UNIVERSITY OF TURKU

ABSTRACT

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Author	Nicolas Salmelin	Number of pages	87 p. + appendix
Title	Dividends and Institutions – Empirical study on dividend decision and ownership structure on publicly listed companies in the European Union		
Supervisor	Prof. Luis H. R. Alvarez Esteban		

Abstract

Pension funds and insurance companies are interesting, usually at least partially tax-exempt, and strictly regulated entities which together manage more that 50% of the assets within the European Union. At the same time, cash dividends are still the most common way to distribute profit to investors and provides a stable cash flow in well diversified portfolio. Intuitively it could make sense that abovementioned institutional investors would prefer stable stream of cash to meet their annual obligations.

The purpose of this master's thesis was to investigate the link between institutional ownership and dividend decisions made by publicly listed firms on the EU market between 2010–2017. This subject has been studied before in different markets, but this thesis is the first that studies this phenomenon at the EU level by utilizing a unique data set combined from Bureau von Dijk's Orbis Europe and Refinitiv's Datastream and Worldscope databases. The main question is whether institutional investors would affect the dividend decision of the company where they have a significant, at least 5% share of equity. Furthermore, it is studied how presence of two or more institutional investors affect the decision. Additionally, few other potential determinants of dividends are tested.

The research was conducted by using a quantitative methodology which is a typical approach in corporate finance where data is widely available. Fixed effects linear regression model was determined to be the most appropriate method as panel data was available and the estimation was done by using ordinary least squares method. Due to heteroskedasticity, Eicker-Huber-White heteroskedastic consistent standard errors were used. Statistical analysis was done in R-Studio.

The empirical results of the thesis suggest that there is large and positive relationship between institutional investors and dividends distributed, even if not statistically significant, at least when one institutional investor is considered. In case of at least two institutional investors, the effect is large and negative while being statistically significant. In addition, earnings and previous dividends turn out to be important determinants of a dividend decision. To conclude, it appears that either institutional investors prefer dividends but the sample does not support that idea, or institutional investors are indifferent between dividends and capital gains and just happen to own large firms which typically pay more dividends, without causality.

Key words	dividends, institutional investor, ownership structure, panel data, dividend decision, EU, fixed effects regression,

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Tiivistelmä

Eläkerahastot ja vakuutusyhtiöt ovat mielenkiintoisia ja yleensä ainakin osittain verovapaita ja tiukasti säänneltyjä yhtiöitä, jotka yhdessä hallitsevat yli 50 % Euroopan Union sijoitusvarallisuudesta. Samanaikaisesti, käteisosingot ovat edelleen yleisin tapa siirtää voittoja sijoittajille, ja ne tuottavat tasaisen kassavirran hyvin hajautetussa portfoliossa. Intuitiivisesti ajatellen on uskottavaa väittää edellämainitun tyyppiset sijoittajat suosisivat tasaista käteisen virtaa pystyäkseen vastaamaan vuosittaisiin velvoitteisiinsa.

Tämän pro gradu -tutkielman tarkoituksena oli tutkia institutionaalisten sijoittajien ja julkisesti listattujen yhtiöiden osingonjakopäätösten välistä linkkiä EU:n markkinoilla aikavälillä 2010–2017. Aihetta on tutkittu aikaisemmin eri markkinoilla, mutta tämä tukielma on ensimmäinen, joka tutkii kyseistä ilmiötä EU:n tasolla käyttäen ainutlaatuista havaintodataa, joka on muodostettu yhdistämällä Bureau von Dijk's Orbis Europe ja Refinitivin Datastream ja Worldscope tietokantoja. Pääasiallisena kysymyksenä on se, että vaikuttavatko institutionaaliset sijoittajat yhtiön osingonjakopäätökseen, kun ne omistavat merkittävän, vähintään 5 % osuuden omasta pääomasta. Tämän lisäksi tutkitaan kuinka useamman kuin yhden merkittävän institutionaalisen sijoittajan läsnäolo vaikuttaa. Myös muutamaa muuta osinkoihin vaikuttavaa tekijää tutkittiin.

Tutkimus toteutettiin käyttämällä määrällistä metodologiaa, mikä on tyypillinen lähestymistapa yritysrahoituksessa, kun dataa on helposti saatavilla. Tutkimuksessa oli käytettävissä dataa paneelimuodossa, joten kiinteiden vaikutusten lineaarinen regressiomalli valittiin sopivimpana käytettäväksi metodiksi. Malli estimoitiin pienimmän neliösumman menetelmällä. Heteroskedatisuudesta johtuen tulosten analysoinnissa käytettiin Eicker-Huber-White heteroskedastisia keskivirheitä. Tilastolliset analyysit toteutettiin R-Studiolla.

Tutkielman empiiriset tulokset antavat ymmärtää, että institutionaalisten sijoittajien ja jaettujen osinkojen välillä olisi suuri ja positiivinen, vaikkakaan ei tilastollisesti merkittävä, yhteys yhden institutionaalisen sijoittajan tapauksessa. Kun sijoittajia on vähintään kaksi on yhteys suuri, negatiivinen, ja tilastollisesti merkittävä. Lisäksi ilmeni, että tuotoilla ja aikaisemmin jaetuilla osingoilla on tärkeä rooli osingonjakopäätöksen taustalla. Loppujen lopuksi, vaikuttaa siltä, että joko institutionaaliset sijoittajat suosivat osinkoja, mutta syystä tai toisesta aineisto ei tue tätä. Toisaalta on myös mahdollista, että institutionaaliset sijoittajat ovat indifferenttejä osinkojen ja myyntivoittojen välillä ja vain sattuvat omistamaan suuria yhtiöitä, jotka tyypillisesti maksavat enemmäm osinkoja, ilman syy-seuraus -suhdetta.

Avainsanat	osingot, institutionaalinen sijoittaja, omistusrakenne, paneelidata, osingonjakopäätös, EU, kiinteiden efektien malli,

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DIVIDENDS AND INSTITUTIONS

Empirical study on dividend decision and ownership structure on publicly listed companies in the European Union

Master's Thesis
in Accounting and Finance

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Espoo

The originality of this thesis has been checked in accordance with the University of Turku quality assurance system using the Turnitin OriginalityCheck service.

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1 INTRODUCTION

> The darkest hour is just before the dawn
>
> Thomas Fuller

Corporate finance in its essence, is looking for the answers to how firms are financed. But why to form firms in the first place? The original reason to establish firms is to redistribute the risk of complex and unpredictable business ventures to a large group of investors, whereas the ventures would be otherwise too risky to carry on by a single entrepreneur. Another important reason is the funding, i.e., the financing of risky projects. To acquire necessary assets to generate cash flow, an initial investment is required. This initial investment, as the future needs of financing, requires cash which could either be acquired by borrowing money or issuing shares. In both cases, lender or investors will demand compensation corresponding to the risk carried. In the case of debt, the answer is usually straightforward enough. Debtors will get the interest payment related to the default risk of investment which is calculated from the static principal lent at one certain point in time. In other words, the interest rate is defined at the moment of transaction and the interest is paid within a predetermined time period.

However, the investors' case is more complex. The investors' investment is more risky since the equity investment has a second lien claim on the residual of the investment in case of default. Furthermore, the compensation of a shareholder is not tied to a static principal or predetermined rate, but it depends on how the firm performs in the future and how profitable its investments in forthcoming projects will be. Additionally, there are multiple ways how the firm could compensate the investors; is the compensation paid in cash dividends, stock dividends, or share repurchase, or is the actual return of the investor generated through higher stock price and realized as capital gains when shares are sold?

This compensation of investors is referred as a *payout policy* of a firm within the modern corporate finance literature. Nevertheless, payout policies are only half of the equation. Since the payout policy is the way to compensate the shareholders[1] for the risk they are bearing for their investment, it depends on the shareholders that what kind of payout policy they prefer. However, in a case of large firms, an

[1]The focus of the thesis is on listed companies, i.e., corporations, thus, the words *shareholder* and *investor* are used interchangeably from now on.

acting management or a board of directors sets the payout policy of a firm, which naturally leads to conflicts of interests between shareholders and the management.

The shareholders have the final say on the payout decisions through an annual general meeting ('AGM'), but the interests of shareholders are not necessarily aligned with each other which lead to a second conflict of interests. Opposing decisions made by the management requires a strong influence among the shareholders. In other words, it requires a large amount of voting rights or collaboration among the shareholders, especially in the case of publicly listed companies with thousands of shareholders. On high level, the shareholders can be divided into two main groups, institutional investors and individual investors (Damodaran 2011).

According to Damodaran (2011), the group of institutional investors includes investors such as mutual funds, pension funds, and corporate investors, while the group of individual investors consist of private persons and other individuals. For instance, an institutional investor with a large stake in the firm could have enough influence to effect the payout decision, but a small individual investor would require a high amount of collaboration with other shareholders to change the decisions.

The main focus of the thesis is on the payout policies of firms and how the ownership affects these. Even though the problems and open questions concerning the payout policies are as old as the concept of a firm itself, the research has still not conclusevily answered these questions. Hence, the payout policies of firms and the determinants behind these payout policies chosen are still unsolved and remain relevant in the 21st century. Based on financial theory, it is not even clear why investors demand cash dividends because dividends are usually subject to double taxation, i.e., taxation first on the firm level and then on the investor level.

The second component of the thesis is the role of institutional investors' ownership. At the end of 2018, assets under management within the European Union amounted to EUR 23.1 trillion, which is the equivalent of 134% of the total GDP of the EU. Pension funds, insurance companies, and banks manage 28%, 25% and 2% of these assets, respectively. (EFAMA 2019, 4-5.)

Within the scope of the thesis, institutional investors are limited to pension funds and insurance companies and the term *institutional investor* refers to these firms exclusively.

Institutional investors are typically regulated by national laws and supervised by governmental authorities. In Finland, for example, both pension funds and insurance companies are regulated by specific laws[2], which limits the investment

[2]By Act on Earnings-Related Pension Insurance Companies (in Finnish 'Laki työeläkevakuutusyhtiöistä' (25.4.1997/354)) and by Insurance Companies Act (in Finnish 'Vakuutusyhtiölaki' (18.7.2008/521)), respectively.

decisions made by setting up restrictions on exposures to certain risks. The operations and compliance of the institutional investors are then supervised by the Finnish Financial Supervisory Authority (in Finnish 'Finanssivalvonta') in the Finnish context.

Based on the regulation and the nature of operation, pension funds and insurance companies require a certain amount of cash to meet pension payments and claims for insurance. This amount of cash and other solvency requirements are typically set in legislation which make this group of investors interesting.

The first to empirically address this problem within modern finance research was Lintner (1956) who conducted interview-based research of US corporate managers to find what is the *primus motor* for dividend policies pursued by companies. The sample of the study was modest and consists of 28 firms of S&P 600. He discovered that managers are following either consciously or unconsciously a certain firm specific target dividend rate.

However, the amount of dividends distributed does not follow this target dividend rate instantaneously, but managers adjust with delay and are reluctant to cut dividends. This manifests itself as smooth changes in dividends from year to year and as sticky amount dividends. As a conclusion, dividends appear to be tied to the long-term earning potential of a firm, while the relationship between current earnings and existing dividend rate sets the anchor point for dividend decisions of the management. (Lintner 1956.)

Nonetheless, Brav, Graham, Harvey and Michaely (2005) conducted a new research by surveying 384 and interviewing 23 financial executives of listed and private US corporations in the early 21st century and found supporting evidence to Lintner (1956) findings. They found out that even if there are no more set dividend payout ratios, the dividends still tend to be smooth and sticky. In other words, managers are still reluctant to cut existing dividends and certain dividend smoothing occurs. These findings are supported by a recent empirical analysis of Leary and Michaely (2011) where they conducted cross-sectional analysis of dividend smoothing properties. They found that the dividend smoothing has actually increased during the last 80 years and discovered additional determinants of dividend policies.

1.1 Purpose of the thesis and research questions

The aim of the thesis is to find the link between institutional ownership and dividend policies pursued by publicly listed companies within the European Union during recent years. The motivation for this thesis topic is that even if dividends and ownership structure have been both studied together and in isolation, this kind of study has not been conducted at the EU level. Furthermore, finding evidence on how presence of institutional investors would affect the dividend decision made by companies would provide beneficial information for other investors and regulators.

Within the scope of the the study, institutional investors are limited to pension funds and insurance companies because of their heavily regulated structure, their specific operating structure, and because they control large amounts of investments. The relationship is studied between firms where an institutional investor owns a significant stake, either directly or indirectly, of the firm's equity in comparison to firms where such ownership does not exist. Institutional ownership is considered to be significant when a single institutional investor has at least 5% stake in the firm's equity.

The initial hypothesis is that since institutional investors risk exposure is limited by regulation and as they need stable need for cash to meet constant liabilities, they would prefer companies that pay stable annual dividends. Hence, based on the abovementioned reasons, the intuition is that there should be a strong and positive link between instituional ownership and dividen policies pursued by firms with all other things equal.

The research questions for this thesis are:

RQ1. How does the presence of an institutional investor affect the dividend policy decision of a firm when the dividend policy is modeled as a change in dividends?

RQ2. How does the presence of two or more institutional investors affect the dividend policy decision of a firm when the dividend policy is modeled as change in dividends?

RQ3. Is institutional ownership a significant determinant for dividend policy pursued by a firm and if so, how large is the effect?

RQ4. Is institutional ownership a significant determinant for dividend policy pursued by a firm and if so, how large is the effect when there are two or more institutional owners?

1.2 Scope and limitations of the study

Scope of the thesis includes the relationship between the ownership structure and dividend policy pursued by European listed companies. The focus on cash dividends paid by companies and other profit distribution mechanisms are excluded, for example, share repurchases, transfer pricing related profit distribution and shareholder loans because there are either not sufficient data available or their effect on the European market is still minor when compared to cash dividends distributed.

The sample consists of 2 818 listed companies in 28 European Union countries where I have included companies recognized as a *corporate* within the Orbis database. This specific political area was chosen for the thesis because most of the research on this subject has focused on either the UK or US market or on some specific countries within Europe or globally. Furthermore, the European Union can be identified as a specific political and economical area.

Based on the data available, the quality of the data, and the search criteria chosen, it is possible that some firms that otherwise would add value to the research might have excluded from the sample. However, the sample includes wide variety of European public companies as described later in Section 3 and it should provide a representative sample of companies within the scope of the thesis.

Data used for the thesis is based on public accounting information of the com-

panies domiciled in the European Union countries was retrieved using commercial databases. Hence, it is subject to different accounting conventions and potentially to accounting information manipulation, i.e., the validity and correctness of the data has not been verified on a firm level.

As dividends are not the only payout option for firms. Share repurchases have more and more important role as a profit distribution mechanism and have been thoroughly researched, especially, in the US market. Additionally, profit distribution mechanisms between parent and child companies within company groups via transfer pricing and group contribution systems, and between private equity investors and investments by funding different group structures, for example via shareholder loans, are important, they have been decided to leave out of the scope of the thesis to keep the scope of the thesis adequate to master's thesis.

1.3 Structure of the thesis

The thesis is divided into six main sections. Section 1 is the introduction and provides the broad background of the study and the motivation behind the research. Also the research questions are introduced in this section. Finally, the scope and limitations are described and defined.

In Section 2, the theoretical background of the study is discussed and it is further divided into three subsections which provide the necessary theoretical framework, review on prior research on dividends, on dividend policies and on the effects of ownership structure. The final subsection introduces the link between the theoretical framework and the models chosen to conduct the empirical analysis of the thesis. Research of dividends and corporate ownership are thoroughly reviewed based on both classic studies and contemporary research.

Section 3 describes the sample used for the thesis and presents the methodology chosen for this research. It begins with detailed description of the data sample and how it is composed. Furthermore it describes the methodology and models chosen to find the answers for the research question. Within this section also the robustness checks applied to the chosen models are discussed.

The analysis of the results are discussed in Section 4, which also provides the answers for the research questions. Section 5 concludes the study and the limitations and suggestions for future research are discussed. Finally, Section 6 summarizes the study.

2 THEORETICAL FRAMEWORK

Theoretical framework, on which the thesis is built, is discussed within this section. As mentioned above, the focus will be on dividends and the determinants of dividend policy, corporate ownership structure, and the models utilized in prior research to find the relationship between dividend policies and corporate ownership structures. The theoretical foundation discussed in the following chapters is consist of both classic research papers and more recent research concerning these themes. The theories discussed within this section are essential as benchmarks for the model tested within this thesis. Based on this theoretical background, it is possible to control the proposed variables and determine if the institutional ownership has a significant effect on the dividend policies.

2.1 Dividends

In the world of corporate finance, there are three fundamental decisions that every firm faces regardless of their size or line of business - investment, financing and dividend decisions. In this thesis, the focus is on the dividend decisions and dividend policies pursued by firms. According to the well established theory of a firm, dividends are defined as a the distribution of the residual cash flow to the shareholders as a compensation of the risk carried. From theoretical point of view, the firm should distribute the surplus to the investors if there is not any positive net present value project available, i.e., projects that could earn at least the investors' required rate of return.(Damodaran 2011, 2–3.)

Firms have been paying dividends since the beginning corporations, but there have been different trends in how the payments have been made during the last 100 years. Most of the time, cash dividends have been the major profit distribution mechanism between firms and investors. However, since the 1980s, when share repurchase legislation was changed in the US, the amount of share repurchases has been increasing faster and faster, especially in the US. In Europe, share repurchases have been legal (in most parts) since the late 1990s but it is still more strictly regulated compared to the US system.

The number of dividend payers decreased sharply in the US between 1978 and 1999 from 66.5% to 20.8% among the listed US firms (Fama and French 2001.) but at the same time the real dollar value of dividends increased by 22.7% between 1978 and 2000 (Grullon and Michaely 2002; DeAngelo, DeAngelo and

Skinner 2004.). The rationale for this seemingly contradicting evidence is that newly established growth companies do not tend to pay dividends but instead retain the earnings in order to grow further. At the same time the more mature firms pay increasing dividends, i.e., the dividends concentrate to a smaller group of firms in the population DeAngelo et al. (2004).

Nevertheless, as mentioned above, dividends are not the only payout option for firms. Share repurchases have more and more important role as a profit distribution mechanism and have been thoroughly researched, especially, in the US market.

2.1.1 Foundation of payout policy theories

The foundation for the research of payout policies was laid when Lintner (1956) and Miller and Modigliani (1961) conducted their pioneering work about the distribution of a firm's earnings and its effect on the firm value. Within Lintner's comprehensive survey on the US market showed that dividends are sticky and they smooth over time. In essence, the stickiness of dividends means that the managers are reluctant to cut dividends and are even prepared to fund the dividends by external funding in order to keep a stable dividend rate i.e. the target dividend payout ratio. The smoothing effect of dividends means that the dividends do not follow the growth or decline of earnings at the same pace, but they tend to smooth over time. These effects are captured in his *full adjustment model* and *partial adjustment model* discussed more in detail in section below.

On the contrary to the contemporary thinking, the underlying paradigm was that the shareholders' wealth was maximized by increasing dividend payouts. Thus, the idea of Miller and Modigliani (1961) that dividends are irrelevant, was considered as renegade. They proved that in frictionless markets the chosen payout policy cannot create value for shareholders over the investment decisions made. However, the investors care for the dividends or other forms of payout because they want the firm to distribute the value generated by investment decisions to the shareholders. A decade later, Black (1976) wrote his influential "The Dividend Puzzle" article where he analyzed the Modigliani-Miller theorem and came to the same conclusion that such large dividend payments made by firms make no sense from the theoretical point of view.

In order to the proposition to hold several assumptions are required. First, the market needs to be frictionless, i.e., there are no difference in taxation between taxes on capital gains and dividend income, and there are no issuance or transaction costs. Second, the investors and managers act rationally, which lead to

fair pricing of securities and rational investment decisions. Third, all market participants are equally informed and they could not have an effect on the market prices. Furthermore, the firm is operating on a infinite time horizon where there is no need to separate between equity or debt as a source of capital, and since the model assumes that the investment policy pursued is held constant over time, the firm will pay 100% of its free cash flow ('FCF') as dividends to the shareholders. These assumptions lead to the following equation where the firm's payout (D) at date t is:

$$D_t = X_t - I_t + S_t = FCF_t + S_t \tag{1}$$

where X is cash from prior operations, I is the size investment decision, S denotes the stock issuance. $X - I$ thus translates to the free cash flow. The only way for the firm to modify its dividend decision is to issue new stock.(Miller and Modigliani 1961; DeAngelo, DeAngelo and Skinner 2009.)

The value of the firm can be expressed as a discounted value of the future cash flows and capital gains:

$$V_t = \frac{D_t + p_{t+1}}{1 + r_e} \tag{2}$$

where V is the value of firm, D is the dividend payout, p denotes the price of a stock and r_e denotes the investor's required return on equity, while t denotes the time period. (Damodaran 2011.)

However, it is possible to express the value including the possible issued stock in the future by extracting the issued stock from the future value, and thus the equation becomes:

$$V_t = \frac{D_t + V_{t+1} - m_{t+1} * p_{t+1}}{1 + r_e} \tag{3}$$

where m denotes the amount of stock issued in the future.

As the only option for funding in this model is equity, the funding of the firm equals to the net profit X and new stock issuance $m_{t+1} * p_{t+1}$. Hence, the required new stock can be expressed by:

$$m_{t+1} * p_{t+1} = I_t - (X_t - D_t) \tag{4}$$

When this is substituted to Equation 2, the value of the firm will become:

$$V_t = \frac{D_t + V_{t+1} - I_t + X_t - D_t}{1 + r_e} = \frac{V_{t+1} - I_t + X_t}{1 + r_e} \tag{5}$$

and the dividends disappear from the equation.(Miller and Modigliani 1961; Tanushev 2016.)

In essence, the dividend irrelevance theorem proves that under a fixed indefinite investment policy, a dividend policy will have no effect on the value of the firm, i.e.,

the shareholders wealth. Hence, an rational investor should be indifferent between a dividend paying firm and a non-paying firm of the same risk class. However, empirical studies have gained contradictory results to this theorem, and other potential explanations have been proposed since then. These other explanations are discussed in the following sections.

2.1.2 Agency theory

Jensen and Meckling (1976) challenged Modigliani's and Miller's view and presented the dividend distribution as a combination of an agency and an ownership relation of a firm. The idea was to view payout policies essentially as a principal-agent problem. In every situation where there is someone acting as a representative, i.e., the agent for someone else, the principal, there is a possibility for a principal-agent problem (hereafter 'agency problem') to occur, because both parties have different incentives and conflicting interests. The information between the agent and the principal is asymmetric in nature and provides an opportunity to the agent to take advantage of the principal. (Ross 1973; Stiglitz 1989). This disparity between agent and principal and its effects on the value of a firm are usually referred as agency costs.

In the context of dividends, an agency problem could appear between corporate management and shareholders (Jensen and Meckling 1976; Easterbrook 1984; Jensen 1986) or between large shareholders and small shareholders (Easterbrook 1984; Shleifer and Vishny 1986; La Porta, Lopez-de Silanes and Shleifer 1999; La Porta, Lopez-de Silanes, Shleifer and Vishny 2000; Maury and Pajuste 2002).

The main hypothesis behind the agency problem is that whenever a business generates excess cash flow after all positive net present value investments, i.e., free cash flow, the management of a company would invest it in a way that is not effective or profitable for the shareholders. They might invest the free cash flow in negative net present value projects, which is aligned with the private interest of the managers, e.g., perquisites or other privately beneficial projects, or they might overinvest in unmonitored mergers. (Easterbrook 1984; Jensen 1986.)

Easterbrook (1984) suggested that one way to reduce the agency costs is to reduce the free cash flow available for the management. He argues that since dividend obligations which have been set reduce the cash available for investments, the management is required to enter the external capital markets to attain funding. Hence, monitoring of the management is outsourced to capital markets which reduce the monitoring costs of shareholders. Wei, Wang and Guo (2019) encountered

evidence supporting this hypothesis in Chinese market where the government has adopted a 30% quasi-mandatory dividend rule. According to their findings, after adopting the rule, overinvestments in small-dividend firms was reduced. Nonetheless, their sample was not conclusive and the results could not be generalized without further research.

Regardless of this explanation's support from empirical studies, it does not answer the questions of how and why the management would give up its private negative value projects in order to increase dividends. Zwiebel (1996) suggests that the constraint which limits the suboptimal investments of the management, is debt. Since the managers usually make the capital structure decisions they try to attain a level of debt that will prevent the company being taken over by hostile raiders. At the same time, if the level of debt is significant enough to make a potentially bad investment decision to cause bankruptcy, they will restrain to invest in negative net present value investments. According to Zwiebel's model, firms with high level debt also pay a large amount of their earnings as dividends instead of retaining the earnings within the firm. He claimed that the managers prefer certain level of net debt in order to prevent losing control of the firm.

Another explanation could be external regulation combined with strong corporate governance and greater protection of minority shareholders. La Porta et al. (2000) identified a significant link between dividends and minority shareholder protection whereas weaker protection leads to higher demand for dividends and vice versa. They also found that there is a significant difference between common law countries and civil law countries where protection for minor shareholders is strong or weak, respectively. Based on their results, they developed two different models, dividend outcome and dividend substitute model. The hypothesis within the first model is that dividends are an outcome of legal protection of minority shareholders. Thus, in countries where the legal protection of minority shareholders is strong, firms tend to pay higher dividends because the legal system is developed and efficient enough to sanction the expropriation of minority shareholders. Alternatively, the substitute model suggests that dividends act as substitute for the insufficient legal protection of minority shareholders and firms are paying dividends in order to gain a reputation as a reliable company. As a result of their research, La Porta et al. (2000) found evidence to support the outcome model. However, Jain and Chu (2014) found contrary evidence that supported the substitute model instead in their recent study consisting of 32 different countries. They argue that the results differ due to the different time periods studied. Additionally, they discovered strong evidence that different dividend clienteles exist.

According to Allen, Bernardo and Welch (2000), firms seek to attract a certain

kind of investors, i.e., clientele by choosing the dividend policy accordingly. They argue that it is also the main reason why firms choose to pay dividends instead of repurchasing sales. In their article, they divide investors based on taxation into institutional untaxed investors and taxed individual investors. They argue further that a presence of an institutional investor has a positive effect on the value and performance of the firm because the institutional investor will monitor the management. Consequently, it implies that low-quality firms try not to attain institutional investors because under their monitoring their lower quality would be revealed. Their study was conducted in the US stock market which differs from the European stock markets within the scope of this thesis regarding tax legislation. Dahlquist, Robertsson and Rydqvist (2014) identified four different tax clientele in Swedish stock market, which included tax-neutral investors (e.g., pension funds and life insurance companies), businesses, and individuals (e.g., private and public corporations), investment funds (mutual funds and close-end funds) and partnerships. They discovered significant evidence that these different tax clientele act accordingly to the tax clientele hypothesis.

2.1.3 Signaling theory

The management of a company consistently has more detailed information of the financial situation or of forthcoming projects than non-manager shareholders. This insider information forms the cornerstone of the agency problem where the asymmetric information gives an advantage to the management. However, the management may use this information to give a signal to less-informed shareholders and investors on how the company is performing. One way to do this, is to signal this insider information to the market via dividend decision. The management may adjust the level of dividends so it would reflect the current situation or future earning potential and vice versa. This could explain why markets typically react positively to increased dividends. (Farre-Mensa, Michaely and Schmalz 2014.)

Bhattacharya (1979) introduced a theory which was later referred as the *signaling theory*. He argued that based on the nature of dividends as surplus of a firm's earnings they are inherently linked to future cash flows. Furthermore, as in his model the firm is expected to meet its financial obligations including promised dividends without raising external funding the change in the level of dividends is a signal of its long-term profitability. This means that only undervalued companies would be able to increase the level of dividends because for overvalued firms it would mean dependence on expensive external funding to cover it dividends.

Alternative signaling models have been proposed by Miller and Rock (1985) and John and Williams (1985) with the same principles except the cost of signaling. Miller and Rock (1985) pointed out that dividends as signals make sense when the insider information is positive and the cost of signaling, i.e., the increase in net dividends is bearable since the cost of giving 'false' signal to the market would be even more harmful.

2.1.4 Catering theory

Baker and Wurgler (2004) proposed in their article that firms are making their dividend policy decisions based on the investors' demand for dividends. In other words, they pay dividends when investors are putting a premium on dividend payers and refrain from paying dividends when investors prefer non-payers. The intuition behind their theory is that the excess demand for dividend payers is positively related to the dividend premium set by investors, whereas the future earnings of the firm are negatively related to this demand. Respectively, this implicates that when the demand for dividend payers is high, firms tend to be overpriced and thus, the future earnings of these firms would be relatively low. In their model it is assumed that investors categorize firms in three different categories: dividend-payers, non-payers, and former dividend payers, and therefore they price these firms differently. Their model is based on the idea that the investors have irrational expectations of the liquidating cash flow of a company and could not perceive the effect of dividends in the final cash flow. Hence, their prices for the stock differ and dividend-payer's stock is priced on premium. As a control for arbitrage, the model includes arbitrageurs which perceive the effect of dividends rationally and thus, do not invest in the mispriced stock. They found supporting evidence that the managers will opportunistically modify the payout policies depending on the investors demands. They also claimed that the reason investors demand dividends is based on sentiment.

The another implication of the study of Baker and Wurgler (2004) is that management's catering the investors might be a reason why the stock price of a firm deviates from its fundamentals. This was further researched by Polk and Sapienza (2008) and they suggest that the management may invest in negative NPV projects if it could boost the stock price, i.e., the management acts against the benefits of shareholders. Ferris, Jayaraman and Sabherwal (2009) found further evidence in their investigation that consist of 25,000 firm year observations from 23 countries. Their results suggest that firms in common law countries are prone to follow the

demands of investors. They argue that this is due the stronger legal protection of the investors. However, this seems not to be the case in civil law countries where instead of strong legal protection, the management is disciplined by controlling inside shareholders. Furthermore, Jiang, Kim, Lie and Yang (2013) and Kulchania (2013) found a statistically significant correlation between dividends paid and dividend premiums attached by investors in the US market. Additionally, they suggest that share repurchases are inversely correlated with dividend premiums and vice versa. Hence, they conclude that they could be used at least as a partially substitute for each other.

However, there has also been evidence that dividend payouts and share repurchases do not stand as perfect substitutes in payout decisions. The evidence of Mitchell and Dharmawan (2007) and Andriosopoulos and Hoque (2013) suggests that specific characeteristrics of different countries affect the payout decision and for example in the UK and Germany dividends and share repurchases complement each other in comparison to France where they are negatively related. Furthermore, Andres, Doumet, Fernau and Theissen (2015) found that dividends and share repurchases have a different role in profit distribution. Common dividends are used to distribute more permanent earnings, while the role of share repurchase is to be a more flexible payout method for transitory earnings.

2.1.5 Life-cycle theory

Life-cycle theory of firms take a radical leap from the fundamentals laid by Modigiliani and Miller's dividend irrelevance proposition. Instead of seeing dividends as irrelevant between the same risk class firms, life-cycle theory categorizes the firms in in different baskets depending on their current state in the life-cycle. As DeAngelo, DeAngelo and Stulz (2006) found within their study, young growth firms tend not to pay dividends but instead retain earnings to grow further. On the other hand the well-established, mature companies that have already track record on paying dividends pay the lion share of earnings out as dividends.

This theory is not contradictory to the earlier findings of Fama and French (2001) where dividends "disappeared" in the US market. Instead, when studying the data set used, it seems that even if the number of dividend paying companies fell sharply, the real value of dividends increased (also in the EU). This could be a result of the appearance of new young public growth companies which did not distribute dividends but instead invested earnings back into business development and growth.

2.2 Corporate ownership structure and dividends

In addition to the abovementioned theories, comprehensive research has been made in finding the determinants or financial attributes associated with dividend policies. It has been shown that for example firm size, industry, free cash flow, earnings, past dividends, corporate ownership structure, firm maturity, leverage, and profitability are often associated with dividend policies. These attributes are also shared between different regions and countries, which enables research on the global market as well. (Denis and Stepanyan 2009; Bancel, Bhattacharyya and Mittoo 2011; Baker, Dewasiri, Koralalage and Azeez 2019.)

One specific area of focus has been a ownership structure of a firm and its effects on the dividend policies. This is an interesting approach and intuitively feasible solution because the dividends distributed are the compensation for the investors for their risk exposure. Typical attributes that have been analyzed in a linkage to dividend policies are the roles of managerial ownership, controlling shareholder ownership or ownership concentration, minor shareholder ownership, state ownership, and institutional ownership.

Faccio and Lang (2002) analyzed the ultimate ownership of European firms and found that a majority of continental Europe firms are still family owned, whereas firms is the UK and Ireland are mostly widely held. Kim, Rhim and Friesner (2007) found that managerial ownership in Korean market is positively related to dividend payments while Short, Zhang and Keasey (2002) study suggests that managerial ownership, when in analyzed with institutional ownership, has a negative effect on dividends in the UK market.

Ownership concentration or controlling ownership, which is typical to family-owned enterprises, is often found to be negatively related to dividend distribution. The previous research suggests that this relationship is due to the expropriation of minority shareholders by large shareholders, i.e., large shareholders which are entitled to a large share of cash flow, especially in dual class share schemes, might use their voting rights or dominant position to attain private benefits instead of distributing dividends. These effects were found in US, Finnish, Italian, UK and Malaysian markets. (La Porta et al. 1999; Faccio, Lang and Young 2001; Maury and Pajuste 2002; Mancinelli and Ozkan 2006; Renneboog and Trojanowski 2007; Ting, Kweh and Somosundaram 2017.)

Similarly, in countries where minority shareholders have stronger legal rights and protection provided by the state, firms tend to pay more dividends than in countries with questionable shareholder protection (La Porta et al. 2000).

2.2.1 Institutional ownership

In order to analyze the effects of an institutional ownership on dividend policy of a firm, the concept of an institutional investor must be defined. On the most high level, investors can be divided into two groups, institutional investors and retail investors. Institutional investors comprise of sovereign or semi-sovereign institutions like central banks, state-owned financial institutions and funds, and of corporates, pension funds, mutual funds, private equity investors and insurance companies. Retail investors on the other hand consist of private persons.

Within this thesis the focus is on institutional ownership and more precisely on pension funds, insurance companies and on other regulated institutional investors. In a recent survey, McCahery, Sautner and Starks (2016) investigated the mechanisms how the institutional investors can use power over the management and have influence on decisions made inside firms. These two main methods are *voice* and *exit* where voice refers to a negotiation and discussions with management and board of directors behind the scenes, and exit to the threat to sell the shares and vote by leaving. One of the main motives behind these actions is the investment horizons of the institutional investor, where long-term investor is more likely to use voice instead of exit and *vice versa*.

The role of institutional investors is ambiguous, but when compared to retail investors, it is clear that they can exercise either direct or indirect power in firms by negotiating with management or threatening with exit and thus having a larger effect even when acting alone. The association between institutional ownership and dividends tends to be positive in empirical research. This relationship has been explained by dividends being premium paid for superior monitoring and to attract more institutional investors in order to enhance the share price (Jensen 1986; Allen et al. 2000). Accordingly, Crane, Michenaud and Weston (2016) suggest that institutional investors reduce the agency cost between management and shareholders by increased monitoring in line with agency theory and associating higher total payout with institutional ownership. However Chang, Kang and Li (2016) found narrowing evidence on institutional investors' ability of effective monitoring and only institutional investors with long investment horizons increased the dividends, thus arguing that institutional investors consist of a heterogeneous mass.

Grinstein and Michaely (2005) found that even though institutional investors tend to own stocks in dividend paying firms, an increase in dividends does not attract more institutions. Consistent with this, Graham and Kumar (2006) suggest that institutional investors are attracted to lower dividend yield stocks. In

other words this means that institutional investors avoid non-paying firms, but the amount of dividends and the presence of institutional investors do not have a positive relation. Hence, these results can be considered mixed. A study of Kowerski and Wypych (2016) on Polish market is consistent with these results as firms owned by institutional investors had the lowest dividend payment ratios. Further, Tran and Le (2019) found evidence that institutional ownership increases the likelihood for a firm to pay dividends but at the same time that the presence of an institutional investor also increases the amount of dividends paid. However, the sample sizes were rather small (N=642) and the sample was created on an emerging market and thus it is not entirely comparable. Based on these results, it can be argued that institutional investors do not appear to have a positive effect on dividend payments but they still tend to be present in dividend paying firms.

Bond, Chennells and Devereux (1995) findings suggest that taxation in the UK put a downward pressure on dividend payments, while at the same time, tax exempt institutional investors such as pension funds were likely to invest in dividend payers. Further, the findings of Short et al. (2002) in the UK market, indicate a strong positive link between institutional ownership and the change in dividends, which they analyzed in detail with four different models. Furthermore, Khan (2014) extended these results by finding that institutional investors are not a homogeneous group, but the presence of insurance companies has a positive effect compared to other blockholders. These findings have been essential when the research questions, scope and limitations of the thesis were formed.

Finally, among the most recent studies Gaspar, Massa, Matos, Patgiri and Rehman (2013), Jory, Ngo and Sakaki (2017) and Kilincarslan and Ozdemir (2018) have argued that the link between institutional ownership and dividends distributed highly correlated with the investment horizon and the volatility of institutional shareholdings. In other words, long-term institutional investors have a positive effect on dividends, while the high volatility of institutional shareholdings is inversely related to dividends. Nonetheless, these studies argue that the size of institutional shareholdings has no effect on the amount of dividends as such.

Based on the considerable amount of empirical research, it is safe to conclude that i) an ownership structure of a firm is a relevant factor when dividend policies are analyzed, ii) institutional ownership is linked to dividend paying firms, iii) institutional investors are a heterogeneous group but insurance companies and pension funds have a positive relation with dividends and iv) institutional investors with long investment horizon increase the dividends distributed. Table 1 summarizes the relevant empirical research related to the link between institutional investors

and dividend policies of firms. Additionally, it summarizes the other significant variables related to dividend policies found in empirical studies.

Table 1: Summary of empirical research of institutional ownership and dividend policy

Author	Market	Dependent variable	IO and/or dividends	Other significant variables
Bond et al. (1995)	UK	Dividends	Positive	Tax
Short et al. (2002)	UK	Change in Dividends	Positive	$Earnings_t$, $Earnings_{t-1}$, $Dividends_{t-1}$
Grinstein and Michaely (2005)	US	Dividend payout ratio	Mixed	$Log(Sales)_t$, $Return_t$, $Market-to-Book_t$, $Div-to-Book_t$ [a]
Graham and Kumar (2006)	US	Dividend yield	Mixed	-
Renneboog and Trojanowski (2007)	UK	Dividends	Negative	$Dividends_{t-1}$,$Earnings_t$, $Firm\_size$, $Leverage$
Gaspar et al. (2013)	US	Total payout	Positive	$Operating\_income$, $Return\_TTM$, $Share\_turnover\_TTM$ [b]
Khan (2014)	UK	Dividends	Positive, insurance firms	$Earnings_t$, $Dividends_{t-1}$, $Sales_t$, $Sales_{t-1}$, $Leverage_t$, $Leverage_{t-1}$
Chang et al. (2016)	US	Div-to-Earn	Mixed	$Log(MV)_t$, $Leverage_t$, $Cash/TA_t$, ROA_t [c]
Crane et al. (2016)	US	Total payout	Positive	$Rank$ [d]
Kowerski and Wypych (2016)	Poland	Dividends	Lowest payout ratio for IO	-
Jory et al. (2017)	US	Div-to-Earn and Div-to-Assets	Positive	$Log(MV)$, $Market-to-Book$, $Cash/TA$, ROE, $IO\_volatility$
Kilincarslan and Ozdemir (2018)	UK	Dividend payout ratio	Positive	$GChurn$,FCF, $Size$ [e]
Tran and Le (2019)	Vietnam	DPS-to-EPS	Positive	CF_ratio, $Liquidity$, $Ageinc$, ROE [f]
Nguyen and Li (2020)	Australia	Div-to-Assets and IO	Negative	TA_{t-1}, ROA_{t-1}, $Market-to-Book_{t-1}$, $Sales\_growth_{t-1}$

[a] These variables affect institutional ownership instead of dividends.
[b] TTM = trailing 12 months
[c] MV = market value, TA = total assets, ROA = Return-on-Assets.
[d] Firm's rank based on market value on Russell index.
[e] GChurn = institutional investor's turnover of stock position in a firm.
[f] CF_ratio = cash flow ratio, Liquidity = Cash/TA, Ageinc = years firm operate as joint stock.

2.3 Modeling a dividend policy

Analysis of dividend policies begins by finding an appropriate measure that describes a dividend policy. Cash dividends or dividends in general are a natural starting point to analyze a dividend policy. However, dividends as such does not translate directly to a decision making or policy but they are rather the result of a chosen policy. Hence, dividend policies are modelled with relative or absolute changes in dividends. For example, ratios such as dividends per price, dividends per share or by using transformations of variables such as natural logarithmic scaling. (Smith Jr and Watts 1992; Short et al. 2002.)

In order to analyze the decision making process and the determinants behind a dividend policy a specific model is required. Many studies have used either the partial adjustment model as introduced in the classic research of Lintner (1956) or an extension of that model such as Waud's model (Waud 1966), or the earnings trend model (Fama and Babiak 1968). The partial adjustment model has been found to be consistent in multiple economic areas and is strongly supported by many scholars. Hence, it has been chosen to be the main approach of the thesis. (Al-Najjar and Kilincarslan 2019.)

In the simplest form, dividends are the excess earnings distributed to shareholders, where excess earnings are the profit after investment decisions and taxes. Hence, as a one-period model:

$$E_{exc} = EBIT - Investments - Taxes \tag{6}$$

where $EBIT$ is accounting earnings before investments and taxes and $Investment$ is the investments made to positive NPV projects and $Taxes$ are the financial year's taxes. In the simplest case where a firm desires to distribute all E_{exc} as dividends the equation becomes

$$D_{it} = E_{exc} \tag{7}$$

where D denotes dividends and E denotes earnings. When expanding this to multiple K periods, then the dividends consist of both current year's earnings and retained earnings from previous years deducted by the already distributed dividends. Then the dividends to be distributed become

$$D_{it} = E_{it} + \sum_{k=1}^{K} E_{i(t-k)} - D_{i(t-1)} \tag{8}$$

where i denotes a specific company and t denotes the year, D_{it} denotes the dividends distributed, E_{it} denotes excess earnings for period t, $E_{i(t-1)}$ represents

the aggregate of earnings from previous years i.e. retained earnings and $D_{i(t-1)}$ previously distributed dividends.

However, as discussed above, this is not the only possibility for a firm, but instead it is possible to retain part of these earnings in the firm, and use these earnings to fund negative NPV projects, or to increase the private benefits of management following the agency theory (Easterbrook 1984; Jensen 1986). Hence, equation 8 becomes the maximum dividends available for a firm i to distribute instead of the actual dividend decision.

Lintner (1956) took the thought process further and conducted a comprehensive survey on the US market in order to define the determinants behind the decisions that firms make and why they differ from the maximum. He found that firms have a target dividend payout ratio, r, which can be expressed as

$$D_{it}^{*} = rE_{it} \tag{9}$$

where D_{it}^{*} denotes the target dividends payout and r denotes the target dividend payout ratio. In other words this means that instead of paying all earnings as dividends, firms tend to pay a certain predetermined amount of dividends proportionate to earnings. Lintner (1956) results suggest that the payout ratio is constant and management follows this target. However, Brav et al. (2005) did not find evidence of such a single constant target payout ratio but that a number of potential targets exist simultaneously.

This target payout ratio can be examined by comparing the change in dividends paid in consecutive years, to the earnings of the firm in consecutive years. This leads to the following equation:

$$D_{it} - D_{i(t-1)} = r * (E_{it} - E_{i(t-1)}) \tag{10}$$

which interprets as a change in dividends, i.e., the dividend policy, is a function of current and previous earnings, and the target ratio. This implies that as the future dividends paid per target ratio it would be possible to model the future dividends policy based on the payout ratio and earnings generated. However, the actual dividend decision relies also on the management's reluctancy to cut dividends. Hence, as Lintner (1956) results indicate, the managers are reluctant to cut dividends, and that reluctancy can be denoted with constant β_0 which would be positive for most companies and zero for some. Finally, when this reluctance is added to the equation, it becomes possible to model the dividend decision of a firm:

$$D_{it} - D_{i(t-1)} = \beta_0 + r * (E_{it} - E_{i(t-1)}) + \epsilon_{ti} \tag{11}$$

where ϵ represents the discrepancy between the actual and expected change.

Furthermore, assuming that firms with institutional ownership have a different r from other ownership structures it is possible to add a dummy variable IO into the model (Short et al. 2002). Then the model would be as follows:

$$D_{it} - D_{i(t-1)} = \beta_0 + r * (E_{it} - E_{i(t-1)}) + r_{IO} * (E_{it} - E_{i(t-1)}) * IO + \epsilon_{ti} \quad (12)$$

where r_{IO} denotes the desired payout ratio of firms held by institutional investors. IO dummy is included in the model as an interaction variable which enables the analysis of the added effect of institutional ownership to the dividend policy. This model where the dividends follow the change in earnings in unison is referred as *the full adjustment model* (Short et al. 2002).

2.3.1 Partial adjustment model

In addition to the full adjustment model, both Lintner (1956) and Brav et al. (2005) suggest that management does not actually follow the change in earnings directly. Hence, the partial adjustment model, in addition to the target payout ratio, includes the dividends smoothing adjustment, i.e., even if the desired target payout ratio changes, managers are not willing to change the amount of dividends paid immediately. In other words, this means that the dividends are only partially adjusted to the new target payout level D^*_{it}. Hence, following Fama and Babiak (1968) and Short et al. (2002), the model is following:

$$D_{it} - D_{i(t-1)} = a_i + c_i * (D^*_{it} - D_{i(t-1)}) \quad (13)$$

where $a = \alpha$, and c denotes the speed of the adjustment, i.e., how fast the management adjust the actual dividends to the target ratio. When the target payout ratio, i.e., Equation 9, is inserted, the partial adjustment model becomes:

$$D_{it} - D_{i(t-1)} = a_i + c_i r_i E_{it} - c_i D_{i(t-1)} \quad (14)$$

which now combines the reasoning behind the amount of dividends as in Equation 8 with the decision making components revealed in Lintner (1956) and Brav et al. (2005). This in turn translates into a testable regression model

$$\Delta D_{it} = \beta_0 + \beta_{1i} E_{it} + \beta_{2i} D_{i(t-1)} + \epsilon_{ti} \quad (15)$$

where $\alpha = a$, $\beta_1 = c_i r_i$ and $\beta_2 = -c_i$.

If it is assumed as above that institutional investors have a different desired

payout ratio r compared to firms without institutional investors, the target dividend payout becomes:

$$D^*_{it} = r_i E_{it} + r_{IO} * E_{it} * IO \tag{16}$$

Substituting this into Equation 13 yields the partial adjustment model for dividends in the presence of institutional investors:

$$\Delta D_{it} = \beta_0 + c_i r_i E_{it} + c_i r_{IO} E_{it} * IO - c_i D_{i(t-1)} + \epsilon_{ti} \tag{17}$$

or

$$\Delta D_{it} = \beta_0 + \beta_{1i} E_{it} + \beta_{2i} E_{it} * IO + \beta_{3i} D_{i(t-1)} + \epsilon_{ti} \tag{18}$$

which now includes the institutional ownership dummy to the model via the interaction term. This model is the starting point for the thesiss empirical analysis.

The previous research discussed above implies that there is a link between institutional ownership and dividend policy and that in most cases the relationship is positive. Hence, it is reasonable to expect that the effect of institutional ownership β_2 to be positive and the effect of dividends distributed in previous years β_3 to be negative also in the research of the thesis. Furthermore, α is expected to be positive because management is still reluctant to cut dividends (Brav et al. 2005).

2.4 Determinants of dividends

As it is already established in the literature review, there is a link between institutional ownership and dividends distributed. In addition, the thorough research focusing on the ownership structure's effect on the dividends distributed has provided additional interesting variables to describe dividend policies in a more straightforward manner.

There is a second approach in the thesis to uncover the determinants of dividend payouts in the EU market and it is constructed by following the other significant variables presented in Table 1.

However, as the results of previous research suggest, there are other variables in addition to the abovementioned and thus it could be possible to test out the institutional investors' influence on the dividend decision via an indirect way. To do that, a model can be specified by following Fama and Babiak (1968) and adding a term for lagged earnings:

$$D_{it} = E_{it} + E_{i(t-1)} - D_{i(t-1)} \tag{19}$$

and as a regression model

$$D_{it} = \beta_0 + \beta_1 E_{it} + \beta_2 E_{i(t-1)} + \beta_3 D_{i(t-1)} + \beta_4 IO_{it} + \beta_5 SIZE_t + \beta_6 PROF_{i(t-1)} + \epsilon_{ti} \quad (20)$$

where D is dividends paid, E net earnings, IO is a dummy for institutional ownership, $SIZE$ consist of total assets and cash, $PROF$ consist of return-on-equity and total return index, i denotes a firm and t denotes the time period. The interpretation and rationale for this model is that the dividends paid at time t depend on earnings from period t and $t-1$, deducted by previously paid dividends, the presence of an institutional investor, the size and the previous profitability of the firm under investigation, which is consistent with the dividend payment model discussed above.

Even though this type of model cannot dig deep enough into the actual dividends policy, it would be good enough to observe the outcome of an institutional ownership to the amount of dividends distributed, and thus, be a sufficient to answer research questions RQ3 and RQ4 and reveal some light on the determinants of dividend payouts in the presence of institutional investors.

2.5 Summary of theoretical background

Dividend policy theories provide the necessary theoretical background and reasons why firms distribute dividends. Even though a clear consensus does not exist, the empirical studies provide amounting evidence on the relationships between management and shareholders; between minority and majority shareholders; and between institutional and retail investors. Furthermore, size, age, capital structure, earnings and dividends play a significant role when dividend policies are set in motion.

However, when the scope of the thesis is considered it is not possible to take all information into consideration when hypotheses are formed, but instead, the focus is on the most relevant information to the research questions. Besides, even though the literature review has been relatively comprehensive it is more than likely that a certain amount of relevant information and insight on this specific area has not been covered, which naturally affects the results and the analysis.

3 DATA AND METHODOLOGY

3.1 Description of the data and screenings made

The dataset for the thesis is formed by combining data from two different commercial data suppliers, Bureau van Dijk's Orbis Europe, and Refinitiv Eikon's[3] Datastream and Worldscope databases. Data manipulations were performed in Microsoft Excel, descriptive statistics and statistical analysis with R-Studio (RStudio Team 2020) and regression tables with Stargazer (Hlavac 2018).

Bureau van Dijk is owned by Moody's Analytics and provides data focused on global mergers and acquisitions, corporate ownership and private company data. Its Orbis Europe database provides information on firms operating in geographic Europe (Bureau van Dijk 2021). Within the scope of the thesis, Orbis Europe was used to retrieve information on the ownership structures of publicly listed companies.

Refinitiv is one of the largest financial market data provider and its products, Datastream and Worldscope, provide both historical time series and cross-sectional financial data globally (Refinitiv 2021a,b). As the data from Orbis Europe was found insufficient for the purpose of the thesis, the actual financial data and ratios were retrieved from Datastream and Worldscope databases, while the data relating to the ownership structure, country of incorporation and operating sector, were acquired from Orbis Europe.

When the initial sample was created both country of incorporation and operating sector of the firm were considered. Firms' operating sectors were identified based on their *Statistical classification of economic activities in the European Community*, i.e., NACE[4] codes. NACE is a four-digit code and it is derived from the United Nation's *International standard industrial classification of all economic activities* ('ISIC'). Usage of NACE code is obligatory within the EU, thus, every firm within the sample should also have NACE code (Eurostat 2020b.)

Figure 1 presents the distribution of operating sectors where the firms within the sample are operating. Almost half of the companies operate in 'manufacturing' sector. However, 'information and communication' sector is also significant among the sample. Figure 1 shows that every European Union country is included in the sample, even though the observations are concentrated in companies located in

[3]Formerly known as Thomson Reuters Eikon.

[4]Abbreviation is derived from French *Nomenclature statistique des activités économiques dans la Communauté européenne.*

the UK, France, Germany and Sweden. From this figure it is clear that developed capital markets have the major amount of publicly listed companies, which is not surprising.

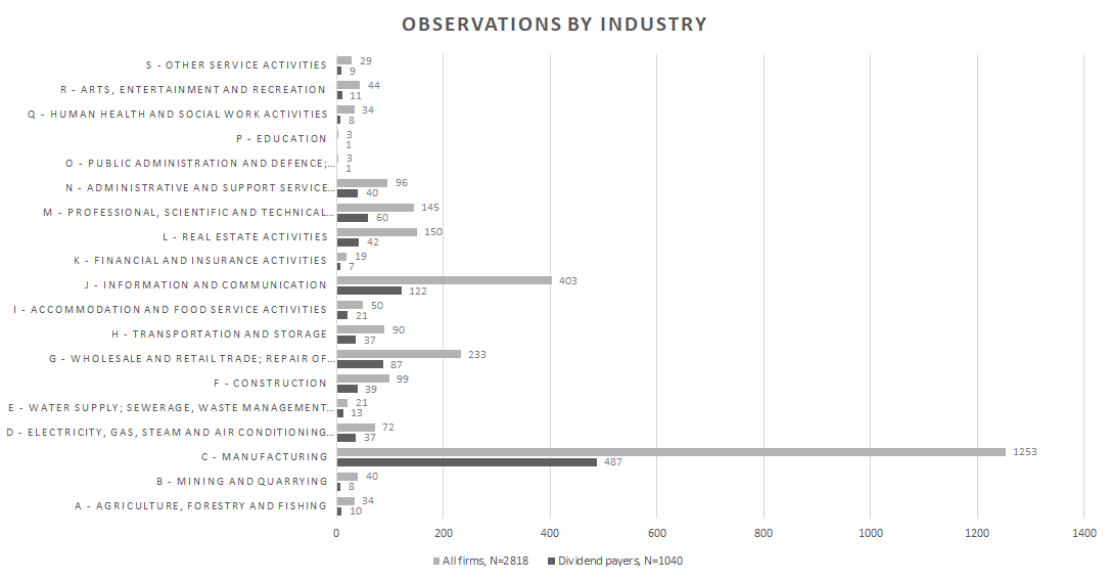


Figure 1: Industries present in the sample.

The initial sample of the study consists of 3 088 listed companies registered in the European Union. The sample includes companies stated as active between 2010 and 2017. It might have been possible to increase the reliability and and validity of this study by increasing the time period but the database utilized did not provide data for a longer period of time. For example, this dataset ignores the turbulent time around the financial crisis in 2007-2009. Furthermore, based on the World Bank (2020) statistics there have been from 7 345 (2010) to 5 893 (2017) publicly listed companies in the EU, while the initial sample of the thesis only includes 3 088. The initial screening was conducted in Bureau van Dijk's Orbis Europe database as shown in Table 2 below.

Status was chosen as 'Active' in order to exclude all non-active firms and firms whose current situation is unknown. Public limited companies and private limited companies were chosen because these companies are generally obliged to file financial statements which increase the chance that the required financial data would be available. Entity type was chosen as 'Corporate' to identify firms that are identified as normal corporations. This approach was chosen due the fact that income recognition and profit distribution conventions may vary materially between corporations and other types of business entities, e.g., partnerships and trusts.

The next step was to screen out non-listed companies because it was found

Table 2: Description of search criteria

This table summarizes the search steps performed in order to create representative sample of firms

Search step	Screening	Search result
Status	Active	66 321 551
Standardised legal form	Public limited company, Private limited company	22 826 448
Entity type	Corporate	22 067 992
Listed/unlisted companies	Publicly listed companies	10 253
Shareholders with subsidiaries by profile	Owned between 0% and 100%	7 477
Total revenues	min=0, 2010-2017	3 563
World region/Country/Region in country	European Union (28)	3 088

that there is not enough information of private limited companies within databases. 'Shareholders with subsidiaries by profile' was set to include firms which have disclosed to be a subsidiary, in order make sure there are information of shareholders within the sample which is critical for the research. Total revenue screening step was included in order to exclude anomalies and erroneous data from the sample. This is possible when there is no information provided by a company, there are mistakes within the data disclosed if their revenue is less than zero or a restructuring have been conducted. Finally, the region was chosen to be the European Union because first of all, there is at least some level of harmonizing of accounting conventions between different countries, it shares the same currency (except Sweden and the UK), and there is data available.

The initial dataset was then manually cross-checked against the Eikon database of public listed companies in 28 European Union countries in order to ensure the validity of observations. 47 firms of the initial sample were excluded because they were not registered in the EU region i.e. their headquarters or main area of business was outside of the European Union. For example, companies registered in British tax haven islands, such as Jersey and Guernsey, were excluded. 18 firms were excluded because there was no data available on Eikon i.e. it was not possible to to find match in both databases. 52 companies were excluded because their operating sectors were not suitable for the scope of this study. This exclusion was made due the fact that either profit generation mechanism or profit distribution differ fundamentally from a normal limited liability company. For example, firms operating in the extraction of crude oil were excluded due the different income measuring rules (Short et al. 2002). This exclusion was made solely based on the NACE code of firms. NACE codes: 0610, 0620, 6420, 7010 were excluded.

Last screening concerns the availability of data. Firms that did not have data available, or yielded other errors when either Eikon, Datastream or Worldscope database was searched, were excluded from the final sample. This step does not

apply to 'NA' values given by database but other possible errors. 153 firms fitting the search criteria of the thesis, were identified. As a result, the final data sample utilized consisted of 2 818 firms in the EU. The screening steps are summarized in Table 3 below.

Table 3: Screenings of the dataset

The manual screenings conducted in order to improve the reliability of the dataset

Screening	Excluded	Firms
Initial sample	-	3 088
Headquarters not in EU	47	3 041
No match	18	3 023
Operating sector	52	2 971
Insufficient data within database	153	2 818
Final sample	270	2 818

Furthermore, in order to study the dividend policy measured as a relative change in dividends, an alternative subset of firms that had paid dividends in every period was created. This subset of dividend payers consists of 1 040 firms in total. The country of origin for each firm in each sample is presented in Figure 2 below.

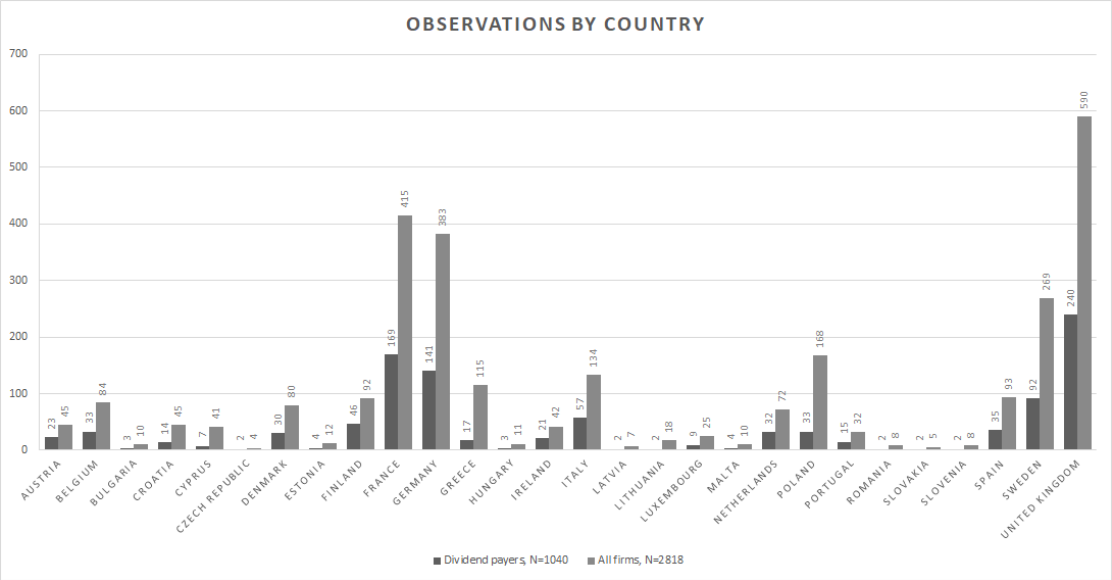


Figure 2: Countries present in the sample.

Within these samples, the presence of an institutional investor have been identified based on the ownership data available through the Orbis database. A firm is labeled as institutionally owned if there is one or more institutional investors

that owns either directly or indirectly at least 5% of equity. The cutoff of 5% was chosen because the firms are required to publicly declare their ownership when 5% of the equity has been acquired. Additionally, this cutoff point has been supported in previous literature as a proper approach (see La Porta et al. (1999, 2000); Short et al. (2002)).

Institutional investors were identified based on their statistical classification of economic activities in the European Community (NACE codes (Eurostat 2020a)). NACE codes were chosen because they are standardized within the EU and they are expected to give reliable information of the real nature of the firms. However, the NACE coding is not an infallible system because it relies on the self-declared information of the company. In addition, when a company works in multiple industries, the NACE code still refers to a single industry. When these things are considered, these samples might have a bias, misrepresent certain industries or miss potentially valuable information because the sector-related screenings have been made based on the NACE codes. These potential biases are recognized, but their effect is estimated to be marginal when the whole sample is considered.

Table 4 summarizes the institutionally owned firms by each financial year across the whole time period within all firms, while Table 5 summarizes the presence of institutional owners within the dividend payers subset. In addition, changes in the institutional ownership and its proportion in each sample are presented. According to the data, it is easy to see that whereas the presence of at least one institutional investor is rather stable from period to period, there are larger annual changes when two or more institutional investors are considered. This is especially true in the dividend payers subset where the mean annual change is -2.61% and the standard deviation is 13 percentage points. The mean institutional ownership have been larger within dividend payers when compared to the whole sample, which supports the intuition that institutional investors would be attracted to dividend payers.

Further analysis of the institutional ownership in the data set shows that how many periods each firm has been owned by an institutional investor as defined above. Across all firms 185 firms have been owned by at least one institutional investor, while two or more institutional owners have been presence in 15 firms during each eight periods of the study. Furthermore, in the dividend payer subset the corresponding numbers are 98 and 15. At the same time, 1 800 firms and 597 firms had no institutional owner in any period at the 5% cutoff level across all firms and dividends payers, respectively. As a conclusion, it means that in 833 firms the institutional owner had either sold or bought shares at least in one financial year. These are summarized in Figure 3.

Table 4: Institutional ownership across whole sample

Identified institutional ownership and the proportion of the observations to the whole sample (N=2 818)

Financial year	IO	Proportion	Change	IO2	Proportion	Change
2010	535	18.99 %	NA	206	7.31 %	NA
2011	542	19.23 %	1.31 %	228	8.09 %	10.68 %
2012	543	19.27 %	0.18 %	212	7.52 %	-7.02 %
2013	528	18.74 %	-2.76 %	194	6.88 %	-8.49 %
2014	539	19.13 %	2.08 %	186	6.60 %	-4.12 %
2015	565	20.05 %	4.82 %	197	6.99 %	5.91 %
2016	592	21.01 %	4.78 %	211	7.49 %	7.11 %
2017	587	20.83 %	-0.84 %	195	6.92 %	-7.58 %
Mean	554	19.65 %	1.37 %	203.63	7.23 %	-0.50 %
Std.Dev	24.44	0.009	0.028	13.34	0.005	0.081

Table 5: Institutional ownership within dividend payers

Identified institutional ownership and the proportion of the observations to the dividend payers (N=1 040)

Financial year	IO	Proportion	Change	IO2	Proportion	Change
2010	278	26.73 %	NA	113	10.87 %	NA
2011	273	26.25 %	-1.80 %	122	11.73 %	7.96 %
2012	256	24.62 %	-6.23 %	101	9.71 %	-17.21 %
2013	241	23.17 %	-5.86 %	99	9.52 %	-1.98 %
2014	247	23.75 %	2.49 %	81	7.79 %	-18.18 %
2015	247	23.75 %	0.00 %	93	8.94 %	14.81 %
2016	258	24.81 %	4.45 %	99	9.52 %	6.45 %
2017	256	24.62 %	-0.78 %	89	8.56 %	-10.10 %
Mean	257	24.71 %	-1.10 %	99.63	9.58 %	-2.61 %
Std.Dev	12.85	0.012	0.040	13.02	0.013	0.130

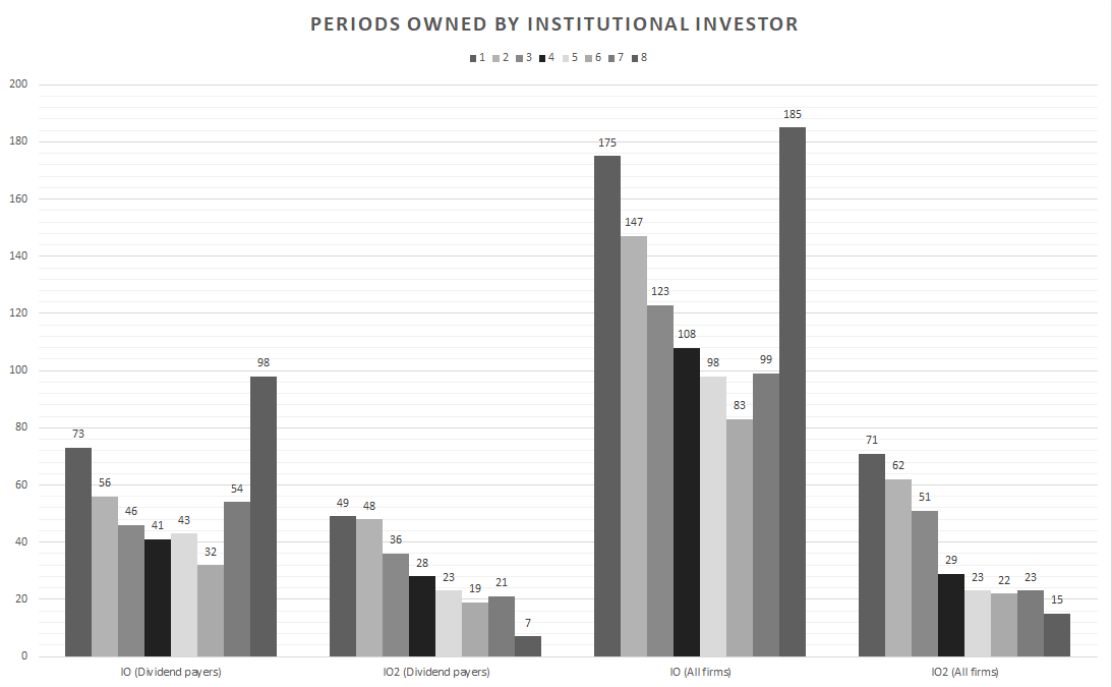


Figure 3: The presence of institutional investors within all firms and dividend payers.

3.2 Variables

After the final set of companies was formed, the variables were collected from Eikon Datastream and Worldscope databases. As discussed in the theory section, dividends and earnings are essential variables when dividend policies are analyzed. Furthermore, both Fama and French (2001) and Denis and Osobov (2008) have found evidence that the likelihood to distribute dividends is related to the size of a firm, its profitability, and growth opportunities available. Variables were both collected and calculated based on the variables available. Most variables chosen for this study have been shown to have correlation and statistical significance when dividend policies are analyzed. Each variable included in the study has been described in detail below including the methods of collecting and forming.

3.2.1 Dividends

Dependent variable of the thesis is common dividends. There are multiple way to measure common dividends, but within the scope of the study, the dividends were measured by cash dividends distributed by a financial year. Additionally,

the dividends-per-share ('DPS') ratio data was acquired, but this approach was later forfeited. However, the DPS data is presented for comparison in following sections. Dividends are possible to analyze in almost endless ways, but in this thesis Datastream's 'WC05376 - Common Dividends (Cash)' was chosen. Other approach would have been to calculate the DPS from cash dividends and shares outstanding because as a ratio it does not depend on the size of the underlying company as much as absolute value of dividends. The development of cash dividends during the period under investigation is presented in Table 4. Dividends and DPS data were downloaded from Datastream and then cleaned and organized manually.

3.2.2 Earnings

As discussed above, earnings are both theoretically and intuitively linked to a dividend policy because in a long run positive earnings are necessary for a firm to survive and producing earnings is the *raison d'etre* for a firm to be formed. Even though it is possible for firms to compensate low or negative earnings with debt in order to pay out dividends, the earnings still must be positive in the long-term for the firm to survive. However, as discussed above, the management is typically reluctant to cut dividends even when the firm is underperforming, and thus it is possible that the link between dividends and earnings might become weaker in certain situations.

Datastream's 'WC01751 - Net Income Used to Calculate Earnings per Share' which is the net earnings after preferred dividends. This specific variable was chosen for this thesis because after few manual tests, this metric was consistent with the actual financial statements. Additionally, the earnings-per-share ('EPS') was considered for this thesis to represent earningsbecause as DPS, it would have been easier to compare across different firms. However, just as with DPS, the number of shares outstanding would have a major impact to this ratio and might impose an inherent bias in the study. Additionally, it is floored to zero which increases the weight of positive results. The development of earnings during the research period is shown in Table 4.

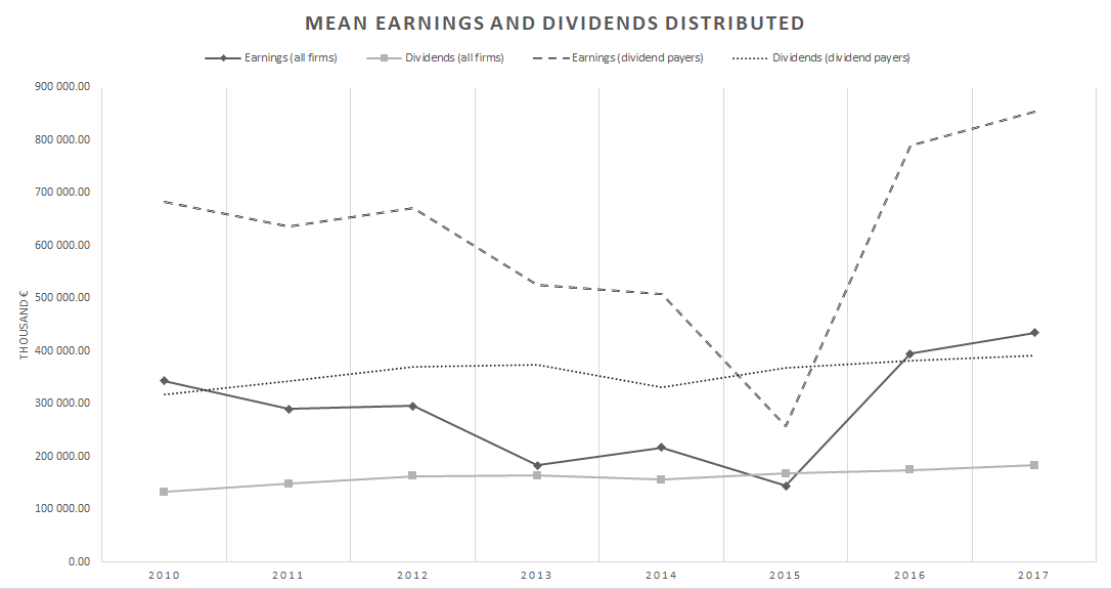


Figure 4: Mean earnings and dividends 2010-2017, thousand euros

3.2.3 Ownership structure

Ownership structure is one of the key aspects of this thesis and two sets of dummy variables have been formed to represent the effect of institutional ownership as an independent variable. The data for institutional ownership was acquired from Orbis Europe database. As mentioned above, institutional ownership is measured in two ways within this thesis. First, companies were labeled based on the presence or absence of an institutional owner with 5% or higher stake of the firms shares. This factor is a binary categorical variable and is set 1 if such institutional ownership exists and 0 when it does not. This variable is labeled as 'IO'. Second, there is a variable for the presence of two or more institutional owners with similar stakes as the IO variable above. This variable is labeled as 'IO2' and it is 1 when such ownership exists and 0 when it does not.

These variables were formed manually based on the data acquired from Orbis Europe database and consist of institutional owners labeled by NACE codes as 6500[5], 6511[6], 6512[7] or 6530[8]. As mentioned above, these NACE codes are partially based on self-declarations of firms, which could impose a risk in the validity of data. However, as the firms in question are publicly listed companies with specific regulation, it is reasonable to believe that these classifications are correct. As

[5]Insurance, reinsurance and pension funding, except compulsory social security
[6]Life insurance
[7]Non-life insurance
[8]Pension funding

expected, the firms with at least two institutional owners are proportionate to the institutional ownership and in general, their number is smaller. However, they still form a meaningful proportion of the whole sample and might yield valuable insight within the scope of the thesis.

3.2.4 Size

There are multiple ways to evaluate the size of a firm. Size could be evaluated based on sales revenue, book value, and market value, and each of these variables have advantages and disadvantages. Revenue is the income that a firm generates before any expenses are subtracted and is a fair measure of a firm size. However, previous literature has been emphasizing the use of assets as a measure because on the one hand it describes the value generating assets while capturing the idea of investment decision and on the other hand it describes the wearing off of assets. In addition, changes in total assets yield more information compared to change in revenue. Positive change in total assets means that an investment has been made which should imply decrease in dividends distributed because these two decisions are exclusive to each other at the fundamental level.

In order to represent assets in this thesis, the accounting book value of assets i.e., total assets ('TA') was chosen as variable. Datastream's 'WC02999 - Total Assets' was used. The firms under investigation vary greatly in the size of total assets, thus the natural logarithm was applied to total assets and the independent variable is 'log_TA'. Other control variable which is linked to the size of a company as well as to dividends is cash in bank ('CSH'). Datastream's 'WC02003 - Cash' was chosen. These two form a 'SIZE' control for the empirical models and helps to isolate the effects of the main independent variables.

3.2.5 Profitability

In addition to earnings, few other measures of profitability were utilized as control variables. Return-on-equity ('ROE') reflects the profitability of an investment to an investor's capital. ROE is crudely comparable between companies although it is prone to changes in capital structure such as increasing of debt, i.e., leverage. Datasrteam's 'WC08301 - Return on Equity - Total(%)' was chosen for ROE variable.

Additionally, the total return index ('RI') was considered as a variable to describe how profitable the market has perceived a company. Where ROE describes have a company has performed during a previous financial year, RI includes the expected earnings potential which is embedded into a stock price. Datastream's 'RI - Total Return Index' was chosen.

A comparison was made between the dividend payers and the whole sample. Figure 5 shows that dividend payers have performed better during the period under investigation. Another interesting detail is that the valuation of firms has been increasing dramatically since the beginning of the period, which might be at least partially explained by the financial crisis of 2008. These two form a 'PROF' control for the empirical models which help to isolate the effects of the main independent variables.

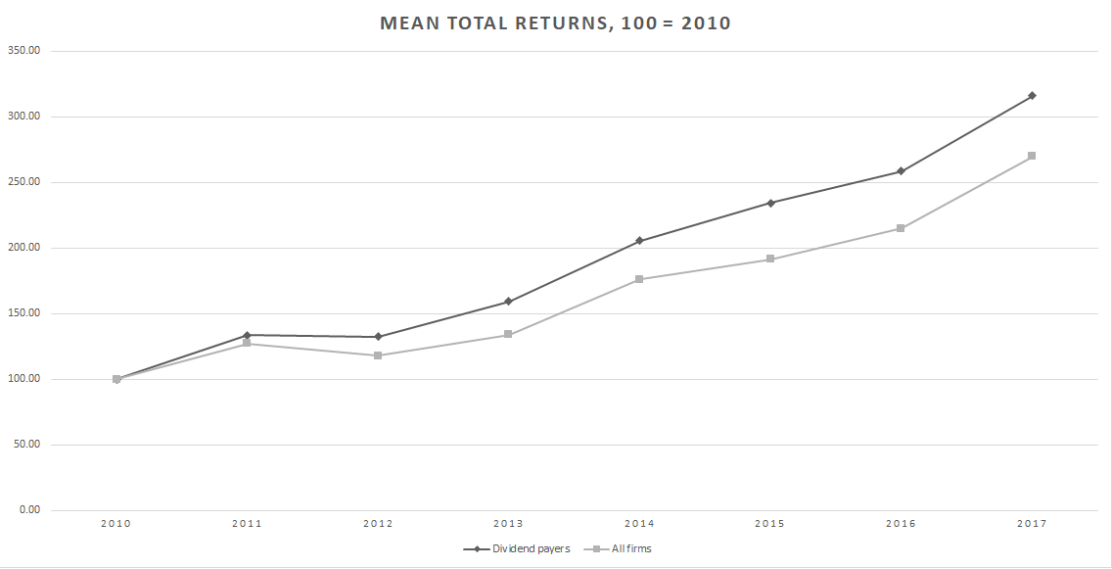


Figure 5: Total returns across the whole time period

3.3 Descriptive statistics

Tables 6 and 7 present dividends, earnings, total assets and amount of cash year by year basis for all firms and dividend payers subset, respectively. These metrics grant an insight of what kind of companies are included in the sample. For example, when comparing the mean and median total assets, it is clear that most of the firms within the sample are smaller as median stays below 300 million euros while the average size of total assets lays between 6.9 billion and 8.2 billion euros. This

means that the sample consists of a few very large firms, based on the total assets, that dominate a much larger group of smaller firms.

Table 6: Descriptive statistics of all firms sample (MM)

Statistic	N	Mean	St. Dev.	Pctl(25)	Median	Pctl(75)
DIV_2010	2,795	8.20	87.26	0.06	0.32	1.81
DIV_2011	2,722	132.08	1,934.36	0.00	0.36	11.76
DIV_2012	2,716	148.09	1,533.75	0.00	0.90	16.77
DIV_2013	2,706	162.15	1,685.94	0.00	1.01	17.75
DIV_2014	2,727	163.38	1,664.32	0.00	1.04	19.84
DIV_2015	2,751	155.80	1,318.63	0.00	1.06	20.27
DIV_2016	2,748	167.14	1,403.29	0.00	1.46	23.73
DIV_2017	2,756	174.30	1,405.63	0.00	1.81	25.52
EARN_2010	2,735	343.23	3,462.51	0.01	5.75	46.54
EARN_2011	2,742	289.89	3,391.96	−0.31	5.44	49.55
EARN_2012	2,744	296.29	3,576.31	−0.80	4.61	46.71
EARN_2013	2,752	183.45	2,619.04	−0.91	4.46	49.47
EARN_2014	2,756	216.81	1,442.50	−0.53	5.34	55.03
EARN_2015	2,746	144.06	5,230.75	−0.27	6.72	63.42
EARN_2016	2,754	395.47	5,605.67	0.06	8.35	72.03
EARN_2017	2,748	435.93	6,301.05	−0.11	8.73	80.10
TA_2010	2,769	6,916.46	92,014.76	48.34	224.47	1,306.47
TA_2011	2,781	7,352.10	100,690.10	51.73	236.81	1,412.97
TA_2012	2,784	7,363.89	96,664.18	51.38	242.56	1,415.50
TA_2013	2,795	7,309.48	94,015.14	52.64	249.84	1,427.58
TA_2014	2,797	7,642.33	94,805.64	55.81	261.18	1,472.40
TA_2015	2,796	7,658.22	82,488.52	57.64	282.53	1,567.78
TA_2016	2,799	8,069.19	85,434.73	61.84	296.23	1,708.03
TA_2017	2,795	8,199.70	87,262.23	63.98	315.37	1,810.95
CSH2010	2,174	480.86	7,042.89	2.74	16.80	90.90
CSH2011	2,182	402.54	3,805.97	2.82	16.74	96.41
CSH2012	2,488	465.59	6,833.38	2.67	14.69	89.21
CSH2013	2,561	587.45	11,436.32	3.55	18.30	103.99
CSH2014	2,749	432.86	4,580.11	3.23	16.58	96.24
CSH2015	2,761	435.93	3,921.72	3.33	17.55	105.10
CSH2016	2,763	452.36	3,218.10	3.52	20.66	127.81
CSH2017	2,768	467.35	3,009.33	4.11	23.30	143.60

This is notable within the dividend payers subset presented in Table 7. Even though the differences in these metrics are smaller within dividend payers, the difference between mean and median is profound. However, these statistics yield additional information between samples. As mentioned above this sample consist of firms that have paid dividends in every period under considerations, so it is no surprise that the mean cash dividends are larger in this sample. To emphasize the effect of size, it is notable that while the mean dividends have been twice as large within dividend payers the median dividends paid by dividend payers have been from 15 to more than 40 times higher amongst dividend payers.

Similar effects are visible when other measures are considered. All in all, the

dividend paying firms appear to be larger companies, especially in size, than a average company of the sample. This finding is in line with the life-cycle theory where larger, matured companies tend to pay dividends instead of retaining earnings opposing to the young growth firms DeAngelo et al. (2006).

Table 7: Descriptive statistics, dividend payers subsample (MM)

Statistic	N	Mean	St. Dev.	Pctl(25)	Median	Pctl(75)
DIV_2010	1,019	213.04	959.87	2.30	12.60	68.91
DIV_2011	1,020	266.44	1,185.62	3.31	15.16	86.10
DIV_2012	1,021	265.62	1,087.21	3.22	16.80	88.70
DIV_2013	1,012	277.94	1,104.82	3.60	19.89	98.00
DIV_2014	1,020	301.79	1,293.74	3.60	21.50	104.40
DIV_2015	1,022	321.78	1,689.65	4.31	23.08	119.29
DIV_2016	1,023	315.02	1,336.13	4.92	24.02	128.35
DIV_2017	1,021	315.54	1,269.57	4.82	26.37	131.60
EARN_2010	1,023	538.44	2,741.99	7.74	32.80	177.50
EARN_2011	1,029	512.67	2,334.04	7.68	34.88	182.20
EARN_2012	1,032	543.75	2,855.06	6.25	34.86	174.33
EARN_2013	1,031	465.77	2,173.84	7.22	37.17	183.77
EARN_2014	1,032	483.57	1,972.81	7.72	39.57	188.86
EARN_2015	1,033	471.16	2,410.29	8.01	41.25	200.00
EARN_2016	1,033	509.34	2,784.47	8.84	46.98	225.02
EARN_2017	1,033	529.98	2,421.63	8.70	51.15	257.80
TA_2010	1,026	8,702.83	32,733.77	166.97	670.44	3,526.29
TA_2011	1,034	9,159.25	35,220.11	177.56	720.46	3,813.88
TA_2012	1,035	9,409.96	35,520.74	186.50	792.10	4,069.76
TA_2013	1,037	9,461.19	36,037.17	192.91	829.49	4,180.32
TA_2014	1,037	9,842.28	37,018.09	203.64	857.44	4,531.00
TA_2015	1,039	10,237.31	38,065.79	222.95	942.53	4,766.66
TA_2016	1,039	11,006.25	40,751.38	239.47	1,029.08	5,227.64
TA_2017	1,039	11,065.55	39,131.36	258.42	1,087.34	5,463.50
CSH2010	930	543.44	3,071.22	7.80	36.52	184.35
CSH2011	938	573.51	4,208.95	7.55	38.49	190.65
CSH2012	995	603.95	3,686.62	9.28	42.85	234.50
CSH2013	1,016	636.73	3,841.40	11.25	51.75	236.80
CSH2014	1,033	636.18	3,609.09	11.28	53.00	240.30
CSH2015	1,037	682.22	4,538.67	11.26	56.30	273.92
CSH2016	1,036	718.20	3,635.84	15.04	64.45	317.89
CSH2017	1,035	726.78	3,090.06	16.97	74.58	360.95

Because of the issues and differences in size, the sample was analyzed in more detail by separating the data into quartiles. Sorting by quartiles was done by size which was measured by total assets at 2010. Table 8 includes the first quartile of firms. By looking at the mean and median values of total assets, it is easy to see that firms in the first quartile are closer to each other size than within the whole sample. Considering this, it is interesting that the differences between mean and median dividends, earnings, DPS and EPS are still large.

This difference suggests that a small amount of companies, which are small

when measured by total assets, e.g., technology companies or service providers, are more profitable and are able to pay more dividends than smaller firms in general. Second explanation when considering DPS and EPS is the fact that these ratios have been floored to zero in the database, which naturally adds bias in these ratios. This would explain as well why the mean earnings are negative while mean EPS is positive. In a way, the actual earnings might give a more correct picture of the nature of the firm and provide a more comprehensive link between earnings and dividends.

Additionally, these findings suggest that when sorted by total assets on 2010 the smallest quartile of firms have made negative earnings, i.e., losses during the period. However, as with other metrics, this one is dominated by firms having large losses. It is just interesting why the smallest companies measured by total assets have made losses on average because there is no direct connection between assets and earnings at least from an accounting perspective. Yet, this is out of scope of the thesis.

Table 9 shows the largest 25% of firms based on total assets. Here still the differences between mean and median values are significant. It is also notable that in every category the mean is much higher than the 75th percentile of this sample which means that the biggest firms measured by total assets contribute most of the metrics here under investigation. This is illustrated in Figure 6 where firms' contributions to a specific variable are presented. These are measured by calculating the amount of contribution to the whole sum of metrics. When total assets, cash dividends, earnings and cash are considered, contribution of top 25% firms is higher than 95.57%. Furthermore, when top 10% firms are considered the amount of contribution is up from 65.46% which still has major effect.

As a part of descriptive statistics, the correlation between variables was investigated. The correlation of each variable between each other variable is shown in Table 11 where both Pearson and Spearman correlation between variables are presented. According to Spearman's rank correlation, earnings and dividend appear to be correlated with each variable except IO and IO2 dummies. This could be because earnings and dividends tend to grow as absolute values of other variables and thus it is just natural that they are correlated with each other.

When Pearson's correlation coefficient is considered, correlations decrease drastically. RI and log(TA) seem to be correlated with almost all other variables at a significant level. Both current and lagged earnings have a moderately strong and positive correlation with dividends, lagged dividends, and cash, which is promising for the purposes of this study. Current dividends are highly correlated with the previous dividends which might prove problematic when hypotheses are

Table 8: Smallest 25% of firms (N=705), sorted by 2010 total assets

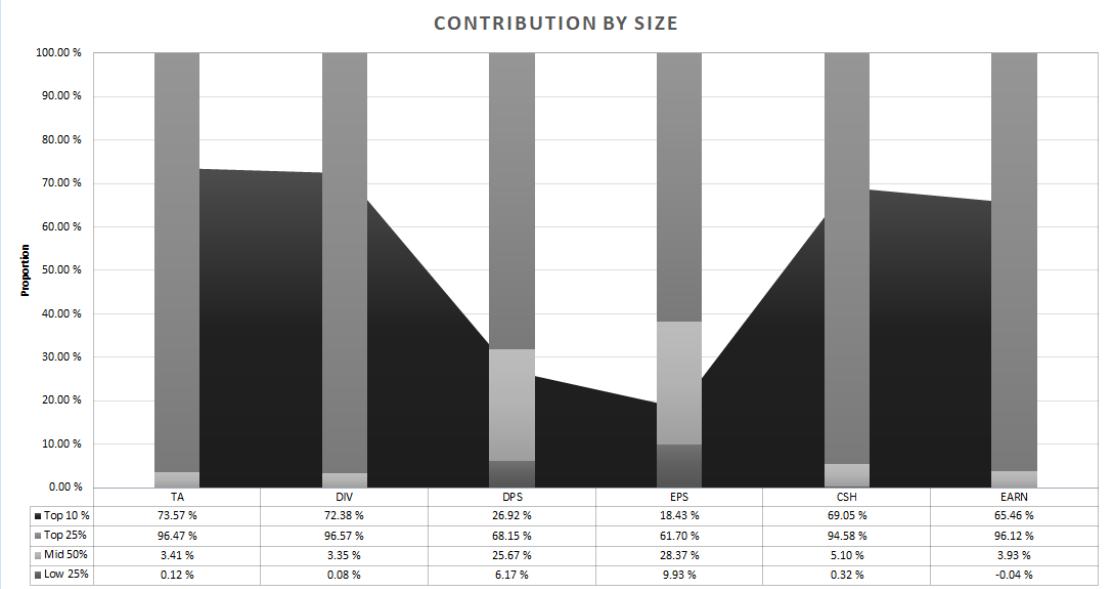
Statistic	N	Mean	St. Dev.	Pctl(25)	Median	Pctl(75)
EARN_2010	677	0.25	26.08	−1.32	0.12	1.00
EARN_2011	672	−0.64	6.60	−1.66	0.11	1.29
EARN_2012	666	−0.55	12.43	−1.77	0.03	1.15
EARN_2013	671	−0.71	15.12	−1.78	0.01	1.25
EARN_2014	675	−0.59	21.20	−1.56	0.14	1.54
EARN_2015	664	−0.15	14.54	−1.82	0.13	1.65
EARN_2016	672	−0.22	13.05	−1.77	0.31	1.85
EARN_2017	667	−1.23	29.69	−2.11	0.25	1.82
DIV_2010	693	0.07	0.28	0.01	0.03	0.05
DIV_2011	668	0.32	2.03	0.00	0.00	0.04
DIV_2012	655	0.35	1.26	0.00	0.00	0.12
DIV_2013	641	0.39	1.38	0.00	0.00	0.21
DIV_2014	653	0.48	1.69	0.00	0.00	0.27
DIV_2015	664	0.52	1.89	0.00	0.00	0.25
DIV_2016	660	0.61	2.53	0.00	0.00	0.30
DIV_2017	665	0.60	2.18	0.00	0.00	0.32
TA_2010	704	20.80	14.42	8.11	18.65	32.90
TA_2011	694	24.13	28.30	8.72	19.78	34.22
TA_2012	692	27.24	43.64	9.19	20.04	34.08
TA_2013	695	32.03	67.06	9.52	21.10	36.25
TA_2014	696	36.70	81.42	10.64	22.24	38.39
TA_2015	692	45.65	141.46	10.93	23.13	44.77
TA_2016	695	52.30	156.66	12.38	24.98	49.53
TA_2017	693	65.59	284.67	12.12	26.34	53.38
DPS_2010	651	0.71	3.54	0.00	0.00	0.05
DPS_2011	704	1.06	4.94	0.00	0.00	0.10
DPS_2012	703	0.98	7.56	0.00	0.00	0.17
DPS_2013	704	1.47	13.61	0.00	0.00	0.21
DPS_2014	698	1.80	18.54	0.00	0.00	0.26
DPS_2015	704	2.01	20.39	0.00	0.00	0.39
DPS_2016	703	1.72	19.68	0.00	0.00	0.19
DPS_2017	704	1.85	23.19	0.00	0.00	0.18
EPS_2010	571	5.93	57.44	0.00	0.00	0.50
EPS_2011	598	17.61	331.81	0.00	0.03	0.72
EPS_2012	630	3.16	13.95	0.00	0.06	0.82
EPS_2013	661	4.01	25.35	0.00	0.01	0.71
EPS_2014	674	5.31	36.04	0.00	0.02	0.75
EPS_2015	695	4.56	33.88	0.00	0.03	0.78
EPS_2016	702	5.34	41.53	0.00	0.03	0.86
EPS_2017	704	7.44	62.73	0.00	0.04	0.9

Table 9: Largest 25% of firms (N=705), sorted by 2010 total assets

Statistic	N	Mean	St. Dev.	Pctl(25)	Median	Pctl(75)
EARN_2010	664	1,385.28	6,928.03	63.24	188.46	633.89
EARN_2011	682	1,134.54	6,734.41	39.36	175.55	601.50
EARN_2012	689	1,149.04	7,072.05	38.67	162.80	601.20
EARN_2013	690	701.31	5,198.27	35.00	168.00	593.08
EARN_2014	691	826.43	2,793.07	36.34	175.60	681.49
EARN_2015	690	524.79	10,430.62	43.73	195.35	732.75
EARN_2016	690	1,525.52	11,127.81	68.73	228.21	919.00
EARN_2017	691	1,676.80	12,489.49	75.35	272.33	1,072.09
DIV_2010	696	31.43	172.86	2.87	6.19	20.10
DIV_2011	658	530.05	3,909.76	2.39	51.62	197.00
DIV_2012	676	576.60	3,035.76	11.35	65.74	256.75
DIV_2013	681	626.01	3,319.34	9.78	70.90	270.00
DIV_2014	685	630.06	3,278.25	7.68	75.60	283.56
DIV_2015	689	600.80	2,585.39	4.14	75.90	289.30
DIV_2016	688	643.29	2,751.28	16.02	93.85	323.70
DIV_2017	690	669.60	2,751.51	13.43	99.55	343.38
TA_2010	657	28,327.46	187,411.60	2,447.76	5,019.00	15,125.00
TA_2011	685	28,999.03	201,452.40	2,364.10	4,980.28	15,011.30
TA_2012	690	28,824.20	192,686.90	2,406.69	5,221.65	16,009.78
TA_2013	695	28,477.99	187,047.30	2,367.12	5,173.82	16,095.31
TA_2014	695	29,684.17	188,574.80	2,452.62	5,315.11	17,165.00
TA_2015	696	29,521.91	163,457.20	2,563.39	5,476.72	18,193.21
TA_2016	696	31,047.49	169,317.60	2,717.77	5,953.85	18,560.02
TA_2017	696	31,425.77	172,861.10	2,868.71	6,189.76	20,098.41
DPS_2010	697	22.67	265.45	0.03	0.60	1.98
DPS_2011	705	20.74	251.25	0	0.6	1.7
DPS_2012	705	12.92	101.92	0.1	0.7	2.3
DPS_2013	705	12.57	97.26	0.1	0.8	3.0
DPS_2014	704	12.97	96.00	0.09	0.88	3.50
DPS_2015	705	19.39	180.05	0.05	0.9	3.7
DPS_2016	705	16.30	128.80	0.1	0.9	3.2
DPS_2017	705	15.15	102.45	0.1	0.8	3
EPS_2010	644	176.93	3,689.22	0.00	1.13	4.86
EPS_2011	653	34.10	247.93	0.36	1.52	5.29
EPS_2012	665	32.85	245.20	0.49	2.19	7.66
EPS_2013	676	102.16	1,947.04	0.23	1.73	5.96
EPS_2014	687	35.30	297.28	0.29	1.84	6.81
EPS_2015	693	20.68	98.71	0.26	1.77	6.92
EPS_2016	700	27.16	149.95	0.33	2.07	8.19
EPS_2017	705	26.48	135.19	0.41	2.33	8.53

Table 10: Mid-sized firms (N=1 410), sorted by 2010 total assets

Statistic	N	Mean	St. Dev.	Pctl(25)	Median	Pctl(75)
EARN_2010	1,396	13.44	44.45	0.46	7.32	22.14
EARN_2011	1,390	15.53	51.44	0.28	7.60	25.10
EARN_2012	1,391	15.68	55.47	−1.11	6.57	24.34
EARN_2013	1,393	15.48	58.12	−0.98	6.19	24.30
EARN_2014	1,392	19.36	68.76	0.09	7.94	27.75
EARN_2015	1,393	24.17	83.01	0.59	8.58	32.41
EARN_2016	1,394	26.38	104.70	0.58	10.38	34.36
EARN_2017	1,392	28.84	89.32	0.78	10.47	37.99
DIV_2010	1,408	0.71	2.38	0.14	0.32	0.77
DIV_2011	1,398	7.65	24.41	0.00	0.70	6.11
DIV_2012	1,387	8.99	24.08	0.00	1.39	8.21
DIV_2013	1,386	8.98	21.21	0.00	1.71	8.88
DIV_2014	1,391	9.96	23.43	0.00	1.57	9.59
DIV_2015	1,400	10.52	27.00	0.00	1.64	9.47
DIV_2016	1,401	11.74	26.91	0.00	2.09	11.33
DIV_2017	1,403	12.89	28.90	0.00	2.48	12.86
TA_2010	1,410	374.02	344.04	110.34	237.81	539.31
TA_2011	1,404	403.37	408.89	115.70	251.00	569.64
TA_2012	1,404	423.59	489.05	118.44	252.31	582.13
TA_2013	1,407	438.26	521.01	116.84	263.71	586.91
TA_2014	1,408	511.57	1,301.68	124.54	279.00	620.38
TA_2015	1,409	592.09	2,040.71	127.18	288.45	658.86
TA_2016	1,410	667.46	2,526.47	131.74	306.09	728.85
TA_2017	1,408	711.11	2,383.33	136.48	323.85	765.93
DPS_2010	1,395	2.00	7.79	0.00	0.05	0.90
DPS_2011	1,410	2.59	13.38	0	0.1	0.9
DPS_2012	1,410	2.70	11.19	0.00	0.10	1.03
DPS_2013	1,410	3.06	12.62	0	0.2	1.3
DPS_2014	1,408	3.06	11.57	0.00	0.16	1.50
DPS_2015	1,410	3.44	14.93	0.00	0.19	1.53
DPS_2016	1,410	3.52	14.69	0.00	0.20	1.60
DPS_2017	1,410	3.55	13.76	0	0.2	1.3
EPS_2010	1,320	6.75	37.36	0.00	0.30	2.20
EPS_2011	1,337	6.70	29.28	0.00	0.45	2.72
EPS_2012	1,366	8.00	46.34	0.04	0.69	3.43
EPS_2013	1,391	8.76	49.58	0.00	0.49	3.04
EPS_2014	1,399	8.64	44.19	0.00	0.52	3.26
EPS_2015	1,407	9.48	45.40	0.00	0.53	3.19
EPS_2016	1,409	10.51	50.72	0.02	0.72	3.63
EPS_2017	1,410	10.89	55.88	0.03	0.72	3.89



	TA	DIV	DPS	EPS	CSH	EARN
Top 10 %	73.57 %	72.38 %	26.92 %	18.43 %	69.05 %	65.46 %
Top 25%	96.47 %	96.57 %	68.15 %	61.70 %	94.58 %	96.12 %
Mid 50%	3.41 %	3.35 %	25.67 %	28.37 %	5.10 %	3.93 %
Low 25%	0.12 %	0.08 %	6.17 %	9.93 %	0.32 %	-0.04 %

Figure 6: Firm contribution by size measured by total assets

tested. However, as Lintner (1956) and Brav et al. (2005) suggest, this correlation is expected since management is reluctant to cut dividends. Hence, the previous dividends distributed becomes an important factor when dividend decisions are made.

Table 11: Pearson ans Spearman correlation between variables

	A	B	C	D	E	F	G	H	I	J	K	L
A: IO_t		**0.76**	**0.56**	**0.51**	0.00	0.00	0.01	0.01	-0.01	**0.01**	**0.09**	**0.16**
B: IO_{t-1}	**0.76**		**0.51**	**0.57**	0.01	0.01	**0.02**	**0.02**	-0.00	**0.02**	**0.08**	**0.17**
C: $IO2_t$	**0.56**	**0.51**		**0.67**	-0.00	-0.00	-0.01	-0.01	-0.01	0.01	**0.05**	**0.12**
D: $IO2_{t-1}$	**0.51**	**0.57**	**0.67**		-0.00	0.00	0.00	0.01	-0.00	0.01	**0.05**	**0.13**
E: $EARN_t$	**0.17**	**0.17**	**0.13**	**0.13**		**0.36**	**0.44**	**0.31**	**0.34**	0.01	**0.05**	**0.16**
F: $EARN_{t-1}$	**0.17**	**0.18**	**0.13**	**0.13**	**0.76**		**0.44**	**0.37**	**0.50**	0.00	**0.04**	**0.17**
G: DIV_t	**0.18**	**0.19**	**0.13**	**0.14**	**0.69**	**0.74**		**0.88**	**0.52**	0.01	**0.07**	**0.26**
H: DIV_{t-1}	**0.17**	**0.18**	**0.13**	**0.14**	**0.64**	**0.68**	**0.89**		**0.40**	**0.02**	**0.06**	**0.24**
I: CSH_t	**0.15**	**0.16**	**0.12**	**0.13**	**0.57**	**0.57**	**0.59**	**0.57**		0.00	0.01	**0.19**
J: ROE_t	**0.13**	**0.13**	**0.10**	**0.09**	**0.75**	**0.55**	**0.48**	**0.43**	**0.30**		0.01	**0.05**
K: RI_t	**0.18**	**0.19**	**0.14**	**0.15**	**0.55**	**0.58**	**0.63**	**0.63**	**0.46**	**0.44**		**0.09**
L: $\log(TA)_t$	**0.18**	**0.19**	**0.14**	**0.15**	**0.64**	**0.65**	**0.66**	**0.65**	**0.82**	**0.29**	**0.52**	

This table reports Pearson correlations above and Spearman correlations below the diagonal. The number of observations ranges from 17 692 to 19 726. Correlations with significance levels below 5% appear in bold print.

Table 12 shows the relevant measures of dividend payers in term of ratios which are used in the models. The most interesting measure is DPS metric. Within these firms, DPS has been slightly increasing since the beginning of the study period both in terms of mean and median values. It is notable that, as with the descriptive statistics above, the dividend payers subset is dominated by a small number of

large firms, which can be seen in how the mean values of DPS are almost three times larger compared to the upper quartile of the sample.

In a similar manner, the development of EPS has been quite stable but there is a slight upwards trend at least on the median values. Moreover, the upper quartile values have been increasing since 2010, while lower quartile values have been more or less the same, which implies that the bigger firms have been growing bigger while the smaller firms have been more static. This would explain the wider interquartile range.

In addition to the DPS and EPS metrics, Table 12 includes the metrics presenting the change of DPS and EPS from period to period. These metrics are only calculated within the dividend payer subset because when a change is considered it is required to have data from every period. Both average and median change in DPS ('D_DPS') has been positive in every period, which can be interpreted that the firms that tend to pay dividends also tend to increase dividend payments from every period. The increases are not substantial but as the underlying metric is a ratio, even a small increase can be meaningful. Furthermore, as the D_DPS is calculated as a difference between t and t-1 it means that D_DPS is compounded and even a small annual increase has a large effect.

The change in EPS ('D_EPS') has been constructed in a similar manner and it describes the relative increase or decrease of EPS between periods. It is notable that both the mean and median changes in EPS have been positive which could imply that the profitability of firms has been increasing during the period under investigation. This idea is supported by fact that the total returns of firms have been increasing consistently during the same time as described in Figure 5.

Furthermore, Table 12 includes D_DIV and D_EARN variables which are constructed same way as their corresponding ratios D_DPS and D_EPS except that they are calculated by using absolute numbers instead of ratios. The main benefit of this is that when calculating the changes in earnings and dividends, this variable is capable of capturing the effect of negative earnings. The difference becomes obvious when D_EPS and D_EARN are compared. For example, the mean change and median change in absolute earnings have been negative in five periods and seven periods, respectively, while the change in the mean and median of EPS has been positive in every period. However, when changes in dividends are considered, the difference between these measures is marginal, which is a result sample of this subset since only firms that pay dividends i.e. either DPS>0 or DIV>0, are included in this sample. All in all, these findings suggest that the absolute measures would provide more convincing results.

Tables 13 and 14 provide descriptive statistics for each variable used in this

Table 12: Descriptive statistics of dividend payers subsample, annual basis

Statistic	N	Mean	St. Dev.	Pctl(25)	Median	Pctl(75)
DPS_2010	1,040	11.52	113.27	0.30	1.05	3.02
DPS_2011	1,040	10.63	91.63	0.31	1.10	3.46
DPS_2012	1,040	11.37	84.57	0.43	1.31	4.00
DPS_2013	1,040	11.45	80.85	0.46	1.38	4.41
DPS_2014	1,040	11.78	79.75	0.45	1.39	4.69
DPS_2015	1,040	16.46	148.78	0.47	1.50	5.00
DPS_2016	1,040	12.08	68.93	0.50	1.59	5.13
DPS_2017	1,040	12.15	67.31	0.43	1.35	5.25
EPS_2010	982	22.00	181.03	0.40	1.59	6.98
EPS_2011	988	21.24	153.63	0.66	2.16	8.39
EPS_2012	1,001	26.73	203.86	0.79	2.67	9.94
EPS_2013	1,017	24.33	167.72	0.67	2.54	9.50
EPS_2014	1,025	28.12	236.48	0.70	2.51	9.83
EPS_2015	1,031	21.64	84.82	0.72	2.54	11.15
EPS_2016	1,037	24.26	107.07	0.80	2.79	11.72
EPS_2017	1,040	24.76	103.98	0.80	2.84	12.84
D_DPS2011	1,040	0.12	0.57	0.00	0.00	0.16
D_DPS2012	1,040	0.37	1.90	0.00	0.11	0.36
D_DPS2013	1,040	0.17	0.68	0.00	0.06	0.20
D_DPS2014	1,040	0.09	0.64	0.00	0.04	0.14
D_DPS2015	1,040	0.20	1.00	0.00	0.06	0.14
D_DPS2016	1,040	0.24	2.74	0.00	0.07	0.19
D_DPS2017	1,040	0.04	0.42	0.00	0.05	0.15
D_EPS2011	871	1.00	12.05	−0.14	0.10	0.39
D_EPS2012	941	1.01	14.68	−0.07	0.12	0.41
D_EPS2013	969	0.10	0.97	−0.21	0.03	0.23
D_EPS2014	957	0.22	1.44	−0.19	0.03	0.22
D_EPS2015	961	0.81	15.08	−0.15	0.05	0.25
D_EPS2016	978	0.38	2.42	−0.13	0.08	0.32
D_EPS2017	985	0.19	1.23	−0.14	0.06	0.25
D_DIV2011	1,084	1.28	8.85	0.00	0.14	0.47
D_DIV2012	1,086	2.07	50.92	−0.01	0.07	0.24
D_DIV2013	1,084	4.26	75.15	−0.01	0.06	0.18
D_DIV2014	1,085	2.81	74.42	−0.003	0.06	0.19
D_DIV2015	1,088	71.67	1,916.27	0.00	0.09	0.24
D_DIV2016	1,087	3.26	67.34	0.00	0.08	0.22
D_DIV2017	1,089	1.72	44.52	0.00	0.07	0.20
D_EARN2011	1,090	0.35	9.34	−0.32	−0.10	0.13
D_EARN2012	1,095	−0.03	5.95	−0.28	−0.06	0.19
D_EARN2013	1,094	−0.07	3.77	−0.30	−0.07	0.18
D_EARN2014	1,095	−0.04	2.60	−0.36	−0.11	0.08
D_EARN2015	1,096	0.03	20.77	−0.35	−0.13	0.07
D_EARN2016	1,096	−0.08	4.52	−0.34	−0.12	0.08
D_EARN2017	1,096	−0.38	13.52	−0.33	−0.12	0.07

thesis through the whole time period. From Table 13 it is clear to see how heterogeneous the sample is, especially considering the size of firms. This is reflected by the substantial standard deviations of absolute variables EARN, DIV, TA, and CSH.

Table 13: Descriptive statistics of dividends, earnings, cash and total assets through the whole period 2010-2017

Statistic	N	Mean	St. Dev.	Pctl(25)	Median	Pctl(75)
EARN	22,008	287,697.50	4,235,979.00	−322.25	6,049.50	56,600.00
DIV	21,876	160,779.50	1,563,311.00	0.00	1,116.00	20,200.00
TA	22,317	7,564,670.00	91,826,682.00	55,535.00	263,685.00	1,491,600.00
CSH	20,673	460,677.70	5,999,982.00	3,000.00	17,365.00	103,200.00
EPS	21,682	20.00	731.66	0.00	0.52	3.48
DPS	22,456	5.97	84.34	0.00	0.13	1.33
RI	22,093	7133.27	55,219	37.49	197.46	908.32
ROE	21,354	−3.92	463.41	−0.51	8.04	15.86
log_EARN	16,069	9.94	2.51	8.24	9.91	11.60
log_DIV	13,068	9.41	2.58	7.71	9.40	11.09
log_TA	22,317	12.62	2.43	10.92	12.48	14.22
log_CSH	20,553	9.72	2.76	8.05	9.78	11.55

Table 14 presents the period-by-period changes in the dependent variables D_DIV and D_DPS and independent variables D_EARN and D_EPS. These are only formed within the dividend payer subsample because within that sample, none of the variables are zero, which enables the calculation of relative change to provide meaningful results. It is notable within this dataset that the relative change in mean D_DIV has been substantial when it is compared to other metrics while the median is still in line with others, which implies that there have been large changes in the biggest firms within the sample.

Table 14: Descriptive statistics of changes in dividends and earnings among dividend payers through the time period 2011-2017 (%)

Statistic	N	Mean	St. Dev.	Pctl(25)	Median	Pctl(75)
D_DIV	7,603	12.46	727.02	0.00	0.08	0.23
D_EARN	7,662	−0.03	10.54	−0.33	−0.10	0.12
D_DPS	7,280	0.18	1.39	0.00	0.06	0.18
D_EPS	6,662	0.52	9.15	−0.15	0.07	0.29

3.4 Methodology

In general, when social sciences, including economics and corporate finance, are considered, two contrasting research philosophies appear, qualitative and quantitative. Qualitative methodologies perceive reality as fundamentally subjective and socially interrelated construction, while quantitative approaches define reality as objective and independent of observer. In practice, both methodologies are needed, and they complement each other, when the boundaries of knowledge are pushed further away. (Wellington and Szczerbinski 2007, pp. 21.)

3.4.1 Quantitative methodology

Even though both methodologies, and their combinations, are used in corporate finance research, is the use of quantitative methodologies, a typical approach. One of the main reasons for this is that when firms and businesses are considered, most of the details can be described with numbers. Quantitative analysis is based on countable objects and events, and then forming and testing hypotheses based on these. The results of these tests may later be refined into theories, thus becoming a natural part of corporate finance research (Wellington and Szczerbinski 2007, pp. 83).

Furthermore, a massive amount of numerical data is available, e.g., in CRSP[9], Compustat and in other commercial databases which increases the appeal of quantitative analysis. Moreover the motivation of financial research is to promote objectivity, predictability, and generalization following suit to natural sciences like physics or chemistry. However, in comparison to natural science, corporate finance is always subject to certain level of subjectivity and even if 'numbers do not lie', the choices made when a test or a theory is tried have a significant effect on the results (Harvey 2017, pp. 1405).

Typical ways to conduct quantitative analysis in corporate finance as well as in economics is either by using time series data, cross-sectional data, or a combination of these two. Panel data, also referred as longitudinal data or cross-sectional time series data, is formed by pooling cross-sectional observations for multiple time periods. The choice between different data depends on the nature of the phenomena under investigation. If the phenomenon is an object that is observed and compared from period to period, thus forming a data composed of *m x 1*

[9]Center for Research in Security Prices

dimensions. This type of phenomenon can be, for example, a stock index and the data is time series data. If the phenomenon happens at the same time to a multiple objects thus forming a data composed of *1 x n* dimensions, e.g., key accounting figures of S&P 500 companies in one financial year, the data is referred as cross-sectional. However, when there is a cross-sectional phenomenon which is followed by multiple periods, thus forming a *m x n* dimensional data, a panel data is formed.

When compared to other data, panel data have certain benefits (Baltagi 2008, pp. 4-7). The following list summarizes the main benefits of panel data compared to either cross-sectional or time series data. Panel data

- allows control for individual heterogeneity;
- add in-depth information of observations;
- reduce collinearity among variables;
- add degrees of freedom and efficiency;
- enables to study the dynamics of adjustment; and
- detect and identify effects that are not possible to find in cross-sectional data.

Especially the control for heterogeneity becomes useful since it allows the data to be analyzed on an individual company level, a year level and on an industry or country level. It makes it possible to estimate different intercepts for each individual, which coincides in this type of data due to the differences between individuals. For example, within the data set of this thesis it is reasonable to assume that the intercepts between different companies vary due to the company specific attributes and due to differences in geographical locations and legislative regions.

However, panel data has also some limitations and potential problems. Main limitations consist of data collection and design, error of measurement, selectivity problems, short time series dimensions and cross-section dependency (Baltagi 2008, pp. 7-8). Considering this thesis, the main problems have been related to the data collection and selectivity problem. As explained in Section 3.1, the data set has been constructed by combining data from multiple databases based on certain chosen attributes. Even though the data set was manually screened and most inconsistencies were fixed, it is still likely that some problems persist.

Cross-sectional dependency is common when a sample has a large number of observed units ('N') and very long length of time period ('T'). This issue is

common among when macro data with large T and large N are analyzed and when the dependencies among the same cross-sections are not controlled away (Baltagi 2008, pp. 237-238).

3.4.2 Linear regression

The cornerstone of quantitative methodology is regression analysis, which enables to study the relationship between two variables. The model is chosen based on the nature of the relationship between the dependent variable and independent variable, and when correctly specified, can be used to make predictions and find causality. If the relationship is linear, then the linear regression model can be expressed as:

$$Y_i = \beta_0 + \beta_1 X_i + u_i \tag{21}$$

where Y is the dependent variable or response variable, X is the independent variable or regressor, β_0 is the intercept or constant and β_1 is the slope of the regression line or coefficient, and i denotes observations. The term u_i is an error term which aggregates the difference between the actual Y and its predicted values. The brief interpretation of this model is that one unit change in the regressor has a linear change in the value of dependent variable. (Stock and Watson 2020.)

The best method to estimate a linear regression model is to use *the ordinary least squares* estimator ('OLS') which is BLUE[10] estimator for all linear regression models. (Stock and Watson 2020.)

As empirical problems are typically complex, one regressor might not be enough to explain all variation of Y. Therefore, an extension of the abovementioned model which includes k regressors each having a corresponding slope coefficient, is used. Adding regressors increases the explaining power of the model up to a limit, but as it is not possible to include everything in a model the results of OLS might be misleading as it is subject to omitted variable bias. (Stock and Watson 2020.)

The omitted variable bias can be mitigated by adding relevant control variables to the model to distinguish potential causal effect of the variables of interest. Adding control variables makes the variables of interest no longer correlated with the error term while control variables are held constant. This works when there are data on effects to control. (Stock and Watson 2020.)

When such data does not exist, it is possible to study changes in Y over time. Thus, controlling for the unknown effects and mitigating the omitted variable bias.

[10]Best Linear Unbiased Estimator

Fixed effects regression model is a appropriate method to control for things that might be impossible to measure but can be thought to remain constant over the analysis period but is allowed to change between entities. In other words, different entities are allowed to have different intercepts, i.e. effects which does not change over time. (Stock and Watson 2020.)

The fixed effect regression model can be expressed as:

$$Y_{it} = \beta_0 + \beta_1 X_{1,it} + ... + \beta_k X_{k,it} + \gamma_2 D2_i + \gamma_3 D3_i + ... + \gamma_n Dn_i + u_{it} \tag{22}$$

where β and γ are coefficients, $X_{1,it}$ is the first regressor of ith entity at time t and $D2_i$ is the first entity specific, time invariant fixed effect expressed as binary variable, u is the error term while k denotes number of regressors and n denotes for number of fixed effects. In order to avoid the dummy variable trap, which leads to perfect multicollinearity, the first dummy variable is arbitrarily omitted from the model. (Stock and Watson 2020.)

In addition to time-invariant fixed effects, it would be reasonable to expect that there are certain unmeasureable which has a constant effect through entities but changes over time. This model combines entity and time fixed effects into a single regression model which can be expressed as:

$$Y_{it} = \beta_0 + \beta_1 X_{1,it} + ... + \beta_k X_{k,it} + \gamma_2 D2_i + ... + \gamma_n Dn_i + ... + \theta_2 B2_t + ... + \theta_T BT_t + u_{it} \tag{23}$$

where D_i are entity specific and B_t are time-specific fixed effects. (Stock and Watson 2020.)

After a regression model is estimated, it is required to analyze whether the variance u_{it} depends on X_{it} or not. In the first case, standard errors are heteroskedastic while in the latter they are homoskedastic. This problem can be mitigated by calculating both standard errors and seeing if they differ. However, it is also possible to just assume heteroskedasticity as they tend to be more reliable.(Stock and Watson 2020.)

3.4.3 Selection of model and methods

Based on the information received when the dataset was analyzed, and according to the previous research on the relationship between dividends, earnings and ownership structure, it is reasonable to believe that a linear relationship exists. In addition, as panel data is available, a linear fixed effects regression model was chosen.

It would be unrealistic to include all relevant variables in the regression model, which in turn, would lead to an omitted variable bias in the results. Hence, both time and entity specific fixed effects were included into the estimation. This is also a common approach in the current research when panel data is used in corporate finance settings and. Finally, as the relationship is assumed to be linear, OLS is used as an estimator since it is the BLU estimator.

4 RESULTS

4.1 Econometric models

Whenever financial econometrics are applied in a research, three key steps are involved: i) model selection, ii) model estimation and iii) model testing (Rachev, Mittnik, Fabozzi and Focardi 2007, pp. 7). The foremost objective of the thesis is to find answers to the research questions which sets the requirements concerning the data collected and the model chosen. Quantitative research is based on statements i.e. research questions that are then transformed into a testable hypotheses. Hypotheses then in turn are translated to a econometric model that either finds support among the data or not. Based on the discussion above in the previous section, a panel regression model with fixed effects was chosen to be the most appropriate in this case. This sections discusses the selected models, chosen estimations, and model testing, i.e., testing the robustness of the models.

The econometric models of the thesis were built based on the findings of the previous research where the relevant variables were found and the research questions of the thesis. Hypotheses under investigation are then formed based on these two.

The research was conducted in three different ways: based on ratios such as EPS and DPS following Brav et al. (2005) and Tran and Le (2019), based on actual absolute numbers following the example of e.g. Bond et al. (1995) and Short et al. (2002) and based on the logarithmic transformations of the abovementioned variables. Even though there were certain differences between these approaches, each approach provided results in line with each other. However, the absolute numbers approach was chosen to be reported here in results due to few reasons. First, when compared to the ratio based approach, it allows negative earnings to taken into consideration instead of flooring them to zero. Second, as a euro value, it is consistent and comparable across all firms and is not dependent on the number of shares or the size of a firm. Third, even though the sample is dominated by large firms which is evident when analyzing the differences between interquartile ranges and means of variables, it is not as sensitive to changes when compared to the logarithmic transformation approach.

The absolute number approach findings will be reported as the results of the thesis and are used to answer the research questions. Nonetheless, for the sake of transparency, the results of other approaches will be presented within the appendices.

4.1.1 Hypotheses and model specifications

The variables and their definitions are summarized in Table 15 below.

Table 15: Variables and definitions

Variable	Abbreviation	Definition
Independent variable		
Change in dividends	D_DIV	The relative difference in dividends paid between t and $t-1$ as percentage
Dividends	DIV	Dividends distributed in euros.
Dependent variable		
Earnings	EARN	Net earnings in euros.
Dividends	DIV	Dividends distributed in euros. Lagged by one year.
Institutional ownership	IO & IO2	At least one/two or more institutional investors with at least 5% stake.
Control variable		
Total assets	log(TA)	Natural logarithm of total assets. Part of SIZE control.
Cash	CSH	Total amount of cash in euros. Part of SIZE control.
Return on equity	ROE	Return on equity as percentage. Part of PROF control.
Returns	RI	Total returns of a firm as index format. Part of PROF control.

The empirical research of the thesis aims to find answers to the four research questions by testing hypotheses. The research questions can be divided into two groups where RQ1 and RQ2 can be answered by focusing on the dividend decision made by an individual firm while when RQ3 and RQ4 are considered the focus is on dividends paid. The hypotheses related to the research questions and the samples used in the estimation are summarized in Table 16 below.

Furthermore, in order to evaluate the soundness of the results, alternative specifications, i.e., control models, were constructed. These models include covariates separate from the economically interesting variables, thus making the interpretation of the results more robust. (Lu and White 2014.)

Table 16: Summary of research questions and hypotheses.

Focus	Research question	Hypothesis	Sample
Dividend decision	**RQ1:** How does the presence of an institutional investor affect the dividend policy decision of a firm when the dividend policy is modeled as change in dividends?	**H1**	Dividend payers
		H2	
	RQ2: How does the presence of two or more institutional investors affect the dividend policy decision of a firm when the dividend policy is modeled as change in dividends?	**H3**	Dividend payers
		H4	
Dividends paid	**RQ3:** Is institutional ownership a significant determinant for dividend policy pursued by a firm and if so, how large is the effect?	**H5**	All firms
		H6	
	RQ4: Is institutional ownership a significant determinant for dividend policy pursued by a firm and if so, how large is the effect when there are two or more institutional owners?	**H7**	All firms
		H8	

Hypotheses 1 and 2 are used to answer RQ1. Models 1 (24) and 2 (25) are tested to either accept or reject these hypotheses. Hence, providing the required support to answer the RQ1.

Hypothesis 1. *Presence of an institutional investor leads to a positive and significant change in dividends distributed, ceteris paribus.*

Hypothesis 2. *Presence of an institutional investor leads to a positive and significant change in dividends distributed when the ownership has been present in the previous period.*

Based on these hypotheses, it was possible to build testable econometric models. Model 1 was formed in accordance with the partial adjustment model as the dividend decision was modelled as a change in dividends between two periods (Lintner 1956; Short et al. 2002). This model was then used to test Hypothesis 1.

$$D\_DIV_{it} = \beta_0 + \beta_1 EARN_{it} + \beta_2 (EARN * IO)_{it} + \beta_3 DIV_{i(t-1)} + \epsilon_{ti} \tag{24}$$

where D_DIV_i denotes the change in dividends distributed between t and $t-1$, β_0 denotes the intercept of firm i, $EARN_i$ denotes net earnings of firm i, IO is institutional ownership dummy, DIV_i denotes dividends paid. $(EARN * IO)$ is

an interaction term which emphasizes the effect of institutional ownership and earnings.

Model 2 was formed as an extension to the partial adjustment model to find if lagged earnings would provide a better proxy for the change in dividends (Fama and Babiak 1968).

$$\begin{aligned} D\_DIV_{it} =& \beta_0 + \beta_1 EARN_{it} + \beta_2 EARN_{i(t-1)} \\ &+ \beta_3 (EARN * IO)_{i(t-1)} + \beta_4 DIV_{i(t-1)} + \epsilon_{ti} \end{aligned} \tag{25}$$

Among these two specifications, β_0 would explain the reluctancy of a firm i's management to reduce dividends[11], betas for earnings refer to cr_i i.e. the target dividend payout rate r modified by speed of adjustment coefficient c_i of individual firms and beta of dividends explaining $-c_i$.

In order to further analyze the effects of institutional ownership, models with control variables were constructed as below.

$$\begin{aligned} D\_DIV_{it} =& \beta_0 + \beta_1 EARN_{it} + \beta_2 (EARN * IO)_{it} + \beta_3 DIV_{i(t-1)} \\ &+ \beta_k SIZE_i t + \beta_l PROF_i t + \epsilon_{ti} \end{aligned} \tag{26}$$

and

$$\begin{aligned} D\_DIV_{it} =& \beta_0 + \beta_1 EARN_{it} + \beta_2 EARN_{i(t-1)} + \beta_3 (EARN * IO)_{i(t-1)} \\ &+ \beta_4 DIV_{i(t-1)} + \beta_k SIZE_{it} + \beta_l PROF_{it} + \epsilon_{ti} \end{aligned} \tag{27}$$

where i now refers either to a firm, a country or an industry, k and l denote the corresponding variables inside SIZE and PROF.

Hypotheses H3 and H4 are used to answer RQ2. Model 3 (28) and Model 4 (29) were formed to test hypotheses H3 and H4. They were constructed analogously to the previous ones except IO dummy variable was replaced by $IO2$ dummy, standing for two or more institutional owners. Due to this similarity, these models will not be discussed in detail.

Hypothesis 3. *The presence of two or more institutional investors lead to a positive and significant change in dividends distributed.*

$$D\_DIV_{it} = \beta_0 + \beta_1 EARN_{it} + \beta_2 (EARN * IO2)_{it} + \beta_3 DIV_{i(t-1)} + \epsilon_{ti} \tag{28}$$

Hypothesis 4. *Presence of two or more institutional investors leads to a positive*

[11] As the sample includes such large number of observations, it is not interesting to analyze individual intercepts, thus constant is omitted from results.

and significant change in dividends distributed when the ownership has been present in the previous period.

$$\begin{aligned} D\_DIV_{it} =& \beta_0 + \beta_1 EARN_{it} + \beta_2 EARN_{i(t-1)} \\ &+ \beta_3 (EARN * IO2)_{i(t-1)} + \beta_4 DIV_{i(t-1)} + \epsilon_{ti} \end{aligned} \tag{29}$$

Hypotheses H5, H6, H7 and H8 were tested with the whole sample that includes both dividend payers and non-payers. This restricts the use of D_DIV as a variable due to the discontinuity of functions. In other words, changes between paying and not paying dividends would lead to non-defined solutions when the percentage change is observed. Hence, the dependent variable is now the amount of dividends distributed i.e., DIV.

Model 5 (30), Model 6 (31), Model 7 (32) and Model 8 (33) are accordingly formed to test hypotheses H5, H6, H7 and H8, respectively. Similarly, RQ3 is answered by H5, H6 and RQ4 is answered by H7, H8. Model 5 (30) and Model 7 (32) are constructed in a similar manner, while Model 6 (31) and Model 8 (33) are constructed in a similar manner.

Hypothesis 5. *Institutional ownership increases dividends distributed.*

$$DIV_{it} = \beta_0 + \beta_1 EARN_{it} + \beta_2 EARN_{i(t-1)} + \beta_3 IO_{it} + \beta_4 DIV_{i(t-1)} + \epsilon_{ti} \tag{30}$$

Hypothesis 6. *Institutional ownership is a positive and statistically significant determinant of the amount of dividends distributed.*

In order to form the testable regression model for H6, variables for size and profitable were added. If the institutional ownership can stand out among variables related to dividends distributed, it is a meaningful determinant of dividend payments.

$$\begin{aligned} DIV_{it} =& \beta_0 + \beta_1 EARN_{it} + \beta_2 EARN_{i(t-1)} + \beta_3 IO_{it} \\ &+ \beta_4 DIV_{i(t-1)} + \beta_k SIZE_{it} + \beta_l PROF_{it} + \epsilon_{ti} \end{aligned} \tag{31}$$

where β_1, β_2 and β_3 are expected to be positive and statistically significant while β_4 is expected to be negative and statistically significant.

Hypothesis 7. *Institutional ownership of two or more institutional investors increases dividends distributed.*

$$DIV_{it} = \beta_0 + \beta_1 EARN_{it} + \beta_2 EARN_{i(t-1)} + \beta_3 IO2_{it} + \beta_4 DIV_{i(t-1)} + \epsilon_{ti} \quad (32)$$

where β_1, β_2 and β_3 are expected to be positive and statistically significant while β_4 is expected to be negative and statistically significant.

Hypothesis 8. *Institutional ownership of two or more institutional investors is a positive and statistically significant determinant of dividends distributed.*

Finally, the test for Hypothesis 8 is formed as below:

$$\begin{aligned} DIV_{it} = &\beta_0 + \beta_1 EARN_{it} + \beta_2 EARN_{i(t-1)} + \beta_3 IO2_{it} \\ &+ \beta_4 DIV_{i(t-1)} + \beta_k SIZE_{it} + \beta_l PROF_{it} + \epsilon_{ti} \end{aligned} \quad (33)$$

where β_1, β_2 and β_3 are expected to be positive and statistically significant while β_4 is expected to be negative and statistically significant.

Each of these eight models was controlled for individual, country and industry fixed effects. In addition, minor variations were introduced to the specifications to increase the effectiveness of the models.

4.2 Empirical results

This section presents the results of the regressions conducted and connects the findings of the thesis with the previous empirical research. All in all, the answers for the research questions will be provided within this section. This section is divided into two subsections where 'Dividend decision' discusses the results related to RQ1 and RQ2 while 'Dividends paid' discuss the results related to RQ3 and RQ4. All results presented in this section are estimated by using heteroscedasticity-consistent standard errors or Eicker-Huber-White standard errors also known as 'HC1' (Long and Ervin 2000).

Table 17 presents the results for fixed effects estimation for the changes in dividends on individual firm level data and Tables 18 and 19 show the results for each specification with controls included[12]. Based on these results, it is attempted to test H1, H2, H3, and H4 to find evidence for the RQ1 and RQ2.

Tables 20, 21, 22, 23 and 24 provide the fixed effects estimation results for hypotheses H5, H6, H7, and H8. In other words, these are attempts to answer

[12]Within the results tables, bolded **M** refers to a model testing a hypothesis while **C** refers to a certain control specification related to a hypothesis

RQ3 and RQ4. The models[13] were more thoroughly tested and analyzed due the better fit and more robust nature of the results in comparison with the models[14] used in dividend decision analysis.

4.2.1 Dividend decision

Building a model consistent with the partial adjustment model was found challenging, which becomes evident when the results of these models are examined.

First of all, none of the models 1, 2, 3 or 4 was really suited to answer the hypotheses due to very low F Statistics, which means that it is not possible to reject the null hypothesis that the coefficients would jointly differ from zero. Secondly, the adjusted coefficient of determination (R^2) is negative in every model which means that the independent variables cannot explain any part of the variance of D_DIV. Thirdly, the regression results imply that most of the coefficients are not statistically significant, thus it is not possible to reject the null hypothesis. However, coefficients for IO_t (t-value = 1.002), IO_{t-1} (t-value = 1.068), $IO2_t$ (t-value = 1.148) and $IO2_{t-1}$ (t-value = 0.369) variables which were large but statistically insignificant. This implies that there is a relationship, even if not statistically significant, between the change in dividends and institutional ownership.

The only statistically significant variables were $EARN_t$ at 10% significance level and $EARN_{t-1}$ below 1% significance level, but both coefficients were estimated to be zero for each model. Further, all interaction terms, i.e., $EARN_t : IO1_t$, $EARN_{t-1} : IO1_{t-1}$, $EARN_t : IO2_t$ and $EARN_{t-1} : IO2_{t-1}$ are small and insignificant. Thus, the results would not carry any economic significance. Even though the results do not carry any direct information and no statistically robust arguments can be formed based on these results, the coefficients for earnings and institutional ownership are positive as expected.

The controlled specifications improve R^2 slightly when instead of firm level fixed effects either industry or country level fixed effects were considered. However, when the models are controlled for these, the statistical significance of the earnings disappear. The results regarding the controlled models for IO specifications and for $IO2$ specifications are presented in Tables 18 and 19, respectively. The results are in line with the previous results in Table 17 and it becomes evident that the models are not suitable for this analysis. In other words this means that either the data is not suitable for this kind of analysis or the model itself was wrongly

[13]Models 5, 6, 7 and 8.
[14]Models 1, 2, 3 and 4.

Table 17: Fixed effects estimation results for the change in dividends.

	One institutional owner		Two or more institutional owners	
	(**Model 1**)	(**Model 2**)	(**Model 3**)	(**Model 4**)
EARN_t	0.000*	0.000*	0.000*	0.000*
	t = 1.830	t = 1.688	t = 1.884	t = 1.677
IO_t	59.286			
	t = 1.002			
EARN_{t-1}		0.000***		0.000***
		t = 9.064		t = 15.077
IO_{t-1}		44.830		
		t = 1.068		
IO2_t			6.500	
			t = 1.148	
IO2_{t-1}				1.531
				t = 0.369
DIV_{t-1}	−0.000	−0.000	−0.000	−0.000
	t = −1.111	t = −0.991	t = −0.961	t = −1.102
$\text{EARN}_t : IO_t$	0.000			
	t = 0.743			
EARN_{t-1}:IO_{t-1}		−0.000		
		t = −0.105		
EARN_t:$IO2_t$			−0.000	
			t = −0.997	
EARN_{t-1}:$IO2_{t-1}$				0.000
				t = 1.289
	D_DIV			
	(**Model 1**)	(**Model 2**)	(**Model 3**)	(**Model 4**)
Time fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Country fixed effects	No	No	No	No
Industry fixed effects	No	No	No	No
N	7,595	7,593	7,595	7,593
R^2	0.001	0.000	0.000	0.000
Adjusted R^2	−0.169	−0.170	−0.170	−0.170
F Statistic	0.901	0.489	0.146	0.166
Degrees of Freedom	df = 4; 6490	df = 5; 6487	df = 4; 6490	df = 5; 6487

Note: Significance is denoted by $^{***} = p < 0.01;^{**} = p < 0.05;^{*} = p < 0.1$.

Table 18: Fixed effects estimation for the change in dividends with controls for size, profitability, country and industry. At least one institutional investor.

	(**M1 C1**)	(**M1 C2**)	(**M1 C3**)	(**M2 C1**)	(**M2 C2**)	(**M2 C3**)
$EARN_t$	0.000***	0.000	0.000	−0.000	0.000	0.000
	t = 2.975	t = 1.230	t = 1.263	t = −0.021	t = 1.001	t = 1.122
DIV_{t-1}	−0.000	−0.000	−0.000	−0.000	−0.000	−0.000
	t = −1.122	t = −1.555	t = −1.400	t = −1.001	t = −1.300	t = −0.932
ROE_t	0.143	−0.002	−0.038			
	t = 0.803	t = −0.239	t = −1.295			
RI_t	−0.000	−0.000	−0.000			
	t = −1.062	t = −0.988	t = −1.226			
CSH_t	0.000***	0.000	0.000			
	t = 16.473	t = 0.949	t = 1.050			
log(TA)	42.655	1.080	−0.151			
	t = 0.938	t = 1.186	t = −0.294			
$EARN_t$:IO_t	0.000	−0.000	−0.000			
	t = 0.005	t = −0.984	t = −0.755			
IO_t	60.265	44.234	34.902			
	t = 1.004	t = 0.968	t = 0.930			
$EARN_{t-1}$				0.000***	0.000	0.000
				t = 9.115	t = 1.018	t = 1.044
IO_{t-1}				46.999	47.374	36.200
				t = 1.079	t = 1.000	t = 0.952
ROE_{t-1}				0.001	−0.017	−0.052
				t = 0.156	t = −0.823	t = −1.059
RI_{t-1}				−0.000	−0.000	−0.000
				t = −0.904	t = −1.039	t = −1.375
CSH_{t-1}				−0.000***	−0.000	0.000
				t = −11.102	t = −0.900	t = 0.253
$\log(TA)_{t-1}$				30.385	1.140	−0.185
				t = 0.875	t = 1.418	t = −0.321
$EARN_{t-1}$:IO_{t-1}				−0.000	−0.000	−0.000
				t = −0.155	t = −1.164	t = −1.005
	D_DIV					
	(**M1 C1**)	(**M1 C2**)	(**M1 C3**)	(**M2 C1**)	(**M2 C2**)	(**M2 C3**)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	No	No	Yes	No	No
Country fixed effects	No	Yes	No	No	Yes	No
Industry fixed effects	No	No	Yes	No	No	Yes
N	7,348	7,348	7,348	7,232	7,232	7,232
R^2	0.001	0.007	0.005	0.001	0.007	0.005
Adjusted R^2	−0.176	0.001	0.001	−0.180	0.001	0.001
Residual Std. Error		739.049	739.257		745.001	745.213
F Statistic	0.622	1.231	1.166	0.360	1.200	1.130
Degrees of Freedom	df = 8; 6241	df = 41; 7306	df = 32; 7315	df = 9; 6125	df = 42; 7189	df = 33; 7198

Note: Significance is denoted by $^{***} = p < 0.01; ^{**} = p < 0.05; ^{*} = p < 0.1$.

specified. Similar problems appeared when other approaches e.g. with ratio based data or logarithmic data, were utilized. Some specifications were better fitted to the data, but no statistical significance was found between changes in dividends and institutional ownership.

Based on these findings, Hypotheses H1-H4 cannot be accepted and a link between dividend decisions and institutional ownership cannot be established based on this data and chosen model specifications. On the other hand, they cannot be rejected either since the models itself were not sufficient to explain the results. Previous research has found evidence both in favor and against the effect of institutional ownership, but according to these results such link does not exist. Nonetheless, when the model and the variables are scrutinized from an economic point of view, it seems odd that none of the variables has any effect on dividend policy, especially when the answers for RQ3 are RQ4 analyzed. These results support the argument that a distinctive and intuitive link between the dividend policy and the variables exist, which implies that the dependent variable D_DIV is not a correct proxy for the dividend policy.

4.2.2 Dividends paid

RQ3 and RQ4 approach the relationship between institutional ownership and dividend policy but from a different perspective. According to Lintner (1956) and Fama and Babiak (1968), a dividend policy of a firm can be described as a function of previous year's earnings, current year's earnings, and previously distributed dividends which in turn can be translated into a specific target dividend rate, speed of adjustment coefficient and a level of reluctancy to reduce the dividends which is manifested by change in dividends.

As discussed above, this approach did not seem to work and none of the models specified based on the partial adjustments model or its extensions provide statistically robust results, thus a different approach was pursued. On the contrary to the models related to RQ1 and RQ2, models discussed from now on provide good fit, or at least are meaningful according to the F Statistics which is significant in each model below 1% significance level.

Research questions RQ3 and RQ4 were analyzed and answered by creating regression models where instead of change in dividends the independent variable is the absolute amount of dividends distributed. This should provide information of the relationship between dividend policy and institutional ownership and addi-

Table 19: Fixed effects estimation for the change in dividends with controls for size, profitability, country and industry. Two or more institutional investors.

	(**M3 C1**)	(**M3 C2**)	(**M3 C3**)	(**M4 C1**)	(**M4 C2**)	(**M4 C3**)
$EARN_t$	0.000***	0.000	0.000	0.000	0.000	0.000
	t = 3.117	t = 1.145	t = 1.221	t = 0.033	t = 1.042	t = 1.126
DIV_{t-1}	−0.000	−0.000	−0.000	−0.000	−0.000	−0.000
	t = −0.977	t = −1.547	t = −1.446	t = −1.105	t = −1.550	t = −1.431
ROE_t	0.148	0.013	−0.016			
	t = 0.806	t = 0.566	t = −1.360			
RI_t	−0.000	−0.000	−0.000			
	t = −1.009	t = −1.065	t = −1.541			
CSH_t	0.000***	0.000	0.000			
	t = 16.799	t = 0.883	t = 0.991			
$\log(TA)_t$	44.859	2.252	0.756			
	t = 0.941	t = 1.140	t = 0.758			
$EARN_t$:$IO2_t$	−0.000	−0.000	−0.000			
	t = −1.078	t = −1.193	t = −1.431			
$IO2_t$	6.705	−5.417	−5.343			
	t = 1.135	t = −0.713	t = −0.815			
$EARN_{t-1}$				0.000***	0.000	0.000
				t = 10.991	t = 0.881	t = 0.952
$IO2_{t-1}$				2.278	−8.101	−8.504*
				t = 0.472	t = −1.427	t = −1.811
ROE_{t-1}				−0.004	−0.015	−0.046
				t = −0.640	t = −0.910	t = −1.083
RI_{t-1}				−0.000	−0.000	−0.000*
				t = −0.917	t = −1.111	t = −1.718
CSH_{t-1}				−0.000***	−0.000	0.000
				t = −9.527	t = −0.702	t = 0.308
$\log(TA)_{t-1}$				32.141	2.472	0.774
				t = 0.885	t = 1.276	t = 0.842
$EARN_{t-1}$:$IO2_{t-1}$				0.000	0.000	0.000
				t = 1.223	t = 1.375	t = 1.364
	D_DIV					
	(**M3 C1**)	(**M3 C2**)	(**M3 C3**)	(**M4 C1**)	(**M4 C2**)	(**M4 C3**)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	No	No	Yes	No	No
Country fixed effects	No	Yes	No	No	Yes	No
Industry fixed effects	No	No	Yes	No	No	Yes
N	7,348	7,348	7,348	7,232	7,232	7,232
R^2	0.000	0.006	0.005	0.000	0.006	0.005
Adjusted R^2	−0.177	0.001	0.000	−0.180	0.001	0.000
Residual Std. Error		739.247	739.406		745.224	745.370
F Statistic	0.263	1.135	1.074	0.183	1.097	1.038
Degrees of Freedom	df = 8; 6241	df = 41; 7306	df = 32; 7315	df = 9; 6125	df = 42; 7189	df = 33; 7198

Note: Significance is denoted by $^{***} = p < 0.01; ^{**} = p < 0.05; ^{*} = p < 0.1$.

tionally, information whether institutional ownership is a relevant determinant for a dividend policy.

Model 5 was constructed to test whether institutional ownership has a positive effect on the amount of dividends distributed while all other factors are kept constant. In other words, it is constructed to test H5. Based on the results of the fixed effects regression estimation presented in Table 20, it appears that even though IO_t dummy had a substantial positive effect in the independent variable by increasing dividends distributed by 33 075, it is not statistically significant with t-value = 0.766. Nevertheless, $EARN_t$ (t-value = 3.560) and DIV_{t-1} (t-value = 7.332) are both significant and had the anticipated signs as earnings increase the payout while historical dividends decrease it.[15] Previous earnings have a positive effect but remains statistically insignificant. These findings are consistent with Short et al. (2002) except to institutional ownership, and they suggest that while increased earnings increase dividends, previously paid dividends would have an opposite effect.

The findings are similar when country and industry level fixed effects are controlled (see M5 C1 and M5 C2 in Table 21) even as the significance of earnings decrease (t-value = 2.376) and the significance of lagged dividends increase (t-value = 8.063). The dominance of DIV_{t-1} becomes evident when it is removed from the model (see M5 C3, M5 C4 and M5 C5 in Table 21) leading to a drastic decrease in R^2 and disappearance of statistical significance among other variables. In general, R^2 is at reasonable level and when the individual effects are considered the adjusted R^2 is 22.5%, and when country and industry level fixed effects are added the coefficient of determination goes up 81.8% and 81.7%, respectively.

Finally, when H5 is considered the evidence from M5 does not support the notion that institutional ownership has an significant effect on the amount of dividends distributed. It is notable though, that its effect appears to be positive and large even if it is not statistically significant. Hence, H5 can be rejected.

Model 6 was constructed to test H6 and it is an extension to M5 where the other relevant determinants of a dividend policy found in previous research are included. The results for M6 are presented in Table 20. The coefficient of determination is slightly higher than in M5 increasing to 22.7% when individual effects are taken into account. $EARN_t$, DIV_{t-1} and CSH are statistically significant with t-values of 4.259, 7.251, and 4.044, respectively. IO_t is again large but not statistically

[15] As dividends are deducting element in the theoretical model the sign will be changed as $\beta DIV_{t-1} = -c_i DIV_{t-1}$

Table 20: Fixed effects estimation for amount of dividends paid. Individual fixed effects.

	One institutional owner		Two or more institutional owners	
	(Model 5)	**(Model 6)**	**(Model 7)**	**(Model 8)**
$EARN_t$	0.024***	0.027***	0.024***	0.027***
	t = 3.560	t = 4.259	t = 3.563	t = 4.264
$EARN_{t-1}$	0.007	0.002	0.007	0.002
	t = 1.015	t = 0.184	t = 1.016	t = 0.184
DIV_{t-1}	0.507***	0.512***	0.507***	0.512***
	t = 7.332	t = 7.251	t = 7.324	t = 7.243
IO_t	33,075.290	32,650.830		
	t = 0.766	t = 0.694		
ROE_t		6.069		4.762
		t = 0.688		t = 0.522
RI_t		0.776		0.785
		t = 1.095		t = 1.115
CSH_t		0.020***		0.020***
		t = 4.044		t = 4.046
$\log(TA)_t$		2,706.211		3,491.932
		t = 0.524		t = 0.757
$IO2_t$			−3,255.713	−2,194.235
			t = −0.499	t = −0.316
	DIV			
	(Model 5)	**(Model 6)**	**(Model 7)**	**(Model 8)**
Time fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Country fixed effects	No	No	No	No
Industry fixed effects	No	No	No	No
N	18,792	17,127	18,792	17,127
R^2	0.339	0.351	0.339	0.351
Adjusted R^2	0.225	0.227	0.225	0.227
F Statistic	2,056.917***	972.069***	2,055.887***	971.637***
Degrees of Freedom	df = 4; 16029	df = 8; 14376	df = 4; 16029	df = 8; 14376

Note: Significance is denoted by $^{***} = p < 0.01; ^{**} = p < 0.05; ^{*} = p < 0.1$.

Table 21: Fixed effects estimation for determinants of dividends paid with controls for lagged dividends, country and industry. At least one institutional investor.

	(M5 C1)	**(M5 C2)**	**(M5 C3)**	**(M5 C4)**	**(M5 C5)**
$EARN_t$	0.054**	0.056**	0.008	0.095	0.112
	t = 2.376	t = 2.387	t = 0.688	t = 1.297	t = 1.350
$EARN_{t-1}$	0.031	0.033	0.003	0.103	0.125
	t = 1.363	t = 1.405	t = 0.198	t = 1.530	t = 1.632
DIV_{t-1}	0.751***	0.764***			
	t = 8.063	t = 8.299			
IO_t	5,461.749	1,785.402	89,785.130	63,409.070*	46,703.520
	t = 0.421	t = 0.155	t = 1.016	t = 1.959	t = 1.540
			DIV		
	(M5 C1)	**(M5 C2)**	**(M5 C3)**	**(M5 C4)**	**(M5 C5)**
Time fixed effects	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	No	No	Yes	No	No
Country fixed effects	Yes	No	No	Yes	No
Industry fixed effects	No	Yes	No	No	Yes
N	18,792	18,792	18,923	18,923	18,923
R^2	0.819	0.817	0.003	0.365	0.294
Adjusted R^2	0.818	0.817	−0.168	0.364	0.293
Residual Std. Error	646,588.700	648,756.000		1,206,125.000	1,271,818.000
F Statistic	2,289.845***	3,000.893***	15.037***	301.530***	290.852***
Degrees of Freedom	df = 37; 18754	df = 28; 18763	df = 3; 16160	df = 36; 18886	df = 27; 18895

Note: Significance is denoted by $^{***} = p < 0.01; ^{**} = p < 0.05; ^{*} = p < 0.1$.

significant (t-value = 0.694). The signs of the coefficients are consistent with theory and previous results.

When the fixed effects are taken into account (see models M6 C1 and M6 C2 in Table 22), also RI_t (t-value = 1.978 and t-value = 1.948) and $log(TA)_t$ (t-value = 2.382 and t-value = 2.271) become significant which implies that when dividend policies are investigated at country or industry level, bigger and more valuable companies tend to pay more dividends. This seems to fit into the life cycle theory where well-established and mature firms pay most dividends while smaller and younger growth companies tend to use earnings for growth (DeAngelo et al. 2006).

Interestingly, the other independent variables IO_t and ROE_t are large and negative while being statistically insignificant in every control model where the controls for country and industry level are included. It is curious that when more determinants are introduced to the model and either the country or industry level aggregated specification is tested, the sign of IO_t coefficient turns to negative.

The dominant position of the previous year's dividends is visible when models M6 C3, M6 C4 and M6 C5 are viewed more closely (see Table 22). When DIV_{t-1} is dropped, R^2 is disappeared in M6 C3 (0.00) and nearly halved in M6 C4 (0.450) and M6 C5 (0.396). Furthermore, being consistent with M5 C4 and M5 C5, the dropping of the dividends variable also made the earnings coefficient insignificant. When dividends are dropped, other variables, ROE_t, RI_t, CSH_t and $log(TA)_t$ become significant. This could be interpreted in a way that when the effects of historical dividends are cleared away, large and more valuable firms with cash are more likely to pay dividends while companies with high return on equity, potentially highly levered firms, are less likely to pay dividends. However, the dataset did not allow to investigate the reasons in detail. The effect of institutional ownership is negative, large but statistically insignificant (t-value = -1.009 and t-value = -1.344).

When H6 is considered, the evidence from Model 6 and its variations do not support the importance of institutional ownership as a determinant for dividends distributed. Hence, H6 is rejected. Furthermore, as both hypotheses related to RQ3 have been rejected and as the evidence does not leave much room for interpretation, it is safe to say that institutional ownership is not a significant determinant of the dividend policy pursued by a firm.

Model 7 was constructed to test H7, and the specification of the model is similar to M5 except for $IO2_t$ dummy which represents the effect of having at least two or more institutional owners. The results are presented in Table 20 The coefficients of $EARN_t$, $EARN_{t-1}$ and DIV_{t-1} are the same as in M5 with a marginal changes in t-statistics. However, $IO2_t$ is much smaller than IO_t and negative while still

Table 22: Fixed effects estimation for the determinants of dividends paid with controls for lagged dividends, country and industry. At least one institutional investor.

	(M6 C1)	**(M6 C2)**	**(M6 C3)**	**(M6 C4)**	**(M6 C5)**
$EARN_t$	0.047***	0.048***	0.009	0.073	0.086
	t = 2.991	t = 2.990	t = 0.820	t = 1.362	t = 1.433
$EARN_{t-1}$	0.010	0.011	−0.001	0.049	0.062
	t = 0.863	t = 0.936	t = −0.083	t = 0.954	t = 1.078
DIV_{t-1}	0.717***	0.728***			
	t = 7.693	t = 7.938			
IO_t	−9,488.297	−10,705.690	93,723.660	−31,847.460	−40,070.220
	t = −0.720	t = −0.843	t = 0.974	t = −1.009	t = −1.344
ROE_t	−10.171	−13.245	0.039	−11.370***	−15.440***
	t = −0.771	t = −1.002	t = 0.046	t = −2.590	t = −2.709
RI_t	0.479**	0.461*	1.384	1.455***	1.372***
	t = 1.978	t = 1.948	t = 1.207	t = 3.209	t = 3.161
CSH_t	0.038*	0.038**	0.013**	0.075**	0.085**
	t = 1.943	t = 1.986	t = 2.409	t = 2.373	t = 2.352
$\log(TA)_t$	17,266.950**	16,500.540**	10,863.620	89,782.450***	94,071.780***
	t = 2.382	t = 2.271	t = 1.059	t = 7.447	t = 6.698
			DIV		
	(M6 C1)	**(M6 C2)**	**(M6 C3)**	**(M6 C4)**	**(M6 C5)**
Time fixed effects	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	No	No	Yes	No	No
Country fixed effects	Yes	No	No	Yes	No
Industry fixed effects	No	Yes	No	No	Yes
N	17,127	17,127	17,203	17,203	17,203
R^2	0.836	0.835	0.007	0.451	0.397
Adjusted R^2	0.835	0.834	−0.183	0.450	0.396
Residual Std. Error	643,482.300	645,384.900		1,173,277.000	1,229,030.000
F Statistic	2,117.571***	2,693.740***	13.520***	352.351***	364.955***
Degrees of Freedom	df = 41; 17085	df = 32; 17094	df = 7; 14452	df = 40; 17162	df = 31; 17171

Note: Significance is denoted by $^{***} = p < 0.01; ^{**} = p < 0.05; ^{*} = p < 0.1$.

being statistically insignificant. This finding, even if not statistically significant, could be supported, and potentially explained by the agency theory where the high cost of monitoring could be compensated by increased dividends which leads to less cash flow for the management to invest. However, when there are multiple large institutional investors the monitoring cost decreases and less dividends are required.

When the controlled specifications of M7 are viewed in detail, it becomes evident that only $IO2_t$ coefficient differs from M5 which is natural as both are estimated with same data and similar models. However, the differences in institutional ownership dummies are interesting while mostly not significant in statistical sense. When the M7 is controlled for country-specific fixed effects, $IO2_t$ is positive and when the industry level fixed effects are controlled it becomes negative. Moreover, it tends to have higher t-statistics in comparison with IO_t in M5. Furthermore, when DIV_{t-1} is excluded, $IO2_t$ becomes statistically significant in M7 C4 (t-value = 2.104) and in M7 C5 (t-value = -1.936). Nevertheless, when H7 is considered, there is not enough supporting evidence to accept the hypothesis. Hence, H7 is rejected.

Finally, Model 8 was constructed to test the last hypothesis H8. The results of M8 are similar to M6 and $EARN_t$, DIV_{t-1} and CSH_t have the same coefficients and materially the same t-statistics. These are presented in 20. Surprisingly, when the controls for country and industry fixed effects are introduced (M8 C1, M8 C2) and when lagged dividends are dropped (M8 C4, M8 C5) $IO2_t$ becomes statistically significant at t-statistics -1.771, -1.804, -5.361 and -5.586 (see Table 24).

In the case of M8 C4 and M8 C5 this is probably due the fact that DIV_{t-1} is dominating the regression thus when it is removed both $IO2_t$ and $log(TA)_t$ capture a larger amount of the variation, hence leading to a larger t-statistics. However, this does not explain why $IO2_t$ becomes significant, even if at the lowest accepted level, in models M8 C1 and M8 C2 which implies that when institutional ownership is examined within a similar sector or country, multiple institutional investors with a material stake of a firm's may have a limiting effect on the dividends distributed which is in line with the previous findings.

All in all, when the hypothesis H8 is considered, the effect of the presence of two or more institutional investors does not have a significant positive effect on a dividend policy, at least when firm level decisions are considered and thus it is safe to reject H8. However, it seems that at least on firm and industry level the presence of multiple institutional investors has a restricting effect on the dividends

Table 23: Fixed effects estimation for determinants of dividends paid with controls for lagged dividends, country and industry. Two or more institutional investors.

	(M7 C1)	**(M7 C2)**	**(M7 C3)**	**(M7 C4)**	**(M7 C5)**
$EARN_t$	0.054^{**}	0.056^{**}	0.008	0.095	0.112
	t = 2.376	t = 2.387	t = 0.685	t = 1.298	t = 1.350
$EARN_{t-1}$	0.031	0.033	0.003	0.103	0.125
	t = 1.363	t = 1.405	t = 0.198	t = 1.531	t = 1.632
DIV_{t-1}	0.751^{***}	0.764^{***}			
	t = 8.067	t = 8.301			
$IO2_t$	7,918.724	−1,689.548	−3,174.442	$22{,}805.370^{**}$	$-19{,}472.240^{*}$
	t = 1.466	t = −0.299	t = −0.324	t = 2.104	t = −1.936
			DIV		
	(M7 C1)	**(M7 C2)**	**(M7 C3)**	**(M7 C4)**	**(M7 C5)**
Time fixed effects	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	No	No	Yes	No	No
Country fixed effects	Yes	No	No	Yes	No
Industry fixed effects	No	Yes	No	No	Yes
N	18,792	18,792	18,923	18,923	18,923
R^2	0.819	0.817	0.002	0.365	0.293
Adjusted R^2	0.818	0.817	−0.169	0.364	0.292
Residual Std. Error	646,588.800	648,756.300		1,206,343.000	1,271,945.000
F Statistic	$2{,}289.843^{***}$	$3{,}000.891^{***}$	10.512^{***}	301.231^{***}	290.654^{***}
Degrees of Freedom	df = 37; 18754	df = 28; 18763	df = 3; 16160	df = 36; 18886	df = 27; 18895

Note: Significance is denoted by $^{***} = p < 0.01; ^{**} = p < 0.05; ^{*} = p < 0.1$.

distributed, but it would require further research to determine the relationship since the evidence is still inconclusive at this point.

Answering RQ4 on the basis of H7 and H8 and given the other evidence revealed should be straightforward. It appears that in general, the presence of multiple institutional investors is not a statistically significant determinant of dividend policies pursued by a firm even though it seems to be associated to dividends distributed with a considerable negative effect. Furthermore, when the analysis is brought to country or industry level, the presence of multiple institutional investors becomes more relevant.

Table 24: Fixed effects estimation for the determinants of dividends paid with controls for lagged dividends, country and industry. Two or more institutional investors.

	(M8 C1)	**(M8 C2)**	**(M8 C3)**	**(M8 C4)**	**(M8 C5)**
$EARN_t$	0.047***	0.048***	0.009	0.073	0.086
	t = 2.991	t = 2.990	t = 0.816	t = 1.361	t = 1.432
$EARN_{t-1}$	0.010	0.011	−0.001	0.049	0.062
	t = 0.863	t = 0.936	t = −0.083	t = 0.954	t = 1.077
DIV_{t-1}	0.717***	0.728***			
	t = 7.692	t = 7.936			
$IO2_t$	−15,245.730*	−20,136.990*	−1,879.407	−96,591.480***	−121,143.500***
	t = −1.771	t = −1.804	t = −0.179	t = −5.361	t = −5.586
ROE_t	−10.248	−13.217	−0.138	−11.394***	−15.410***
	t = −0.769	t = −0.991	t = −0.172	t = −2.623	t = −2.763
RI_t	0.477**	0.458*	1.409	1.449***	1.371***
	t = 1.963	t = 1.921	t = 1.241	t = 3.201	t = 3.191
CSH_t	0.038*	0.038**	0.013**	0.075**	0.085**
	t = 1.944	t = 1.987	t = 2.410	t = 2.372	t = 2.352
$\log(TA)_t$	17,231.080**	16,481.720**	13,041.510	90,361.470***	94,615.370***
	t = 2.382	t = 2.276	t = 1.228	t = 7.312	t = 6.599
			DIV		
	(M8 C1)	**(M8 C2)**	**(M8 C3)**	**(M8 C4)**	**(M8 C5)**
Time fixed effects	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	No	No	Yes	No	No
Country fixed effects	Yes	No	No	Yes	No
Industry fixed effects	No	Yes	No	No	Yes
N	17,127	17,127	17,203	17,203	17,203
R^2	0.836	0.835	0.006	0.451	0.397
Adjusted R^2	0.835	0.834	−0.183	0.450	0.396
Residual Std. Error	643,480.500	645,377.000		1,173,083.000	1,228,715.000
F Statistic	2,117.585***	2,693.819***	11.764***	352.610***	365.427***
Degrees of Freedom	df = 41; 17085	df = 32; 17094	df = 7; 14452	df = 40; 17162	df = 31; 17171

Note: Significance is denoted by $^{***} = p < 0.01; ^{**} = p < 0.05; ^{*} = p < 0.1$.

5 CONCLUSIONS

5.1 Findings

The purpose of the thesis was to find how the ownership structure and the dividend policy of a firm are connected and if such connections can be identified what is the effect of institutional ownership on dividend policies. The main contribution of the study from the academic perspective is related to what kind of variables and setups are feasible and significant and what kinds of setups do not produce robust results. Additionally, it inspects ownership structure's effects from the perspective of a group of specific institutional investors which consist of pension funds and insurance companies.

Most of the studies related to the effect of ownership structure on dividend policies are focused on a single country, e.g., the UK listed firms (Short et al. 2002; Kilincarslan and Ozdemir 2018), or on a different type of shareholders e.g. controlling or managerial shareholders (La Porta et al. 1999; Maury and Pajuste 2002; Kim et al. 2007). This study attempts to form a comprehensive research on European listed companies with an unique data set manually combined from multiple databases. In addition, potential effects of an institutional investor and of multiple institutional investors have taken into account.

The research questions were designed in a way that the answers would fill the abovementioned gap and as a result, four research questions were formed. The empirical part of the thesis was conducted as quantitative analysis and the research questions were translated into testable hypotheses. For the sake of robustness, alternative specifications were constructed to test the soundness of results. The empirical tests for RQ1 and RQ2 were conducted by following the example of Lintner (1956) and Fama and Babiak (1968).

Unfortunately, these tests did not provide proper results and the specification of the models was not significant. Further, every coefficient of the models was zero except the ones related to institutional ownership which were large but statistically insignificant. These findings imply that there is an association, as the findings of previous research suggest, but due to the statistical insignificance with this dataset, no connection can be proven. Hence, no conclusive answer to RQ1 or RQ2 can be given. However, from an academic perspective it is useful to know that this kind of a model including these variables does not provide useful results. Especially, when the results appear to insignificant greatly due the change in dividends variable that becomes visible with the further analysis.

RQ3 was answered by testing two separate hypotheses, H5 and H6. H5 tested whether the presence of an institutional investor increases the dividends distributed or not. This hypothesis was eventually rejected due the results did not show statistically significant connection between the two. The effect of IO was positive and large nevertheless, and it was consistent throughout analysis. Current earnings and lagged dividends were both significant and had expected signs, thus being consistent with findings of Short et al. (2002).

H6 tested whether institutional ownership has an effect when covariates for the size and profitability are added and this hypothesis was rejected as well. The effect of IO is large but insignificant, and in addition to earnings and dividends, the amount of cash and total assets became significant. These effects are supported by the findings of Chang et al. (2016), Kilincarslan and Ozdemir (2018) and Nguyen and Li (2020) where they have been positive and significant. Additionally, when the lagged dividends variable was dropped, the size of a firm took an even larger role. These effects could be explained with life-cycle theory where the maturity and size of a firm goes hand-in-hand with dividend payments (DeAngelo et al. 2006). Interestingly, ROE became negative and significant when country and industry level fixed effects were toggled on, which could have a relation with the leverage of firms.

Most of the studies discussed in the theory section found positive links between dividends and institutional ownership, and usually the institutional ownership was found to be statistically significant. However, one of the most recent studies on Australian market support the findings of the thesis and maybe there is a difference in the samples studied (Nguyen and Li 2020). The results suggest that the presence of an institutional investor does not affect the dividends distributed. Within the scope of the thesis, no significant effect of institutional ownership could be identified.

However, when compared to the previous research on the subject, this study focused solely on certain type of institutional investors, regulated pension funds and insurance companies. These kind of investors are typically tax exempt and have strict regulations on how much stock exposure is allowed. Hence, it is possible to argue that this specific group of investors is indifferent between capital gains and dividends but tend to own stock in larger firms that pay dividends regardless of the ownership structure.

Lastly, RQ4 considers whether multiple institutional investors would have an effect on the dividends distributed. The results suggest that the effect of multiple institutional investors is large and negative even if not statistically significant, with the dividends distributed at the firm level. However, when country and industry

level fixed effects are taken into account, and especially when the dividends variable is removed, the institutional ownership of multiple investors becomes large, negative and statistically highly significant. This implies that on when country and industry differences are taken into account, multiple institutional owners would reduce the amount of dividends distributed. This could be explained by agency theory where multiple institutional investors might reduce agency costs and thus reducing dividends distributed (Jensen 1986). Furthermore, most of the results are similar or just marginally different in comparison with the previous RQ3 which is expected since the other variables are the same.

As a conclusion, it appears that institutional ownership does not have statistical significance on the dividend policies pursued by firms on the European Union market but the dividend decisions are driven by earnings and previous dividends. The relationship between dividends, earnings and previous dividends is well established in the previous results of Lintner (1956), Brav et al. (2005) and Leary and Michaely (2011), and the results of the thesis support the previous findings. Additional significant determinants for dividends distributed were identified where the amount of cash and total assets showed a positive relationship with dividends.

5.2 Limitations and suggestions for future research

Every research conducted, however objective in nature, includes biases and limitations due to either subjective decisions made by researcher when the scope of research is defined or the availability of proper and correct data. Thus, it is essential that the researcher disclose these decisions made and the arguments behind choices.

The largest limiting factor in the setup of the thesis is the time period chosen and the firms included in the sample. The firms were limited to ones headquartered in the EU region while excluding large firms whose operations might be material in the EU area due to the fact that their headquarter is not in the EU. On the other hand, it could have made more sense to study firms located only in the Western Europe, which would have formed a more homogeneous sample due the similarities.

As a continuation, the limiting the sector of institutional investors was made based on NACE codes, which are relayed on the declarations of firms, thus they might include firms that do not belong to the sector while excluding firms that should be included as investors. However, as the pension funds and insurance

companies are generally state regulated it is reasonable to assume that the correct firms belong into this set.

The time period is also a substantially restrictive factor. For example, the sample of the thesis does not take the financial crisis in 2007-2008 into account and thus the returns of the sample firms have more than doubled during the time period (see Table 5). This limitation was due to the restrictions in the database, thus, unavoidable within the scope of a master's thesis.

The most obvious shortcoming of the thesis is the implementation of the partial adjustment model and its extensions. Since the model was not fit to the data, it was not possible to reliably answer the two first research questions. This is most likely related to the dependent variable which did not perform well in this type of analysis. However, the dataset itself, especially the independent variables might not have been the best regressors. However, it is possible to grasp into the relationship between dividend policy and institutional ownership, and as such the thesis achieved its purpose.

Other notable limitation is survivor bias. Since every firm in the sample was required to have minimum revenue of 0.00 for each year under investigation, it means that every firm in the sample has existed in every year. In other words, this means that even when new firms have listed during the period, they would have been left out from the sample. Further, when firms became delisted during the time period they would not be included in the sample for any year. These combined, the sample constructed is potentially biased towards more conservative and older firms.

As a suggestion for future research, there still seems to be a gap regarding the importance of institutional ownership and payout policies, and it might be more beneficial to study these on a country level since it appears that the EU region is rather heterogeneous and it could be hard to find common independent factors without considering the different tax systems and other regulation in more detail. Additionally, as stated in the scope of the thesis, other firms of payouts are not included in the analysis. For example, share repurchases have become an increasingly important form of payout and research on this subject is still more limited. Moreover, it would be interesting to study how the compensation for the risk and profits travel through the group structures of multinational corporations or in different types of fund structures. This would be beneficial when regulation is improved and harmonized, for example, in the EU.

6 SUMMARY

The thesis begins from the concept of firm, risk and compensation, which are essential topics in corporate finance. The natural path from these leads to different decisions made by firms and to the decision makers itself. On the basic level, shareholders invest funds in their firm and get the returns in form of either payouts or as capital gains when the value of the firm increases. As discussed in the theoretical framework section, in the perfect frictionless market, shareholders should be indifferent between different forms of compensation. Hence, paying dividends has no effect on the value of a firm (Miller and Modigliani 1961; Black 1976).

Still, it seems that firms tend to pay dividends and management is even reluctant to cut dividends regardless of the performance of the firm (Lintner 1956; Brav et al. 2005). Therefore is this urge to pay dividends arising from the perspective of management or from shareholders? Shareholders are the ones who appoint management but as various studies argue, an agency problem may arise, especially in large public companies (Jensen and Meckling 1976; Easterbrook 1984; Stiglitz 1989). A small retail investor does not have such an effect on the decision making, hence the point of interest turns to different type of investors, institutions.

The holdings of institutional investors are enormous basically in every market and they have a real potential to affect the decisions made by management by either using threats or negotiating behind the scenes with management (McCahery et al. 2016). This, combined with the interesting results from the UK, US, Finnish, Italian, and Polish markets, gave inspiration to the idea of studying what is the relationship between controlling, large or institutional shareholders and dividend policies pursued by firms.

A quantitative analysis was chosen, and a fixed effects linear regression was conducted on the data set of 2 818 European publicly listed firms. The full sample under analysis consists of nearly 22 500 firm years of data including manually combined institutional ownership dummy factors. Data was cleaned and manipulated in Excel, the statistical analysis was done in R-Studio (RStudio Team 2020) and the regression tables were printed with Stargazer (Hlavac 2018).

The results were mixed at best but still adding new information to this topic. There was a clear discrepancy between the two types of models tested and the models based on Lintner (1956) the partial adjustment model did not not come out as significant. The results of the other type of models worked as intended and the results were mostly consistent with the previous finding regardless that the institutional ownership was insignificant when dividend payments were analyzed.

However, when the effects of previous dividends were cleaned from the model, the presence of two or more institutional investors became significant and negative.

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APPENDIX I: R CODE

Below is presented a core sample of the R Code used to create panel data and a panel regression model utilized in this thesis.

```
#### Creating panel ####
####### Model settings ######
periods <- 7
obs <- nrow(payData)
variables <- (ncol(payData) - 3) / periods

varnames_PAM <- c("comp_id", "count_id", "ind_id","year","IO","IO2","lag_DIV","CSH
    ","ROE", "log_TA", "EARN", "D_DIV", "D_EARN")
varnames_All <- c("comp_id", "count_id", "ind_id","year","IO","lag_IO", "IO2","lag
    _IO2", "EARN", "lag_EARN", "DIV","lag_DIV","CSH","lag_CSH", "ROE","lag_ROE","
    RI","lag_RI", "log_TA","lag_log_TA")

# Set start and end period of first variable #


a<-4
b<-10



############################


df1 <- as.data.frame(payData[,1])
colnames(df1) <- "Company_id"

id_panel=c()
for (i in 1:obs){
  x=rep(df1[i,],periods)
  id_panel=append(id_panel,x)
}

df1 <- as.data.frame(payData[,2])
colnames(df1) <- "Country_id"

Comp_id_panel=c()
for (i in 1:obs){
  x=rep(df1[i,],periods)
  Comp_id_panel=append(Comp_id_panel,x)
}

df1 <- as.data.frame(payData[,3])
colnames(df1) <- "Ind_id"

Ind_id_panel=c()
for (i in 1:obs){
  x=rep(df1[i,],periods)
  Ind_id_panel=append(Ind_id_panel,x)
}

years_panel=rep(1:periods,obs)
```

```
panel<- cbind(id_panel, Comp_id_panel, Ind_id_panel ,years_panel)
colnames(panel) =c("id", "count_id", "ind_id","year")

y <- c()
vars <- c()

for (g in 1:variables) {

  for (i in 1:obs) {
    x=payData[i,]
    x=x[c(a:b)]
    x=t(x)
    y=rbind(y, x)
  }

  vars = cbind(vars,y)
  y = c()
  a = a + periods
  b = b + periods

}


pdata <- cbind(panel, vars)
row.names(pdata) = seq(dim(pdata)[1])
pdata <- as.data.frame(pdata)

############Creating the year and industry dummies################
combined_data <- tmp_PAM

dumbeg = ncol(combined_data) + 1
combined_data_wdum = dummy_cols(combined_data, select_columns = c(
  #"comp_id",
  "count_id",
  #"ind_id",
  "year"
  ), remove_first_dummy = TRUE)
Ncols = ncol(combined_data_wdum)
print(dim(combined_data_wdum))

#Extracting the dummies into a new variable
dummies = combined_data_wdum[, dumbeg:Ncols]
remove(combined_data_wdum)

#Creating a new temporal data variable for the regressions
reg_data = combined_data

############################## PAM Lintner#############################
fit = lm(D_DIV ~ EARN + lag_DIV + as.matrix(dummies), data = reg_data)
PAM <- coeftest(fit, vcov. = vcovHC, type = "HC1")


##### Printing results ##########################

library(stargazer)
###### PAM RESULTS ################################
```

```
stargazer(PAM,
          style = "qje",
          type="latex",
          t.auto = FALSE,
          dep.var.labels.include = TRUE,
          header = FALSE,
          model.names = FALSE,
          report = "vc*t",
          omit.table.layout = "n",
          intercept.top = TRUE,
          intercept.bottom = FALSE,
          omit.stat=c("LL","f", "ser", "rsq", "adj.rsq", "n"),
          no.space = TRUE)

stargazer(fit,
          style = "qje",
          type="text",
          t.auto = FALSE,
          dep.var.labels.include = TRUE,
          #keep = namkeep,
          header = FALSE,
          model.names = FALSE,
          report = "*",
          intercept.top = TRUE,
          intercept.bottom = FALSE,
          omit.stat=c("LL"),
          omit.table.layout = "n",
          no.space = TRUE)
```