The determinants of the dividend puzzle: evidence from the S&P500

Student Name: Rens Oosterik (s2633132)
Email: r.b.oosterik@student.utwente.nl

MSc Business Administration
Track: Financial Management
1st Supervisor: IR. E.J. Sempel
2nd Supervisor: DR. A. ABHISHTA
Date: Jan. 14, 2023

Acknowledgements

This paper is written as a completion of the Business Administration program at the University of Twente, with a specialization in Financial Management. Before I get to the content of this research, I would like to thank a few people who helped me during the process of my master thesis.

First of all, I would like to thank my first supervisor IR. E.J. Sempel for his guidance and insightful feedback during the process. Second, I thank to thank DR. A. Abhishta for being my second supervisor and providing feedback for this paper. Finally, I would like to thank my family and friends for their support during my study and my master thesis project.

Abstract

What determines the level of dividends paid by firms? Black (1976) already stated, "The closer we look at the dividend picture, the more it looks like a puzzle, with pieces that just don't fit together". This study examines the determinants of dividend policy for non-financial S&P500 firms between 2016-2019. It is one of the few studies with a wide variety of variables that test many different theories: the agency problem theory, the signalling theory, the pecking order theory and the life-cycle theory. The results contribute to solving the dividend puzzle by examining the level of dividend payment. The research method used in the study is multiple (OLS) regression, as well as robustness checks and WLS regression to validate the results. After controlling for the variables tangibility (TANG) and different industries (INDUSTRY), a number of determinants of dividend payout levels were found. The results present that dividend-paying S&P500 firms that pay more dividends have higher free cash flow, are more profitable, have more growth/investment opportunities and score higher on CSR. In addition, it is interesting to note that ownership concentration (OWN^2) affects the level of dividend payout, showing a concave (∩-shaped) relationship. Finally, no significant relationships are found for the variables leverage, age and size. A limitation is that some robustness checks show different results that differ from the main model. Second, adding multiple variables may lower the predictive power and reduce the focus on one specific variable. Finally, these results add to the scarce U.S. literature on dividend policy and dividend payment levels in recent years. In addition, this study is useful for investors who examine dividend payout levels when constructing their portfolios.

Table of Contents

1. Introduction

What determines whether a firm pays dividends and what does the amount of dividends paid indicate? After Miller and Modigliani (1961) introduced the dividend irrelevance theory, dividend payout policy has been one of the most researched corporate finance puzzles. This puzzle appears difficult to solve as Black (1976) already stated, "The closer we look at the dividend picture, the more it looks like a puzzle, with pieces that just don't fit together". Despite numerous studies, no general consensus has been reached and this puzzle is still unsolved, so it remains a hot topic to study.

Miller and Modigliani (1961) (hereinafter abbreviated as MM) developed the dividend irrelevance theory and stated that dividend patterns had no effect on share value. This theory is based on several assumptions of perfect market conditions, such as 100% payout of free cash flow (FCF), information is costless and available for everyone, no addition costs (e.g. transaction and flotation costs) and no distorting taxes. But in the real world, MM's assumptions do not apply, e.g. information is not costless and available to all and distorting taxes do exist (DeAngelo & DeAngelo, 2006). Therefore, several academics have tried to find out what factors really affect dividend payout policy. They came up with many explanations and theories that have been tested and discussed worldwide with the hope of solving the dividend puzzle, but it still remains inconclusive. The most important theories that will be used in this study will be discussed hereafter.

One of the oldest and well-known theories is the agency problem theory. Berle and Means (1932) analysed the separation of ownership and control within a firm and argued that this creates a conflict between owners (principals) and managers (agents), also known as the principal-agent problem. According to this problem, the agent should act on the principal’s behalf and in his best interest, but agents are more interested in their own compensation maximization. Managers may engage in managerial opportunism and may overinvest in projects that are not so profitable and do not fully contribute to maximizing the wealth of the owners (Jensen et al., 1976). They may invest in NPV projects, but in recent years firms are also increasingly investing in CSR activities. For example, several researchers argue that managers' investments in CSR activities are a manifestation of the agency problem (Cheng et al., 2013)(Masulis & Reza, 2015). To reduce costs and conflicts between the two parties, profit distribution such as dividends reduces the agency problem (Park, 2009). By reducing internal free cash flows, the management is forced to enter the capital market for financing, leading to market monitoring (Jensen, 1986). Another type of agency problem arises from a conflict between major and minor shareholders, the principal-principal problem. Major shareholders with substantial voting power may be tempted to benefit themselves by keeping money inside the firm at the expense of minor shareholders (Gugler & Yurtoglu, 2003). To mitigate this conflict, dividend distributions to all shareholders will reduce the potential private profits of the major shareholders (Andres et al., 2019). The third agency problem is the shareholder-bondholder conflict, but this type of conflict will not be included in this study.

The signalling theory is one of the most studied explanations of dividend policy. This theory argues that a firm’s management has a better understanding of the firm’s true value than external investors because they have inside information. Thus, information asymmetry exists and is in contrast with MM’s theory, which stated that information is available for everyone (Millerr & Kevin, 1985). Therefore, managers use the payment of dividends as a signal to communicate private information to external investors about the prospects for future profits. A higher dividend payout is a signal to these investors that the firm’s prediction of future cash flows is positive (Benartzi et al., 1997).

Another theory that is caused by information asymmetry is the pecking order theory. This theory is developed by Myers and Majluf (1984) and argues that information asymmetry between managers and investors leads to a preference ranking for financial sources. The pecking order theory does not explain the determinants of dividend policy, but if a firm chooses to pay a dividend, the pecking order preferences should affect this decision (Fama & French, 2002). A firm should finance itself with internal cash first, then by issuing new debt and lastly by issuing new equity. This is because internal financing is cheaper and easier to access than external financing (Leary & Roberts, 2010). So the pecking order theory states that firms should use internal funds first to invest in NPV projects and pay dividends. This is also preferred by managers because they don't want to send adverse signals to investors. For example, when managers announce a new stock issue, the price of the share will drop because investors think that managers will only issue new equity when shares are overpriced. Thus, managers should payout dividends out of internal cash that is left after the firm paid all of its expenses and after all investments are made.

Grullon et al. (2002) developed a more recent theory, the life-cycle theory. They attempted to link firm age with dividend payout policy, that's why this theory is also called the 'maturity theory'. Firms are more likely to pay higher dividends when they move from the growth stage to a more mature phase (Al-Najjar & Kilincarslan, 2018). Other studies added that the probability of paying dividends was greater for larger and older firms, which usually have fewer investment opportunities (DeAngelo et al., 2006)(Fama & French, 2001).

To conclude, the theories mentioned above are studied and used within this study: agency problem theory, signalling theory, pecking order theory and the life-cycle theory. Finally, the literature contains other theories of dividend payout policy that are worth noting. Lintner (1956) and Gordon (1959) criticized the theory of MM and developed the bird-in-hand theory. This theory indicates that there is a relationship between dividend payout and firm value. Another explanation for the importance of dividend policy is the tax preference theory. Investors may prefer firms to hold funds over the payment of dividends because of tax-related reasons. The catering theory states that the decision to pay dividends is driven by prevailing investor demand for dividend payers (M. Baker & Wurgler, 2004). The clientele effect theory presents that when dividend policy changes, investors' decisions always depend on the dividend policy of firms, which may lead investors to stay with this firm or switch to another firm (Sinha et al., 2021).

Previous studies focus on multiple countries or one single country and provide different results. Cross-country research provides similar research while single-country research provides mixed results (Chang et al., 2018). Single-county studies can't be generalized and compared to other countries. The determinants of dividend payout policy need to be examined individually for each country (Benkert, 2020). Single country studies can potentially be more reliable and face less bias and coverage problems (H. K. Baker et al., 2012). This thinking also applies to this study, which is why this study is also limited to one country, the U.S.

The purpose of this study is to investigate the firm-level determinants of dividend policy for the S&P500, over the period of 2016-2019. The following research question is formulated: "*What are the firm-level determinants of the level of dividends paid by S&P500 firms?*". Within the sample of this study, utility firms and financial firms are excluded.

The theoretical contributions of this study are multi-folded. First, much research has been done in the past on the above theories in the U.S., but there have been no recent comprehensive studies in this area (Al-Najjar & Kilincarslan, 2018)(Mohanasundari & Vidhya Priya, 2016). For example, in the literature review by Al-Naijar & Kilincarslan (2018), the most recent study they examined about the Principal-Agent theory of U.S. firms dates back to 1996. Studies in recent years have mainly investigated developing countries or multiple countries.

Second, most studies focus on one specific theory to explain the determinants of dividend policy (Kahraman, 2021). This study contributes to literature by examine multiple theories, including the agency cost theory, life-cycle theory, signalling theory and pecking order theory. The oldest and well known agency cost theory will be studied, the signalling and pecking order theory will be examined through the asymmetry of information, and finally the life cycle theory will be studied. For example, Al-Naijar & Kilincarslan (2018) argue that the life-cycle theory is a recent explanation that needs to be studied further to examine whether it can add something to the dividend puzzle.

Third, the variable CSR will be included in the model because most studies did not include this variable in their model. There is a growing interest in CSR and recent researchers want to explore the link between corporate finance and CSR. Research on the link between CSR and dividend policy is still scarce (Benlemlih, 2018).

Overall, this study aims to add something to the dividend payout puzzle. After years of research, there is still no consensus on the determinants that influence dividend payout policies, even in the US context (Shao et al., 2010).

The remainder of this study is structured as follows. Section two provides a literature review discussing previous results regarding the theories used in this thesis, after which the hypotheses are formulated. Section three describes the methodology used in this paper, including the models used, the variables, data sources and the sampling criteria. Chapter four presents the results, while the fifth section provides the conclusions, addresses limitations and offers recommendations for further research.

2. Literature Review

The following subchapters discuss the results of other studies concerning dividend payout policy. This process involved examining all available existing literature/research on dividend policy and the theories derived from it. The most well-known theories will be discussed below, these are the agency problem theory, signalling theory, pecking order theory and life-cycle theory. From these theories, variables will be formed that are used in this study. In addition, Chapter 2.6 identifies other possible determinants that could affect the level of dividend payment but were not included in this study. Finally, the conceptual framework is formed and hypotheses are formulated.

2.1 Dividend payout policy

Dividend payout policy refers to the amount and the patterns of cash distributions to shareholders, it is the practice that a manager follows in making dividend payout decisions (Lease et al., 2000; Brealey, Myers, & Allen, 2020). These cash distributions can be paid in the form of cash dividends or share repurchases, this study will only focus on ordinary cash dividends. In 2001, Fama and French stated that the share of firms paying cash dividends has fallen sharply in recent years. However, this decline has not continued; the percentage of dividend payers has approximately doubled since the beginning of this century (Brawn & Šević, 2018). The propensity to pay has therefore increased in recent years, but this is no indication of how much has been paid out. Therefore, previous research focuses on two dimensions of dividend payout behaviour: the propensity to payout and the level of payout. There are some studies, mostly qualitative research, that focus on changes in dividends by managers. In this study, only the level of dividend payout will be examined, as this is expected to be more interesting. For example, common law countries, such as the U.S., pay dividends less frequently, but they do pay higher dividends on average compared to civil law countries. It will therefore be interesting to see what factors play a role in the level of dividend payment, i.e. looking at absolute numbers rather than the change in dividends. The level of dividend payout will be studied by using multiple theories which are examined below.

2.2 Agency problem theory

Before examining the existing literature regarding agency problem theory, it is important to distinguish between two types of conflicts that were already identified in the introduction and will be used within this study: (I) the principal-agent conflict and (II) the principal-principal conflict.

2.2.1 Principal-agent conflict

The principal-agent conflict derives from the separation of ownership (principal) and management (agent). Managers may use free cash flow to (over)invest in NPV projects and CSR activities that are not so profitable and do not contribute to maximizing the wealth of the owners. For example, Benlemlih (2018) finds strong evidence that firms with a high level of CSR in the U.S. use dividend policy to manage the agency problem related to overinvestment in CSR. In addition, Denis and Osobov (2008) find evidence that more profitable U.S. firms have more free cash flow and thus pay higher dividends.

Less recent literature on U.S. firms argues that free cash flow can be used to pay cash dividends to mitigate the principal-agent conflict (Lang & Litzenberger, 1989)(Johnson, 1995). By reducing free cash flows, managers are forced to enter the capital market, which induces market monitoring (Rozeff, 1982)(Easterbrook, 1984). Easterbrook (1984) also stated that firms with high growth opportunities and large shareholders pay fewer dividends because these factors serve as alternative non-dividend monitoring devices for controlling agency costs. This is also in line with Noronha et al. (1996), who argued that U.S. industrial firms with alternative monitor mechanisms (e.g. growth opportunities) do not use dividends for the agency problem.

To conclude, firms that are more profitable, with more free cash flow, with fewer growth opportunities and a higher CSR score pay more dividends, mitigating the principal-agent problem.

2.2.2 Principal-principal conflict

The principal-principal conflict derives from a conflict between major and minor shareholders. Major shareholders have larger benefits of control because they have the incentive and ability to monitor and supervise managers (Kent Baker & Kilincarslan, 2018). Minority shareholders have less interest in these activities and just follow these major shareholders, also known as free-riding. This is mostly occurring within firms with a very low ownership concentration (Aguilera & Crespi-cladera, 2016). To reduce free-riding by minority shareholders, dividend payments are used. However, when ownership concentration increases at a low level, less dividends are expected to be paid. This is because at that point they prefer active monitoring rather than paying dividends. In addition, major shareholders have more (voting) power than minor shareholders to make managerial decisions, such as dividend payout. Larger ownership concentrations could thereby expropriate minority shareholders and prevent them from receiving income, this situation is also known as the rent extraction hypothesis (Gugler & Burcin Yurtoglu, 2003). By paying dividends to all shareholders, less capital will be available for the potential private benefits of the largest shareholder (Andres et al., 2019). That's why there is a higher need for dividend payout when the level of shareholder concentration is high to ensure monitoring. It can be said that at higher levels of ownership concentration, agency costs are highest and thus the need to pay dividends is greater. Overall, there seems to be a U-shaped relationship between dividend payout and ownership concentration.

Previous literature provides evidence that firms operating in countries with better protection of minority shareholders pay higher dividends. Common law countries, like the U.S., offer better shareholder protection than civil law countries (Truong & Heaney, 2007)(La Porta et al., 2000). In this study, it will therefore be interesting to examine whether the principal-principal conflict is applicable in the U.S.

Short et al. (2002) indicate that future research should investigate the effect of ownership structures on dividend payout models in the U.S. Recent research in this area in the U.S. is still scarce. Ancient literature provides evidence that firms with relatively less individual shareholding pay more dividends (Rozeff, 1982)(Moh'd et al., 1995). Other researchers found that large shareholders, especially institutions, prefer cash dividends over retained earnings (Barclay et al., 2009)(Short et al., 2002). In contrast, Gugler and Yurtoglu (2003) found evidence among German firms that larger shareholder concentration reduces the dividend payout. Truong & Heaney (2007) found evidence, in an study across 37 countries, of an convex relationship between the largest shareholder and dividend payout. Farinha (2003) found the same U-shaped convex relationship, in an study examining UK firms, between insider ownership and dividend payout. Overall, it will be interesting to explore whether this convex relationship between ownership concentration and dividend payout also applies in the U.S.

2.3 Signalling theory

Another theory that is investigated often is the signalling theory which has been investigated frequently within the U.S. in the past. This theory states that asymmetric information exists between managers and investors. Managers use dividend payments to signal inside information to investors about expected future earnings. In this way, a firm's dividend payout policy serves to minimize asymmetric information between managers and investors.

According to previous literature in the U.S., dividend increases are received as positive signals; dividend decreases, in contrast, serve as signals that future cash flows will decline (Bhattacharya, 1979)(Miller and Rock, 1985). Akhigbe and Madura (1996) find evidence for the signalling theory and find that firms have positive long-term share price performance after dividend initiations. In addition, they find that firms that cut dividends face negative long-term share performance. Lipson et al. (1998) also found support for the signalling theory and studied the performance of newly public firms in the U.S. that did or did not initiate dividends. They found that only the initiation firms have favourable earnings forecasts in the first and second years after dividend initiation. More recent research by Liu and Chen (2015) shows that managers change dividends to signal equity-scaled earnings prospects. Their findings also suggest that investors might not be able to recognize the signalling purpose of dividends in predicting future earnings. Therefore, they think that managers may refrain from the use of dividends to indicate the future earnings of their firm.

By contrast, Jensen and Johnson (1995) conducted research on dividend cuts by managers of U.S firms, they find no support for the signalling theory and argue that dividend cuts do not necessarily indicate a decline in earnings. DeAngelo et al. (1996) examined whether U.S. firms used dividends to communicate future earnings forecasts by looking at firms whose earnings suddenly declined after nine or more consecutive years of stable growth. Their results do not provide support for the signalling theory and argue that a dividend increase in the year of recession is not a useful tool for improved future earnings performance. Denis and Osobov (2008) also find no evidence for the signalling theory within the U.S., they state that larger, older and more profitable firms are more likely to pay dividends. According to the signalling theory, this would imply that a greater information asymmetry exists within these firms. However, this is not plausible; for example, larger firms receive more media attention and are followed by more financial analysts.

Overall, we can conclude that there is still no consensus in the literature about the signalling theory of dividend payout policy in the U.S. New research in this area will contribute to the literature.

2.4 Pecking order theory

As explained in the introduction of this paper, the pecking order theory states that due to information asymmetry, firms should finance themselves first with internal cash rather than external financing. By issuing external financing, managers may send adverse signals to external outsiders. For example, investors think that managers will only issue new equity when shares are overpriced, so the share price will drop when managers do this. Firms with more free cash flow borrow less because they do not need external financing (Fama & French, 2002). Managers should therefore pay dividends out of internal free cash flow.

Previous literature has shown mixed empirical evidence on the pecking order theory. Shyam-

Sunder and Myers (1999) find strong evidence for the pecking order theory among large U.S. firms. In addition, Frank and Goyal (2003) argue that Shyam-Sunder and Myers's study rejects the pecking order theory for smaller firms. They argue that this contradicts the pecking order theory since these firms are believed to suffer the most from asymmetric information and should follow the pecking order. A more recent study by Bulan and Yan (2009) investigated the pecking order theory among U.S. firms and they classified them into two life cycle stages: the growth- and mature stages. Their findings contrast with the theory's prediction that firms with the greatest information asymmetry (specifically young and growth firms) should make financial decisions based on the pecking order theory. The results of their study show that the pecking order theory describes the financing decisions of mature firms best, these firms have more free cash flow, fewer NPV projects and access to cheaper credit (Bulan & Yan, 2009).

Other studies criticize the work of Shyam-Sunder and Myers, arguing that their research has not taken into account the debt capacity of firms, a restriction that is especially binding on small firms (Lemmon & Zender, 2010)(Ağca & Mozumdar, 2004). That’s why Lemmon & Zender and Ağca & Mozumdar used sub-samples of firms that are the least debt-constrained. In their results, they find evidence that the pecking order theory also performs well under small firms, after accounting for debt capacity constraints.

Overall, it can be concluded that results for the pecking order theory are mixed. However, according to these studies, there are several factors concerning this theory that influence the dividend payout policy: free cash flow, growth opportunities and debt.

2.5 Life-Cycle theory

The more recent life-cycle theory states that firms that are larger and older pay more dividends. Firms reach an inflexion point in terms of market share when they grow and mature. For such firms, investment opportunities decrease, which reduces their capital expenditures, increasing their free cash flow, and allowing these firms to pay more dividends (Brawn & Šević, 2018).

Fama and French (2001) already found that firm age has a significant influence in determining dividend payments. Grullon et al. (2002) were the first to come up with the maturity hypothesis, the counterpart of the signalling theory, and examined NYSE and AMEX firms between 1967 and 1993. They state that a dividend increase may not be a signal for better profitability and higher cash flows in the future, but a decline in the systematic risk of the firm. The dividend change may convey information about lower future growth. DeAngelo et al. (2006) test the life cycle theory by examining whether firms with a high share of retained earnings in total equity (RE/TE) and total assets (RE/TA) are more likely to pay dividends. This variable measures the extent to which a firm is self-financing or reliant on external capital. Firms with a high RE/TE (or RE/TA) tend to be more mature with higher cumulative profits which makes them good candidates to payout dividends. In line with their expectations, they find a positive and highly significant relationship between the probability of paying dividends and its earned/contributed capital mix for NYSE firms. Brawn and Šević (2018) researched U.S. firms and found that firm size (by market value) and firm age are important determinants of whether a firm pays dividends.

It can be concluded that multiple studies have shown that more mature U.S. firms are more likely to pay dividends. This is an interesting finding as it is in contrast with the signalling and pecking order theory of dividends. They argue that firms with greater information asymmetry are more likely to pay dividends, with the expectation that this applies especially to smaller and younger firms. Within this research, it will therefore be interesting to see to what extent and if evidence can be found for the life-cycle theory of dividends.

2.6 Other potential determinants

In addition to the above theories, other factors exist that may affect the level of dividend payment but are not included in this study. An international study found significant results between cultural differences between countries and dividend payment levels. For example, countries that are strongly future-oriented pay fewer dividends (Bae et al., 2010). In addition, Driver, Grosman and

Scaramozzino (2020) argue that pressure from short-term-oriented investors, executives and board members results in higher dividend payments. For example, they find that firms pay out more dividends to discourage takeover bids (Driver et al., 2020). Other studies focus on the relationship between corporate governance and the level of dividends. Some researchers conclude that good corporate governance structures result in higher dividend payments (Pahi & Yadav, 2019)(Adjaoud & Ben-Amar, 2010). Another possible important determinant may be the extent to which firms buy back shares. However, in the study of Bhargava (2010) among US firms, they state that dividend decisions are likely to precede those regarding share repurchases. In addition, Wang, Yin and Yu (2021) find that share-repurchasing firms do not cut dividends as a substitution. They state that firms repurchasing shares lead to reductions in capital expenditures and R&D.

Although these factors may affect the level of dividends, it was decided not to include them within the study. This research uses only firm-level characteristics based on the above theories with which the study is delineated and achievable.

2.7 Conceptual framework

Based on the literature review above, it can be concluded that several theories may explain the level of dividend payout. Consequently, there are conjectures of relationships between different variables that will be explored within this study. However, the question will be whether there is a clear causality between the variables or some other factors at play, as the dividend puzzle remains unsolved after all these years of research. The cause-effect relationship between firm-level characteristics and the level of dividend payment is assumed within this study to measure the variables. Based on the above literature review, the following relationships are expected to exist:

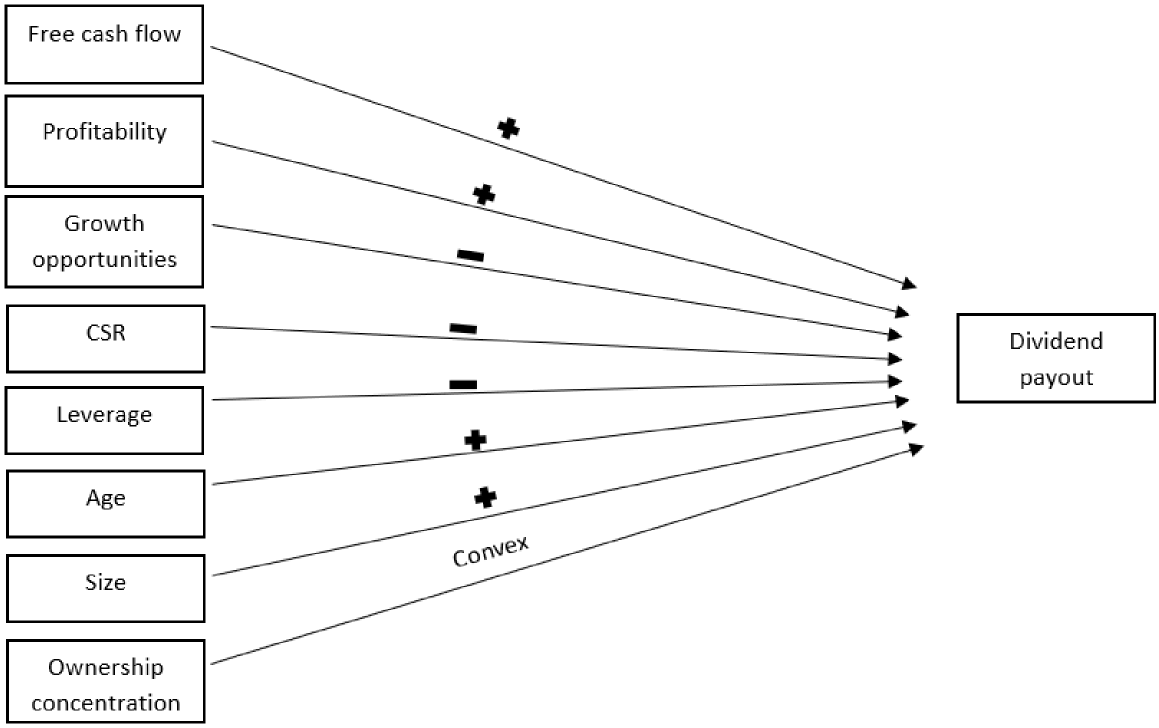


Figure 1. Conceptual framework.

Figure 1 presents eight independent variables that affect a dependent variable. Based on this conceptual framework, the hypotheses are developed in the next chapter.

2.8 Hypothesis development

In the last sections, several theories and determinants that may influence firms' dividend payout policy have been explained, after which a conceptual framework was developed. The most relevant determinants will be used to develop hypotheses to answer the research question of this paper: "*What are the firm-level determinants of dividend policy of S&P 500 firms?*". First, hypothesis development based on the independent variables and the dependent variables will be examined below.

2.8.1 Free cash flow

Free cash flow is expected to be one of the most important determinants of dividend payout policy. The free cash flow of a firm can be used to payout dividends to reduce agency costs and to signal future prospects. Firms with higher free cash flow will have to raise less external money and can use internal funds when making expenditures. Therefore, the following hypothesis is developed:

H1: There is a positive relationship between free cash flow and the level of dividend payout among S&P500 firms.

2.8.2 Profitability

According to the existing literature and the theories mentioned above, there exists a positive relationship between profitability and dividend payout. More profitable firms are more likely to have excess cash and thus payout dividends. Managers can use this excess cash to mitigate agency problems or to signal to investors about future profitability. Firms with a higher level of profitability may also have more internal funds and therefore need less external cash, as advised by the pecking order theory. The following hypothesis is developed:

H2: There is a positive relationship between profitability and the level of dividend payout among S&P500 firms.

2.8.3 Growth and investments

According to the literature mentioned above, the growth and investment opportunities of a firm can have a great impact on the dividend payout policy. For example, the principal-agent problem suggests that managers might overinvest in NPV projects or CSR, at the expense of investors. So the more NPV projects a firm has, or the degree to which it invests in CSR can come at the expense of the level of dividend payout. In addition, the pecking order theory states that firms should use internal funds before raising new equity or debt. Thus, the more firms invest in growth opportunities and CSR, the fewer internal funds to pay dividends. Therefore, two hypotheses are developed:

H3a: There is a negative relationship between growth opportunities and the level of dividend payout among S&P500 firms.

H3b: There is a negative relationship between CSR and the level of dividend payout among S&P500 firms.

Another view of the above explanation is that if a firm invests heavily in NPV projects, it is likely to make more profits in the future and thus be able to pay more dividends. It will therefore be interesting to see to what extent the above hypotheses are accepted or rejected. This will be discussed in more detail in paragraph 5.1 (discussion of results).

2.8.4 Leverage

The level of debt can also be an important factor in determining the level of dividends to pay. According to the pecking order theory, firms with a high level of debt face higher external financing costs such as interest payments to debtholders. These highly leveraged firms might also face costs of financial distress. Therefore, managers have less internal funds available to pay dividends. The following hypothesis is developed:

H4: There is a negative relationship between the level of debt and the level of dividend payout among S&P500 firms.

2.8.5 Age and size

The age and size of a firm also seem to affect the level of dividend payout. As explained before, the life-cycle theory argues that more mature firms payout more dividends. This is in contrast with the information asymmetry theories, which expect information asymmetry to be greatest among smaller growth firms. It will therefore be interesting to test the following hypotheses:

H5a: There is a positive relationship between a firm's age and the level of dividend payout among S&P500 firms.

H5b: There is a positive relationship between firm size and the level of dividend payout among S&P500 firms.

2.8.6 Ownership concentration

To determine whether the principal-principal conflict applies to S&P500 firms and affects the level of dividend payout, the ownership concentration of these firms will be studied. As concluded earlier in this paper, previous studies found a convex relationship (U-shaped) between ownership concentration and dividend policy. Therefore, this study will examine to which extent ownership concentration influences the level of dividend payments:

H6: There is a convex relationship between ownership concentration and the level of dividend payout among S&P500 firms.

3. Methodology

This section presents the method and model used in this paper to answer the research question. All variables used will be explained, the sampling criteria are explained and the data sources are described.

3.1 Research method & model

To analyse the relationships between the variables, only the relationships between the independent variables and the dependent variable are initially considered. To determine the research method of this study, the methods of similar studies were examined. Previous studies focusing on the propensity to payout dividends follow a logit regression (Denis & Osobov, 2008)(Khalfan & Wendt, 2020). In contrast, previous studies examining the level of dividend payments used a multiple (OLS) regression (Andres et al., 2019)(Kahraman, 2021)(Benkert, 2020). Multiple (OLS) regression can be used when a metric dependent variable is used in combination with at least two metric independent variables. This applies in this study, therefore, multiple (OLS) regression will be used within this study, the OLS model will be formulated as follows:

$$DIV\_TA_{it} = \beta_0 + B_1 FCF_{i,t-1} + \beta_2 PROF_{i,t-1} + \beta_3 GROWTH_{i,t-1} + \beta_4 CSR_{i,t-1} + \beta_5 \mathcal{L}EV_{i,t-1} + \beta_6 AGE_{i,t-1} + \beta_7 SIZE_{i,t-1} + \beta_8 OWN^2_{i,t-1} + \beta_x CONTROL_{i,t-1} + \varepsilon_{i,t-1}$$

The above is the main model of this study, it contains abbreviated variables out of the conceptual model and these variables are further explained below and in *table 1*. In addition to this main model, three other dependent variables are used in this study as robustness checks, these are also further explained in *table 1*.

3.2 Variables

3.2.1 Dependent variables

The dependent variable used in this study is dividend payout ratio. The dividend payout ratio

(DIV_TA) is calculated as ordinary cash dividends scaled by total assets and is in line with similar studies (Benkert, 2020)(Kahraman, 2021)(Barclay et al., 2009)(Khalfan & Wendt, 2020)(Alzahrani & Lasfer, 2012). Following previous studies, as a robustness check, this study will scale the dividend payout ratio by other measures: payout ratio scaled by net income (DIV_NI), by total sales (DIV_SALES) and by free cash flow (DIV_FCF).

3.2.2 Independent variables

Different explanatory variables are used to test the hypotheses; the measurement of these variables will be explained below. Following previous studies such as Howe et al. (1992) and Kahraman (2021), the variable free cash flow (FCF) will be measured as earnings before depreciation and amortization minus taxes, interest and dividends, scaled by total assets. Second, the variable profitability (PROF) will be measured as return on assets (ROA) and will be calculated as the net income scaled by total assets, following the studies of Benkert (2020), Kahraman (2021) and Gill et al. (2010). Third and fourth, the growth and investment hypotheses will be measured by looking at the market-to-book ratio (GROWTH) and the CSR score (CSR) of a firm. While it can be difficult to measure growth opportunities based on financial data, this study attempts it using the market-to-book ratio, measured by the market value of total assets to the book value of total assets. This follows Patra et al. (2012), Denis and Osobov (2008), Benkert (2020) and De Jong et al. (2019). The CSR score (CSR) will be determined by using the ESG (environment, social and governance) score of firms. This score includes all dimensions of CSR, as previous studies have used other measures that focus only on one single dimension of CSR (Alareeni & Hamdan, 2020). Fifth, the variable leverage (LEV) will be measured as total debt scaled by total assets, following several studies such as De Jong et al. (2019), Truong & Heaney (2007) and Benkert (2020). Sixth, firm age (AGE) will be measured by the total number of years since the founding date, following Baker and Kilincarslan (2019). Seventh, firm size (SIZE) will be measured similarly to van Beusichem (2016), Brockman, Tresl, & Unlu (2014) and Benkert (2020), by using the natural logarithm (ln) of the total assets divided by 1000. Lastly, ownership concentration (OWN^2) will be measured by looking at the fraction of large shareholders. It is expected that there exists a convex relationship between dividend payout and ownership concentration. To test this convex (non-linear) relationship, this variable will be squared, following Benkert (2020), Kahraman (2021), Truong and Heaney (2007) and Farinha (2003). The independent variables will be lagged by one year (t-1) because the level of dividends of year t will be determined based on the data from year t-1.

3.2.3 Control variables

Control variables will be used within this study that has also been used in previous studies. An industry variable (INDUSTRY) will be added to this research to control for possible industry effects, following studies like Benkert (2020) and Kahraman (2021). This will be done by creating a dummy variable based on the SIC codes of the industries. In addition, the control variable tangibility (TANG) will be added to this study because a firm's level of fixed assets can affect its dividend policy. Firms fixed assets can be used as collateral to debtholders, as a result, the costs of debts decrease. They may therefore attract more leverage (Zou & Zezhong Xiao, 2006). This may affect the pecking order for attracting new capital. This control variable will be measured as fixed assets scaled by total assets. The control variables will be lagged in the same way as the independent variables (t-1).

Table 1. Summary variables

Variables	*Explanation*
Dependent variables	
DIV_TA	Ordinary cash dividends scaled by total assets
DIV_NI	Ordinary cash dividends scaled by net income
DIV_SALES	Ordinary cash dividends scaled by total sales
DIV_FCF	Ordinary cash dividends scaled by free cash flow
Independent variables	
FCF	Earnings before depreciation and amortization minus taxes, interest and dividends, scaled by total assets
PROF	Net income scaled by total assets
GROWTH	Market-to-book ratio
CSR	ESG score of firms
LEV	Total debt scaled by total assets
AGE	Total number of years since founding
SIZE	Natural logarithm (ln) of total assets divided by 1000
OWN^2	Fraction of the largest shareholders to the power of two
Control variables	
INDUSTRY	Dummy variable based on SIC codes of the industries
TANG	Fixed assets scaled by total assets

3.3 Data and sample

To answer the research question, this study uses a sample of non-financial firms listed on the S&P500 that pay dividends. Financial firms face different regulations than non-financial firms and this affects their dividend policy. Following previous studies, financial firms will be excluded based on their SIC codes, firms with SIC codes 6000-6999 will therefore be excluded. The sample period of this study is 2016-2019, the year 2020 will not be used within this study because many firms in the U.S. cut dividends because of the impact of the COVID-19 pandemic(Krieger et al., 2021). The sample size is N= 272, resulting in 816 firm-year observations. The financial data will be retrieved from the database ORBIS and the annual reports of the firms.

4. Results

This section will present the results derived from the analysis. First, the assumptions for the analysis will be discussed and the process of treating outliers explained. After that, the descriptive statistics of the sample will be presented. Finally, the results of the multiple (OLS) regression are examined, including robustness checks.

4.1 Assumptions

To use multiple regression and obtain meaningful results, several assumptions must be checked. This includes an examination of linearity, multicollinearity, homoscedasticity and normality (Kaap, 2021)(Jason W. Osborne & Waters, 2003). These have been extensively tested and are presented in Appendix I. To keep the number of pages limited, it was chosen to display only the most important graphs and tables in this appendix. The first assumption is linearity, characterized by a straight line in the relationship between the independent variables and the dependent variables. Multiple (OLS) regression is a statistical model used to explain the dependent variable (dividend) based on variation in the independent variables. It does this based on linear relationships between these dependent and independent variables, therefore it is important to test for this linearity assumption. This is tested within this study by creating scatterplots between each independent variable and the dependent variable. After reviewing these scatterplots, it was concluded that the scatterplots are considered relatively straight enough, assuming linearity.

The second assumption tested is multicollinearity, this occurs when independent variables are highly correlated within the regression model. This causes a problem, a change in one variable will cause a change in another. This may be the case, for example, when strong moderating relationships exist between independent variables. As a result, a small change in the data can lead to unstable and fluctuating model results. Two methods are used to test this assumption. The first method is by looking at the VIF (Variance Inflation Factor) of the independent variables. This is a statistical test that measures the degree of multicollinearity, the VIF value must be less than 10 or preferably less than 5. The results are shown in Appendix I, where it can be seen that the highest VIF value among the independent variables is only 2.096. The second method of checking multicollinearity is by using Pearson's correlation matrix, presented in *table 2*. This matrix displays values that indicate the strength of relationships between variables. The correlation values range from -1 to +1 where values above -0.7 and +0.7 can cause multicollinearity problems. The highest correlation between the independent variables is the positive correlation between FCF and PROF (0.585**). This strong and positive correlation is not surprising, as firms with higher profits may have higher free cash flow left over. However, this correlation does not exceed the limit of +0.7. For example, this can be explained because firms may borrow money to make investments. This increases profits, but free cash flow increases less due to interest payments. In addition, the matrix presents a high negative correlation between FCF and SIZE (-.523**). Thus, the higher a firm's total assets, the lower its free cash flow. One explanation may be that firms with many fixed assets have to pay a lot of maintenance costs, and therefore have less free cash flow. In conclusion, all correlation values between the independent variables do not exceed the threshold of -0.7 and 0.7, therefore it can be assumed that there are no multicollinearity problems.

Table 2. Pearson's correlation matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13
1 DIV_TA	1	.068	.653**	.559**	.598**	.427**	.304**	.085	.097	.156**	-.280**	.033	-.179**
2 DIV_NI	.068	1	.294**	.267**	-.095	-.137*	.025	.045	-.050	.025	.051	-0.30	.138*
3 DIV_SALES	.653**	.294**	1	.693**	.167**	-.024	.064	.013	.140*	.040	.088	-.025	.129*
4 DIV_FCF	.559**	.267**	.138*	1	-.068	-.052	.150*	.098	.263**	.160**	.128*	-.028	-.037
5 FCF	.598**	-.095	.167**	-.068	1	.585**	.253**	.008	-.187**	-.008	-.523**	.044	-.209
6 PROF	.427**	-.137*	-.024	-.052	.585**	1	.354**	.083	-.035	.038	-.323**	-.117	-.266**
7 GROWTH	.304**	.025	.064	.150*	.253**	.354**	1	.009	.022	.135*	-.124*	-.011	-.120
8 LEV	.085	.045	.013	.098	.008	.083	.009	1	.119*	.007	.038	.014	.139*
9 CSR	.097	-.050	.140*	.263**	-.187**	-.035	.022	.119*	1	.184**	.394**	-.034	-.024
10 AGE	.156**	.025	.040	.160**	-.008	.038	.135*	.007	.184**	1	.017	-.002	-.053
11 SIZE	-.280**	.051	.088	.128*	-.523**	-.323**	-.124*	.038	.394**	.017	1	-.051	.203**
12 OWN	.033	-0.30	-.025	-.028	.044	-.117	-.011	.014	-.034	-.002	-.051	1	-.019
13 TANG	-.179**	.138*	.129*	-.037	-.209	-.266**	-.120	.139*	-.024	-.053	.203**	-.019	1

***. Correlation is significant at the 0.01 level (2-tailed).*
**. Correlation is significant at the 0.05 level (2-tailed)*

The amount of error in the residuals should be the same at each point of the linear model, this is what multiple linear regression assumes. This is called homoscedasticity and will be checked using a scatterplot. The standardized residuals are plotted against the predicted values to identify whether the dots are fairly distributed across all values of the independent variables. Multiple (OLS) regression attempts to minimize the residuals (and standard errors), therefore multiple (OLS) regression gives equal weight to all observations. The unequal distribution of the dots is called heteroscedasticity and this causes problems for the analysis. An example of heteroscedasticity is when firms with relatively low values of the independent variables, have very low residuals, while firms with relatively high values have a large variation in the size of the residuals. By looking at the scatterplot in Appendix I, it can be seen that it appears that the residuals are not evenly distributed. So it seems that the residuals are much more spread out as the standardized predicted values become large. A type of "cone shape" emerges and this is a sign of heteroscedasticity. When heteroscedasticity is present, it makes it more likely that an OLS regression will declare an independent variable to be statistically significant, when in fact it is not. To check whether heteroscedasticity affects the results of the multiple (OLS) regression, a weighted least squares regression will also be performed. This is a way of fixing heteroscedasticity, it assigns a weight to each data point, based on the variance of the residuals.

Multiple (OLS) regression assumes that the variables are normally distributed, non-normally distributed variables affect significance tests and can affect the relationship between variables. This assumption is especially important for relatively small samples(J.W. Osborne & Waters, 2002)(Williams et al., 2013). To check for normality, examining histograms and PP plots can be useful graphical methods. In addition, the Kolmogorov-Smirnov (KS) and Shapiro-Wilk (SW) tests are common ways to check for normality (Bee Wah & Mohd Razali, 2011) (ORCAN, 2020). Both tests assume that the variables are normally distributed (H0). By examining the histograms and PP plots, the variables seem to be normally distributed, except for the dependent variable DIV_NI (see Appendix I). However, when looking at the Kolmogorov-Smirnov (KS) and Shapiro-Wilk (SW) tests, almost all variables show significance values, indicating non-normality. Although a violation of the assumption could be ignored based on the Central Limit Theory (CLT). For example, Henseler (2019) and Berg (2021) argue that a sample size of N>200 is sufficient to satisfy this theory. Finally, the skewness of the variables was analysed. Some researchers argue that a skewness above 1 indicates non-normality (Chung, 2011) (Berg, 2021). It can be seen that especially the dependent variables are highly skewed, with values of >11 (DIV_NI) and >4 (DIV_SALES). Therefore, it was chosen to transform the dependent variables by using natural logarithms, this limits the degree of skewness and non-normality, following studies of Benkert (2020) and Kahraman (2021). The disadvantage of using natural logarithms is that they can only be calculated for values above zero, so negative values are eliminated. The advantage is that the number of negative values of the dependent variables is quite small.

4.2 Outliers

Using (extreme) outliers can distort relationships and significance tests (Jason W. Osborne & Waters, 2003). Before performing the multiple (OLS) regression, the presence and effect of (extreme) outliers were first examined using boxplots and by converting data into z-scores. Once the (extreme) outliers were identified, each outlier was examined to check whether there was, for example, a measurement error or a one-time event. For example, according to the data, Colgate-Palmolive was found to have a P/B ratio of about 2900 at the end of 2016; this would have had a great impact on the results. To mitigate the effect of outliers, it was decided to apply winsorization for all metric variables (with outliers) at the 1 percent and 99 percent tail. Except for the variable GROWTH, which is winsorized at the 2.5 percent and 97.5 percent tail, due to very extreme outliers. To maximize the sample size, winsorization was chosen instead of just removing the (extreme) outliers. The extreme values are replaced by the maximum/minimum values of the remaining data points.

4.3 Descriptive statistics

The descriptive statistics of the variables used in this study are shown in *table 3* below:

Table 3. Descriptive statistics

Dependent variables	N	Minimum	Maximum	Mean	Std. Deviation
DIV_TA	288	0,00	0,18	0,04	0,03
LN_DIV_TA	286	-8,19	-1,71	-3,59	0,96
DIV_NI	288	-4,19	10,63	0,68	1,36
LN_DIV_NI	271	-5,08	2,36	-0,78	0,94
DIV_SALES	285	0,00	0,27	0,06	0,05
LN_DIV_SALES	282	-7,70	-1,31	-3,22	1,05
DIV_FCF	291	-0,48	1,07	0,30	0,21
LN_DIV_FCF	286	-6,21	0,06	-1,40	0,80
Independent variables					
FCF	288	-0,02	0,66	0,14	0,10
PROF	285	-0,15	0,31	0,08	0,07
GROWTH	283	-75,89	38,69	5,05	9,45
CSR	288	16,50	93,57	66,55	14,68
LEV	288	0,26	1,45	0,72	0,23
AGE	291	1,22	122,37	43,97	31,04
SIZE (ln)	286	6,28	12,94	9,75	1,26
OWN^2	283	0,00	0,16	0,01	0,02
Control variable					
TANG	288	0,14	1,47	0,72	0,24

Note: This table shows the descriptive statistics of the variables in this study. Data from the dependent variables are from 2017, 2018, and 2019, while the independent and control variables are lagged by one year (2016, 2017, 2018). For all variables, winsorization is applied to the tails of 1 percent and 99 percent. With exception of the variable GROWTH, which is winsorized on the tails of 2.5 percent and 97.5 percent.

By examining the dependent variables, it can be seen that these values differ from each other. For example, the values of DIV_TA vary between 0.00 and 0.18 with a mean of 0.04, while DIV_NI has minimum and maximum values of -4.19 and 10.63 with a mean of 0.68. In addition, it is notable that DIV_NI and DIV_FCF have negative values, this indicates that firms paid dividends despite having negative net income and free cash flow that year. Finally, it is noteworthy that DIV_NI and DIV_FCF display values above 1, which means that firms paid out more dividends than their net income or free cash flow.

Looking at the independent variables, it can be seen that the S&P500 firms are very different from each other. It can be seen from the variable AGE that the youngest firm in the sample has been in business for just over a year, while the oldest firm has been in business for over 122 years. The variable FCF ranged between -0.02 and 0.66 with a mean of 0.10, indicating that at least one firm had negative free cash flow. The variable PROF also shows a negative minimum value, with a mean of 0.08 varying between -0.15 and 0.31. In addition, it can be seen that the variable GROWTH has a mean value of 5.05, which reflects that the firms in the sample have growth potential. The minimum value of this variable is negative, this means that a firm has more debt than total assets. The variable LEV has a rather high mean of 0.72, which means that on average more than 70% of total assets are debt. The variable CSR ranges from 16.5 to 93.57 with a mean of 66.55, this mean is relatively high. In the study by Alareeni & Hamdan (2020), a sample of S&P500 firms was used using a period from 2009 to 2018, here the mean ESG score was 33.166. The transformed (using natural logarithm) variable SIZE has a mean of 0.017 varying between 0.01 and 0.02. Finally, by looking at the variable OWN^2, we see that the mean is 0.01, this means that on average the largest shareholder holds about 11.4% of the shares. The largest shareholder of this sample owns 40% of the shares. Within this study, one metric control variable is used: TANG. The mean of this variable is 0.72 varying between 0.14 and 1.47.

4.4 Regression results

To answer the research question of this study: "*What are the firm-level determinants of the level of dividends paid by S&P500 firms?*", an multiple (OLS) regression was conducted. *Table 4* presents the results of the regression with the dependent variable LN_DIV_TA(main model). These results are presented below and compared with other studies. The next chapter (5) discusses these results further in relation to the hypotheses and theories.

Table 4. OLS regression result LN_DIV_TA

	Exp. Sign	Unst. Beta	Std. Error	Std. Beta	t-value	Sig. level
Constant		-4.88	.59		-8.28	<0.01
FCF	+	3.39	.63	.38	5.39	<0.01***
PROF	+	2.47	1.01	.17	2.45	.02**
GROWTH	-	.01	.01	.13	2.41	.02**
CSR	-	.01	.00	.17	2.87	.01***
LEV	-	.18	.23	.04	.79	.43
AGE	+	.00	.00	.08	1.51	.13
SIZE (ln)	+	-.04	.05	-.05	-.80	.42
OWN^2	Convex	-3.88	2.22	-.09	-1.75	.08
TANG		-.05	.23	-.01	-.23	.82
Industry dummy	Yes					
N	272					
R^2	.45					
Adjusted R^2	.37					

*Note: this table reports the unstandardized beta, the standard error for the unstandardized beta, the standardized beta, the t-test statistic and the probability value (sig. level) for the OLS regression with the dependent variable LN_DIV_TA. *** and ** indicate significance levels of 1% and 5%, respectively.*

The table presents four positive and significant independent variables. The variable free cash flow (FCF) is positive and significant at a 1 percent level. This result is in line with studies such as Brawn and Šević (2018), Thanatawee (2011) and Fama and French (2002). The *unstandardized beta* of this variable is relatively high compared to the other independent variables with a value of 3.39. This means that for every one unit increase in the variable FCF, the dependent variable LN_DIV_TA increases with 3.39. The profitable (PROF) variable is also positive and significant, at the 5 percent level. This result is consistent with studies such as Hübers (2022), Baker and Kilincarslan (2019), Kahraman (2021), Lang and Litzenberger (1989) and Johnson (1995). That both variables free cash flow and profitability are positive and significant is no surprise. As indicated earlier in this report when looking at the correlation matrix, when firms are more profitable, they may also have more free cash flow left over. However, this result is not found in all studies, for example, Kahraman (2021) found a positive significant relationship between profitability and dividend payment level, but the same study also found a negative significant relationship between free cash flow and dividend payment level. The variable GROWTH is also found to be positive and significant, at a 5 percent level. Thus, although the expectation was that the relationship between dividend payout and GROWTH would be negative, the results reflect the opposite. This suggests that firms with a higher market-to-book ratio pay a higher level of dividends. This is in line with the expectations of studies such as Bhattacharya (1979) and Miller and Rock (1985). The variable CSR is positive and significant at a 1 percent significance level. This suggests that firms with high CSR scores are paying more dividends, whereas the expectation was that this might the opposite. However, this outcome is similar to studies such as Salah and Amar (2022), Benlemlih (2018), and Rakotomavo (2012).

The relationship between debt (LEV) and the dependent variable was expected to be negative. After running the regression, the relationship appeared to be positive, although the relationship was found to be insignificant. The remaining independent variables AGE, SIZE and OWN^2 were also found to have insignificant relationships. The same applies to the control variables tangibility (TANG) and different industries (INDUSTRY), which also show non-significant p-value.

As mentioned in the first section of this chapter, a weighted least square (WLS) regression was performed to solve the heteroscedasticity problems. The results of the WLS regression are presented in Appendix II. Here it can be seen that the same independent variables show significant values, except the variable AGE is also significant at a 5 percent level. The fact that the variable AGE is significant is in line with the studies of Brawn & Šević (2018), Grullon et al. (2002) and Fama and French (2001). In the next chapter, it will be interesting to see to what extent these results relate to the robustness checks.

The R^2 gives a value of how much variation of the dependent variable LN_DIV_TA can be explained by the independent variables. In *table 4* can be seen that the R^2gives a value of 0.45. But the R^2 is primarily intended for a regression model with one independent variable. When adding a second independent variable, the R^2can only increase and not decrease. In this study, multiple regression is used, therefore the focus will be on the adjusted R^2. The adjusted R^2square takes into account the number of explanatory variables in the model when calculating explained variance. The adjusted R^2 shows a value of 0.37 for the model with the dependent variable LN_DIV_TA. This means that 37% of the variance in LN_DIV_TA can be explained by the independent variables. In general, the higher this value, the more precisely the independent variables in the model can predict the level of dividends. To estimate the extent to which this is a good adjusted R^2 value, it is compared with previous studies. The value is slightly lower but similar to results from other studies with the same dependent variable in the model, such as Hübers (2022) and Kahraman (2021).

4.5 Robustness checks

To check the robustness of the results presented above, different dividend payout ratios were used. Dividend payout divided by net income, sales and free cash flow are analysed, defined by the dependent variables LN_DIV_NI, LN_DV_SALES and LN_DV_FCF and are presented in *tables 5*, *6* and *7*. These results are first analyzed, then the weighted least squares (WLS) results are examined, and finally the adjusted R^2 is looked at.

Table 5. OLS regression result LN_DIV_NI

	Exp. Sign	Unst. Beta	Std. Error	Std. Beta	t-value	Sig. level
Constant		-4.79	.71		-6.74	<.01
FCF	+	2.19	.76	.22	2.88	<.01***
PROF	+	.12	1.21	.01	.10	.92
GROWTH	-	.01	.01	.08	1.32	.19
CSR	-	.01	.01	.11	1.63	.09
LEV	-	-.11	.27	-.02	-.40	.69
AGE	+	.00	.00	.03	.42	.68
SIZE (ln)	+	.04	.06	.05	.70	.48
OWN^2	Convex	-5.90	2.68	-.13	-2.21	.03**
TANG		.35	.28	.08	1.25	.21
Industry dummy	Yes					
N	267					
R^2	.33					
Adjusted R^2	.24					

*Note: this table reports the unstandardized beta, the standard error for the unstandardized beta, the standardized beta, the t-test statistic and the probability value (sig. level) for the OLS regression with the dependent variable LN_DIV_NI. *** and ** indicate significance levels of 1% and 5%, respectively.*

Table 5 shows the results for the variable LN_DIV_NI, ordinary cash dividends scaled by net income. The table presents the same significant independent variables as in the OLS regression with the variable LN_DIV_TA, however, now the variable OWN^2 is also significant at a 5 percent level. The expectation of the variable OWN2 was a positive significant result with the level of dividend indicating a convex (U-shaped) relationship. However, the results show a negative significant value, indicating on the contrary a concave relationship. This is not consistent with the findings of Truong & Heaney (2007) and Farinha (2003) in their studies, although Gugler and Yurtoglu (2003) and Hübers (2022) found the same results. In addition, it seems a bit odd at first glance that the variable PROF seems to have a negative significant relationship with the level of dividend payout. On the other hand, this can be explained because the higher a firm's profit, the lower the dependent variable LN_DIV_NI, but the higher the independent variable PROF. In addition, the weighted least square (WLS) results (Appendix II) of this dependent variable were examined. Here it can be seen that it shows the same results, only the variable CSR is no longer significant at a 5 percent level.

Table 6. OLS regression result LN_DIV_SALES

	Exp. Sign	Unst. Beta	Std. Error	Std. Beta	t-value	Sig. level
Constant		-1.29	.67		-1.91	.06
FCF	+	2.66	.79	.29	3.36	<.01***
PROF	+	-8.22	1.41	-.51	-5.85	<.01***
GROWTH	-	.02	.01	.14	2.38	.02**
CSR	-	.01	.00	.15	2.33	.02**
LEV	-	.21	.26	.05	.83	.41
AGE	+	.00	.00	.03	.42	.68
SIZE (ln)	+	-.03	.06	-.04	-.53	.59
OWN^2	Convex	-5.58	2.49	-.13	-2.24	.03**
TANG		-.11	.27	-.03	-.41	.69
Industry dummy	Yes					
N	260					
R^2	.34					
Adjusted R^2	.25					

*Note: this table reports the unstandardized beta, the standard error for the unstandardized beta, the standardized beta, the t-test statistic and the probability value (sig. level) for the OLS regression with the dependent variable LN_DIV_SALES. *** and ** indicate significance levels of 1% and 5%, respectively.*

Secondly, regression *table 6* presents the results for the dependent variable LN_DIV_SALES, i.e., ordinary cash dividends scaled by total sales. It can be seen here that the results differ from the regression in *table 4*. For example, it can be seen that the variables PROF, GROWTH and CSR have now become insignificant. In contrast, the variables FCF and OWN^2 are still significant at respective 1 and 5 percent levels. Examining the weighted least square (WLS) results for the variable LN_DIV_SALES, it can be seen that only the FCF remains significant.

Table 7. OLS regression result LN_DIV_FCF

	Exp. Sign	Unst. Beta	Std. Error	Std. Beta	t-value	Sig. level
Constant		-1.73	.56		-3.09	<.01
FCF	+	-.10	.60	-.13	-1.67	.10
PROF	+	-.37	.96	-.03	-.39	.70
GROWTH	-	.01	.01	.16	2.62	<.01***
CSR	-	.01	.00	.20	3.16	<.01***
LEV	-	.19	.22	.06	.89	.37
AGE	+	.00	.00	.06	.91	.37
SIZE (ln)	+	-.04	.05	-.07	-.89	.37
OWN^2	Convex	-5.03	2.11	-.14	-2.38	.02**
TANG		-.28	.22	-.09	-1.28	.20
Industry dummy	Yes					
N	271					
R^2	.27					
Adjusted R^2	.17					

*Note: this table reports the unstandardized beta, the standard error for the unstandardized beta, the standardized beta, the t-test statistic and the probability value (sig. level) for the OLS regression with the dependent variable LN_DIV_FCF. *** and ** indicate significance levels of 1% and 5%, respectively.*

The final robustness check was performed with the dependent variable LN_DIV_FCF. *Table 7* shows these results. It can be seen that the variables GROWTH, CSR and OWN^2 are significant. Appendix II shows that the weighted least square (WLS) regression shows significant values for the variables GROWTH and CSR only, the variable OWN^2 becomes insignificant.

Finally, the adjusted R^2 of the various dependent variables of the robustness checks are examined. The adjusted R^2 of the model with the dependent variable LN_DIV_NI shows a value of 0.24, which is lower than the adjusted R^2 of the main model with the dependent variable LN_DIV_TA. This lower value is consistent with the study of Kahraman (2021) and De Jong et al. (2019), but a lot higher than the studies of Hübers (2022) and Kent Baker and Kilincarslan (2018). The model with the dependent variable LN_DIV_SALES shows approximately the same value, presenting a value of 0.24. This is similar to the above studies. Finally, the adjusted R^2 of the model with the dependent variable LN_DIV_FCF gives a value of 0.17, which is the lowest of all the models. This means that only 17% of the variance in LN_DIV_FCF can be explained by the independent variables of the model.

5. Conclusions

In this final chapter, conclusions will be formed following the reported results from section 5 and discussed based on the theories and hypotheses formulated. In addition, the contributions of the results to theory and practice are illustrated. Finally, the limitations of the study are discussed after which implementations for future research are presented.

5.1 Discussion of results

After Miller and Modigliani (1961) presented the dividend irrelevance theory, Black (1976) already concluded that the dividend puzzle is difficult to solve, with pieces that do not fit together. After years of research, there is still no consensus regarding the determinants that determine the level of dividend payments. There are no recent studies in the U.S. on the different theories regarding dividend payout policy (Al-Najjar & Kilincarslan, 2018)(Mohanasundari & Vidhya Priya, 2016). Therefore, the following research question was formulated for this study: "*What are the firm-level determinants of the level of dividends paid by S&P500 firms?*". To answer this research question, several theories regarding dividend payout were studied, such as the agency problem theory, the signalling theory, the pecking order theory and the life-cycle theory. To examine whether these theories are valid for S&P500 firms between 2016-2019, hypotheses were formulated for firm-level determinants. Based on the regression results presented above, the extent to which there is support for the hypotheses (and theories) will be discussed below.

The first hypothesis (H1) states that there is a positive relationship between free cash flow and the level of dividend payout among S&P500 firms. The results of the main model (LN_DIV_TA), the robustness checks and the weighted least squares (WLS) regressions show significant positive results between free cash flow and the level of dividend payout. These results support the first hypothesis (H1), i.e., the more free cash flow an S&P500 firm has, the higher the probability of a higher dividend payment. This outcome is consistent with several theories, such as agency theory, which argues that free cash flow can be used to mitigate the principal-agent conflict between managers and owners. In addition, the outcome is also consistent with the signalling theory, which states that firms should use free cash flow to pay dividends to signal future prospects. Finally, it is consistent with the pecking order theory, which suggests that firms should first use their free cash flow to invest and pay dividends. Finally, the pecking order theory is also consistent with that outcome; this theory suggests that firms should use free cash flow first for investments and dividend payments before attracting debt. The outcome of this hypothesis is not surprising, as firms with a lot of free cash flow should be able to pay more dividends.

The second hypothesis (H2) predicts a positive relationship between profitability and the level of dividend payout among S&P500 firms. The results show significant positive results for the main model (LN_DIV_TA), the robustness check (LN_DIV_NI) and the weighted least squares (WLS) regression (LN_DIV_TA and LN_DIV_NI). This provides support for the second hypothesis, the more profitable the firm, the more likely it is to pay higher dividends. This outcome, similar to the first hypothesis, provides support for the agency problem-, signalling- and pecking order theory. According to the agency theory, more profitable firms pay more dividends to reduce managers' waste of liquidity. In addition, firms with higher profitability pay more dividends to minimize information asymmetries and to signal future prospects. Finally, firms with higher profits have more internal capital available to payout dividends and therefore need to raise less external capital, which is in line with the pecking order theory. The outcome of the hypothesis seems obvious, however, this is not the case. For example, firms borrow money to invest, as a result, profits are higher but they pay relatively higher interest. This may mean there is less capital left to pay dividends, which is why this variable was not always significant in other studies.

The principal-agent conflict suggests that managers overinvest in NPV projects and/or CSR, at the expense of investors. This would come at the cost of the level of dividend payment. In addition, according to the pecking order theory, a firm pays less dividends when they invest a lot of internal funds in NPV projects/CSR. Based on these theories, hypotheses H3a and H3b were developed. H3a states: There is a negative relationship between growth opportunities and the level of dividend payout among S&P500 firms. In addition, hypothesis (H3b) states: There is a negative relationship between CSR and the level of dividend payout among S&P500 firms. Despite these predictions, the results show positive significant results for the main model (LN_DIV_TA), the robustness check (LN_DIV_NI and LN_DIV_FCF) and the weighted least squares (WLS) regression (LN_DIV_TA, LN_DIV_NI (GROWTH) and LN_DIV_FCF). Thus, these results contradict the theory of the agency problem (principal-agent conflict) and the pecking order theory, which suggests that firms with fewer growth opportunities pay more dividends. However, these results are consistent with the signalling theory, which suggests that firms with the greatest information asymmetry between managers and stakeholders pay the most dividends. Assuming that within small firms (with many growth opportunities), information asymmetry is greatest. Despite the prediction of the hypotheses, the results are convincing. A possible explanation for the positive relationship between GROWTH and the level of dividend payment has been mentioned earlier in section 2.8.3. Here it was argued that firms that have many growth opportunities and invest heavily in NPV projects may be more profitable in the future and thus be able to pay more dividends. One possible explanation for the positive significant relationship between CSR and the level of dividend payment is the stakeholder theory. It states that by publicizing CSR activities, asymmetry between stakeholders decreases, social risks can be better managed, financial performance improves, and reputation is enhanced. This leads eventually to additional wealth for paying dividends (Dakhli, 2021)(Shen et al., 2020)(Nyeadi et al., 2018).

The fourth hypothesis (H4) states that there is a negative relationship between the level of debt and the level of dividend payout among S&P500 firms. According to the pecking order theory, firms with a higher level of debt face higher external financing costs such as interest payments, therefore they maintain less internal capital to pay out dividends. However, the variable LEV does not show a significant value in any of the models, which is why the hypothesis is rejected. The outcome of this hypothesis is convincing, which is somewhat surprising because other studies did find significant values. However, the result can be explained; for example, an increase in debt does not directly reduce the level of dividends paid. Borrowed money can be invested with which, after deduction of repayment and interest, profits are made.

The life-cycle theory suggests that more mature firms pay out more dividends. This theory predicts that a firm's age and size have a positive significant relationship with the level of dividend payout (H5a and H5b). The results show no significant values in almost all models, except for the variable AGE in the weighted least squares (WLS) regression with the dependent variable LN_DIV_TA. Based on these findings, it is concluded that hypotheses H5a and H5b are rejected even though the outcome is not entirely convincing. Consequently, this study found no support for the life-cycle theory for the level of dividend payments. An explanation for this outcome is that mature firms have fewer growth opportunities/NPV projects and therefore make less profit to pay out dividends.

At last, the sixth hypothesis (H6) concerns the principal-principal conflict (agency problem theory) as explained earlier in this report and predicts a convex (U-shaped) relationship between ownership concentration and the level of dividend payment. The results show no significant results for the main model (LN_DIV_TA), but all the robustness checks (LN_DIV_NI, LN_DIV_SALES and LN_DIV_FCF) and the weighted least squares (WLS) results (LN_DIV_NI) show significant negative values. Based on these results, it can be concluded that there is no convex (U-shaped) relationship found between ownership concentration and level dividend payment, but a concave (∩-shaped) relationship. Thus, it can be concluded that ownership concentration affects the level of dividend payment, but the outcome is not in line with the prediction of the principal-principal conflict (agency problem theory II). For example, at low levels of ownership concentration, the level of dividends increases when the ownership of the largest shareholder increases. In contrast, the agency cost theory predicted that the higher the level of ownership concentration, the higher the agency cost and thus the need to pay dividends. Overall, it can be concluded hypothesis six (H6) can be rejected and that no evidence is found for the agency problem theory (principal-principal conflict) within this study. The results are not entirely convincing; the main model does not show significant values.

As mentioned in the results, the adjusted R^2 is a measure that represents the proportion of the variance for the dependent variables that is explained by the independent variables. For the main model, 37% of the variance in LN_DIV_TA can be explained by the independent variables. As mentioned earlier, this value is similar to other studies but slightly lower. A possible reason that the adjusted R^2 is slightly lower is that more independent variables were added in the model of this study, compared to other studies. As a result, by adding multiple independent variables, there is a risk of decreasing the adjusted R^2.

Overall conclusion, this study contributes to Black's (1976) dividend puzzle. To be specific, this study focuses on the firm-level determinants of the level of dividends paid by S&P500 firms between 2016-2019. After controlling for the variables tangibility (TANG) and different industries (INDUSTRY), a number of determinants of dividend payout levels were found. There are a total of four variables that show significant values in the main model as well as the robustness checks and WLS regressions. First, the variables free cash flow (FCF) and profitability (PROF), fulfilled expectations and both showed positively significant values. Second, the variables GROWTH and CSR also showed positively significant values, but against expectations that they would be negatively significant. It can be argued that dividend-paying S&P500 firms that pay a larger amount of dividends have higher free cash flows, are more profitable, have more growth/investment opportunities, and score higher on CSR. Finally, the variable ownership concentrations (OWN^2) affect the level of dividend payment and shows a significant concave (∩-shaped) relationship in the robustness checks and the WLS regression.

5.2 Limitations, relevance and future research

After looking back critically at this study, a number of limitations were identified. In the process, the strengths and weaknesses of this study are examined. Based on these findings, the theoretical and practical relevance of this study will be discussed. Finally, recommendations for future research will be made.

First, as stated earlier in this report, this study adds to the scarce U.S. literature on dividend policy in recent years. In addition, this study contributes to the literature by looking at the level of dividend payment rather than just the probability of a firm paying dividends. Besides, this is one of the few studies that test many different theories with a wide variety of variables. In this process, this study included variables that have been studied for decades, as well as very hot and recent ones such as CSR, which distinguishes this study from other studies. One advantage is that by using multiple variables, many relationships between the independent variables and the rate of dividend payment can be explained. A disadvantage is that by adding many variables, there is a greater risk that the adjusted R^2 will have a lower value. For instance, this value decreases when a predictor improves the model less than was predicted by chance. To reduce the number of variables, it is recommended that future research should first conduct a qualitative study in which people (like managers) who determine the level of dividends are surveyed/interviewed. This will ensure that unimportant variables are not included in the study and that new variables can be identified that may be crucial. This may involve looking at the variables identified in section 2.6 of this study. Finally, in practice, this means that investors now know what factors affect the amount of the dividend payment. By using the before-mentioned recommendations in future research, a model can be developed that can better predict dividend payment rates. This allows investors to better estimate the amount of dividends paid by firms.

Second, as mentioned above and in the discussion section, by adding many variables, there is a greater risk that the adjusted R^2will be lower. A lower adjusted $R^2$is in general a bad sign for predictive models, which makes it more difficult for investors to properly predict dividend levels using this study. However, adding many variables also has advantages for investors. The results of this study are useful to investors, now they have gained new insights into the determinants of dividend payout levels by S&P500 firms. If an investor, for example, has a strategy to build a portfolio of firms that pay high dividends, he or she can use these results. He or she can invest in S&P500 firms that pay a larger amount of dividends, have higher free cash flows, are more profitable, have more growth/investment opportunities, and score higher on CSR. In this way, the firms in the portfolio are more likely to pay higher dividends currently or in the future compared to other firms. In addition, when an S&P500 firm announces that it is going to invest heavily in the field of CSR in the future, an investor knows that this will not come at a cost, but rather will have a positive effect on the level of dividend payment. Thereby, many investors expect firms that have a lot of growth opportunities to invest a lot and that this will come at the expense of the level of dividend payment. With the results of this study, these investors now know that this theory does may not hold in reality for U.S. firms.

Third, it is a limitation that some robustness checks show different results that differ from the main model. This is due to the different characteristics of the dependent variables as can be seen in the descriptive statistics (*table 2*) and Pearson's correlation matrix (Appendix I). This makes it more difficult to compare results, future research could use other dependent variables as robustness checks to examine the level of dividend payment. In addition, the dependent variables had a minimum of 0, making the data less dependent and less normally distributed. A strength of this study is that it solved this limitation by using natural logarithms. However, it is recommended for future research to look at the rate of change in dividends rather than absolute numbers, which will make the data more dependent and normally distributed. The same is applicable to the independent variables.

Fourth, it is a limitation that limited focus has been given to a variable such as CSR. A strength of this study is that many different variables were used; however, a disadvantage is that this reduces the focus on a variable such as CSR. Therefore, it may be interesting to look more closely at some variables in future research. The variable CSR used in this study is measured by the ESG score, which looks at a firm's exposure to long-term environmental, social and governance risks. It would be interesting to study these three types of risks separately from each other, this study limited itself to the overall ESG score without considering the influence of environmental, social and governance risks separately. In addition, a concave relationship was found between owner concentration and the level of dividend payment. For future research, it will be interesting to find an explanation for this relationship. Here it will be interesting to study and include the degree of shareholder protection in the country in question, which this study has done to a limited extent. The variable growth may also be further highlighted in future research. In this study, it is a limitation that the measurability of the degree of growth (p/b ratio) is debatable. The variable GROWTH should also be further explored in future research. Based on financial data, it is difficult to measure this variable, this may be a limitation of this study. An advantage of this study is that the measurement method of variables (such as GROWTH) has been determined based on many previous studies. Finally, the control variable INDUSTRY was used within this study and showed no significant values for the main model. Therefore, this study is limited to whether a particular sector pays significantly more or less dividends. However, it would be interesting to look at similarities and differences between sectors in terms of dividend policy. For example, the P/B ratio (variable GROWTH) is strongly influenced by the sector in which a firm operates. In capital-intensive industries such as construction, the P/B ratio will be lower than in other sectors, such as service industries. Accordingly, several independent variables are divided by total assets. This limitation may affect the results of this study. In the past, when manufacturing firms (such as factories) were important, tangible assets were the main focus when valuing firms. Therefore, earlier studies may have more often divided variables by total assets. Today, other factors are also important like intangible assets, such as intellectual property and R&D. It is difficult to determine a certain value for these intangible assets; as a result, technology firms may get a lower value. Therefore, it is recommended for future research to look at other measures of the independent variables that are currently divided by total assets.

References

Adjaoud, F., & Ben-Amar, W. (2010). Corporate governance and dividend policy: Shareholders' protection or expropriation? *Journal of Business Finance and Accounting*, *37*(5–6), 648–667. https://doi.org/10.1111/j.1468-5957.2010.02192.x

Ağca, Ş., & Mozumdar, A. (2004). *Firm Size, Debt Capacity, and Corporate Financing Choices * Firm Size, Debt Capacity, and Corporate Financing Choices*.

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

Al-Najjar, B., & Kilincarslan, E. (2018). What Do We Know About the Dividend Puzzle?-A Literature Survey*. *Forthcoming in International Journal of Managerial Finance.* https://doi.org/10.1108/IJMF-03-2018-0090

Alareeni, B. A., & Hamdan, A. (2020). ESG impact on performance of US S&P 500-listed firms. *Corporate Governance (Bingley)*, *20*(7), 1409–1428. https://doi.org/10.1108/CG-06-2020-0258

Alzahrani, M., & Lasfer, M. (2012). *Investor protection, taxation, and dividends ☆*. https://doi.org/10.1016/j.jcorpfin.2012.06.003

Andres, C., Betzer, A., van den Bongard, I., & Goergen, M. (2019). Dividend policy, corporate control and the tax status of the controlling shareholder. In *Journal of Industrial and Business Economics* (Vol. 46, Issue 2). Springer International Publishing. https://doi.org/10.1007/s40812-018-0100-6

Bae, S. C., Chang, K., & Kang, E. (2010). *Culture, Corporate Governance, and Dividend Policy.* (Issue January).

Baker, H. K., Chang, B., Dutta, S., & Saadi, S. (2012). Why Firms Do Not Pay Dividends: The Canadian Experience. *Journal of Business Finance and Accounting*, *39*(9–10), 1330–1356. https://doi.org/10.1111/jbfa.12005

Baker, M., & Wurgler, J. (2004). A catering theory of dividends. *Journal of Finance*, *59*(3), 1125–1165. https://doi.org/10.1111/j.1540-6261.2004.00658.x

Barclay, M. J., Holderness, C. G., & Sheehan, D. P. (2009). Dividends and corporate shareholders. *Review of Financial Studies*, *22*(6), 2423–2455. https://doi.org/10.1093/rfs/hhn060

Bee Wah, Y., & Mohd Razali, N. (2011). Power comparisons of Shapiro-Wilk, Kolmogorov-Smirnov, Lilliefors and Anderson-Darling tests. *Journal of Statistical Modeling and Analytics*, *2*(November), 21–33.

Benartzi, S., Michaely, R., & Thaler, R. (1997). Do Changes in Dividends Signal the Future or the Past? *The Journal of Finance*, *52*(3), 1007–1034. https://doi.org/10.1111/J.1540-6261.1997.TB02723.X

Benkert, C. (2020). *Ownership Concentration & Agency Theory : Investigating the Effect of Large Shareholders on Corporate Payout Policy in Danish Publicly Listed Companies*. *November*.

Benlemlih, M. (2018). *Corporate social responsibility and dividend policy*. https://doi.org/10.1016/j.ribaf.2018.07.005

Berg, B. van den. (2021). *Firm-specific determinants of capital structure : Evidence on UK listed and unlisted firms*.

Brawn, D. A., & Šević, A. (2018). *'Firm size matters: Industry sector, firm age and volatility do too in determining which publicly-listed US firms pay a dividend'*. https://doi.org/10.1016/j.irfa.2018.05.002

Bulan, L., & Yan, Z. (2009). The Pecking Order of Financing in the Firm's Life Cycle. *Banking and Finance Letter*, *1*(3), 1–42.

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), 445–484. https://doi.org/10.1111/jfir.12159

Cheng, I., Hong, H., & Shue, K. (2013). Do Managers Do Good with Other People's Money? - NBER Working Paper Series. *National Bureau of Economic Research*, *w19432*.

Chung, E. K. (2011). Reading Statistics and Research. In *Korean Journal of Medical Education* (Vol. 23, Issue 2). https://doi.org/10.3946/kjme.2011.23.2.141

Dakhli, A. (2021). Does financial performance moderate the relationship between board attributes and corporate social responsibility in French firms? *Journal of Global Responsibility*, *12*(4), 373–399. https://doi.org/10.1108/JGR-02-2021-0016

DeAngelo, H., & DeAngelo, L. (2006). The irrelevance of the MM dividend irrelevance theorem. *Journal of Financial Economics*, *79*(2), 293–315. https://doi.org/10.1016/j.jfineco.2005.03.003

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

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

Driver, C., Grosman, A., & Scaramozzino, P. (2020). Dividend policy and investor pressure. *Economic Modelling*, *89*(November 2019), 559–576. https://doi.org/10.1016/j.econmod.2019.11.016

Fama, E. F., & French, K. R. (2001). Disappearing dividends: Changing firm characteristics or lower propensity to pay? *Journal of Financial Economics*, *60*(1), 3–43. https://doi.org/10.1016/S0304-405X(01)00038-1

Fama, E. F., & French, K. R. (2002). Testing Trade-Off and Pecking Order Predictions About Dividends and Debt. *The Review of Financial Studies*, *15*(1), 1–33.

Gugler, K., & Burcin Yurtoglu, B. (2003). Corporate governance and dividend pay-out policy in Germany. *European Economic Review*, *47*, 731–758. www.elsevier.com/locate/econbase

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

Jensen, M. C. (1986). Agency Costs of Free Cash Flow , Corporate Finance , and Takeovers Author (s): Michael C . Jensen Source : The American Economic Review , Vol . 76 , No . 2 , Papers and Proceedings of the Ninety-Eighth Annual Meeting of the American Economic Association. *The American Economic Review*, *76*(2), 323–329.

Jensen, M. C., Meckling, W. H., Benston, G., Canes, M., Henderson, D., Leffler, K., Long, J., Smith, C., Thompson, R., Watts, R., & Zimmerman, J. (1976). Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure. *Journal of Financial Economics*, *4*, 305–360. http://hupress.harvard.edu/catalog/JENTHF.html

Kaap, H. G. van der. (2021). *Lecture 10: Multiple regression* (Issue Inferential statistics, pp. 1–5). https://canvas.utwente.nl/courses/7122/pages/lecture-10-introduction-to-multiple-regression?module_item_id=187749

Kahraman, M. (2021). *Determinants of dividend policy in the Netherlands*. 1–53.

Kent Baker, H., & Kilincarslan, E. (2018). *Why companies do not pay cash dividends: The Turkish experience* ☆. https://doi.org/10.1016/j.gfj.2018.02.005

Khalfan, T. M., & Wendt, S. (2020). The impact of ownership concentration on payout across Nordic firms. *J. of Multi. Fin. Manag*, *56*, 100640. https://doi.org/10.1016/j.mulfin.2020.100640

Krieger, K., Mauck, N., & Pruitt, S. W. (2021). The impact of the COVID-19 pandemic on dividends. *Finance Research Letters*, *42*, 101910. https://doi.org/10.1016/J.FRL.2020.101910

La Porta, R., Lopez-De-Silanes, F., Shleifer, A., & Vishny, R. W. (2000). Agency problems and dividend policies around the world. *Journal of Finance*, *55*(1), 1–33. https://doi.org/10.1111/0022-1082.00199

Leary, M. T., & Roberts, M. R. (2010). The pecking order, debt capacity, and information asymmetry. *Journal of Financial Economics*, *95*(3), 332–355. https://doi.org/10.1016/j.jfineco.2009.10.009

Lemmon, M. L., & Zender, J. F. (2010). Debt capacity and tests of capital structure theories. *Journal of Financial and Quantitative Analysis*, *45*(5), 1161–1187. https://doi.org/10.1017/S0022109010000499

Masulis, R. W., & Reza, S. W. (2015). Agency problems of corporate philanthropy. *Review of Financial Studies*, *28*(2), 592–636. https://doi.org/10.1093/rfs/hhu082

Millerr, M. H., & Kevin, R. (1985). American Finance Association Dividend Policy under Asymmetric Information Author (s): Merton H . Miller and Kevin Rock Source : The Journal of Finance , Vol . 40 , No . 4 (Sep ., 1985), pp . 1031-1051 Published by : Wiley for the American Finance Asso. *The Journal of Finance*, *40*(4), 1031–1051.

Mohanasundari, M., & Vidhya Priya, P. (2016). Dividend Policy and Its Impact on Firm Value: A Review of Theories and Empirical Evidence. *Journal of Management Sciences and Technology*, *3*(3), 59–69.

Nyeadi, J. D., Ibrahim, M., & Sare, Y. A. (2018). Corporate social responsibility and financial performance nexus: Empirical evidence from South African listed firms. *Journal of Global Responsibility*, *9*(3), 301–328. https://doi.org/10.1108/JGR-01-2018-0004

ORCAN, F. (2020). Parametric or Non-parametric: Skewness to Test Normality for Mean Comparison. *International Journal of Assessment Tools in Education*, *7*(2), 236–246. https://doi.org/10.21449/ijate.656077

Osborne, J.W., & Waters, E. (2002). Multiple Regression Assumptions. *ERIC Clearinghouse on Assessment and Evaluation*, 1–6. https://files.eric.ed.gov/fulltext/ED470205.pdf

Osborne, Jason W., & Waters, E. (2003). Four assumptions of multiple regression that researchers should always test. *Practical Assessment, Research and Evaluation*, *8*(2), 2002–2003.

Pahi, D., & Yadav, I. S. (2019). Does corporate governance affect dividend policy in India? Firm-level evidence from new indices. *Managerial Finance*, *45*(9), 1219–1238. https://doi.org/10.1108/MF-01-2019-0030

Park, J. J. (2009). Shareholder Compensation as Dividend. *Michigan Law Review*, *108*(3), 323–371.

Shao, L., Kwok, C. C., Guedhami, O., & Guedhami, O. (2010). National culture and dividend policy. *Journal of International Business Studies*, 1391–1414. https://doi.org/10.1057/jibs.2009.74

Shen, X., Ho, K. C., Yang, L., & Wang, L. F. S. (2020). Corporate social responsibility, market reaction and accounting conservatism. *Kybernetes*, *50*(6), 1837–1872. https://doi.org/10.1108/K-01-2020-0043

Short, H., Zhang, H., & Keasey, K. (2002). The link between dividend policy and institutional ownership. *Journal of Corporate Finance*, *8*(2), 105–122. https://doi.org/10.1016/S0929-1199(01)00030-X

Sinha, A., Hansda, S., & Bandopadhyay, K. (2021). *Dividend Policy: Evidence of Clientele Effect in India*. *August*.

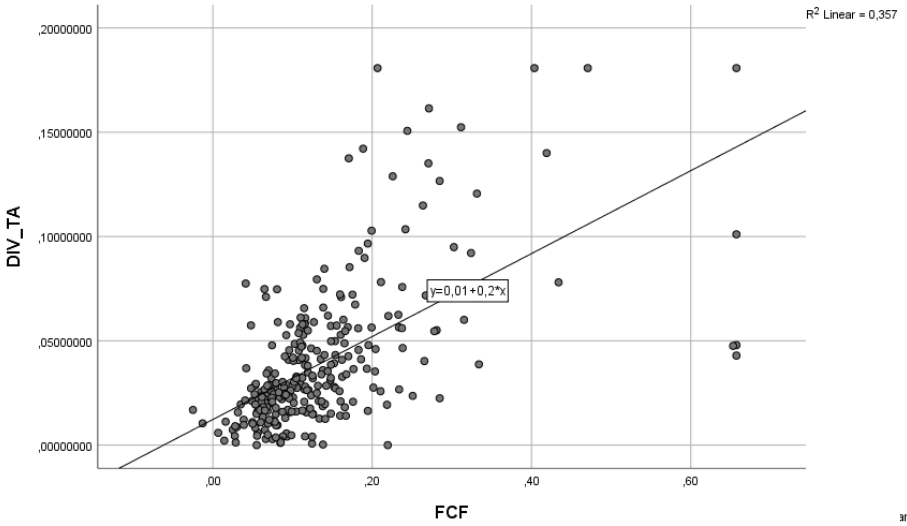
Truong, T., & Heaney, R. (2007). *Largest shareholder and dividend policy around the world*. https://doi.org/10.1016/j.qref.2007.09.002

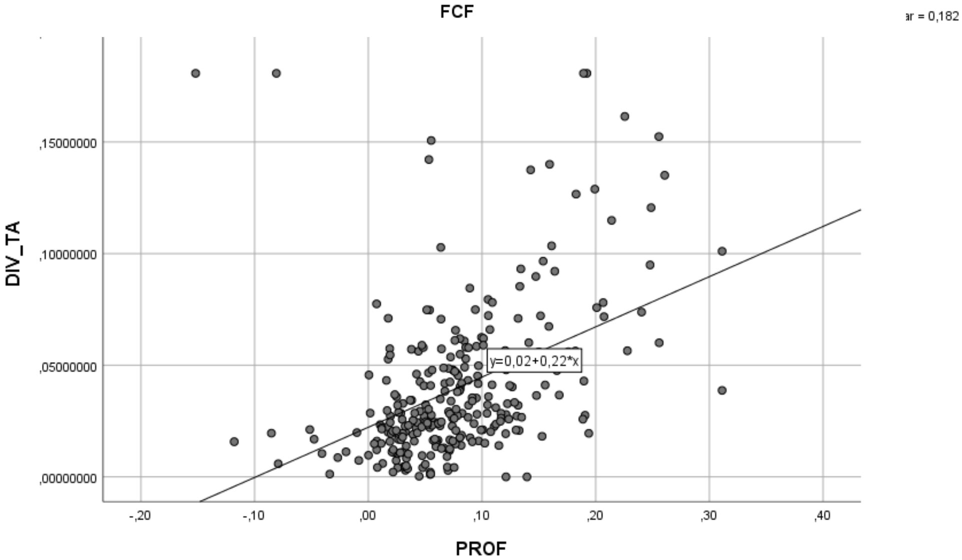
Williams, M., Gomez Grajales, C. A., & Kurkiewicz, D. (2013). Assumptions of Multiple Regression: Correcting Two Misconceptions - Practical Assessment, Research & Evaluation. *Evaluación Práctica, Investigación y Evaluación*, *18*(11), 1–16. https://scholarworks.umass.edu/pare/vol18/iss1/11

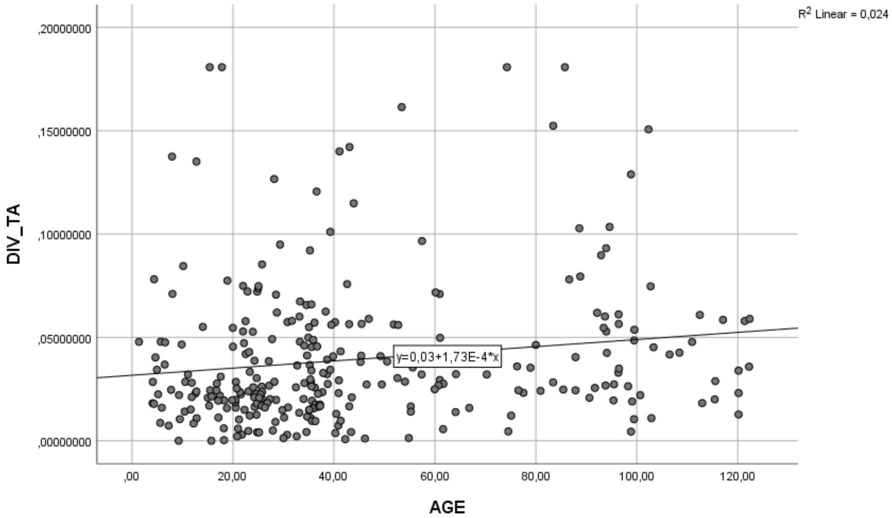
Zou, H., & Zezhong Xiao, J. (2006). The financing behaviour of listed Chinese firms. *The British Accounting Review*, *38*, 239–258. https://doi.org/10.1016/j.bar.2006.04.008

Appendix I: Assumption Testing

Linearity







Multicollinearity

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-,014	,020		-,722	,471		
	FCF	,174	,021	,530	8,166	<,001	,479	2,089
	PROF	,044	,034	,084	1,289	,199	,477	2,096
	GROWTH	,001	,000	,154	3,076	,002	,800	1,249
	LEV	,007	,008	,047	,938	,349	,812	1,232
	CSR	,000	,000	,126	2,332	,020	,688	1,453
	AGE	8,273E-5	,000	,075	1,490	,138	,804	1,244
	OWN	-,001	,076	-,001	-,019	,985	,865	1,156
	SIZE	-,001	,002	-,020	-,316	,752	,522	1,916
	TANG	-,011	,008	-,079	-1,441	,151	,666	1,502
	Business_Services	,016	,013	,072	1,174	,242	,538	1,858
	Chemicals_Petroleum_Rubber_Plastic	,015	,010	,142	1,504	,134	,228	4,391
	Communications	,009	,012	,054	,749	,455	,389	2,568
	Computer_Hardware	,000	,015	,002	,031	,976	,599	1,668
	Computer_Software	-,001	,012	-,005	-,072	,942	,471	2,124
	Construction	-,007	,015	-,029	-,508	,612	,622	1,608
	Food_Tobacco_Manufacturing	,024	,011	,184	2,267	,024	,306	3,263
	Industrial_Electric_Electronic_Machinery	,001	,010	,007	,063	,950	,176	5,680
	Leather_Stone_Clay_Glass_products	,029	,027	,052	1,083	,280	,877	1,140
	Media_Broadcasting	-,005	,027	-,008	-,168	,867	,887	1,127
	Metals_Metal_Products	,004	,015	,015	,254	,800	,614	1,628
	Mining_Extraction	-,005	,012	-,027	-,395	,693	,431	2,319
	Miscellaneous_Manufacturing	,021	,027	,037	,780	,436	,881	1,136
	Printing_Publishing	,022	,027	,039	,800	,425	,866	1,155
	Public_Administration_Education_Health_Social_Services	-,005	,017	-,016	-,309	,758	,722	1,385
	Retail	-,002	,011	-,011	-,154	,878	,360	2,777
	Textiles_Clothing_Manufacturing	,014	,016	,048	,878	,381	,672	1,489
	Transport_Manufacturing	,005	,011	,034	,477	,634	,396	2,523
	Transport_Freight_Storage	,001	,011	,006	,075	,940	,356	2,811
	Travel_Personal_Leisure	,023	,012	,134	1,940	,054	,424	2,356
	Utilities	,015	,010	,136	1,475	,142	,238	4,200
	Waste_Management_Treatment	,002	,021	,005	,099	,921	,770	1,298
	Wholesale	,007	,012	,039	,577	,564	,443	2,257

a. Dependent Variable: DIV_TA

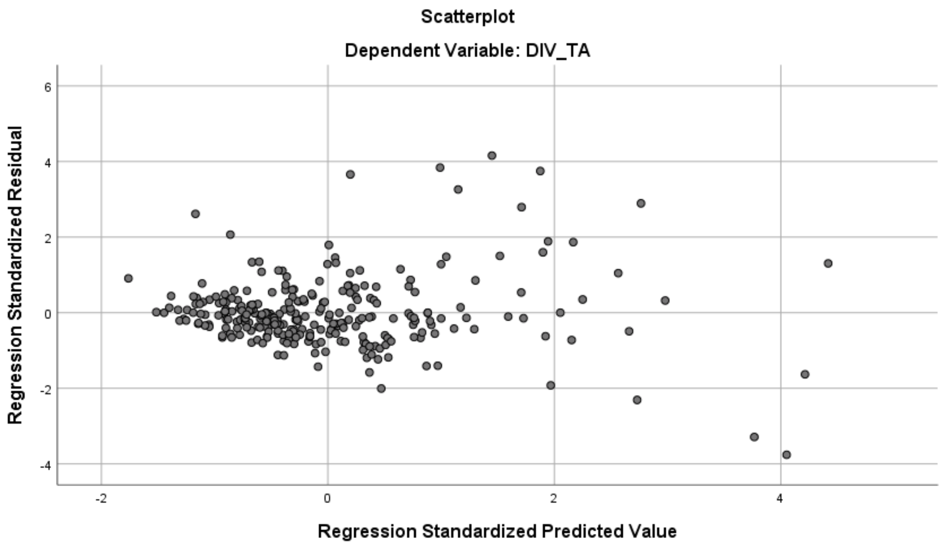
Correlations

		DIV_TA	DIV_NI	DIV_SALES	DIV_FCF	FCF	PROF	GROWTH	LEV	CSR	AGE	SIZE	OWN	TANG
DIV_TA	Pearson Correlation	1	,068	,653**	,559**	,598**	,427**	,304**	,085	,097	,156**	-,280**	,033	-,179**
	Sig. (2-tailed)		,250	,000	,000	,000	,000	,000	,148	,103	,008	,000	,582	,002
	N	288	285	282	288	288	285	283	288	286	288	286	283	288
DIV_NI	Pearson Correlation	,068	1	,294**	,267**	-,095	-,137*	,025	,045	-,050	,025	,051	-,030	,138*
	Sig. (2-tailed)	,250		,000	,000	,111	,021	,681	,445	,399	,671	,395	,613	,019
	N	285	288	282	288	285	285	280	285	285	288	283	280	285
DIV_SALES	Pearson Correlation	,653**	,294**	1	,693**	,167**	-,024	,064	,013	,140*	,040	,088	-,025	,129*
	Sig. (2-tailed)	,000	,000		,000	,005	,692	,291	,827	,018	,498	,142	,684	,031
	N	282	282	285	285	282	279	277	282	282	285	280	277	282
DIV_FCF	Pearson Correlation	,559**	,267**	,693**	1	-,068	-,052	,150*	,098	,263**	,160**	,128*	-,028	-,037
	Sig. (2-tailed)	,000	,000	,000		,248	,385	,012	,098	,000	,006	,030	,636	,534
	N	288	288	285	291	288	285	283	288	288	291	286	283	288
FCF	Pearson Correlation	,598**	-,095	,167**	-,068	1	,585**	,253**	,008	-,187**	-,008	-,523**	,044	-,209**
	Sig. (2-tailed)	,000	,111	,005	,248		,000	,000	,887	,001	,888	,000	,458	,000
	N	288	285	282	288	288	285	283	288	286	288	286	283	288
PROF	Pearson Correlation	,427**	-,137*	-,024	-,052	,585**	1	,354**	,083	-,035	,038	-,323**	-,117	-,266**
	Sig. (2-tailed)	,000	,021	,692	,385	,000		,000	,161	,558	,527	,000	,051	,000
	N	285	285	279	285	285	285	280	285	283	285	283	280	285
GROWTH	Pearson Correlation	,304**	,025	,064	,150*	,253**	,354**	1	,009	,022	,135*	-,124*	-,011	-,120*
	Sig. (2-tailed)	,000	,681	,291	,012	,000	,000		,886	,713	,023	,037	,860	,044
	N	283	280	277	283	283	280	283	283	281	283	282	278	283
LEV	Pearson Correlation	,085	,045	,013	,098	,008	,083	,009	1	,119*	,007	,038	,014	,139*
	Sig. (2-tailed)	,148	,445	,827	,098	,887	,161	,886		,045	,906	,518	,815	,019
	N	288	285	282	288	288	285	283	288	286	288	286	283	288
CSR	Pearson Correlation	,097	-,050	,140*	,263**	-,187**	-,035	,022	,119*	1	,184**	,394**	-,034	-,024
	Sig. (2-tailed)	,103	,399	,018	,000	,001	,558	,713	,045		,002	,000	,564	,685
	N	286	285	282	288	286	283	281	286	288	288	284	283	286
AGE	Pearson Correlation	,156**	,025	,040	,160**	-,008	,038	,135*	,007	,184**	1	,017	-,002	-,053
	Sig. (2-tailed)	,008	,671	,498	,006	,888	,527	,023	,906	,002		,769	,967	,366
	N	288	288	285	291	288	285	283	288	288	291	286	283	288
SIZE	Pearson Correlation	-,280**	,051	,088	,128*	-,523**	-,323**	-,124*	,038	,394**	,017	1	-,051	,203**
	Sig. (2-tailed)	,000	,395	,142	,030	,000	,000	,037	,518	,000	,769		,397	,001
	N	286	283	280	286	286	283	282	286	284	286	286	281	286
OWN	Pearson Correlation	,033	-,030	-,025	-,028	,044	-,117	-,011	,014	-,034	-,002	-,051	1	-,019
	Sig. (2-tailed)	,582	,613	,684	,636	,458	,051	,860	,815	,564	,967	,397		,747
	N	283	280	277	283	283	280	278	283	283	283	281	283	283
TANG	Pearson Correlation	-,179**	,138*	,129*	-,037	-,209**	-,266**	-,120*	,139*	-,024	-,053	,203**	-,019	1
	Sig. (2-tailed)	,002	,019	,031	,534	,000	,000	,044	,019	,685	,366	,001	,747	
	N	288	285	282	288	288	285	283	288	286	288	286	283	288

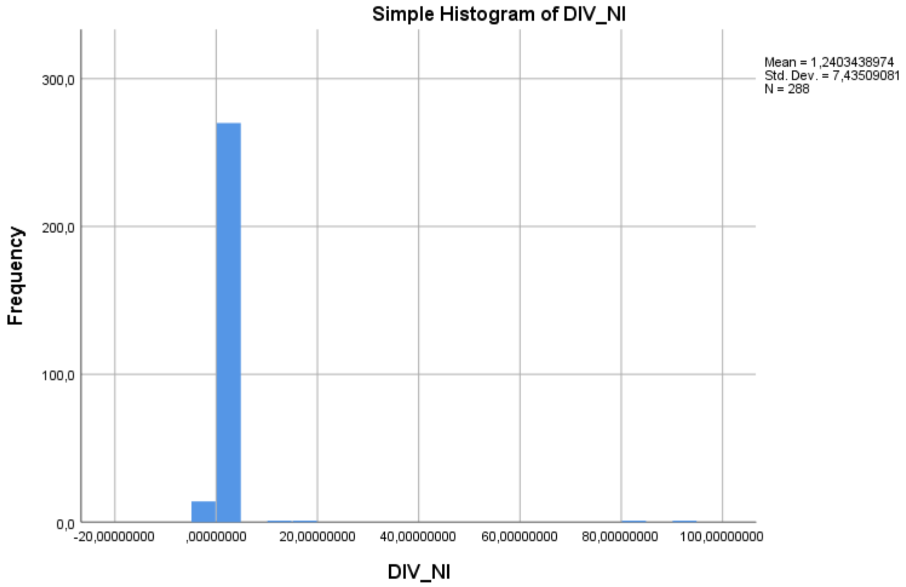
**. Correlation is significant at the 0.01 level (2-tailed).

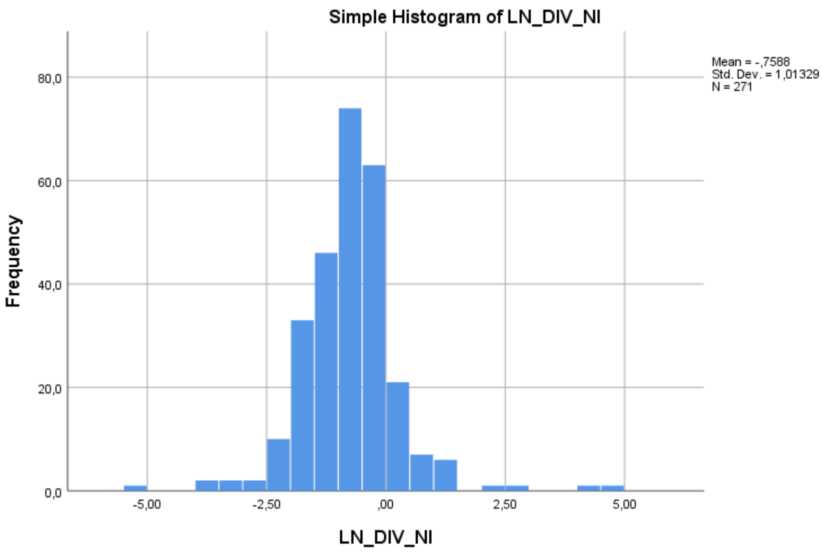
*. Correlation is significant at the 0.05 level (2-tailed).

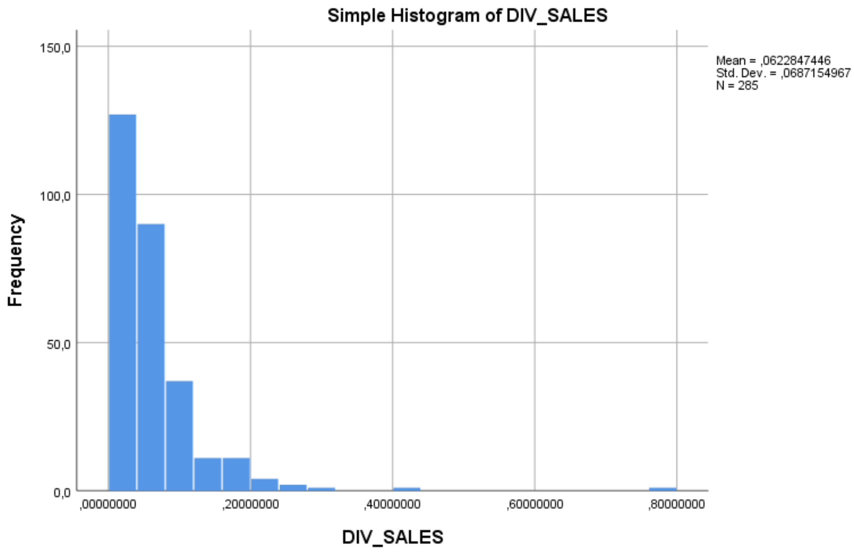
Homoscedasticity

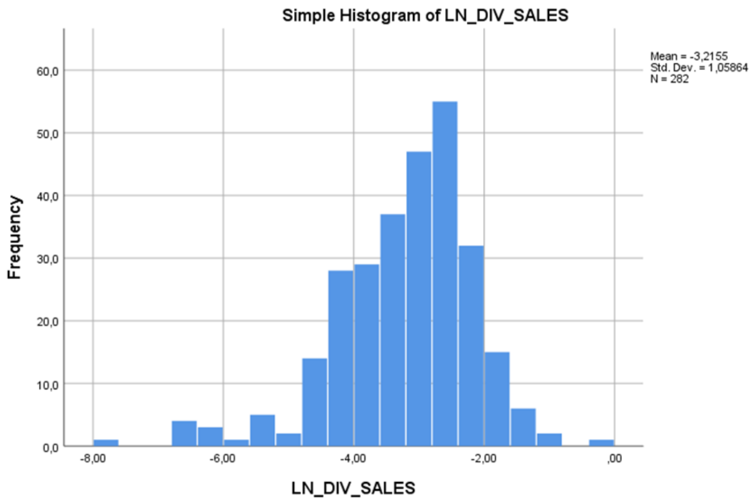


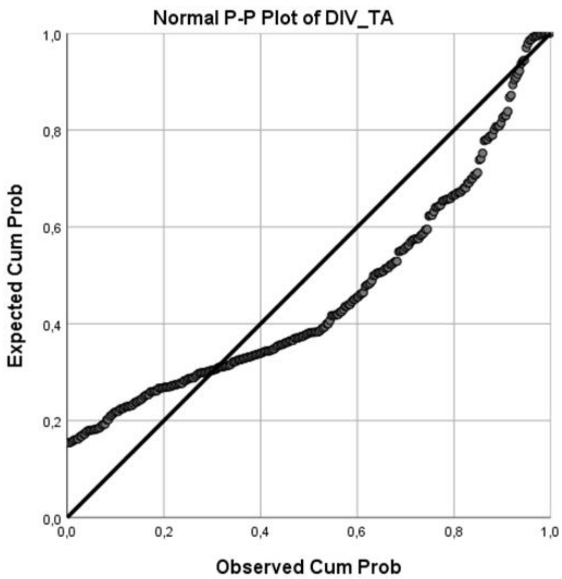
Normality

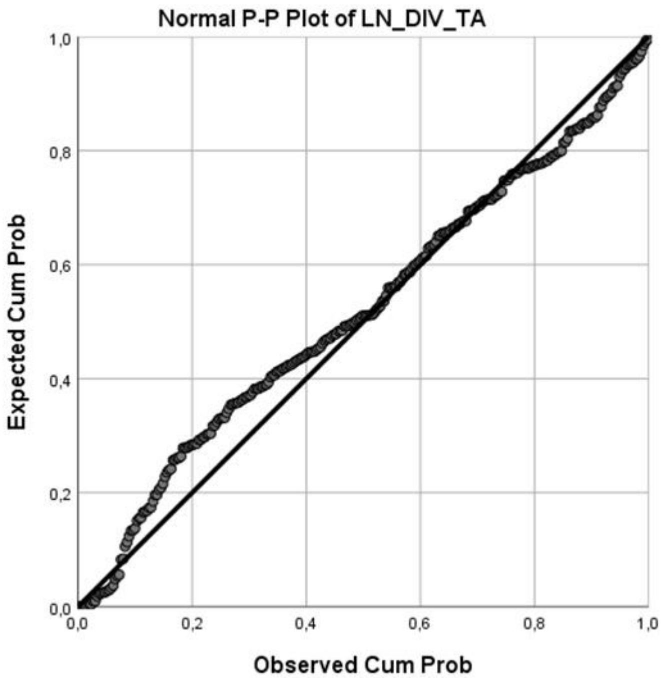

Simple Histogram of DIV_NI
Mean = 1,2403438974
Std. Dev. = 7,43509081
N = 288
300,0
200,0
100,0
0,0
Frequency
-20,00000000
,00000000
20,00000000
40,00000000
60,00000000
80,00000000
100,00000000
DIV_NI

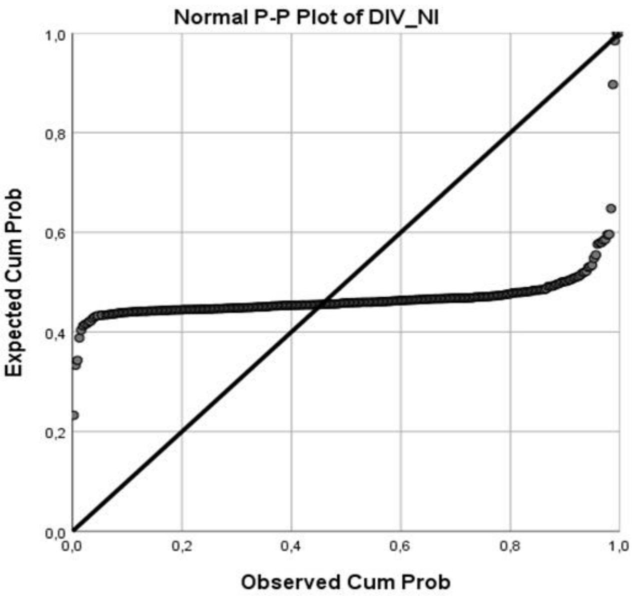

Simple Histogram of LN_DIV_NI
Mean = -,7588
Std. Dev. = 1,01329
N = 271
80,0
60,0
40,0
20,0
0,0
Frequency
-5,00
-2,50
,00
2,50
5,00
LN_DIV_NI

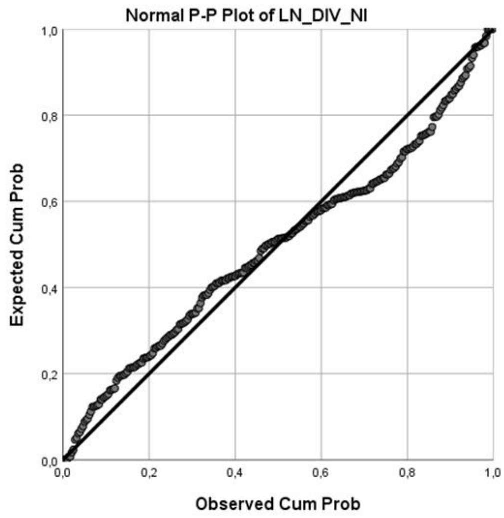

Simple Histogram of DIV_SALES
Mean = ,0622847446
Std. Dev. = ,0687154967
N = 285
Frequency
DIV_SALES


Simple Histogram of LN_DIV_SALES
Mean = -3,2155
Std. Dev. = 1,05864
N = 282
Frequency
LN_DIV_SALES


Normal P-P Plot of DIV_TA
Expected Cum Prob
Observed Cum Prob

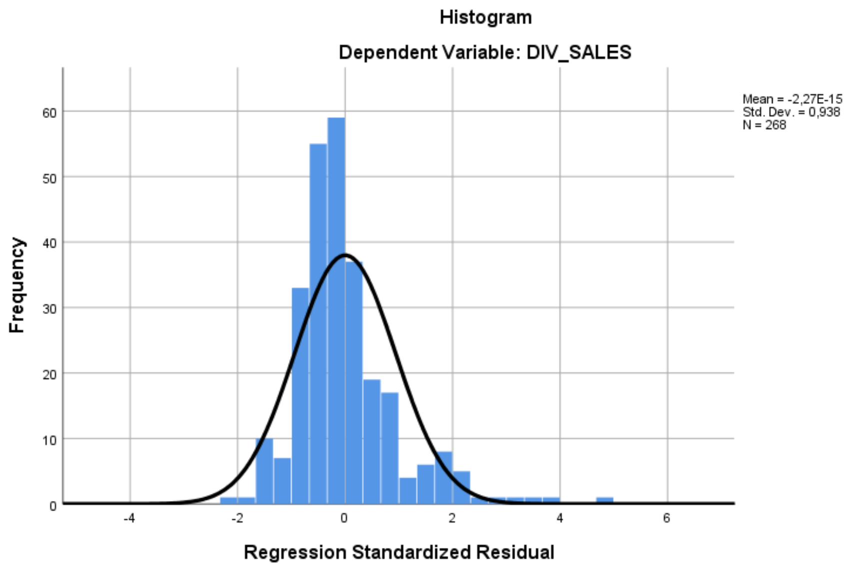

Normal P-P Plot of LN_DIV_TA
Expected Cum Prob
Observed Cum Prob
1,0
0,8
0,6
0,4
0,2
0,0
0,0
0,2
0,4
0,6
0,8
1,0

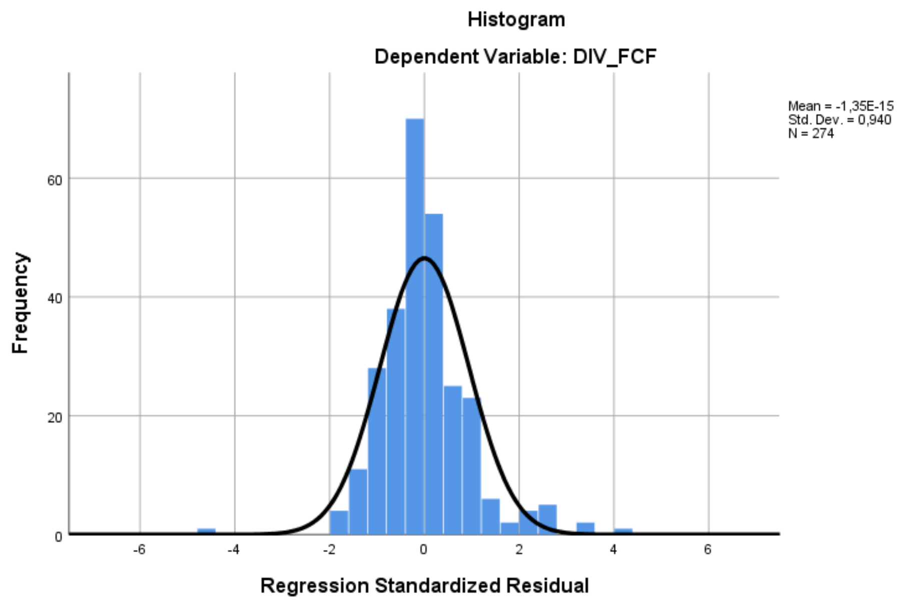

Normal P-P Plot of DIV_NI
Expected Cum Prob
Observed Cum Prob
1,0
0,8
0,6
0,4
0,2
0,0
0,0
0,2
0,4
0,6
0,8
1,0



Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
DIV_TA	288	,00000000	,33881184	,0403464427	,0396159428	3,248	,144
LN_DIV_TA	286	-8,19	-1,08	-3,5846	,96485	-1,016	,144
DIV_NI	288	-4,18912574	93,00000000	1,240343897	7,435090810	11,452	,144
LN_DIV_NI	271	-5,08	4,53	-,7588	1,01329	,731	,148
DIV_SALES	285	,00000000	,76093817	,0622847446	,0687154967	4,755	,144
LN_DIV_SALES	282	-7,70	-,27	-3,2155	1,05864	-,921	,145
DIV_FCF	291	-,80650685	1,87942305	,3044891503	,2307037157	1,262	,143
LN_DIV_FCF	286	-6,21	,63	-1,3975	,80881	-1,716	,144
Valid N (listwise)	264						





Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
FCF	,162	268	,000	,751	268	,000
DIV_TA	,145	268	,000	,811	268	,000
DIV_NI	,286	268	,000	,435	268	,000
DIV_SALES	,125	268	,000	,849	268	,000
DIV_FCF	,094	268	,000	,929	268	,000
PROF	,094	268	,000	,952	268	,000
GROWTH	,263	268	,000	,652	268	,000
LEV	,058	268	,030	,965	268	,000
CSR	,086	268	,000	,961	268	,000
AGE	,182	268	,000	,885	268	,000
SIZE	,035	268	,200*	,996	268	,811
OWN	,351	268	,000	,344	268	,000
TANG	,041	268	,200*	,987	268	,015

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Appendix II: Weighted least squares (WLS) results

Coefficients[a,b]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-4,769	,557		-8,562	<,001
	FCF	2,225	,463	,380	4,806	<,001
	PROF	2,946	,847	,248	3,477	<,001
	GROWTH	,013	,005	,146	2,838	,005
	LEV	,036	,194	,010	,188	,851
	CSR	,009	,004	,141	2,404	,017
	AGE	,003	,002	,102	1,978	,049
	OWN	-1,695	2,233	-,037	-,759	,449
	SIZE	-,024	,048	-,036	-,498	,619
	TANG	-,025	,220	-,007	-,113	,910
	Business_Services	,347	,365	,059	,952	,342
	Chemicals_Petroleum_Rubber_Plastic	,390	,272	,140	1,433	,153
	Communications	,113	,322	,026	,351	,726
	Computer_Hardware	-,015	,440	-,002	-,034	,973
	Computer_Software	,169	,328	,034	,514	,607
	Construction	-,787	,496	-,083	-1,587	,114
	Food_Tobacco_Manufacturing	,497	,286	,154	1,735	,084
	Industrial_Electric_Electronic_Machinery	,024	,265	,010	,090	,928
	Leather_Stone_Clay_Glass_products	,472	,578	,042	,817	,415
	Media_Broadcasting	-,071	,787	-,004	-,090	,929
	Metals_Metal_Products	,119	,417	,016	,286	,775
	Mining_Extraction	-,392	,361	-,068	-1,086	,279
	Miscellaneous_Manufacturing	,627	,642	,048	,977	,330
	Printing_Publishing	,074	,959	,004	,078	,938
	Public_Administration_Education_Health_Social_Services	-,484	,577	-,042	-,839	,402
	Retail	-,013	,300	-,003	-,043	,966
	Textiles_Clothing_Manufacturing	-,155	,461	-,018	-,337	,737
	Transport_Manufacturing	-,194	,341	-,038	-,571	,569
	Transport_Freight_Storage	-,185	,300	-,048	-,619	,537
	Travel_Personal_Leisure	,348	,316	,079	1,099	,273
	Utilities	,250	,280	,084	,892	,373
	Waste_Management_Treatment	,228	,572	,021	,399	,690
	Wholesale	-,064	,322	-,015	-,197	,844

a. Dependent Variable: LN_DIV_TA

b. Weighted Least Squares Regression - Weighted by weight_LN_DV_TA

Coefficients[a,b]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-1,204	,677		-1,778	,077
	FCF	2,597	,782	,283	3,319	,001
	PROF	-8,543	1,411	-,520	-6,052	<,001
	GROWTH	,017	,007	,149	2,475	,014
	LEV	,237	,261	,054	,908	,365
	CSR	,009	,004	,130	1,965	,051
	AGE	,001	,002	,029	,475	,635
	OWN	-5,623	2,551	-,125	-2,204	,028
	SIZE	-,027	,056	-,035	-,472	,637
	TANG	-,111	,271	-,028	-,410	,682
	Business_Services	,284	,441	,046	,645	,519
	Chemicals_Petroleum_Rubber_Plastic	,621	,329	,217	1,889	,060
	Communications	,563	,373	,136	1,509	,133
	Computer_Hardware	,317	,482	,046	,657	,512
	Computer_Software	,351	,387	,073	,908	,365
	Construction	-,749	,507	-,098	-1,477	,141
	Food_Tobacco_Manufacturing	,680	,344	,200	1,979	,049
	Industrial_Electric_Electronic_Machinery	,166	,315	,066	,527	,599
	Leather_Stone_Clay_Glass_products	,601	,851	,041	,706	,481
	Media_Broadcasting	-,196	,933	-,012	-,210	,834
	Metals_Metal_Products	,246	,474	,036	,519	,604
	Mining_Extraction	-,240	,416	-,044	-,576	,565
	Miscellaneous_Manufacturing	,673	,828	,047	,813	,417
	Public_Administration_Education_Health_Social_Services	-,567	,614	-,057	-,924	,357
	Retail	,018	,359	,005	,051	,960
	Textiles_Clothing_Manufacturing	-,253	,528	-,031	-,478	,633
	Transport_Manufacturing	,031	,383	,007	,081	,935
	Transport_Freight_Storage	,078	,363	,019	,215	,830
	Travel_Personal_Leisure	,163	,401	,031	,406	,685
	Utilities	,815	,332	,284	2,456	,015
	Waste_Management_Treatment	,391	,664	,036	,590	,556
	Wholesale	,224	,385	,048	,583	,560

a. Dependent Variable: LN_DIV_NI

b. Weighted Least Squares Regression - Weighted by weight_LN_DV_NI

Coefficients[a,b]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-4,960	,682		-7,278	<,001
	FCF	1,964	,623	,264	3,153	,002
	PROF	,061	1,089	,004	,056	,955
	GROWTH	,008	,006	,080	1,312	,191
	LEV	-,106	,259	-,025	-,411	,682
	CSR	,007	,005	,098	1,454	,147
	AGE	,001	,002	,047	,774	,440
	OWN	-5,004	2,921	-,099	-1,713	,088
	SIZE	,085	,056	,119	1,517	,131
	TANG	,210	,269	,052	,780	,436
	Business_Services	,333	,453	,055	,736	,463
	Chemicals_Petroleum_Rubber_Plastic	,478	,340	,181	1,407	,161
	Communications	,478	,386	,118	1,240	,216
	Computer_Hardware	-,144	,535	-,018	-,269	,788
	Computer_Software	,129	,408	,026	,315	,753
	Construction	-1,238	,663	-,115	-1,868	,063
	Food_Tobacco_Manufacturing	,547	,357	,170	1,534	,126
	Industrial_Electric_Electronic_Machinery	,175	,334	,071	,524	,601
	Leather_Stone_Clay_Glass_products	,506	,725	,043	,699	,485
	Media_Broadcasting	-,355	1,032	-,020	-,344	,731
	Metals_Metal_Products	-,011	,521	-,001	-,021	,983
	Mining_Extraction	-,079	,424	-,015	-,186	,852
	Miscellaneous_Manufacturing	,603	,832	,043	,725	,469
	Printing_Publishing	-,240	1,139	-,012	-,210	,833
	Public_Administration_Education_Health_Social_Services	-,887	,763	-,069	-1,163	,246
	Retail	-,864	,416	-,166	-2,076	,039
	Textiles_Clothing_Manufacturing	-,488	,606	-,051	-,804	,422
	Transport_Manufacturing	-,352	,423	-,067	-,831	,407
	Transport_Freight_Storage	-,183	,387	-,042	-,472	,637
	Travel_Personal_Leisure	,327	,400	,071	,817	,415
	Utilities	,716	,347	,251	2,061	,040
	Waste_Management_Treatment	,385	,656	,037	,587	,558
	Wholesale	-,801	,467	-,125	-1,717	,087

a. Dependent Variable: LN_DIV_SALES

b. Weighted Least Squares Regression - Weighted by weight_LN_DV_SALES

Coefficients[a,b]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-2,115	,503		-4,204	<,001
	FCF	-,809	,633	-,107	-1,277	,203
	PROF	-,124	,916	-,012	-,135	,893
	GROWTH	,013	,004	,205	3,127	,002
	LEV	,214	,198	,067	1,081	,281
	CSR	,008	,004	,144	2,135	,034
	AGE	,001	,001	,063	,993	,322
	OWN	-3,459	2,487	-,081	-1,391	,166
	SIZE	,013	,042	,022	,300	,764
	TANG	-,258	,199	-,088	-1,298	,196
	Business_Services	,278	,312	,065	,891	,374
	Chemicals_Petroleum_Rubber_Plastic	,440	,224	,253	1,961	,051
	Communications	,473	,280	,138	1,693	,092
	Computer_Hardware	,068	,379	,012	,179	,858
	Computer_Software	,207	,296	,052	,699	,485
	Construction	-,548	,506	-,065	-1,083	,280
	Food_Tobacco_Manufacturing	,615	,233	,317	2,640	,009
	Industrial_Electric_Electronic_Machinery	,104	,230	,053	,452	,652
	Leather_Stone_Clay_Glass_products	,471	,466	,063	1,011	,313
	Media_Broadcasting	-,025	,756	-,002	-,033	,974
	Metals_Metal_Products	,093	,375	,017	,249	,803
	Mining_Extraction	-,434	,362	-,081	-1,198	,232
	Miscellaneous_Manufacturing	,728	,405	,118	1,796	,074
	Public_Administration_Education_Health_Social_Services	-,439	,647	-,039	-,679	,498
	Retail	-,115	,277	-,034	-,417	,677
	Textiles_Clothing_Manufacturing	-,304	,460	-,041	-,660	,510
	Transport_Manufacturing	-,005	,288	-,001	-,018	,986
	Transport_Freight_Storage	,051	,284	,014	,178	,859
	Travel_Personal_Leisure	,211	,275	,064	,768	,444
	Utilities	,381	,238	,184	1,603	,110
	Waste_Management_Treatment	,193	,505	,024	,383	,702
	Wholesale	,156	,283	,044	,550	,583

a. Dependent Variable: LN_DIV_FCF

b. Weighted Least Squares Regression - Weighted by weighted_LN_DV_FCF