CHARLES UNIVERSITY

FACULTY OF SOCIAL SCIENCES

Institute of Economic Studies

Bachelor thesis

2019   **Jan Picálek**

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State ownership and ownership concentration as determinants of dividend policy

Bachelor thesis

Prague 2019

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Academic Year: 2018/2019

Bibliographic note

Abstract

This bachelor thesis complements the existing research on implications of various ownership structures on dividend policy. It extends the literature focused on state ownership and its impact on dividend amount paid out to shareholders for testing such relationship in the environment of EU listed stock market and EU government agencies, scope so far lacking in the scientific literature. Moreover, it provides new way of testing agency theory of dividends by adopting Herfindahl's index as proxy of ownership concentration. Therefore, interaction between shareholders is accounted for as opposed to the commonly used proxy largest shareholder. As a result, this thesis helps to explain relations between various ownership structure characteristics and dividend policies. Primary econometric methods, panel data estimation methods, of this thesis found significantly positive relationship between state owned enterprises and the amount of profit distributed among shareholders. Compared to existing research on emerging economy of China, less evidence is found. Therefore, I argue that tunnelling tendencies in EU are substantially lower due to level of market development and minority investor protection in EU. The results also back up the agency theory, however, its influence is found to be lower than proposed by past studies.

Abstrakt

Tato bakalářská práce doplňuje existující výzkum dopadů různých vlastnických struktur na dividendovou politiku firem. Konkrétně tato práce rozšiřuje stávající literaturu zabývající se státním vlastnictvím a jeho vlivem na velikost vyplácených dividend o testování tohoto vztahu v prostředí kótovaných společností a státních institucí Evropské unie. Dále je prezentován nový způsob testování teorie agenta v kontextu dividend za pomoci využití Herfindahlova indexu, který jakožto proxy pro koncentraci vlastnictví umožňuje, aby byla zohledněna i interakce mezi jednotlivými akcionáři na rozdíl od tradičně používané proxy podílu vlastněného největším akcionářem. Tato teze tedy pomáhá vysvětlit vztah různých charakteristik vlastnických struktur a dividendové politiky. Za pomoci ekonometrických nástrojů pro panelová data bylo zjištěno, že státem vlastněné firmy kótované na území EU mají tendenci vyplácet vyšší dividendy. Nicméně se ve srovnání s Čínou, kde je tunelování společností státem předmětem mnohých výzkumů, tato tendence zdá být v prostředí EU podstatně nižší. Výsledky této práce také představují důkazy ve prospěch teorie agenta, ačkoliv podle nich je její vliv slabší, než uvádí předchozí výzkum.

Keywords

Dividend policy, Dividends, State-owned enterprise, Ownership concentration, Ownership structure, Shareholder, Listed company

Klíčová slova

Dividendová politika, Dividendy, Státem vlastněné podniky, Koncentrace vlastnictví, Akcionář, Kótovaná společnost

Range of thesis: 71 862 characters (with spaces)

Declaration of Authorship

1. The author hereby declares that he compiled this thesis independently, using only the listed resources and literature.

2. The author hereby declares that all the sources and literature used have been properly cited.

3. The author hereby declares that the thesis has not been used to obtain a different or the same degree.

Prague 5.5.2019 **Jan Picálek**

Acknowledgments

Institute of Economic Studies

Bachelor thesis proposal

Proposed Topic:

State ownership as determinant of dividend policy

Preliminary scope of work:

Research question and motivation

Dividends are for many investors the key motivation when buying a stock. Moreover, according to various models, they determine the intrinsic stock value, e.g. Gordon Growth Model (Gordon, 1959). There are various models and research papers analyzing determinants of dividend policy. One of the first models ever developed to explain firm's dividend policy decisions was constructed by John Lintner in 1956. Lintner's (1956) model proposed that firms adjust dividends as their net income fluctuates and that their target payout ratio is set such that it can be sustainable in the long run. Naturally, the fact that dividend policy is basically affected by net earnings and investment opportunities with positive net present value was empirically proven many times, e.g. by Fama & French (2001) and Truong & Heaney (2007). In many cases, however, dividend policy does not correspond to such basic determinants and seems to be inappropriate in terms of firm's performance and future projects. Such a failure of the fundamental determinants provides motivation for further research, especially on the non-performance factors influencing magnitude and type of dividends. A lot of research papers clarifying the effects of such determinants were already published. For instance, Ho (2003) supported a positive relationship between liquidity and dividends with his signalling theory of dividend policy, Rozeff (1982) revealed a negative relationship between leverage and dividends with argumentation of the agency problem theory or Booth & Zhou (2017) proposing negative relationship for risk.

Another non-performance determinant of dividend policy is ownership structure, which directly affects corporate governance and thus dividend payout ratio (Reyna, 2015). Large amount of free cash flow means excess cash in hands of firm's management, which can result in the issue known as agency problem. To prevent such a conflict, the management should be under monitoring of the stock holders or the managers should not be in possession of excess funds. Since individuals with larger shares are more motivated to supervise the firm's management, the ownership concentration is the one of the most effective corporate governance mechanisms (Jensen & Meckling, 1976). When the supervision is absent, another tool to prevent the agency problem are higher dividends, since higher dividend payments result in less cash in possession of the managers. Thus, to finance large project, the firm needs to go to capital markets to raise new capital, resulting in firm's examination by potential creditors. (Jensen, 1986).

Based on the mentioned findings, I would like to examine the relationship between ownership concentration and dividends. I conjuncture that high ownership concentration is negatively correlated with dividends, since larger shareholders tend more to supervise the company and care more about the firm's future performance. Apart from the ownership concentration, a different view of ownership structure may also be the type of the owner, e.g. individual, institutional or state. Such various types of ownership are also subject to research in terms of its impact on dividend policy. Reyna (2015) empirically showed that there is a significant difference in dividend policy between companies owned by individuals and by institutions at least in Mexico, where he realized his research. Research on the effects of state ownership were realized primarily in China, e.g. by Wang et al. (2011).

Government tends to regulate strategic industries, e.g. energy industry (Bremberger et. al., 2013). Moreover, big players in such strategic markets are, in many cases, partially or fully owned directly by state and these State-owned enterprises (SOEs) are predominant providers of key public services. (OECD, 2015). Since state usually owns substantial share in such companies (OECD Directorate for financial and enterprise affairs, 2007), conjecture that their dividends may be higher than usual would be in contrast with the hypothesis regarding ownership concentration and dividends. However, fact, that dividends are taxed immediately in contrast to capital gains with tax credit conditional on

time period of the shareholding, may serve as a good incentive for SOEs to pay larger dividends and prefer cash dividends over share buybacks since the taxes on cash dividends of the private shareholders would also mean additional income for the government. Another motivation may be that government may need funds to government budget.

Empirical research on state ownership and its effect on dividends regarding listed companies was primarily applied to the Chinese market, where government participation in the economy is of greater magnitude, e.g. Wang et al. (2011) or Lam et al. (2012). These research papers argue that, ceteris paribus, SOEs exhibits higher dividends than purely private firms. Since there are also listed SOEs in the EU market, I would like to test such a conjecture in the EU environment.

Hypotheses:

H1: Ownership concentration has a negative effect on dividends.

H2: Firms partially owned by state have higher dividend payout ratio than those without state participation.

H3: Potential state ownership effect of higher dividends is increasing with concentration. (Contrast with hypothesis H1)

H4: Firms partially owned by state have lower tendency to perform share buyback as a tool of paying dividends.

Contribution

In this thesis, I would like to reveal dividend policy preferences of SOEs and provide an empirical evidence, that state does not behave as classical long-term shareholder even though it usually holds its stocks in long-term horizon.

Potential relationship between state ownership and dividends would give to the investors another factor for consideration when seeking stocks with higher dividend yield. Moreover, the magnitude of this potential effect with respect to ownership concertation should be clarified as well.

Data

I am going to work with both types of quantitative data and qualitative data in form of binary information. To obtain the relevant data, I will use the services of companies providing economic and finance data such as Bloomberg or Reuters. As an alternative may be the Yahoo finance web page, where I can obtain the data for every firm separately. Size of the sample of listed SOE in EU is supposed to be in order of dozens as governments tend to hold shares in the strategic industries.

Methodology

To analyse the outlined hypotheses, I am going to apply the multiple regression model along with use of OLS estimators.

The main explanatory variable is supposed to be dummy and it will be the ownership of the government divided into several categories based on the share owned. Most variables I going to use in my empirical research are quantitative and their main purpose will be to reduce the amount of disturbances arising from covariance between explanatory variables. Such controlling variables will be various ratios analysing company's operational performance and profitability. Since every industry is very specific in terms of investment opportunities, profitability and market outlooks, it will be important to compare companies always within a same industry.

Outline

1. Introduction
2. Review of relevant literature on dividend policy models and corporate governance
3. Hypothesis development
4. Data and Methodology
5. Econometric model
6. Results discussion and interpretation
7. Conclusion

List of academic literature:

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Contents

Introduction

The key objective of an investment in stocks is the future stream of cashflows. As many investors prefer stable income over the speculative one, dividend-paying firms might be a suitable investment for them. In such a case, firm's dividend policy should be an important factor in their investment decision-making process. Paying out dividends has also implications for the stock prices as various research papers suggest, e.g. Miller & Modigliani (1961) pointed out that demand responds to dividend announcements, subsequently affecting the stock prices. Moreover, there are various stock valuation models based on dividend income, e.g. Gordon Growth Model (Gordon, 1959). As both dividend income and capital gains are affected by firm's dividend policy, it is crucial to know how the decision-making logic in this regard is shaped.

As most natural determinant of dividend policy seems to be firm's profitability and investment opportunities with positive net present value. If the company is able to generate higher than market returns from its operations and there is a space for its growth, reinvesting its earnings is the best choice for both the investors and the management. Such logical implications were already empirically proven by various research papers, e.g. by Fama & French (2001) and Truong & Heaney (2007). In many cases, however, dividend policy does not primarily correspond to such natural determinants and might seem to be inappropriate in terms of firm's performance and future projects, e.g. a firm pays high dividends, even though it needs the capital to finance its upcoming investments. Such an inconsistency with the natural determinants provides motivation for further research, especially on the non-performance factors influencing probability of dividend payments and their magnitude.

Dividend payments are considered as a reward to shareholders for their investment into company's equity basically originating from company's net earnings. However, profitability of the business does not necessarily imply positive dividend payouts. The decision whether the firm's profit will be distributed to its owners and how much will potentially be retained within the business is subject to management's proposal and subsequent approval by shareholders at general meeting. Therefore, there are two parties involved in the decision-making process and management does not have complete autonomy in this regard. In the perfect scenario, the interests of shareholders and management are aligned, and both parties seek best dividend

1

policy in terms of the future growth and profitability of the company's operations. However, under utility maximization assumption, the separation of ownership and executive power, which has been a noticeable trend (Berle & Means, 1967), may result in an inappropriate managerial behaviour (Jensen & Meckling, 1976). Such a misalignment may lead to an issue documented in academic literature as agency problem, where agent, management, acting on behalf of a principal, stockholder, does not act in the best interest of the principal. Particularly, the theory suggests that unless net income is distributed among the investors, it may be exploited by corporate insiders for their personal benefits (La Porta et al., 2000). However, conflict of such essence might arise even in the principal-principal level. In the context of dividend policy, preferences of various shareholders might differ substantially as personal cash needs and alternative investment opportunities varies individually, e.g. state's tendency to fund its budget affects its dividend preference in case of state-owned enterprises (SOEs). There are many methods to prevent opportunistic management from such unfavourable acting, e.g. by appropriate incentivization or more rigorous monitoring of the actions taken by managers. Regardless of which preventive mechanism is applied and if any, separation of equity investors and control is always associated with agency costs. [1]

Monitoring approach of such prevention gives a rise to issue of who bears the costs of the increased supervision over the agents, at least the costs associated with implementation of the precautionary measures. As there may be thousands of equity investors in case of large listed companies with relatively equally distributed claims, finding a volunteer willing to do the job for the others, free riders, in such a setting seems to be difficult. Moreover, the one shareholder willing to devote his own time to monitoring activities would have to bear full costs of doing so, however he would take advantage only proportionally to his holdings (Easterbrook, 1984).

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[1] Jensen & Meckling (1976, p. 308) defined agency costs as „*sum of (1) the monitoring expenditures by the principal, (2) the bonding expenditures by the agent, (3) the residual loss*", where monitoring expenditures are those associated with the actions taken by principal to optimize agent's behaviour, e.g. monitoring devices or budget constraints implementation; bonding costs are those associated with the actions taken by agent to assure the principal that his best interests are sought, e.g. increased reporting, and residual loss is the profit lost due to an intentional and inappropriate behaviour of agent in spite of the precautionary actions.

As there is not always that dominant shareholder who is willing to undertake active role in the monitoring, best solution would be to have someone to monitor the management while not being in the principal-agent relationship with them. Such a person with interests aligned with stockholders is another investor providing capital to the company. The idea is that paying out dividends consequently diminishes the free cash flow left for new investments forcing the firm to seek new external financing. Regardless whether the new capital is raised by debt or new equity issues, the company will be monitored and evaluated by potential investors. Therefore, there is either increased monitoring activity undertaken by shareholders or increased dividend payouts when it comes to dealing with agency problem.

As large shareholders are more able to influence management's decisions than those holding only negligible portion of the claims to the firm and their willingness to take sufficient supervising actions to eliminate opportunistic behaviour of the corporate insiders is naturally greater, using dividends as an agency conflict mitigating tool is not that needed for highly concentrated ownership structures. (Rozzef, 1982)

Investigating the relationship between ownership concentration and dividend policy, abundant research papers have been published in the course of past forty years providing us with rather consistent results that such a relationship is statistically significant and negative. Many of those are either single country-oriented, examples include Reyna (2017) for firms listed in Mexican Stock Exchange, Khan (2005) for UK firms etc., or there are firms from regulated industries (financial, gas, electric utilities, air transport etc.) excluded as their financing policies may differ due to their regulated environment, e.g. Rozzef (1982). Such filtering procedures implemented in the already existing research papers provide motivation for further testing of the agency theory in connection with dividend payouts beyond the scopes outlined. Moreover, the proxy variables (number of shareholders or share of the largest shareholder) for measuring ownership concentration used in the econometric models in the existing academic literature do not reflect the possibility of an interaction between individual shareholders which might distort the results in form a bias if such an interaction actually occurs. For example, proxy in the form of largest shareholder does not distinguish between two following ownership structures: (i) dominant shareholder possessing 40% of shares followed by thousands of other investors each holding only negligible shares, (ii) dominant shareholder possessing 40% followed by two another holding 15% each, while the remaining 30% is spread between *thousands of* stockholders each holding only negligible equity portion. In this thesis, I am going to empirically show

relationship of ownership concentration and dividend payments for firms incorporated in countries of European Union, while controlling for different industries and not excluding any (at least intentionally). At the same time, the potential of the shareholders to interact is taken into account, which represents the contribution of this thesis in terms of research on agency problem and its association with dividend policy.

Apart from the ownership concentration, a different view of ownership structure may also be the type of the owner, e.g. individual, institutional or state. Composition of ownership from perspectives other than concentration is also subject of broad research in terms of its impact on dividend policies around the world. The various theories providing motivation for those investigations include heterogenous voting practices across different types of institutional owners, e.g. Mallin (1999) pointed out considerably lower voting levels for pension funds than those for insurance companies on a sample of UK firms; or diverse influencing power across different investor types documented by Holland (1999).

Focused on impact of institutional or family investor being the dominant one on dividend policy, the research field is already quite saturated, however, the publications are usually single country-based or do not use samples of firms from European Union at all. Even less explored I find the impact of state ownership on dividend policies, even though its preference in terms of dividend policies might be influenced by even more factors than in case of institutional or individual shareholders. It has been suggested that interests of state institutions and the other owners may diverse due to state's potential need of cash to balance public budgets (Frederick, 2011). Moreover, Frederick (2011) mentioned that some SOEs are necessarily expected to pay out certain fraction of their profits. There are various research papers from the environment of China which investigate how dividend policies of SOEs are affected by its unique ownership structures, e.g. Lam et al. (2012), Chen et al. (2009) or Wang et al. (2011). As the most of previous studies were limited to China or other developing countries, I would like to examine the relation between state participation in the ownership structure and dividends in the environment of EU listed companies so far lacking in the scientific literature. The effects are expected to vary as the characteristics of EU stock market and state participation in the economy are different from the Chinese one, leaving less space for tunnelling tendencies to be brought about.

The remainder of this paper is organised as follows. Section *Literature review* summarizes existing academic literature focused on dividend policy and its determinants. Moreover, hypotheses are formulated at the end of that section. In the next section, *Methodology and Data*, econometric models are constructed, and data sample composition is introduced. At the end of this paper, results are interpreted in the section *Empirical results*, followed by *Conclusion* summarizing the findings and discussing potential limitations to the empirical analysis presented.

Literature review

As the aim of this thesis is to investigate the relationships between various ownership structures and dividend policies, the essential theories they are based on are presented in detail in this section. Along with agency theory of dividends and tunnelling theory which provide fundamental theoretical background for hypotheses formulation in this paper, signalling and dividend smoothing theories are described as well. Taking into account most of the existing dividend theories, relevant factors considered as determinants of dividend policy in academic literature should be theoretically covered by this section. These factors include profitability, investment opportunities, leverage, past dividends, various ownership structure characteristics and size.

Miller & Modigliani were among the first researchers ever to pay attention to dividend policy and its importance/unimportance in terms of the stock value and closely related stock yield. In 1961, they presented their theoretical paper suggesting that dividend payments are irrelevant of the stock value (Miller & Modigliani, 1961). Their ideas presented in the work are fundamentally based on set of assumptions and a valuation model. The valuation model relies on three, in economic theory basic assumptions formulated by Miller & Modigliani as (i) Perfect capital markets – market prices cannot by affected by actions taken by an individual, no information asymmetry, no transaction costs and tax system with equal treatment of capital gains and dividends; (ii) Rational investors – investors prefer maximal level of wealth with no regard whether it is in form of cash or market values of their shares and (iii) "Perfect certainty" – investors can be sure about the future profits of the companies, there is no risk in the firm's future projects and as a consequence there is no need to distinguish between different approaches of raising capital, equity and debt. Their valuation model is expressed as

$$V_t = \frac{1}{1+r}[D_t + V_{t+1} - m_{t+1}P_{t+1}]$$ (1)

, where V_t is the firm's value at time t, r is an appropriate constant discount rate, D_t is cash dividend paid during period t and m_{t+1} is number of new shares sold in the period t for share price corresponding to next period t+1, P_{t+1}. The term $m_{t+1}P_{t+1}$ represents the amount of capital raised during period t. Fact that companies finance their investments by a given combination of retained earnings and new stock issuance based on dividend policy implies

$$m_{t+1}P_{t+1} = I_t - [X_t - D_t] \tag{2}$$

,where I_t is new investment at time t and X_t represents net earnings in t. Plugging equation (2) into (1) and repeating the valuation in the same manner every next period,

$$V_t = \sum_{s=t}^{\infty} \frac{X_s - I_s}{(1+r)^s} \tag{3}$$

Miller & Modigliani suggested via their above described theoretical valuation model that stock value, under certain conditions depends fundamentally on three factors – Net earnings, discount rate and level of investments and, therefore, dividend policy is irrelevant of the stock value as increased dividend payments are always offset by lower retentions which are associated by additional capital raising. However, such theories and especially some of the assumptions made by Miller & Modigliani were in contrast with existing research of Lintner (1956) even at the time their first publication. Particularly, the assumption that firms choose their dividend policies based solely on the level of their investment opportunities and net profits had been empirically disproved by Lintner (1956) even before Miller & Modigliani (1961) brought in their dividend irrelevance theory as he argued that firms smooth their dividend payout ratios towards a target. In other words, their dividend policies converged to a target ratio of dividends and net profit. The targets and the rate of adjustment towards their predefined proportional dividend goal varied significantly among the sample. Lintner (1956) tested his theories on a sample of 28 firms from a widely defined industrial sector using corresponding financial data between 1947 and 1953. Lintner indicated that apart from two companies, the observed firms were making its dividend decisions with respect to their dividend target and that majority of the sample had a preference to adjust relative dividends payments in direction to their aim every financial year. Almost fifty years later, Brav et al. (2005) conducted another research focused on dividend smoothing on a sample of 384 companies, most of which were listed and while the public and private companies were analysed separately. Brav et al. (2005) and his colleagues based their research on the Lintner's (1956). As a result, they substantiated one of the Lintner's conclusions, that managers are conservative when setting the dividend payments as they are concerned with the market's potential reaction to a considerable negative change in dividends due to information asymmetry between company insiders and the rest of the market including outside investors and, therefore, dividend payments are reduced hardly ever (Brav et al., 2005).

On the other hand, they suggested that management's self-commitment to stick and partially adjust dividend payout ratio towards the target is weaker than it used to be in the time of Lintner's research in 1956 (Brav et al., 2005). Moreover, by interviewing top executives of individual dividend paying companies in their sample, they recorded that almost 40% of the survey participants smooth their dividends with regard to a given dividend per share target, as opposed to a target dividend payout ratio presented in Lintner's model. Such a new targeting preference suggested by Brav et al. (2005) implies that dividend payments are, at least in North America, more consistent and less volatile compared to 1956 since dividend per share smoothing objective is not relative to net earnings (Wang et al.,2011). Further results of the survey also indicate that managers perceive dividend payouts as very committing, and that they suppose that any dividend reduction or omission would result in a market capitalization shrinkage which is consistent with signalling theories.

Even though Miller & Modigliani (1961) argued with their theoretical model that dividend changes should not have any implications on stock value as the stock valuation is function of future profit and investment opportunities, in their discussion of potential impacts of invalidity of used assumptions they acknowledged that dividend change "*provides an occasion for a price change*" (Miller & Modigliani, 1961, p. 430). According to Miller & Modigliani (1961), the statement was result of failure of "Perfect certainty" assumption which implied that uncertain investors perceived dividend policy changes as managements reaction to company's future performance outlook. Although signalling theory implies that dividend payments affect the market price it is still consistent with the Miller & Modigliani's conclusion that stock value is determined solely by its profit and profitable investment opportunities as the investors still value the stock with respect to these two factors. However, their expectation of values of these two factors is affected by the dividend policy (Miller & Rock, 1985).

Dividend signalling theory, same as agency cost theory, is built on concept called "information asymmetry". The opposite serves often as important assumption in basic economic models. Efficient market hypothesis implying that the only way to "beat" the market, in other words generate higher than market returns at a given level of risk or to purchase an undervalued stock, is to be in possession of an information which is not available to the other market participants is a representation of the information asymmetry (Fama, 1969). In the context of corporate finance, information asymmetry exists between corporate insiders and outside investors as financial statements do not provide detailed information about every single transaction closed

and operation undertaken. Moreover, reliability of the reported statements might by disputable, despite potential fines for illegal accounting practices and accounting figure manipulation. Therefore, dividends are by many investors perceived as indirect source of information so far known only by firm's executives. (Miller & Rock, 1985; John & Williams, 1985). Such a theory is aligned with the survey results introduced Brav et al. (2005) and exposes the corporate executives´ unwillingness to make dividend cuts. Signalling through dividends is viewed as reliable source of information since it is associated with extra cost that could hardly be borne by a company which faces a weak financial situation. (Booth & Zhou, 2017). One example of such signalling costs might be the forgone profit resulting from a "*loss of the familiar Fisherian criterion for optimal investment by the firm-viz., invest in real assets until the marginal internal rate of return equals the appropriately risk-adjusted rate of return on securities*" (Miller & Rock, 1985, p. 1032). In other words, artificial dividend inflation unsubstantiated by firm's performance improvement or better future profit prospects is followed by an investment reduction. Later, when the public finds out and aligns it expectations with the reality, the stock's price comes back to its unbiased level. (Miller & Rock, 1985). On the other hand, the signalling firm might attempt to sustain its level of investments. In connection to that, seminal contribution has been made Bhattacharya (1979) describing costs of raising additional capital and specifying conditions to get back into equilibrium, where firm's available funds meet its optimal level of investments. Both research papers referenced above also mentioned temptation of top corporate executives to exploit such powerful tool as dividend signalling in order to maximize their individual utility. Especially, when their personal benefits are directly related to stock price. With such thoughts they outlined the other body of research on dividend models based on information asymmetries, agency models, then already developed, for example by Jensen & Meckling (1976).

Jensen & Meckling brought some information about the background of the agency problem and claimed that modern setting of separation of ownership and executive power gave a rise to such problem. At the beginning of their theoretical study Jensen & Meckling (1976, p. 308) defined agency relationship as "*a contract under which one or more persons (the principal(s)) engage another person (the agent) to perform some service on their behalf which involves delegating some decision-making authority to the agent. If both parties to the relationship are utility maximisers there is good reason to believe that the agent will not always act in the best interests of the principal*". La Porta et al. (2000) mentions theft, stock issuance to the insiders, unreasonable payrolls, asset disposals to themselves directly or indirectly via a proxy at

inadequate prices, or transfer pricing with firm's they have claims to as most common ways how corporate executives (agents) expropriate firm's assets to their own benefit. In later sections of their paper they provide a thorough analysis of agency and transaction costs related to external financing via equity issue and debt, respectively. In the case of outside equity, they suggest that such costs are induced by potential appropriation of firm's capital by corporate insiders to seek their own interests, or by decrease of their effort to maximize principal's wealth, since they bear the costs resulting from residual loss only proportionally to their ownership claims, if there are any. Later, they allow for the possibility of monitoring of the agents in their model and list examples of this preventive mechanism including incentivisation to align interests of both principal and agent, internal and external audit, imposed budget constraints etc. Regardless who monitors agent's behaviour, equity owners bear the complete price of doing so (Jensen & Meckling, 1976).

Rozzef (1982) introduced the relation between agency problem and dividends payouts and provided an empirical evidence for such suggestions. He argues that dividends serve as an instrument to mitigate the negative effects of agency problem on costs, e.g. bonding, monitoring and residual loss, since raising additional funds from external investors is needed when a firm suffers from a shortage of funds to be able make required investments. Such logic was already suggested in the Miller & Modigliani's (1961) stock valuation model with the argumentation that there is shortage of funds to make required investments when higher than optimal level of dividends is paid. Making a thorough analysis of the firm's performance and requiring detailed information about management's objectives, the new potential investors substitute monitoring activity of existing shareholders. In addition, Rozzef pointed out the existence of trade-off between transaction expenditures associated with raising extra capital and agency costs. Formulating a cost function composed of these two types of expenses with respect to percentage of net profit distributed among owners, he discussed optimal dividend policy for various characteristics of a company. In terms of ownership structure, ownership highly concentrated among corporate insiders will move optimum towards higher profit retentions and vice versa. The other factors affecting the optimum are closely related risk and leverage as both determine the transaction costs of external financing. Firms which have high debt-to-assets ratio will rather retain more earnings in order to improve their financial stability and reduce their risk. (Rozzef, 1982).

The relationships hypothesized above were also empirically validated by Rozzef (1982) on a sample of 1000 non-financial and non-regulated firms while the multiple regression model was estimated. The selected regressand was firm's target dividend payout ratio. Regressors were chosen so that they proxy agency and transaction costs, e.g. transaction costs associated with raising additional capital are proxied by past and expected growth rate of sales and risk in a form a beta coefficient, and to reflect agency costs impact on dividends number of shareholders and share held by corporate insiders is used. As a result, all estimated coefficients were significant. Therefore, the Rozzef's research paper concludes that the dividend payout ratio is significantly negative function of all the independent variables listed above, except number of shareholders for which the impact is found significantly positive. These findings were consistent with Easterbrook's (1984) suggestion that maintaining lower retentions compels firms to enter capital markets, which provide monitoring at promisingly lower costs. The other studies supporting the theory using dividend payments as a device to mitigate agency problem include Meyers (1998), Gomes (2000) etc.

La Porta et al. (2000) introduced another way how to shed a light on the occurrence of agency problem in corporate governance and its impact on dividends by focusing on dividend policies across different levels of legal protection of outside investors. Developing such a hypothesis, he referenced to La Porta et al. (1998) which analysed degree of legal protection of outside shareholders in terms of law quality and its enforcement across 49 countries and indicated its considerable diversity. La Porta et al. (2000, p. 3) listed examples of particular privileges: "*right to receive the same per share dividends as the insiders, the right to vote on important corporate matters, including the election of directors, the right to sue the company for damages*". He pointed out two different views of the effect of legal system on dividends. First, they provide argumentation based on the bird in the hand theory, that stockholders deem cash payments as less risky than capital gains and therefore their preference is leaned towards higher payout ratio which consequentially increases stock price (Wang et al., 2011; Bhattacharya, 1979). They argue that investors with more legal powers are more able to force corporate insiders to greater profit distributions. Such a theory is recognized in literature as complement or outcome model (Booth & Zhou, 2017). Second, they proposed a view that is based on the need of raising external capital. They argue that firms from an environment of moderate legal power of the outside investors need to persuade investors about its proper agency behaviour by paying sufficiently high dividends, defined by La Porta et al. (2000) as substitute model. The empirical

results of theirs were in favour of the outlined hypothesis that having stronger legal protection, the investors use their privileges to extract dividends from firms. As the level of stock market development might be correlated with the quality of legal environment, the other possible interpretation of observed relationship is that dividends are increasing with the accessibility to external financing (La Porta et. al, 2000).

On the other hand, there are numerous studies finding evidence rather in favour of the substitute model while using different approaches (than the one used by La Porta et al. (2000) of distinguishing between common and civil law legal systems) to measure level of legal protection of stockholders. E.g. John, Knyazeva & Knyazeva (2015) and Karpoff & Wittry (2014), both working with sample of North American companies.

Ownership concentration was already identified as a determinant of dividend policy by Rozzef (1982). The research paper, however, paid attention only to the ownership concentrated among insiders. Regardless of equity claims of the insider, generally ownership concentration has a significant impact on the dividend payments as big shareholders are more able to influence management's decisions (Ramli, 2010). In addition, large shareholders would bear large portion of the loss arising from inappropriate managerial behaviour. Thus, it is in their best interest to mitigate such agency conflicts and maximize wealth of the company. (Shleifer & Vishny, 1997). Over time, an extensive literature has developed on the relationship of dividends and ownership structure. Very common trend is to use the share held by largest shareholder as a proxy for the ownership concentration.

Truong & Heaney (2007) published their research paper analysing various determinants of probability that dividends will be paid out. Their main objective was to unveil the role of largest shareholder. Using dataset composed of financial data for year 2004 on 8279 listed from 37 countries, their analysis yielded results in favour of agency theory. They reported that probability of dividend payments is decreasing with the share held by the largest shareholder. They also incorporated in their model several other variables such as profitability measured by return on assets, leverage measured as debt to assets ratio and variables distinguishing between various types of the largest shareholder and levels of legal protection. Most of their results were coherent with the existing literature. Thus, more profitable firms, firms financed rather by equity and those with fewer investment opportunities are more likely to distribute their income among their investors. Such results were aligned with those presented by Fama & French

(2001). Consistent with Da Silva et al. (2004) and Khan (2005), they discovered convex relationship between individual shareholding and dividends while they provided the argumentation of increased monitoring activity by the largest shareholder. The turning point of the convexity is explained as a share large enough and held by an individual such that he has power to influence the corporate executives and expropriate the company's capital at the expense of minority stockholder.

There are many other studies investigating the impact of ownership structure in connection with dividend policy. Using percentage of holdings in possession of largest and second largest equity investors as proxy, Gugler & Yurtoglu (2003) found a negative and significant relationship between dividend policy and highly concentrated ownership structures in their sample of major German companies. Such results are fully consistent with the agency theory. Maury & Pajuste (2002) reported similar results in terms of the sign and significance of the relationship, even though they used sum of votes of the three most dominant shareholder to measure ownership concentration and ran their regression analysis on a sample consisting of companies listed on Helsinki Stock Exchange. Examples of other studies revealing causality between presence of large blockholders and dividends to earnings ratio include Renneboog & Trojanowski (2007), or Reyna (2017). However, Reyna (2017) in his research conducted on a sample of companies listed at Mexican Stock Exchange focused rather on the impact of concentration in the hands of particular investor types such as families and banks. Reyna (2017) found positive relation between institutional ownership and dividends to earnings ratio and a negative one for cases where the large blockholder is a family. Therefore, he argues that different agency conflict mitigating mechanisms are preferred by different investor types, e.g. banks tend to use dividend payments. On the other hand, families rather increase their monitoring activity to prevent wealth expropriation by corporate insiders.

Many research papers hypothesize the impact of the type of largest blockholder along with the ownership concentration. Only partially consistent with Reyna (2017), Khan (2005) reported that with increasing fraction of equity owned by a large individual or an institutional investor dividend tend to decrease until reaching a turning point. However, Khan noted one exception for the case of an institutional shareholder that with increasing holdings by insurance companies, greater faction of profit is distributed among the stockholders. Truong & Heaney (2007) also examined whether insider, institutional (financial) or state ownership work as a determinant of dividend policy. They discovered that firms where the largest shareholder is an

insider are both less leaned towards any dividend payments and tend to pay lower fraction of their income when they decide to pay them. Such results were consistent with existing literature, e.g. with Rozzef (1982). Moreover, when a financial institution is the one holding largest share, probability of paying out dividends is lower too. In case of state-owned enterprises (SOE), not enough evidence in favour of an existence of a relationship between SOE and dividends was found.

Truong & Heaney's (2007) research paper is one of few taking a look into state ownership and one of even fewer investigating its impacts on corporate decisions such as dividend payouts in countries other than China. Primarily, such researches are conducted in the environment of Chinese market as the Chinese government controls directly or indirectly lion's share of local listed firms through tradable or non-tradable shares (Areddy, Bai, & Leow, 2008; Gul, Kim, & Qiu, 2010). Such issuance of two groups of shares is common in China and it is known as "split-share structure" (Wang et al., 2011). Wang et al. (2011) discovered increased likelihood of non-zero dividend payout ratio for SOEs in China substantiated with argumentation that state needs sufficient amount of cash to cover public expenses. Since tunnelling activity occurs primarily in emerging markets and China is characterized to be one (Lam et al.,2012), Lam et al. (2012) hypothesized and empirically proved that with increasing state ownership firms pay higher cash dividends. Lam's (2012) theoretical background and results were fully consistent with the Wang's (2011).

As already outlined above, most of the research on SOEs in terms of dividends is single-country based. Even though the amount of SOEs in EU is substantially limited compared to China, we can observe that there is still state's participation in the ownership, especially in strategic industries, e.g. utilities, energy, transportation or financial service.

Motivated by the limitations of the existing research (presented in the section *introduction*) on the theories presented above, I am going to provide closer look into the implications of various ownership structures while the following hypotheses find its fundament in the agency theory which was successfully established, described and proven by many research papers. However, the complexity of the proxy for the associated explanatory variable, ownership concentration, might be questionable. Therefore, the first hypothesis of this paper re-examines the classical view of agency theory with use of Herfindahl's index as a measure of ownership concentration.

Hypothesis 1: *Ownership concentration has a negative effect on dividend payout ratio.*

Not only dividend amount paid out is tested, but I also examine whether ownership concentration affects the probability of a positive dividend payment.

Hypothesis 2: *Ownership concentration has negative impact on the probability of paying out dividends.*

On similar basis as agency conflict between shareholders and management, there might also be misalignment between the interests of various shareholders. In such a case, their dividend policy preferences might differ. Many research papers investigating the impact of various shareholder types on dividends have been already presented above. As opposed to institutional or individual investors, the effect of state ownership has not been paid much attention to especially in European environment although there is still motivation for tunnelling due to the potential need to balance national budgets (Frederick, 2011).

Hypothesis 3: *Firms with a state ownership have higher dividend payout ratio than those without state participation.*

Similarly, as in case of the hypothesis regarding ownership concentration, probability equivalent is also tested.

Hypothesis 4: *Firms with a state ownership are more likely to pay a positive dividend amount than those without state participation.*

Methodology and Data

Econometric models

In this thesis, the panel data and limited dependent variable methodologies were used. Each econometric model presented in this thesis examines two hypotheses at the same time, e.g. panel data model is associated with magnitudes of dividend payout ratios and dependent variable model is related to the probabilities of dividend payments.

To analyse the impact of ownership concentration and state ownership on decision of what fraction of net earnings will be distributed among stockholders, random effects model (RE) was applied. It is common to report fixed effects (FE) model results together with the random effects, however, fixed effects model is not suitable in this case as dummy variables are used and time-demeaning procedure in the "within transformation" eliminates such variables unless they vary in time. As variable for state ownership and industry dummies are constant over time, FE model estimation might be subject to evaluation only in case of investigating the impact of ownership concentration on dividends. However, this thesis aims to control for industry effects in all of its models in order to eliminate bias[2] and maintain consistency. Therefore, using FE estimation is not considered as suitable as it requires omission of industry dummy variables and the one representing state ownership. Moreover, I assume that factors contained in the fixed error term are random. I believe that the only fixed factors related to individual firms affecting dividend payout and some of the random variables included in the model might potentially be regulatory environment, government activity and level of minority investors protection. However, I believe that these factors do not differ significantly across European countries.

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[2] As Fixed Effects model requires strict exogeneity assumption to be fulfilled, using FE model, which eliminates industry dummies, is not suitable this case. Industry dumms are correlated with the dependent variable Dividend payout ratio (see RE model results in *Table 2*) and at the same time they are correlated with the explanatory variable Ownership concentration (see *Appendix A* for pooled Ordinary Least Squares (OLS) model exploring the relationship between ownership concentration and industry effects). Therefore, omission of these variables would result in violation of the assumption of strict exogeneity and subsequently biased result would be produced.

Taking into account the above theoretical reasoning, RE model is applied even though the result of performed Hausman test were in favour[3] of FE model.

Along with variables of the main interest of this thesis, set of control variables is included in order to eliminate potential bias and inconsistency of the estimation, which could arise from omission of those factors that affect both regressors and regressand. In other words, unless these control variables are included in the model, strict exogeneity assumption is violated. Set of control variables is composed of leverage, profitability, size, liquidity, investment opportunities, dividend smoothing and dummy variables representing various industries. The estimated RE model examining the hypothesized determinants of dividend amount paid out is defined as follows:

$$
\begin{aligned}
Dividend\ Payout\ Ratio_{it} \\
&= \beta_0 + \beta_1 Debt\ to\ Assets_{it} + \beta_3 SOE_{it} + \beta_4 ROA_{it} + \beta_5 \log(Total\ assets)_{it} \\
&+ \beta_6 Ownership\ concentration_{it} + \beta_7 \log(Cash\ Balance)_{it} \\
&+ \beta_8 Dividend\ Payout\ Ratio_{it-1} + \beta_9 Growth\ Rate\ of\ Sales_{it} \\
&+ \beta_{10} Real\ Estate_{it} + \beta_{11} Utilities_{it} + \beta_{12} Communication\ Services_{it} \\
&+ \beta_{13} Financials_{it} + \beta_{14} Industrials_{it} + \beta_{15} Consumer\ Discretionary_{it} \\
&+ \beta_{16} Consumer\ Staples_{it} + \beta_{17} Energy_{it} + \beta_{17} Materials_{it} \\
&+ \beta_{18} Information\ Technology_{it} + \varepsilon_{it}
\end{aligned}
$$

, where $i = 1, \dots, 2624;\ t \in \{2013, 2014, 2015, 2016, 2017\}$.

The second model is constructed in order to estimate the relationship between state ownership and ownership concentration and the probability that a positive dividend amount will be paid out. Since the dependent variable is of qualitative character, binary response model is applied. Particularly, probit model shaping the probability by standard normal cumulative distribution function is implemented. Even though my data sample consists of cross-sections observed during 5-year time period, probit pools the data. As a result, full information included in the data is not utilized under this estimation method. The probit model was constructed as follows:

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[3]P-value below 5% level of significance indicated that fixed error a_i is correlated with some explanatory variable.

$$Dividend\ Paid_i$$

$$= \beta_0 + \beta_1 Debt\ to\ Assets_i + \beta_3 SOE_i + \beta_4 ROA_i + \beta_5 \log(Total\ assets)_i$$
$$+ \beta_6 Ownership\ concentration_i + \beta_7 \log(Cash\ Balance)_i$$
$$+ \beta_8 Dividend\ Paid\ Last\ Year_i + \beta_9 Growth\ Rate\ of\ Sales_i$$
$$+ \beta_{10} Real\ Estate_i + \beta_{11} Utilities_i + \beta_{12} Communication\ Services_i$$
$$+ \beta_{13} Financials_i + \beta_{14} Industrials_i + \beta_{15} Consumer\ Discretionary_i$$
$$+ \beta_{16} Consumer\ Staples_i + \beta_{17} Energy_i + \beta_{17} Materials_i$$
$$+ \beta_{18} Information\ Technology_i + \varepsilon_i$$

, where $i = 1, \dots, 7075$.

In addition, the above probit model is also estimated with no lagged dependent variable (see results in *Appendix D*), e.g. variable Dividend Paid Last Year is excluded. Such exclusion rules out controlling for dividend smoothing effect. On the other hand, allowance of dividend title status of a company to vary in the model might cause that long-term preferences of SOEs (or firms with highly concentrated ownership structures) are reflected in the resulting estimates.

Definition of variables

According to previous research focused on determinants of dividend policy, dividend payout ratio is a frequently used form of dividend policy, e.g. Rozzef (1982) or Wei et al. (2011) preferred this proxy. Moreover, dependent variable ***Dividend Payout Ratio*** in percent was directly provided by Reuters, while their calculation proceeded as dividing dividend per common share by earnings (excluding extra items) per common share. It is important to define the formula used in the computation, since the outcomes may vary when different types of shares or extra items are taken into account. In case of variable ***Dividend Paid***, it equals 1 if dividend payout ratio for corresponding year is a positive number and 0 otherwise.

As already described in previous sections, state ownership is the independent variable of our interest. If a company is held by a government agency, ***SOE*** equals to 1 and 0 otherwise. Even though OECD definition requires state to exercise control through at least a significant minority ownership to consider a firm as SOE (PWC, 2015), the only Reuters Eikon's filtering pattern available for generating the required data was adopted. Therefore, government or a government

agency might hold even insignificant share[4] in a firm, and it is still considered as SOE in this thesis. Moreover, in our definition we include firms held centrally, regionally or locally by a government or by a government-established public body.

To account for level of indebtedness and financing structure, **_Debt to Assets_** calculated as total debt outstanding divided by company's total assets and expressed in percentage is used as inspired in Lam et al. (2012). Capital structure is correlated with both ownership concentration (Erem Ceylan, 2018) and dividends. McCabe (1979) provided evidence that long-term debt has negative impact on dividends. Rozzef (1982) added argumentation that it is the higher risk represented by beta coefficient influencing the dividends and that higher beta is a result of higher financial and operating leverage.

Following fundamental logic that a firm has to generate a positive value in order to be able make dividend payments regularly, it is crucial to include profitability in our models. Most of the referenced empirical studies in this thesis did so. Miller & Modigliani (1961) constructing their valuation model assumed net earnings and investment opportunities to be even the only determinants of dividend policy. Following Lam et al. (2012), we select return on assets (ROA) to account for earnings and profitability. **_ROA_** was calculated as net earnings after tax divided by total assets times 100.

Firm's size and life cycle is also controlled for. Large firms have easier access to capital markets. Therefore, being able to raise additional funds easily and for lower costs, they are not that reliable on retained earnings and more likely to pay dividends (Ho, 2003). Moreover, characteristics such as profitability, investment opportunities, ownership structure and financing system vary with different stages of firm's life cycle (Booth & Zhou (2017). As central governments tend to own firms in strategic industries (OECD, 2015) and generally big players operate in such industries, life cycle is also correlated with the observed state ownership. Literature shows that natural logarithm of total assets is predominantly considered as appropriate proxy for firms' size and life cycle. Therefore, **_log(Total assets)_** is introduced in my models.

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[4] Average share held by government or a government agency in SOEs in the sample is 31.5%.

Investment opportunities and growth potential are crucial factors when making a decision on dividend policy. Again, it was fundamental assumption made by Miller & Modigliani (1961) that decision on dividends is a function future investments and profit. As an evidence serves La Porta et al. (2000) with his empirical study using sample of UK a US firms and reporting negative relation between these two variables regardless of level of legal protection of minority shareholders. Choice of the most suitable measurement standard for such a variable is complicated as investment opportunities could be only estimated, not computed from financial statements as most of the others. After thorough consideration, growth rate of sales is adopted. The argumentation is that the decision on how much to invest into expansion in upcoming year is made upon the revenues made the current financial year. Variable **Growth Rate of Sales** is calculated as difference between revenues and its lagged value divided by the lagged value.

In the existing literature, there are various proxies for **Ownership concentration** such as share held by largest shareholder, number of shareholders, sum of shares held by a certain number of the largest shareholders, ratio of the holdings of the largest and second largest etc. Since it is fundamental variable of this paper, as accurate measurement form as possible should be taken. In order to allow for interplay between shareholders, the selected proxy is Herfindahl index (Herfindahl, 1950). Herfindahl index is computed by taking sum of squared voting rights held by certain number of largest equity investors, e.g. when a company is held by only three stockholders and they own 40%, 35% and 25% of the equity respectively, Herfindahl index is calculated as $0.4^2 + 0.35^2 + 0.25^2 = 0.345$. For the purposes of this paper, it is assumed that voting rights are equal to the fraction of equity held and seven largest shareholders are included in the calculation. Returned value is always between 0 and 1. Contrary to the basic proxies mentioned above, such a method takes into account changes such as third largest stockholder selling a part of his holdings to the second largest. As a result, ownership concentration rises. In other words, if share owned by a shareholder is increased at the expense a smaller one, ownership concentration correctly increases.

Following Lam et al. (2012), proxy **log(Cash Balance)** for control variable liquidity is added. Its impact on dividends has been documented by Ho (2003) to be positive.

According to signalling theory of dividends, decreasing dividends would be perceived by investors as negative management's view of future performance (Booth & Zhou, 2017). Therefore, lagged dividend payout ratio (**Dividend Payout Ratio$_{t-1}$**) is introduced in the model.

Moreover, incorporating lagged dividends into the model is also consistent with dividend smoothing theory.

To control for industry effects across sample, ten dummy variables are included. Based on eleven sectors defined by Global Industry Classification Standard (GICS), it is distinguished between the following sectors: Real Estate, Utilities, Communication Services, Financials, Industrials, Consumer Discretionary, Consumer Staples, Energy, Materials, Information Technology and Health Care which is represented by intercept.

Data Sample

The data sample used in this thesis was obtained from open platform Thompson Reuters Eikon, financial data provider. The sample is composed of companies incorporated and headquartered in EU and listed in selected stock exchanges.

As shedding a light on the potential effect of state ownership on dividend payouts in EU is the main objective of this work, data on SOEs are the core of this sample. It was generated in Reuters platform built-in application Screener by screening listed companies incorporated and headquartered in Europe and held by a government agency in the Ownership holdings universe. As a result, vector of EU companies with state participation in the ownership structure was produced and while being composed of listed firms owned centrally, regionally or locally by state, regardless of the fractions owned.

Peer group consists of EU companies from selected European capital markets. Size and level of development were taken into account when selecting those markets. As a result, set of 2507 companies from 27 European stock exchanges (complete list of these stock exchanges is available in *Appendix B*) was generated.

Subsequently, annual financial data for a period of 5 years from 2013 to 2017 denominated in Euro was retrieved, while absolute figures reported in currencies other than Euro were converted for exchange rates corresponding to certain point of time. Retrieved dataset was subject to further filtering as it was likely that firms in unfavourable financial conditions would produce bias in the estimated coefficients. Moreover, Reuters reported incorrect figures in few cases. Following filtering conditions were applied: (i) All firms with negative annual revenue

were excluded as such reported figures in income statement were a result of an accounting inconsistencies and restatements. (ii) All firms with negative book value were excluded as firms with more liabilities than tangible assets represent extraordinary cases which might substantially distort regression results. (iii) Companies with debt-to-assets ratio greater than 1 were also omitted due to the same reason as in *(ii)*. (iv) Companies with ownership concentration, which was measured by Herfindal's index calculated from shares owned by seven largest shareholders, greater than 1 got ruled out as such a result is mathematically impossible. (v) The most dominant filter in terms of number of exclusions implied was conditioning on dividend payout ratio to be non-negative. The negative figures were probably result of adverse reporting practices by data provider Reuters Eikon or a result of positive dividend payment while annual accounting loss was incurred. Since private companies are not obliged to share as detailed financial information as the public ones, such an unavailability of some data was probably result of the fact that some firms went public and used initial public offering (IPO) as a form of financing during the observed 2013 to 2017 period, e.g. there was no information provided by Reuters Eikon about dividends paid in case of German firm Uniper SE operating in energy market until it launched its IPO in XETRA stock exchange in 2016. Once the filtering criteria and missing values have been accounted for, sample of 2624 listed companies of which 117 are considered as SOEs is used in empirical part of this thesis.

In *Table 1* you can see descriptive statistics of selected variables used in econometric analysis sorted by state ownership, e.g. SOEs, non-SOEs and their union respectively in 3 panels. Note that all the continuous variables were winsorized[5] by 1% on each side in order to mitigate the impact of outliers.

Presented in *Table 1*, descriptive statistics demonstrate that SOEs are leaned towards higher dividend payments. In case of SOEs, mean dividend payout ratio is 61%, while listed EU firms with no government involvement in ownership allocate on average 36% of their net earnings among their shareholders. When we look at the median values, the difference is even larger even though the influence of outliers is at least partially eliminated due to the application of

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[5] Winsorizing is procedure of replacing extreme values in the data by the next largest (or smallest) value (Dixon, 1960). In the context of this thesis, observations larger (or smaller) than n^{th} largest (or smallest) observation are substituted by value of the corresponding n^{th} observation. Values of the corresponding n^{th} observations are determined by taking 1st and 99th percentiles.

winsorizing. In terms of dummy variable whether a dividend was paid, diverse behaviour of these two groups is observed. Especially, 1st quartile indicates that. We can conclude that only in less than 25% of cases SOE did not pay a dividend. On the other hand, non-SOEs retained all of its earnings in more than 36% cases. Moreover, our sample indicates that SOEs compared to their peers are on average more profitable, maintain comparable level of leverage, are, on average, slightly larger, experienced less growth in terms of revenue over the period from 2013 to 2017 and their ownership structure is less dispersed. Such results suggest that SOEs are probably in later stage of their life cycles than the listed European non-SOEs.

Table 1 : Descriptive statistics

Three panels of descriptive statistics for selected variables for SOEs, non-SOES and their union, respectively

Variables	Min	1st Quartile	Median	Mean	3rd Quartile	Max
Panel A : SOEs						
Dividend Payout Ratio (%)	0.00	25.49	50.58	61.08	77.99	406.36
Dividend Paid (dummy)	0.00	1.00	1.00	0.85	1.00	1.00
ROA (%)	-119.38	2.10	4.14	3.50	6.65	25.63
Debt to Assets (%)	0.00	6.22	19.16	20.64	30.58	69.88
Log(Total Assets)	13.52	20.25	21.62	21.54	23.13	25.00
Ownership Concentration	0.00	0.05	0.14	0.22	0.36	0.88
Growth Rate of Sales (%)	-88.62	-3.25	1.90	6.45	10.39	549.60
Log(Cash Balance)	6.91	15.69	17.84	17.25	19.78	22.15
Panel B : non-SOEs						
Dividend Payout Ratio (%)	0.00	0.00	21.65	36.34	51.50	406.36
Dividend Paid (dummy)	0.00	0.00	1.00	0.59	1.00	1.00
ROA (%)	-119.38	0.46	3.76	0.99	7.47	30.93
Debt to Assets (%)	0.00	3.66	16.65	20.05	30.96	76.27
Log(Total Assets)	13.52	17.43	18.86	19.08	20.54	25.00
Ownership Concentration	0.00	0.04	0.10	0.18	0.27	0.88
Growth Rate of Sales (%)	-88.62	-4.56	4.82	15.55	16.43	549.60
Log(Cash Balance)	6.91	14.13	15.83	15.74	17.55	22.15
Panel C : whole sample						
Dividend Payout Ratio (%)	0.00	0.00	23.52	37.51	53.06	406.36
Dividend Paid (dummy)	0.00	0.00	1.00	0.60	1.00	1.00
ROA (%)	-119.38	0.58	3.79	1.11	7.44	30.93
Debt to Assets (%)	0.00	3.80	16.80	20.08	30.94	76.27
Log(Total Assets)	13.52	17.49	18.95	19.19	20.77	25.00
Ownership Concentration	0.00	0.04	0.10	0.18	0.28	0.88
Growth Rate of Sales (%)	-88.62	-4.45	4.64	15.12	16.05	549.60
Log(Cash Balance)	6.91	14.15	15.90	15.81	17.69	22.15

Note: *Dividend Payout Ratio* is the ratio of dividend amount paid out and net earnings net of extra items expressed in percentage, *Dividend Paid* is dummy equal to 1 if positive dividend amount is paid out, *ROA* is the ratio of net earnings net of extra items and total assets expressed in percentage, *Debt to Assets* is the ratio of total debt outstanding and total assets expressed in percentage, Log(Total Assets) is calculated by taking natural logarithm of total assets, *Ownership Concentration* is calculated as sum of squares of shares held by 7 largest shareholders, *Growth Rate of Sales* is the relative annual increase in revenue, *Log(Cash Balance)* is calculated by taking natural logarithm of the sum of cash and cash equivalents.

Correlation analysis

In *Appendix C*, Pearson and Spearman correlation matrices of selected variables are presented. Since the data sample used in the models consists of both continuous and discrete variables, Spearman Rank correlation coefficients are reported as well. Moreover, assumptions for Pearson correlation coefficients require outliers to be absent. Even though two-sided winsorization was applied, some of the variables used, such as dividend payout ratio or ROA, take values greater than their interquartile range multiplied by 3. As a result, we can conclude that even after winsorization outliers are detected. Comparing Pearson and Spearman correlation coefficients, the potential effects of the mentioned outliers are outlined. E.g. Spearman's and Pearson's correlations between ROA and ownership concentration differ in direction. Such a difference is consistent with the finding above, that variable ROA exhibits greater number of outliers.

Since the largest correlation coefficient of the Pearson's method has value of 0.69, there are no perfect linear relationship among explanatory variables. Therefore, there is no concern for the presented regression models in this regard.

Empirical results

As described in the previous sections, objective of this thesis is to shed a light on ceteris paribus effect of ownership concentration and state ownership on dividend payout ratio and on the probability of paying out any dividends.

Estimation of RE model associated with the *Hypotheses 1* and *3* is reported in *Table 2*. As Breusch-Godfrey and Breusch-Pagan tests suggested (p-values substantially lower than 0.0001), *Model (1)* originally suffered from heteroskedasticity and autocorrelated errors causing inconsistency of RE estimators and making their statistical testing invalid. Therefore, correction for serial correlation and heteroskedasticity was made by estimating standard errors robust to both, heteroskedasticity and autocorrelation, as proposed by Arellano (1987).

As reported in *Table 2* the empirical analysis provides enough evidence (at 5% significance level) to claim that ownership concentration has negative relationship with dividend payout ratio. Thus, the result is in favour of *Hypothesis 1*. Since the level of ownership is captured by Herfindahl index, general interpretation of the estimated coefficient of -6.96 is complicated. However, particular example should clarify the relationship implied by the coefficient. Let a company have three owners with holdings 40%, 30% and 30% respectively. Second owner selling his 30% share to the first one would cause, on average, decrease of dividend payout ratio by 1.67 percentage points [Change of the Herfindahl index is calculated as follows $(0.7^2 + 0.3^2)$ - $(0.4^2 + 0.3^2 + 0.3^2) = 0.24$]. Such result is fully consistent with agency theory as with increasing share held, equity investors have greater motivation to monitor management and to subsequently mitigate its potential opportunistic behaviour. Moreover, using Herfindahl index the ability to make alliances between owners to have greater influencing power could be reflected. Therefore, dividend payments as agency problem preventing device are substituted by greater monitoring activity and influence of shareholders.

SOE represents the variable of the interest of this thesis. As opposed to the case of China, Civil law country with weak investor protection, where the state ownership effect on dividend policy was found highly significant by various researchers (see section *Literature review*), its impact in EU is expected to be little lower as the EU environment is more developed in terms of regulation, minority shareholder protection and ownership structure diversity. The estimation

26

result gives evidence at 10% level of significance that state ownership positively affects the amount of profit distributed among equity investors. Thus, *Hypothesis 3* could not be rejected. As expected by tunnelling theory which is besides other factors determined by level of market development, minority shareholders protection, government agency's need to balance its budget and other tunnelling incentives[6] the significance level is higher than in case of research in China. Therefore, less evidence that SOEs preferences are leaned towards higher dividends is found though still we can conclude that even government agencies of EU favour dividend policies which might be conflicting with the wealth maximization of the other shareholders. Particularly, it has been found that on average firms at least partially held by state tend to pay to its stockholder more profit by 6.69 p.p. than firms fully owned by entities from private sector.

In terms of the other variables included in the model which were found also significant, no inconsistencies with the main streams of the literature occurred. Particularly, the effect of leverage was estimated highly significant and negative as already documented before, e.g. by Truong & Heaney (2007), Wei et al. (2011) and many others. The same applies to the identification of positive relationship for profitability. Positive coefficient of lagged dividend payout ratio is in favour of dividend smoothing theory, first proposed by Lintner (1956). As growth rate of sales represents the proxy for investment opportunities in our model, the negative and very significant relationship explored is aligned with existing literature and with natural expectation that firms with potential to expand their business tend to retain earnings.

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[6] Chen et al (2009) argues that tunnelling incentives for the majority shareholders arise especially in China due to its split-share structure, where tradable and non-tradable shares are issued. As a result of this unique structure and different pricing of the two different types of shares, diverse dividend yields create an incentive for majority shareholders to expropriate cash out of the company by establishing abnormally high dividend payments.

Table 2 : Random effects model

Model (1): Random effects model with Dividend Payout Ratio as dependent variable

Variable	Coefficient estimate	Std. Error	t-statistic	p-value	
(intercept)	-37.475	6.368	-5.885	< 0.001	***
Debt to Assets (%)	-0.191	0.035	-5.435	< 0.001	***
SOE	6.688	3.596	1.860	0.063	*
ROA (%)	0.173	0.022	7.958	< 0.001	***
Log(Total Assets)	3.042	0.474	6.416	< 0.001	***
Ownership Concentration	-6.963	3.240	-2.149	0.032	**
Log(Cash Balance)	0.269	0.349	0.772	0.440	
Dividend Payout Ratio lag	0.359	0.023	15.519	< 0.001	***
Growth Rate of Sales (%)	-0.048	0.010	-4.802	< 0.001	***
Real Estate	3.562	3.014	1.182	0.237	
Utilities	10.933	5.452	2.005	0.045	**
Communication Services	9.488	3.748	2.531	0.011	**
Financials	5.176	3.148	1.644	0.100	
Industrials	7.369	2.484	2.966	0.003	***
Consumer Discretionary	2.912	2.583	1.127	0.260	
Consumer Staples	2.683	2.709	0.990	0.322	
Energy	0.542	4.208	0.129	0.898	
Materials	2.735	3.191	0.857	0.391	
Information Technology	3.820	2.684	1.423	0.155	

Notes: There are 2624 cross-sections included in the model, while overall number of complete observations is 7075. R-squared equals 0.200. Marks at the right-hand side of the table denote the following: * significance at 10% level, ** significance at 5% level, *** significance at 1% level.

The estimated coefficients of the probit model addressing *Hypotheses 2* and *4* are presented in *Table 3*. Disregarding the industry variables which are solely the control ones, direction of the coefficients of all the explanatory variables, included in the model are consistent with the expectations as already discussed in RE model results interpretation above, except *Growth Rate of Sales*. However, the results differ in terms significance. Particularly, we failed to reject null hypothesis in favour of *Hypothesis 4*. Thus, there is no relationship between state ownership and probability of positive dividend payments. Such result is not perfectly consistent with the above RE model outcome that, other things equal, state ownership is positively related to the dividend payout ratio at 10% level of significance. Potential reason for these two slightly

diverse results might be in the non-panel nature of the probit model combined with high correlation between dummy for paying out any dividends (dependent variable) and its lagged value. In comparison of correlation coefficients for dividend payout ratio and its lagged value and its binary equivalents used in the probit model, in the binary variables case the correlation is twice stronger. See *Appendix D* for the results of estimation of the probit model excluding its lagged dependent variable, *Dividend Paid Last Year*. The results presented in the appendix confirm the expectation already outlined in the section *Econometric models*, that allowing for long-term preferences of SOEs and highly concentrated ownership structures to vary in the model generate results more consistent with the hypothesized relationships associated to magnitudes.

Moreover, it is discovered by the probit model analysis that ownership concentration is negatively and significantly related to the probability of a profit distribution at 10% level (p-value 7.9 %). Compared to the corresponding RE model estimate, less evidence in favour of the tested agency theory is found in case of probit model. However, both hypotheses regarding ownership concentration are consistent with each other. Therefore, the result is in favour of *Hypothesis 2*, and consequently in favour of the agency theory which is the core theoretical background of this hypothesis.

Table 3 : Probit model

Model (2): Probit model with dummy whether dividends were paid as dependent variable

Variable	Coefficient estimate	Std. Error	t-statistic	p-value	
(intercept)	-5.166	0.298	-17.327	< 0.001	***
Debt to Assets (%)	-0.007	0.002	-4.443	< 0.001	***
SOE	0.019	0.141	0.132	0.895	
ROA (%)	0.072	0.004	16.932	< 0.001	***
Log(Total Assets)	0.189	0.019	9.743	< 0.001	***
Ownership Concentration	-0.224	0.128	-1.757	0.079	*
Log(Cash Balance)	0.013	0.013	0.981	0.327	
Dividend Paid Last Year	2.405	0.052	46.614	< 0.001	***
Growth Rate of Sales (%)	0.000	0.000	-0.194	0.846	
Real Estate	0.500	0.127	3.946	< 0.001	***
Utilities	0.451	0.199	2.272	0.023	**
Communication Services	0.281	0.134	2.100	0.036	**
Financials	0.320	0.125	2.552	0.011	**
Industrials	0.422	0.103	4.111	< 0.001	***
Consumer Discretionary	0.334	0.110	3.040	0.002	***
Consumer Staples	0.532	0.136	3.918	< 0.001	***
Energy	-0.170	0.161	-1.059	0.290	
Materials	0.444	0.130	3.407	0.001	***
Information Technology	0.196	0.115	1.710	0.087	*

Notes: There are 7075 complete observations consisting of 2624 cross-sections in the model. Marks at the right hand-side of the table denote the following: * significance at 10% level, ** significance at 5% level, *** significance at 1% level.

Since, in case of binary response models such as probit and logit, direct interpretation of the estimated coefficients is not possible due to nonlinearity of the function used for modelling of probabilities in these two models, *Table 4* with average partial effects[7] (APEs) for all the explanatory variables included in the model is presented. Even though we found most of the explanatory variables statistically significant, economically it is not always the case, e.g. 10 p.p. increase in debt-to-asset ratio implies 1% reduction in probability of a dividend payment. However, occurrence of dividend payment in previous financial year is according our data of 2624 EU listed companies associated with 27% increase in probability that a dividend will be

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[7] I do not list corresponding partial effects on average (PEAs) as taking average of binary variables is not meaningful

paid in the current period. Such a finding is in favour of Lintner's dividend smoothing theory. On the other hand, ownership concentration is estimated to have an impact on dividend payments, but the economic significance is questionable as 0.5 increase in Herfindahl's index, which, for example, corresponds to a majority ownership stake takeover, implies only 1.25% decrease in likelihood of a profit distribution. Thus, based on probit model estimation, only statistically enough evidence at a certain level of significance to conclude that equity owners of EU listed companies tend to mitigate agency conflicts by setting non-zero dividend payout ratio was found.

Table 4 : Average partial effects interpretation of *Model (2)* results

Variable	APE
Debt to Assets (%)	-0.001
SOE	0.002
ROA (%)	0.008
Log(Total Assets)	0.021
Ownership Concentration	-0.025
Log(Cash Balance)	0.001
Dividend Paid Last Year	0.272
Growth Rate of Sales (%)	0.000
Real Estate	0.056
Utilities	0.051
Communication Services	0.032
Financials	0.036
Industrials	0.048
Consumer Discretionary	0.038
Consumer Staples	0.060
Energy	-0.019
Materials	0.050
Information Technology	0.022

Conclusion

In this thesis, it is empirically tested whether EU listed companies a state has an ownership claim in tend to distribute greater amount of profit among its shareholders. Such a hypothesized ceteris paribus effect has been already explored in the environment of Chinese stock market and theoretically backed up with the tunnelling effect theory. However, China where two types of shares are listed provides favourable environment for government which owns lion's share of the local market to take advantage of these specific circumstances by decisions to pay higher than equilibrium dividends. Therefore, it was expected that the potential tendency of state entities in EU to tunnel cash would be lower due to higher level of market development and the results of this thesis indicate so.

As outcome of random effects model suggests positive relation between state ownership and dividend payout ratio at 10% level of significance, we can see that the explored relationship is weaker compared to those explored in the dividend literature oriented on emerging markets of Asia. Even though the effect in EU is found positive in this thesis, the ownership structure patterns and quality of legal protection of minority shareholders in EU presumably mitigate the tunnelling tendencies. Thus, state agencies in EU tend to have conflicting interests in terms of dividend policy with the other owners. However, such a tendency is substantially lower than in case of China. As opposed to the first and fundamental hypothesis that, in the second one, the state ownership is related to the probability of paying out any positive dividend amount to equity stakeholders. This second part of testing whether state ownership is a determinant of dividend policy found no evidence to claim that state ownership has an impact on the decision whether to pay dividends or not. However, random effects model investigating the impact on dividend amount is considered as the essential one in the conclusion-making and this research assigns substantially greater weight to it. Per contra, the probit model result could not be disregarded although potential bias might have occurred due to the panel data pooling. In addition, such lack of evidence might be alternatively viewed as outcome consistent with the lower level of significance of the first model. Therefore, I argue that the higher dividend payout preference of government agencies in EU is present. On the other hand, the evidence is not that strong as in case of Chinese research and suggest that there are lower tunnelling tendencies in EU than in case of China.

The second part of the research sheds a light on theory of using dividends as agency problem mitigating mechanism. Even though there are many existing research papers investigating the relationship between dividends and ownership concentration which subsequently provided evidence for that, I believe that unique proxy Herfindahl's index for ownership concentration and industry variables introduction in the panel data model used in this thesis might be a contribution to that literature pool.

The presented empirical findings are consistent with exiting literature. I argue that in case of listed EU companies, ownership concentration is negatively related to dividend payments as with higher ownership stake the investors tend more to monitor management's behaviour to ensure that company's assets are not appropriated and that their wealth is maximized. Such suggestion was substantiated by two empirical findings. The first, produced by random effects model applied to panel data on listed EU companies, provides evidence that with increasing ownership concentration lower dividend amount is paid out. The second relates ownership concentration with the probability of a dividend payment and is fully consistent with the first one. As a result of increased monitoring activity undertaken be shareholders, higher than optimal dividend payments and subsequent need to raise additional capital followed by firm's evaluation by potential external investors is not needed.

These results presented above help investors to understand the implications of various ownership structures on dividend policies in the environment of EU listed companies. Especially, the impact of state ownership in such developed market had been almost uncovered by prior literature on dividends. In addition, I provide another testing of the impact of ownership concentration on dividend policy as it reflects the concentration more precisely than most of the prior literature.

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Appendices

Appendix A

Pooled OLS model exploring the relationship of ownership concentration and industry effects and state ownership

Variable	Coefficient estimate	Std. Error	t-statistic	p-value	
(intercept)	0.348	0.022	15.497	< 0.001	***
Debt to Assets (%)	0.000	0.000	2.398	0.016	**
SOE	0.057	0.011	4.931	< 0.001	***
ROA (%)	0.001	0.000	5.372	< 0.001	***
Log(Total Assets)	-0.004	0.002	-2.605	0.009	***
Log(Cash Balance)	-0.010	0.001	-8.309	< 0.001	***
Growth Rate of Sales (%)	0.000	0.000	-3.602	< 0.001	***
Real Estate	0.076	0.011	6.608	< 0.001	***
Utilities	0.112	0.017	6.469	< 0.001	***
Communication Services	0.040	0.012	3.349	0.001	***
Financials	0.011	0.011	1.040	0.298	
Industrials	0.059	0.009	6.457	< 0.001	***
Consumer Discretionary	0.091	0.010	9.398	< 0.001	***
Consumer Staples	0.131	0.012	11.384	< 0.001	***
Energy	0.064	0.014	4.489	< 0.001	***
Materials	0.068	0.011	6.067	< 0.001	***
Information Technology	0.002	0.010	0.240	0.810	

Notes: There are 2624 cross-sections included in the model, while overall number of complete observations is 7075. R-squared equals 0.071. Marks at the right-hand side of the table denote the following: * significance at 10% level, ** significance at 5% level, *** significance at 1% level.

Appendix B

List of stock exchanges where the companies included in the peer group are listed

OSLO BORS ASA
XETRA
DEUTSCHE BOERSE AG
ELECTRONIC SHARE MARKET
BRATISLAVA STOCK EXCHANGE
NASDAQ OMX HELSINKI LTD.
PRAGUE STOCK EXCHANGE
LONDON STOCK EXCHANGE
ZAGREB STOCK EXCHANGE
NYSE EURONEXT - EURONEXT AMSTERDAM
NYSE EURONEXT - EURONEXT PARIS
NYSE EURONEXT - EURONEXT BRUSSELS
BULGARIAN STOCK EXCHANGE
BOLSA DE MADRID
NASDAQ OMX NORDIC
OMX NORDIC EXCHANGE COPENHAGEN A/S
MALTA STOCK EXCHANGE
NYSE EURONEXT - EURONEXT LISBON
LJUBLJANA STOCK EXCHANGE (OFFICIAL MARKET)
NASDAQ OMX VILNIUS
ATHENS EXCHANGE S.A. CASH MARKET
BUDAPEST STOCK EXCHANGE
NASDAQ OMX TALLINN
IRISH STOCK EXCHANGE - ALL MARKET
WARSAW STOCK EXCHANGE/EQUITIES/MAIN
MARKET
SPOT REGULATED MARKET - BVB
CAN-ATS

Appendix C

Correlation matrix

	Dividend Payout Ratio	Debt-to-Assets	SOE	ROA	Log(Total Assets)	Ownership concentration	Log(Cash balance)	Dividend Payout Ratio Lag	Sales Growth Rate	Dividend Paid Last Year
Dividend Payout Ratio		-0.049	0.092	0.179	0.224	-0.047	0.169	0.473	-0.067	0.448
Debt-to-Assets	-0.043		0.007	-0.022	0.228	0.060	0.033	-0.044	-0.037	-0.075
SOE	0.137	0.019		0.032	0.228	0.047	0.113	0.095	-0.027	0.114
ROA	0.427	-0.161	0.030		0.312	0.046	0.197	0.198	-0.029	0.397
Log(Total Assets)	0.390	0.294	0.217	0.236		-0.066	0.689	0.221	-0.050	0.446
Ownership concentration	-0.071	0.098	0.053	-0.056	-0.076		-0.139	-0.044	-0.060	-0.071
Log(Cash balance)	0.321	0.051	0.125	0.223	0.719	-0.164		0.165	0.006	0.314
Dividend Payout Ratio Lag	0.803	-0.037	0.142	0.438	0.386	-0.071	0.312		-0.006	0.531
Sales Growth Rate	0.042	-0.023	-0.036	0.221	0.031	-0.069	0.061	0.049		-0.069
Dividend Paid Last Year	0.747	-0.028	0.114	0.524	0.454	-0.069	0.346	0.883	0.073	

Notes: The upper part of the matrix is the Pearson correlation matrix and the lower part is the Spearman Rank correlation matrix.

Appendix D

Alternative model to *Model (2)*: Probit model with dummy whether dividends were paid as dependent variable, lagged dependent variable excluded

Variable	Coefficient estimate	Std. Error	t-statistic	p-value	
(intercept)	-6.345	0.221	-28.670	< 0.001	***
Debt to Assets (%)	-0.013	0.001	-10.561	< 0.001	***
SOE	0.156	0.106	1.467	0.142	
ROA (%)	0.100	0.004	27.667	< 0.001	***
Log(Total Assets)	0.338	0.014	23.747	< 0.001	***
Ownership Concentration	-0.425	0.094	-4.513	< 0.001	***
Log(Cash Balance)	-0.010	0.009	-1.048	0.295	
Growth Rate of Sales (%)	-0.002	0.000	-5.543	< 0.001	***
Real Estate	0.581	0.095	6.089	< 0.001	***
Utilities	0.569	0.151	3.761	< 0.001	***
Communication Services	0.140	0.102	1.377	0.169	
Financials	0.221	0.094	2.352	0.019	**
Industrials	0.492	0.078	6.323	< 0.001	***
Consumer Discretionary	0.342	0.083	4.106	< 0.001	***
Consumer Staples	0.615	0.099	6.186	< 0.001	***
Energy	-0.359	0.125	-2.864	0.004	***
Materials	0.382	0.098	3.921	< 0.001	***
Information Technology	0.364	0.087	4.177	< 0.001	***

Notes: There are 7075 complete observations consisting of 2624 cross-sections in the model. Marks at the right hand-side of the table denote the following: * significance at 10% level, ** significance at 5% level, *** significance at 1% level.