifecycle internal funds exceed investment opportunities, therefore firms are more likely to pay dividends.

In this sense, we see investment opportunities as the most important determinant of how large a firm's growth will be. Fama and French(2001) stated that when firms have never paid dividends, they have the best growth opportunities. In their research they also conclude that firms



which have never paid dividend tend to have better growth opportunities. Although results in the research of Denis and Osobov(2008) is less homogeneous, in their model Canada, US and the UK show a significant negative relationship with dividend payment and for Germany, Japan and France the slope is positive but only significant in Japan.

Even if the result in the latter study is somewhat contradictory. In this paper, we assume that having growth opportunities has a negative impact on paying dividends. Therefore this results in the following hypothesis:

**H4: There is a negative relationship between firm growth and the likelihood to pay dividends by Dutch listed firms.**

## 2.2.5 Firm Leverage

As we start talking about a company's external financing(e.g. Leverage), this is part of the agency theory. In addition, another dimension of agency costs is the conflict between shareholders and debtholders. Debtholders interests may not be protected when high levels of dividend are paid out (Patra, et al, 2012). Resulting in these shareholders preferring not to receive a dividend payment.

Jensen(1986) (as cited in Patra, et al(2012) points out that debt can be used as a substitute device for dividends in reducing the agency costs of free cash flow. This means that a firm with financial leverage will be monitored by its debtholders and will have less discretionary funds available to its managers. Hence, highly leveraged firms are expected to pay lower dividends.

These findings are also supported by Eije and Megginson(2008) as they stated that higher leverage reduces the likelihood of paying cash dividends. Therefore this results in the following hypothesis:

**H5: There is a negative relationship between firm leverage and the likelihood to pay dividends by Dutch listed firms.**

**Table 1**

*Hypothesis summary*

Hypothesis	Variable	Prediction
H1	Firm age	+
H2	Firm size	+
H3	Firm profitability	+
H4	Firm growth	-
H5	Firm leverage	-

### 3. Research methodology

For this study, mainly the research method of Patra, et al(2012), Denis & Osobov(2008) and Hübers(2022) will be used as a guiding line. Firstly, the univariate/descriptive statistics of our dependent and independent variables will be extracted and a correlation matrix will be performed. This will allow us to see to what extent our variables are correlated. The correlation coefficient will always have a value between -1 and +1. Whereby a coefficient of +1 means high mutual correlation and 0 means little to no correlation, and it is therefore also possible that there is a negative correlation.

Next will be the multivariate statistics. In which a logistic multiple linear regression will be used, which allows us to measure what effect the independent variables have on the dividend payout. A number of assumptions apply to a multiple regression. First, there needs to be a linear relationship between the dependent and independent variables. Second the independent variables should not be too highly correlated with each other. Third residuals should be normally distributed with a mean of 0 and variance(Adam Hayes, 2022).

To deal with multicollinearity problems we will use a VIF(variance inflation factor) test to detect and measure collinearity. This test will be run to keep the results of the research reliable. A simple procedure for adjusting for multicollinearity consists of using only one of the variables in a highly correlated set of variables(Henseler, 2016).

#### 3.1 Dependent variable

To check whether the determinants in this research have an influence on a firm's dividend payments. The dependent variable in the regression will be a dummy variable named DivPay, which takes a value of 1 if a firm pay dividend in year t and zero otherwise. Thus, we follow the research of Denis and Osobov(2008)

#### 3.2 Independent variables

In this paragraph we will discuss the calculation of the independent variables. First, firm size(SIZE) is measured as the book value of total assets following the study of Denis and Osobov(2008). Second, firm age(AGE) is measured as the number of years since incorporation. Third, profitability(PROF) is measured as the ratio of earnings before interest to the book value of total assets. We also see this calculation in the study by Ghose, et al(2022).

When we want to check which determinants influence a firm's dividend payment. It will be useful to know to what extent a firm has investment opportunities. Therefore the third variable

growth opportunities(GROWTH) will be measured as the marketcap ratio difference of year  $i$  relative to year  $i^{-1}$ .

Then the variable leverage(DEBT) will be measured as the ratio of total debt to total assets following Ghose, et al(2022). Since having a lot of debts also means having to pay interest and this may affect the dividend payment choice.

### 3.3 Control variables

Control variables are all variables that are kept constant in a study. They are variables that you are not interested in, but that are controlled for because they can influence the results. These variables contribute to the internal validity of a study by reducing the influence of confounding variables and other external variables. This allows you to demonstrate correlations or causal relationships between the relevant variables with more certainty.

As far as it concerns control variables, this research will follow the study of Baker and Kilincarslan(2019) and Hübers(2022). Especially the study of Baker and Kilincarslan(2019) they said that they attempt to control for the industry-specific effects and unobserved time-varying factors by adding industry and year dummies. INDUSTRY is a vector of dummy variables representing 14 different industry classifications firms, however utilities and financial will be excluded(see par 3.4 data collection).

**Table 2**

*Summary variables and their measurement*

Variable	Named	Measurement
<b>Dependent variable</b>		
Dividend payment	DivPay	Dummy variable(0=no dividend, 1 = dividend)
<b>Independent variables</b>		
Firm size	SIZE	Book value total assets
Firm age	AGE	Years incorporation
Firm Profitability	PROF	Ratio of earnings before interest to the book value of total assets
Firm growth	GROWTH	The marketcap ratio difference of year $i$ relative to year $i^{(-1)}$
Firm Leverage	DEBT	Ratio of total debt to total assets
<b>Control Variable</b>		
Industry	IND	Dummy variable

### 3.4 Data collection

Our sample is collected from the database Orbis, this is a database provided by Bureau van Dijk. This database contains all the information on companies that we need for our research. For our variables dividend payment(dummy), profitability, leverage, growth, age and size we can therefore find all data. The population for the study will consist of dutch listed companies, since there is still a research gap in this field in the Netherlands. The reason for choosing listed firms is that these companies have to deal with agency and assymetry problems because of having shareholders. Therefore, these companies are also obliged to make all data from each year public. As the data is public, it is easier to use it for our research.

Moreover we exclude utilities with SIC codes 4900-4949 and financial firms with SIC codes 6000-6999 from our sample. This is consistent with the study of Denis and Osobov, (2008) and also used by Fama and French(2001). Baker and Kilincarslan(2019) stated that these type of companies are governed by different regulations and follow arguably different investment and dividend policies. Therefore they need to be excluded.

Furthermore firms with missing values will be removed for that specific year. Next, we also need to deal with outliers in our research, this can be done by deleting the outliers after the descriptive statistics are done. In the descriptive statistics we use the boxplot from each individual variable, and check whether there are extreme outliers. Any extreme outliers will be excluded from this research, to not influence the validity of this research.

This results in a sample of 91 Dutch listed firms that have accountable years for the period 2014 till 2019. We stop collecting data in 2019 because of the coronavirus pandemic that started in 2020, which might adversely affect the outcome of our research.

## 4. Results

In this chapter we will discuss all results of our analysis will be discussed. In section 4.1 we will briefly point out the descriptive statistics. Then, in section 4.2 the Pearson correlation matrix will be discussed. Third, section 4.3 the hypotheses and regression analysis results will be discussed. Finally, there will be performed some robustness checks.

### 4.1 Descriptive statistics

First, the number of cases in table 3 differ for each variable, because ORBIS doesn't give all data for each Dutch listed firms. Besides that, we manually removed extreme outliers for each variable from the dataset using boxplots. We chose this option because in our opinion this way the validity of the study is least compromised. In figure 1 is shown that our variables are normally distributed after we excluded outliers.

The variables DivPaid and LN\_AGE were not adjusted. Since DivPaid is a dummy variable that can only have the value 1 or 0. And the variable AGE is where we took the natural algorithm, partly because of that it has no outliers.

For the analysis of descriptive statistics, for some variables we will use the research of Hübers(2022)for comparison, this researcher used 2 panels for different time periods. But nevertheless some variables and way of testing are similar.

First of all, our dependent variable DivPaid takes a value of 1 if they paid dividend or 0 if they didn't. In the descriptive statistics we see that the dependent variable has an average of 0.59, which means that 59% of Dutch listed firms pay dividends. When comparing this to Hübers(2022) study where 94% of the firms pay dividends, the percentage in the Netherlands is thus still a lot lower. However, the research of Eije and Megginson(2008) showed an average of around 60% for Benelux countries. Although their study covers the Benelux, our result corresponds pretty well to their research.

Looking at the independent variables, we see that GROWTH which is measured as as the marketcap ratio difference of year  $i$  relative to year  $i^{-1}$ . In table 3 we see growth has a minimum value of -1 and a maximum of 1.5139. The minimum value of -1 indicates that a firm has lost its entire market cap. And the maximum value 1,5139 indicates that a firm has increased its market cap by over 150%. A mean of 0.04 indicates that the market cap of Dutch listed firms is growing at an average annual rate of 4%. The study of Hübers(2022) used the market-to-book ratio for their growth variable, therefore we cannot compare the figures.

The PROF variable measured as the ratio of earnings before interest to the book value of total assets. The minimum value is -0,2015, which indicates that Dutch firms have a profitability

between 20,14% loss and 30,15% profit. With a mean of 0,0537 we can conclude that on average Dutch listed firms make 5,37% profit. In the study by Ghose, et al (2022), we see that the results do not match their results for the profitability variable with a minimum of -0.69, a maximum of 0.72 and a mean of 0.09. However we excluded all outliers from this research, another to deal with outlier is to do it like Ghose, et al(2022), where they had chosen to winsorize their outliers.

Within the AGE variable there is a difference of no less than 333 years between the youngest firm and the oldest firm, with an average age of 56.74. In these descriptive statistics it is easy to follow this way. However, for proper research we will only use LN\_AGE. The mean of LN\_AGE in this study is 3,63 and is similar to the LN\_AGE of Hübers(2022) which has a mean of 3,84.

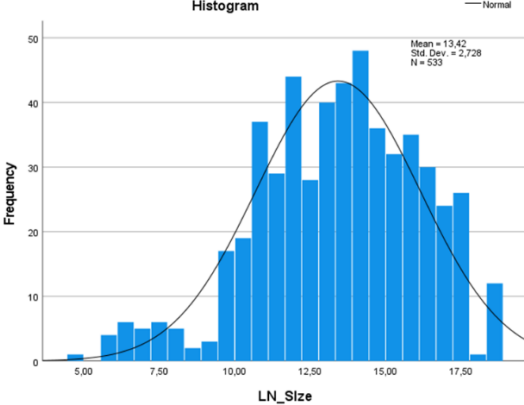
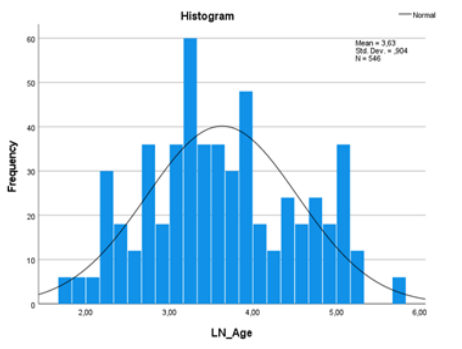
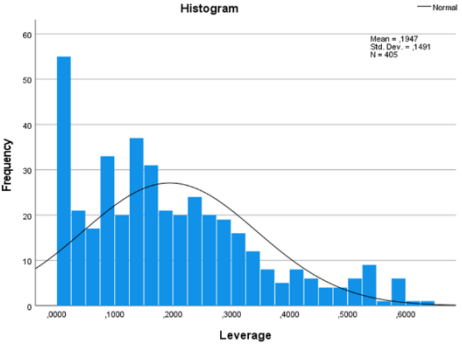
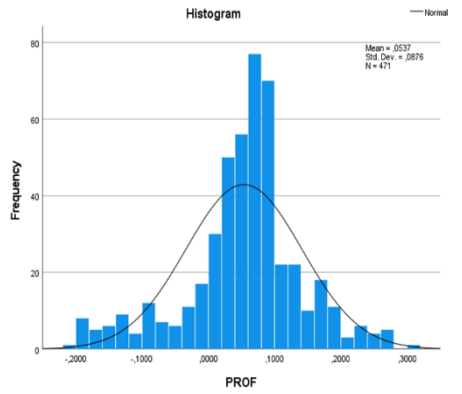
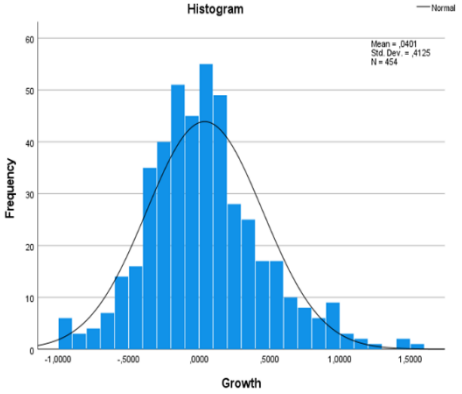
For the SIZE variable, we see that there is a big difference between largest firm which has a total assets of 131.901.776(thousand) and the smallest firm which has a total assets of 98(thousand). The mean for this independent variable is 7.909.616(thousand). However these statistics won't be used, since we took the natural logarithm of total assets. In the LN\_SIZE we see that the statistics are a lot closer to each other, and therefore will increase the validity of the results from the regression.

Finally the DEBT variable shows a minimum 0,00 indicating that the firm has no DEBT and a maximum of 0,6491, which means that firm has 64,91% leverage to total assets. On average Dutch listed firms have a debt level of 19,47%. Comparing these descriptive statistics with other studies, both Ghose, et al(2022) and Hübers(2022) show that their maximum value is well above 1 and their mean value is also quite a bit higher respectively at 43% and 88%. Only here again, the way outliers are handled by the researchers is decisive. In Hübers(2022) study, outliers are winsorized.

**Table 3 Descriptive statistics**

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
<b>Dependent variable</b>					
Div paid(3 or more times paid)	546	0	1	,59	,492
<b>Independent variables</b>					
Growth	454	-1,0000	1,5139	,040057	,4124966
PROF	471	-,2014	,3015	,053699	,0875901
Age	546	6	339	56,74	56,063
LN_Age	546	1,79	5,83	3,6309	,90410
Size	533	98	131901776	7909616,68	19954775,002
LN_Size	533	4,59	18,70	13,4212	2,72771
Debt	405	,0000	,6491	,194705	,1490955
<b>Control variables</b>					
INDUSTRY_FORFISH	546	0	1	,02	,147
INDUSTRY_MINCON	546	0	1	,08	,267
INDUSTRY_MANUFACT	546	0	1	,51	,500
INDUSTRY_TRANSCOM	546	0	1	,08	,267
INDUSTRY_WHOLERETAIL	546	0	1	,11	,313
INDUSTRY_SERVICES	546	0	1	,21	,407
Valid N (listwise)	326				

Figure 1 Normal distribution independent variables(after excluding outliers)



## 4.2 Pearson correlation matrix

The Pearson correlation coefficient is often used in studies to measure linear correlation. It is a number between -1 and 1 that measures the strength and direction of the relationship between two variables. In a positive correlation, the variables change in the same direction. And with a negative correlation, if one variable changes, the other variable changes in the opposite direction.

The general rule of thumb for the Pearson correlation matrix is that if the value is greater than 0.5 or less than -0.5 that there is a strong correlation. A moderate correlation exists if the value is between 0.3 and 0.5, either negative or positive. If the value is between -0.3 and 0.3 one assumes no correlation (Scharwächter, 2022).

As can be seen in table 4, there are no variables that have a strong correlation with each other. However, we do notice that the dependent variable (DivPaid) has a moderate correlation with LN\_Size and PROF. A possible explanation could be that this is because both variables use Total assets in the denominator. However, the DEBT variable also has Total assets in the denominator, and has no correlation with the dependent variable. All the other variables have no correlation.

Going through the correlation coefficients individually, we see that GROWTH remarkably has a positive correlation with DivPaid of 0.079. In other words, this would mean that if the growth of a firm increases, the probability of that same firm paying Dividend also increases. However, the coefficient is not significant. A correlation that stands out even more is the DEBT variable with a significant positive coefficient of 0.182 on DivPaid. Which would imply that when a firm has more debt this increases the probability of a dividend payout. Based on previous studies, it was expected to be negative. Going forward, we will see if this also holds in the regression analyses.

Then we have the correlation coefficients of the independent variables PROF(0.357), SIZE(0.462) and AGE(0.272). All these variables have a significant positive correlation with DivPaid. This is in line with our expectation. Although we will have to wait for the regression analyses before drawing a final conclusion.



Multicollinearity causes the following two basic types of problems: The coefficient estimates can swing wildly based on which other independent variables are in the model. The coefficients become very sensitive to small changes in the model. Secondly, multicollinearity reduces the precision of the estimated coefficients, which weakens the statistical power of your regression model. You might not be able to trust the p-values to identify independent variables that are statistically significant. By selecting each independent variable also as a dependent variable for the VIF scores, we can see in this study whether we are experiencing a multicollinearity problem. As long as the VIF scores are between 1 and 5 you are fine as far as multicollinearity is concerned. In figure 2, we can see that all VIF scores are low in 1, which means that there is no multicollinearity in this research. (Frost, 2023)

**Table 4 Pearson’s correlation matrix**

**Correlations**

	DIV PAID	GROWTH	PROF	DEBT	LN_AGE	LN_SIZE
DIV PAID	1	,079	,357**	,182**	,276**	,462**
GROWTH	,079	1	,220**	-,029	,044	,148**
PROF	,357**	,220**	1	,156**	,163**	,247**
DEBT	,182**	-,029	,156**	1	-,095	,241**
LN_AGE	,276**	,044	,163**	-,095	1	,141**
LN_SIZE	,462**	,148**	,247**	,241**	,141**	1

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

Figure 2 VIF scores for multicollinearity

**Coefficients<sup>a</sup>**

Model	Collinearity Statistics	
	Tolerance	VIF
Debt	,864	1,158
LN_Age	,934	1,071
LN_Size	,924	1,083
PROF	,943	1,060
Growth	,972	1,029

a. Dependent Variable: DivPaid

**Coefficients<sup>a</sup>**

Model	Collinearity Statistics	
	Tolerance	VIF
Debt	,864	1,157
LN_Age	,918	1,089
LN_Size	,800	1,250
DivPaid	,778	1,285
PROF	,914	1,094

a. Dependent Variable: Growth

**Coefficients<sup>a</sup>**

Model	Collinearity Statistics	
	Tolerance	VIF
Debt	,879	1,138
LN_Age	,920	1,088
LN_Size	,801	1,249
DivPaid	,825	1,212
Growth	,999	1,001

a. Dependent Variable: PROF

**Coefficients<sup>a</sup>**

Model	Collinearity Statistics	
	Tolerance	VIF
LN_Age	,977	1,024
LN_Size	,845	1,183
PROF	,904	1,106
Growth	,972	1,029
DivPaid)	,778	1,286

a. Dependent Variable: Debt

**Coefficients<sup>a</sup>**

Model	Collinearity Statistics	
	Tolerance	VIF
LN_Size	,800	1,249
PROF	,891	1,123
Growth	,972	1,029
DivPaid	,792	1,263
Debt	,920	1,087

a. Dependent Variable: LN\_Age

**Coefficients<sup>a</sup>**

Model	Collinearity Statistics	
	Tolerance	VIF
PROF	,889	1,124
Growth	,971	1,030
DivPaid	,898	1,114
Debt	,912	1,096
LN_Age	,918	1,090

a. Dependent Variable: LN\_Size

### 4.3 Logistic regression

Table 5 shows the results of the logistic regression with the dependent variable DivPaid. In this regression we have 2 models, the first model contains all variables and in the 2nd model the control variables are left out.

In model 1, we can see that PROF, LN\_AGE and LN\_SIZE have a significant positive correlation with the dependent variable DivPaid. A one unit increase in PROF causes the log odds on dividend to increase by 7.011 units. Which means that when a firm's profitability increases by 1%, this increases the likelihood on paying dividends by 7.011. For LN\_AGE, we see a coefficient of 0.782, meaning that when LN\_AGE increases by 1 unit this increases the likelihood to pay dividends by 0.782. LN\_SIZE has a coefficient of 0.448, meaning that a unit increase in LN\_SIZE causes the likelihood of paying dividends to increase by 0.448. For the variables PROF and LN\_SIZE, these results are consistent with the studies by Hübers(2022), Fama and French(2001) and Barros et al(2020). These studies also show a significant positive correlation with paying dividends. However, in the study of Hübers(2022), we see a negative but insignificant correlation for the LN\_AGE variable. Whereas, Baker and Kilincarslan(2019) for firm age see a positive and significant correlation on dividend payment.

Furthermore, the results show that GROWTH has a negative correlation with a coefficient of, and DEBT has a positive correlation with the dependent variable DivPaid. For GROWTH, this means that if a firm grows their market cap by 1% this means that the likelihood to pay dividends decreases by -0.394. Conversely, the positive coefficient for DEBT means that if a firm sees their debt level increase by 1% this means the likelihood to pay dividends increases by 0.806. Only both results are insignificant, therefore we cannot draw a valid conclusion. The results for the GROWTH and DEBT variable are not consistent with past studies. The study by Baker and Kilincarslan(2019) shows a significant negative correlation for both variables, also Hübers(2022) sees a negative correlation.

Looking at the control variables, we see that firms from the MANUFACT and TRANSCOM industries are the only ones to have a significant negative correlation with DivPaid; the other industries are not significant. Apart from whether the control variables have a significant positive or negative correlation with DivPaid, it is especially important to look at the differences between the results from model 1 and model 2. Thus, we see back that adding the control variables in model 1 causes the significance for the variables to increase. And this makes the conclusions we can draw from this research stronger.

When we discuss the control variables, we also come to the  $R^2$ , the value of  $R^2$  represents to what extent the variation of the dependent variable is explained by the independent variable and hence the control variables. Table 5, model 1 shows a pseudo  $R^2$  of 0.392, meaning that 39.2% of

DivPaid is explained by the independent and control variables. However, in model 2 where the control variables are left out, the pseudo R<sup>2</sup> is a lot lower at 0.294. Thus, we can see that adding the control variables has a positive impact on the explainability of the dependent variable. Other researchers like Hübers(2022) and Baker and Kilincarslan(2019) found an R<sup>2</sup> of 0.492 and 0.346 in their studies, respectively. The R<sup>2</sup> is thus reasonably similar to other studies, although still a large part of the variation in our dependent variable is explained by variables not included in this study.

All together, we can conclude that PROF, LN\_AGE and LN\_SIZE are the only independent variables that have a significant and positive influence on the choice of dutch listed firms to pay dividends. And these results also remain constant in the model without the control variable. The other 2 independent variables GROWTH and DEBT have no significant relationship with DivPaid, where GROWTH is the only independent variable showing a negative coefficient. Overall, all results are consistent for both models, thus the results appear to be quite robust. Still, some robustness tests will be done in the next section. Section 4.4 will further discuss whether these results confirm our hypotheses.

**Table 5 Logistic regression results**

**Model 1: Full model DivPaid**

	B	S.E.	Sig.
Constant	14,718	23114,378	,999
Growth	-,394	,408	,334
PROF	7,011	2,208	,001
Debt	,806	1,040	,438
LN_Age	,782	,199	<,001
LN_Size	,448	,079	<,001
INDUSTRY_FORFISH	-22,150	23114,378	,999
INDUSTRY_MINCON	1,115	,639	,081
INDUSTRY_MANUFACT	-1,169	,477	,014
INDUSTRY_TRANSCOM	-2,144	,968	,027
INDUSTRY_WHOLERETAIL	-,055	,573	,924
Pseudo R2	,392		

**Model 2: Control variables omitted**

	B	S.E.	Sig.
Constant	-6,973	1,195	<,001
Growth	-,278	,381	,465
PROF	7,485	2,098	<,001
Debt	,347	,992	,727
LN_Age	,351	,163	,031
LN_Size	,425	,072	<,001
Pseudo R2	,294		

## 4.4 Robustness Tests

Robustness tests are done to increase validity and reliability in a study. First, a logit regression is done again this time only with significant independent variables. In addition, a regression will be run with the original values of independent variables AGE and SIZE, instead of taking their logarithm.

Table 6 shows that when only significant variables PROF, LN\_AGE and LN\_SIZE are used in the regression model. As a result no difference occurs compared to the main model in table 5, the coefficients decrease slightly but remain significant.

**Table 6 Robustness check significant**

<b>Only significant independent variables</b>			
	B	S.E.	Sig.
Constant	-6,223	,882	<,001
PROF	7,039	1,441	<,001
LN_Age	,435	,131	<,001
LN_Size	,363	,053	<,001

a. Variable(s) entered on step 1: PROF , LN\_Age, LN\_Size.

In Table 8, we use the original variables AGE and SIZE as we also extracted them from Orbis. Looking at the results of this, we see that for AGE it reduces the likelihood of paying dividends, when compared with the coefficient in Table 5. Although there does remain a positive and significant correlation with the dependent variable. For the original SIZE variable, the correlation with the dependent variable becomes Convex and insignificant. The DEBT variable also suffers from these 'original' variables, e.g. the likelihood of paying dividends increases substantially to a level that it is significant.

Looking at what these results mean for the reliability and validity of this study. First, table 6 confirms that this study remains reliable and valid when only the significant variables are used. Unfortunately, we see that this is not true when we use the 'original' variables of SIZE and AGE. The results for the SIZE and, strangely enough, also the DEBT variable change to such an extent that you could say that the results are no longer reliable and valid. However, we already saw this problem coming due to the large differences in values within these variables. By taking the logarithm of AGE and SIZE, we tried to maximise the reliability and validity of this study.

**Table 7 Robustness check original values****With original values AGE and SIZE**

	B	S.E.	Sig.
Constant	-2,030	,534	<,001
Age	,018	,004	<,001
Growth	-,305	,380	,422
PROF	7,455	2,076	<,001
Size	,000	,000	,343
Debt	2,013	1,004	,045
INDUSTRY_FORFISH	22,421	23085,976	,999
INDUSTRY_MINCON	-,667	,622	,283
INDUSTRY_MANUFACT	1,416	,461	,002
INDUSTRY_TRANSCOM	2,573	,900	,004
INDUSTRY_WHOLERETAIL	,159	,546	,770

a. Variable(s) entered on step 1: Age , Growth, PROF , Size, Debt, Forestry and fishing(SIC 1 tm 9), Mining and construction(SIC 10 tm 17), Manufacturing (SIC 20 tm 39), Transportation and communication (SIC 40 tm 49), Wholesale and retail (SIC 50 tm 59).

## 5. Conclusion

In the final chapter of this study, we will first discuss the main results from section 4, looking in particular at what that means for our hypothesis formulated after the literature review. Then we will finally discuss limitations and options for further research.

### 5.1 Main findings and discussion

Dividend payment is a research area where many have tried to contribute to the "dividend puzzle". Many studies also mean many different outcomes; as mentioned in the introduction to this research, not much research has been done in the Netherlands on dividend payments within Dutch listed firms. The main objective of this research is to find out which firm-specific factors influence dividend payments within Dutch listed firms. Therefore, we arrived at the following research question: "To what extent do the determinants of Dutch listed firms affect the choice on dividend payout". To answer this question, we obtained the data via Orbis and derived data of 91 Dutch listed firms. Based on the literature review, we have formulated 5 hypotheses discussed in section 2. These concern firm-specific factors such as firm age, firm size, firm profitability, firm growth and a firm's debt level. In this section we will use regression analysis to determine whether a hypotheses can be supported or rejected.

The first hypotheses(H1) states that; There is a positive relationship between firm age and the probability of dividend payment by Dutch listed companies. All models from the regression analysis showed that profitability has a positive and significant relationship with DivPaid. Which means that H1 with determinant LN\_AGE can be seen as supported. In other words, you can say that the older a firm is, the higher the likelihood that a firm will pay dividends. This outcome is in line with lifecycle theory, which predicts that as a firm matures the internal funds exceed investment opportunities so firms pay out the excess funds with dividends. Baker and Kilincarslan(2019) and Deangelo(2016) came to the same conclusion in their research. In Hübers(2022)'s study, the hypotheses could not be confirmed as the variable was not significant.

Secondly we hypothesized(H2) that; There is a positive relationship between firm size and the likelihood to pay dividends by Dutch listed firms. The main model showed that size has a positive and significant relationship with DivPaid. As discussed earlier in section 4.4, we see that only 1 of the 2 robustness tests confirms this result. Probably the reason for this difference lies in the fact that we used the original values of size. For our main model we therefore took the logarithm of size as a precaution, therefore looking at that model we can conclude that H2 with determinant LN\_SIZE is supported. With this, we reach the same conclusion as Hübers(2022) who states that "companies

that are larger are more likely to pay dividends which supports the life cycle theory that states that larger firms are less likely to have positive NPV projects and growth opportunities and therefore, those companies pay dividends to limit the waste of excess cash". The studies by Baker and Killincarslan(2019) and Fama and French(2001) also show that the larger a firm is, the greater the likelihood of paying dividends.

In the third hypotheses(H3) we stated that; There is a positive relationship between firm profitability and the likelihood to pay dividends by Dutch listed firms. In both the main model and both robustness tests, the profitability determinant has a positive and significant relationship with the dependent variable DivPaid. Therefore, like H1 and H2, we can also consider this hypotheses as supported. Which tells us that the more profitable a Dutch listed firm is, the higher the likelihood will be to pay dividends.

Fourth, we come to the hypotheses(H4); There is a negative relationship between firm growth and the likelihood to pay dividends by Dutch listed firms. In all models we saw that firm growth has a negative relationship with DivPaid, however, none of the results is significant. Therefore, we have no choice other than to consider these hypotheses with GROWTH as the determinant, as rejected. Hübers(2022) encountered the same problem where the growth coefficient was not significant and therefore the hypotheses could not be confirmed.

Finally, in our final hypotheses we stated that; There is a negative relationship between firm leverage and the likelihood of paying dividends by Dutch listed firms. In our models, however, for leverage(DEBT) we strangely see a positive but insignificant relationship. This positive result is completely the opposite of what Baker and Killincarslan(2019) got as a result. Thus, because it is insignificant, this hypotheses should also be considered as rejected.

Overall, with this research we have tried to find out whether the factors firm age, firm size, firm profitability, firm growth and firm leverage (DEBT) affect dividend payment at Dutch listed firms. Looking at the research question, we cannot give a complete answer, as there are large differences between the results. The results show that an increase in age, size and profitability increases the probability of a dividend payment. For these variables, therefore, we have fulfilled the research question and can say that AGE, SIZE and PROF have an impact on dividend payments within Dutch listed firms. Unfortunately, for GROWTH and LEVERAGE(debt), we cannot conclude that these firm-specific factors affect dividend payments within Dutch listed firms.



## 5.2 Limitations and Further research

This research has contributed to the unstoppable quest to try to solve the "dividend puzzle". We have discussed the results in detail in the previous sections, although these results do have several limitations.

First limitation is that a lot of data from the orbis database was missing or had been entered incorrectly. The problem this caused was that it caused many outliers, which were then manually added or removed. This problem can occur when you depend on such a database. For further research it would be better to collect the data through annual reports, however this is difficult to achieve in a short time.

Secondly, we do not know if the variables we have chosen using theory are the right ones, we possibly miss crucial factors. For further research, it can therefore be useful to do some qualitative research in addition to quantitative research, using a survey, for example. For instance, it can be an addition for your research to add corporate governance factors, such as ownership concentration and board diversity, and then also compare them with dividend payment.

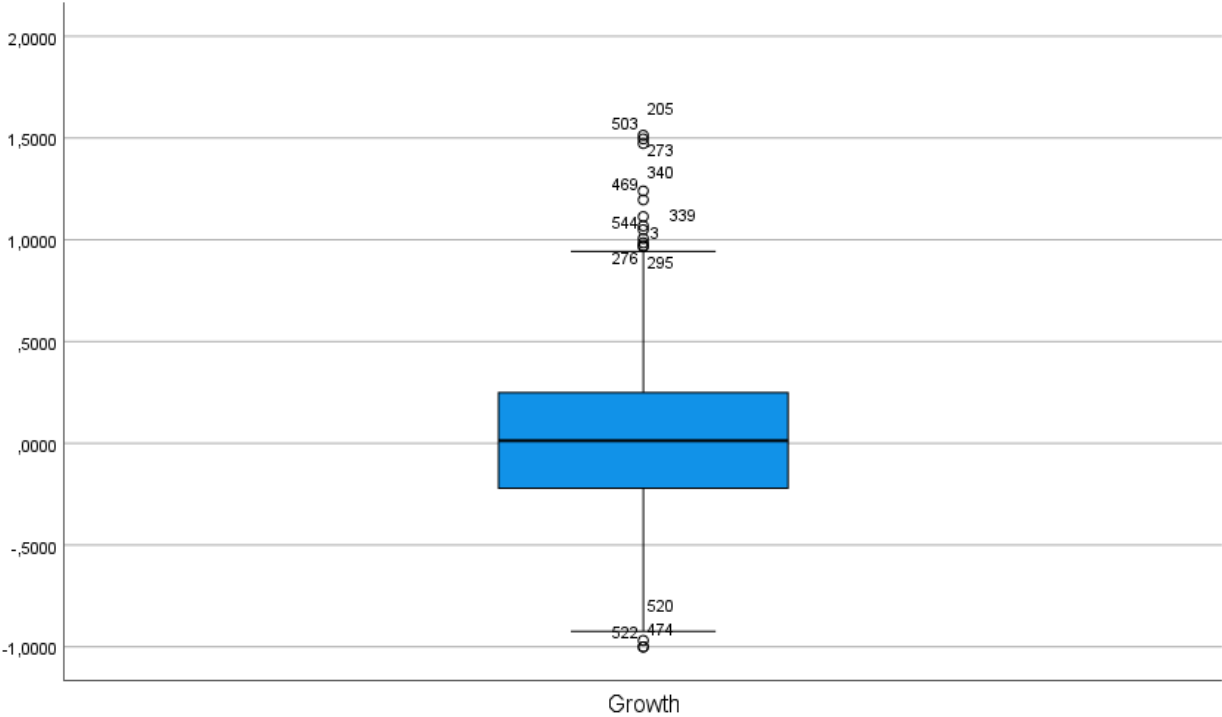
Third, we see back in one of the robustness checks that there is a change in the results of some variables. In further research, more robustness tests could reduce this reliability problem.

Fourth, a limitation is that we cannot make a comparison with another time period or country using panel data. For further research it is therefore advisable to compare different time periods, and possibly to see whether a difference can be observed between, for instance, Dutch listed firms and German listed firms.

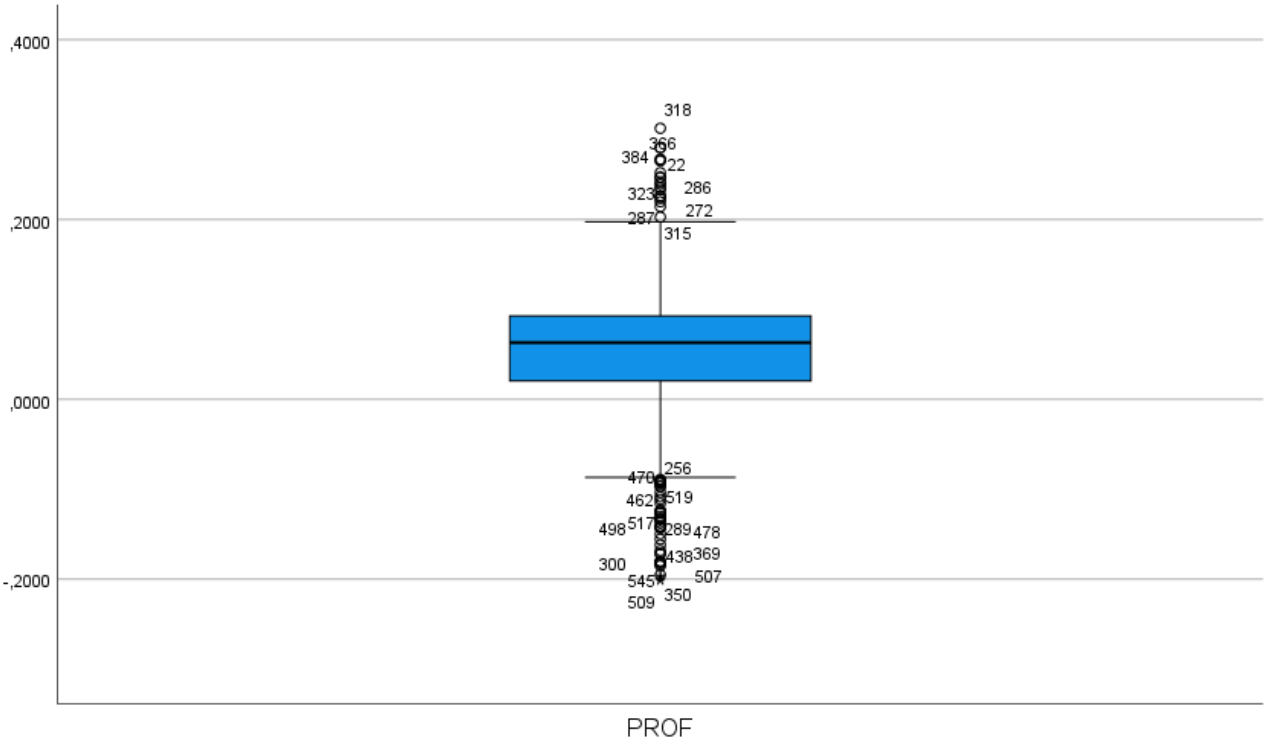
# Appendix A

## Boxplots after excluding extreme outliers

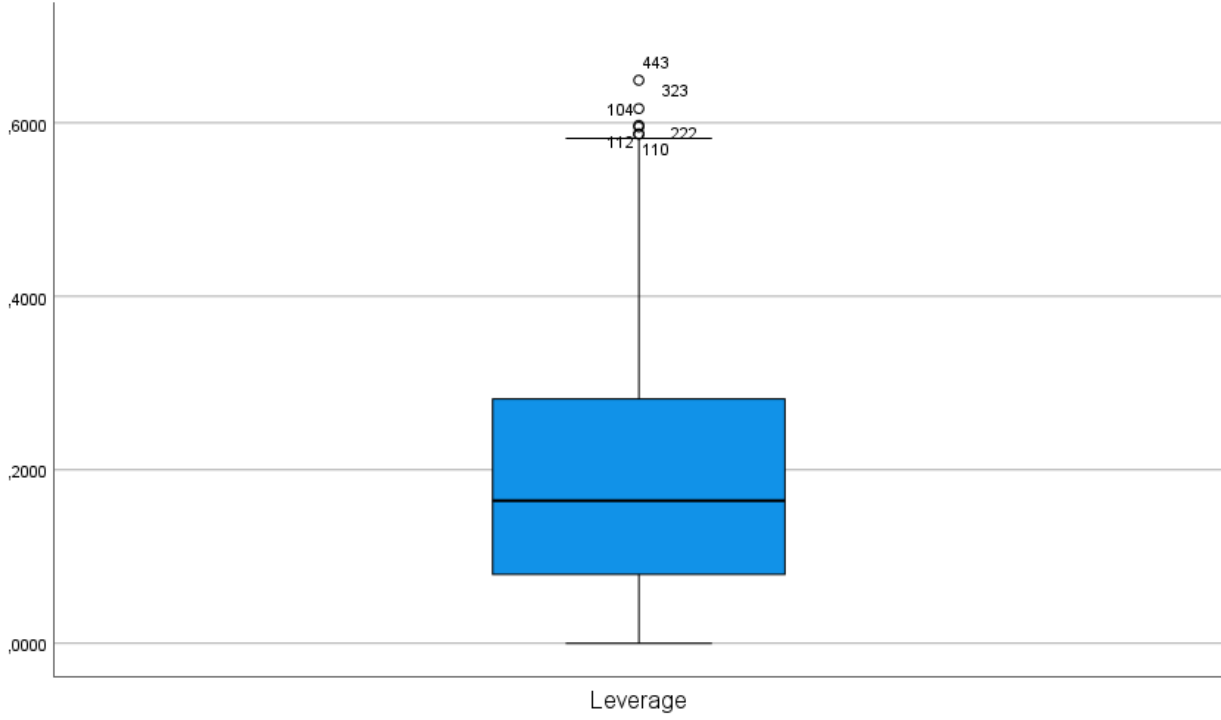
Boxplot Growth variable



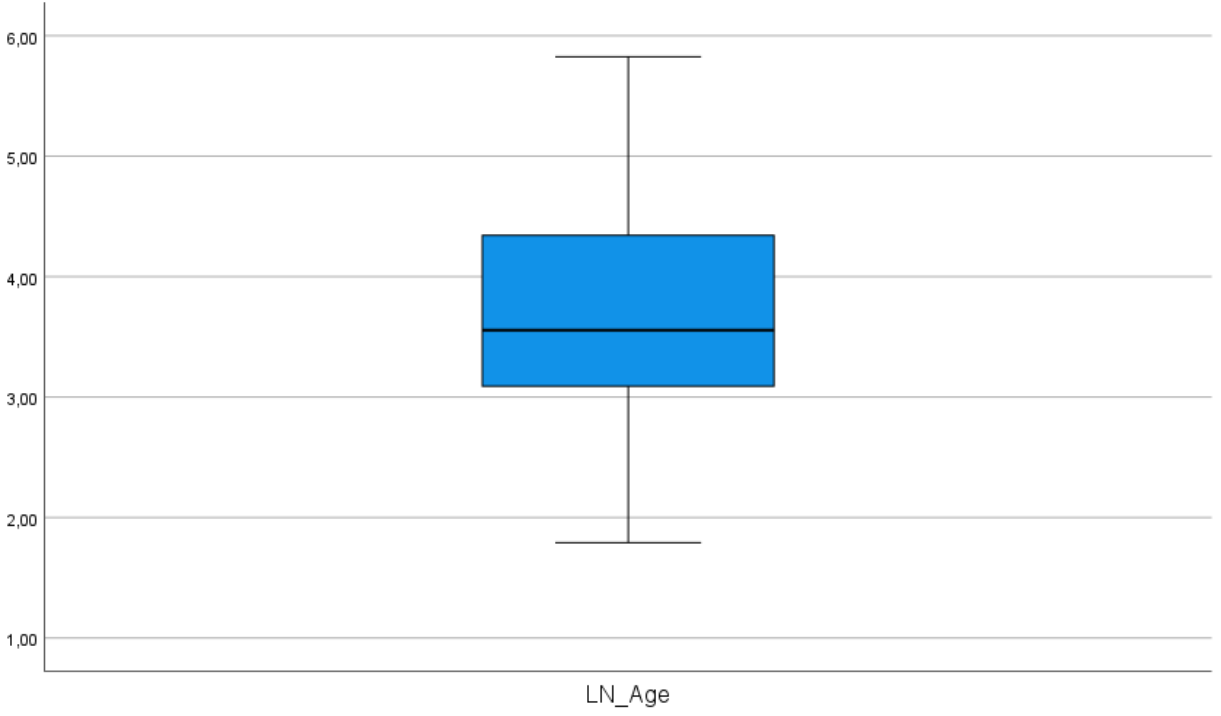
Boxplot PROF variable



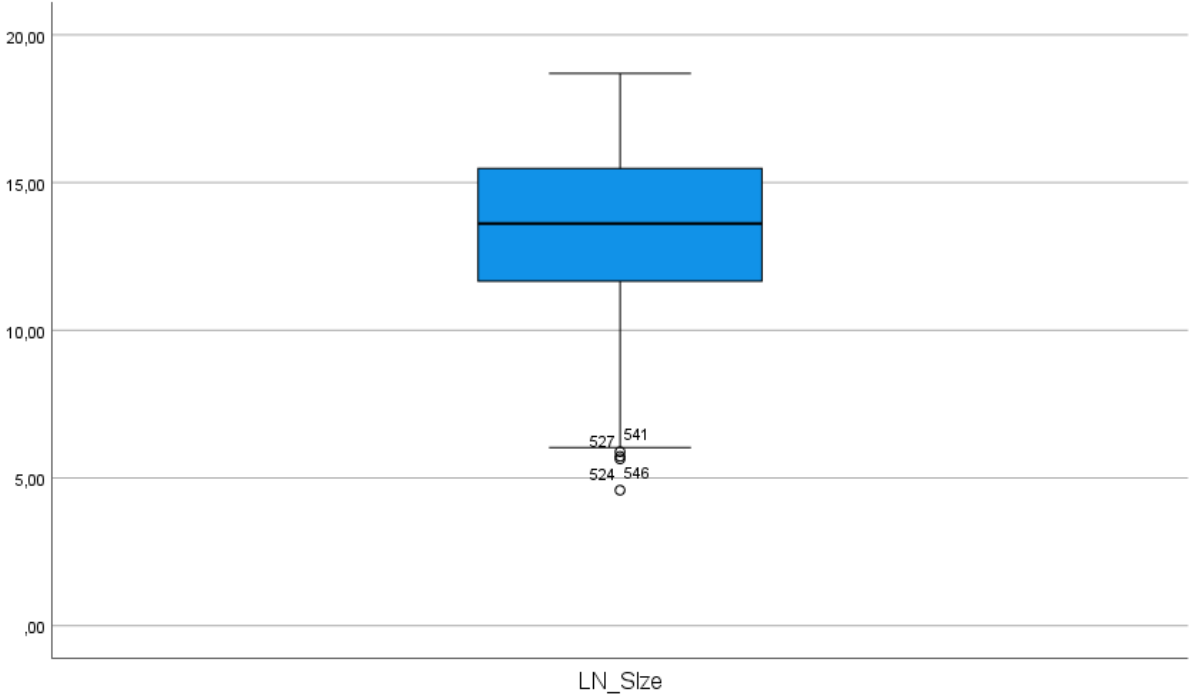
Boxplot DEBT variable



Boxplot LN\_Age variable



Boxplot LN\_Size



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