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Ownership Structure and Debt: Substitutes or Complementary Corporate Governance Mechanisms?

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Abstract

Corporate governance is a very complex issue, with specific mechanisms in each country, and therefore cannot be generalized. As such, the purpose of this dissertation is twofold: first, to study how ownership concentration can influence firm performance in countries with different systems of corporate governance, and second, to understand how ownership concentration and debt act as corporate governance mechanisms.

Using a sample of 846 companies from 16 European countries, from 2010 to 2018, and applying the two-step system generalized method of moments (GMM), the results show that ownership concentration is related to performance in a non-linear way. At low levels, large shareholders tend to expropriate minority shareholders but at high levels, they can increase performance through the monitoring of managers. When differences in corporate governance systems are considered, ownership concentration still act as a corporate governance mechanism, but there is no expropriation of minority shareholders in the sample in which investors are more protected. The debt proves to be a complementary mechanism of corporate governance to the ownership structure. Ownership concentration plays a more important role in corporate governance when debt negatively affects performance.

This study demonstrates that greater investor protection is needed in European countries, because, although the higher ownership concentration allows reducing agency costs, it also has consequences for minority shareholders. Also, market-oriented reform measures to improve liquidity and stock market efficiency must be adopted. This study also sheds light on the endogenous and dynamic nature of the corporate governance–performance relationship.

Resumo

Corporate governance é um tema muito complexo, com mecanismos muito específicos em cada país, e por isso não pode ser generalizado. Assim, esta dissertação é realizada com dois objetivos: primeiro, o de estudar como a concentração acionista influencia o desempenho das empresas em países com sistemas de *corporate governance* diferentes, e segundo, o de perceber como a concentração acionista e a dívida atuam como mecanismos de *corporate governance*.

Utilizando uma amostra de 846 empresas de 16 países Europeus, no período de 2010 a 2018, e aplicando um *two-step system generalized method of moments (GMM),* os resultados revelam que a concentração acionista se relaciona com a desempenho das empresas de uma forma não linear. Quando existe uma baixa concentração acionista, os maiores acionistas tendem a expropriar os menores, mas uma grande concentração acionista aumenta a desempenho como resultado da monitorização dos gestores. Quando consideramos diferentes sistemas de *corporate governance,* a concentração acionista continua a ser um mecanismo de *corporate governance*, mas não se verifica o efeito de expropriação na amostra em que a proteção de investidores é maior. A dívida e a concentração acionista revelam-se mecanismos complementares de *corporate governance*. O papel da concentração acionista como mecanismo de *corporate governance* é mais importante quando a dívida afeta negativamente o desempenho.

Este estudo revela que existe a necessidade de uma maior proteção dos investidores nos países Europeus, porque, embora a concentração acionista permita reduzir os *agency costs*, esta também traz consequências para os acionistas minoritários. Adicionalmente, devem ser adotadas medidas para melhorar a liquidez e a eficiência do mercado de ações. Este estudo reforça ainda a natureza dinâmica e endógena da relação entre o desempenho e *corporate governance*.

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1. Introduction

The idea that ownership concentration could have an impact on firm performance dates back to the thirties when Berle and Means (1932) first addressed the separation of ownership and control. The conflict of interests between shareholders and managers, which leads to agency costs, lies at the heart of corporate governance literature (Jensen & Meckling, 1976). The authors argue that, although the ownership concentration incentives an active monitoring of managers (Shleifer & Vishny, 1986), which increases firm performance, this also leads to private benefits of control, in which large shareholders expropriate the minority shareholders (Shleifer & Vishny, 1997) and it decreases performance. Since then, the relationship between ownership structure and firm performance has received considerable attention from researchers.

The literature provides evidence for a positive (Kapopoulos & Lazaretou, 2007), negative (Lehmann & Weigand, 2000), non-existent (Demsetz & Villalonga, 2001), and non-linear relationship (Thomsen & Pedersen, 2000), between ownership concentration and firm performance. However, most of the studies that analyse the ownership structure as a method of corporate governance, focus only on the effect of ownership concentration on performance, ignoring the identity of owners, as a dimension of ownership structure, that has important implications in corporate governance (Boone, Colombage, & Gunasekarage, 2011).

Also, studies on this topic have mainly focused on the United States, where firms are owned by widely dispersed shareholders (Gedajlovic & Shapiro, 1998), the securities markets are well-developed, and in which a shareholder is very unlikely to be locked into a company where performance is considered unsatisfactory, and therefore it is likely to be no relationship between ownership concentration and performance. In European countries, where firms' ownership is more concentrated and securities markets are less efficient, it is expected that the impact of ownership concentration will be different from that seen in Anglo-Saxon countries that have a very different corporate governance system.

Alongside the relationship between ownership structure and firm performance, other decisions are made, namely decisions related to the capital structure of the company. Grossman and Hart (1982) argue that debt can be a way of aligning the interests of managers with that of shareholders, and thus, reduce agency costs. Therefore, ownership concentration

and debt may act as substitutes (Zeckhauser & Pound, 1990) or complementary (Paligorova & Xu, 2012) mechanisms of corporate governance.

This research aims to demonstrate how different levels of ownership concentration affects performance of companies from countries with different levels of investor protection and different internal control systems of corporate governance, as is the case of European countries. In addition, this study seeks to explain the role of debt and ownership concentration in corporate governance.

Many of the estimation procedures employed in the study of corporate governance-performance relationship have been criticized for assuming that ownership concentration is an exogenous factor to firm value and performance (Demsetz, 1983). Using a set of tests it was found in our sample the three sources of endogeneity that according to Wintoki, Linck, and Netter (2012) are likely to exist in the corporate governance- performance relationship: unobservable factors, simultaneity, and dynamic endogeneity. Even though some studies try to correct the endogeneity caused by simultaneity (Demsetz & Villalonga, 2001) employing a 2SLS model, the dynamic endogeneity is one of the most ignored sources of endogeneity, and for that reason, it questions the validity of many of the researches carried out.

The choice of the appropriated model to the characteristics of the samples, and indicated to correct the endogeneity, as well as the instrumental variables, is fundamental to produce consistent estimators and is one of the biggest challenges in the study of this relationship. The two-step system generalized method of moments (GMM), the applied method, has been widely used in recent years and appears to outperform other estimation techniques (Flannery & Hankins, 2013), providing efficient and consistent estimates, robust to endogeneity and heteroscedasticity (Blundell & Bond, 1998).

Using a panel data of 846 listed companies (7614 observation) from 16 European countries for the period 2010-2018, that are divided into four sub-samples according to the origin country and the origin law as in LaPorta, Lopez-de-Silanes, Shleifer, and Vishny (1998), this research reveals that the relationship under study varies according with the sample and the measures of ownership concentration.

The study provides evidence for the expropriation of minority shareholders at low levels of ownership concentration and actively monitoring at high levels in firms belonging to the 16 European countries.

A more detailed analysis shows that in firms with Germanic and French origin law, where investors are less protected, lows levels of ownership concentration increase performance, but high levels deteriorate it. For firms with Scandinavian origin law, there is evidence of expropriation of minority shareholders at low levels of ownership concentration and of an active monitoring of managers at high levels. For firms with English origin law, in which investors are more protected, low levels of ownership concentration decrease firm performance, as a consequence of the agency costs due to the weak internal system of corporate governance in this sample, and high levels increase it.

The study does not provide evidence that debt and ownership concentration are alternative methods of corporate governance but complement each other.

The remainder of this dissertation is organized as follows. Chapter 2 reviews the existing literature on the relationship between ownership structure and performance, as well as the relation with capital structure, and details the research hypotheses. Chapter 3 describes the methodology and data employed. Chapter 4 presents the discussion of empirical results. Chapter 5 provides the conclusions and implications of the study, as well suggestions for future research.

2. Literature Review

2.1. Ownership Structure and Firm Performance

The relationship between ownership concentration and firm performance began to be studied in the thirties by Berle and Means (1932), which states that a company with a large number of small shareholders, i.e. with more dispersed ownership, tend to underperform. With more dispersed ownership, managers have greater control over the decisions that are made in the company than they would have if ownership were more concentrated, and because managers and shareholders' interests often diverge, managers will use the corporate resources to their interests and not to maximize shareholder value, as it was supposed to. Later, and given Berle and Means (1932) contributions to literature, Jensen and Meckling (1976) explored this conflict, which is the roots of the owner-manager agency problem. According to the authors, agency costs are unlikely to be zero, since it is unlikely for the manager to make optimal decisions from the owner's viewpoint without any incentive or supervision. Managers who have few or no shares will put much less effort into managing and creating new projects than they would if they had a large percentage of shares. Thus, a higher concentration of ownership (through efficient monitoring at low costs) or managerial share-ownership are ways to reduce agency costs, as it reduces managerial incentives to consume perquisites and aligns the interests of both.[1]

Morck, Shleifer, and Vishny (1988) investigated what is the effect of increasing managers' ownership in Tobin's Q, and found a nonmonotonic relation. There is a positive relationship when managerial ownership increases from 0% to 5% and beyond 25%, being negative in the remaining range. The positive effect can be explained by an alignment of interests between owners and managers as the latter become owners. However, the negative effect is due to the entrenchment effect that dominates the convergence of interests' effect (the positive). The entrenchment effect is related to the fact that from a certain level of insider ownership, managers have sufficient voting power to make decisions for their interest without

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[1] Stulz (1988) studied the relationship between insider ownership and firm performance when it comes from the takeover process and not driven by the convergence of interests. The author developed a model in which, first, firm value increases as insider ownership increases and then decreases. This is because hostile takeovers can hurt managers, and when insider ownership increases the likelihood of a successful hostile takeover decreases, becoming zero at a certain level of ownership insider.

jeopardizing their professional position. Knowing which of these forces will dominate at any level of managerial ownership is not possible, a priori. Thus, we can only say with certainty that managerial equity ownership has an impact (positive and negative) on firm performance, and not at what levels. [2]

Shleifer and Vishny (1986) argue that small shareholders will not have the incentive to monitor managers, because the costs of doing so are so high that it outweighs the gains. However, the situation is reversed when the company has large shareholders. In this case, and as earnings are distributed in proportion to the shares, the marginal benefits generally exceed the marginal costs. Therefore, large shareholders are a way to mitigate agency problems through the active monitoring of managers, which consequently leads to better company performance. Like these authors, there are others who argue that the impact of large shareholders on firm performance would be higher in countries with weak investor protection, using ownership concentration as a substitute for legal protection[3].

Later, Zeckhauser and Pound (1990) addressed the effectiveness of large shareholders in monitoring managers and found empirical evidence to support their theory that is very difficult for large shareholders to monitor managers of companies with high specific assets, because analysing managers' investment decisions will be a much more complicated task due to the company's closed information structure. Thus, in industries/companies with high asset specificity, it is expected that large shareholders will not provide effective monitoring and that their positive impact on performance will be much lower or even harmful than in companies with low asset specificity.

Although large shareholders are a more efficient way of monitoring, there may be some costs associated with them. When there is a large shareholder, he has the power to make fundamental decisions in the company, which may be in his interest and not in the interest of other investors, managers, or employees, and thus minority shareholders may be expropriated (Shleifer & Vishny, 1997). Also, excessive monitoring may lead to the loss of some investment opportunities, as this may limit managers' initiative, and shareholders are

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[2] McConnell and Servaes (1990) found a curvilinear relationship between insider ownership and firm value, reaching a maximum between 40% and 50%, results consistent with the model developed by Stulz (1988), but corroborating the idea that we do not know , a priori, which force will dominate at each level of insider ownership (Morck et al).

[3] See La Porta, Lopez-de-Silanes, Shleifer, and Vishny (2002) and Boubakri, Cosset, and Guedhami (2005).

not so capable of evaluating such opportunities (Burkart, Gromb, & Panunzi, 1997). In this way, we can also see a negative relationship between ownership concentration and firm performance.

Hypothesis 1: Firm performance increases with ownership concentration at low levels (as a consequence of the monitoring effect and alignment of interest) and decreases with ownership concentration at high levels (as a result of the effect of minority shareholders expropriation).

Demsetz (1983) challenged previous literature, arguing that a company's ownership structure should be treated as an endogenous outcome of strategic decisions that reflect the actions of existing shareholders and small investors in capital markets. According to the author, the only reason that leads to a change in ownership structure is the desire of an existing shareholder to increase or decrease their stakes, and the same to potential owners. Thus, changes in ownership structures are driven by shareholders' interest in maximizing profitability, leading to rapid and drastic changes in equity in response to changes in their profitability.[4]

There are several studies regarding the relationship between ownership concentration and firm performance. Kapopoulos and Lazaretou (2007) tested this hypothesis for Greek firms and, controlling the endogeneity of ownership concentration, they found a linear positive relationship between the percentage of shares held by important shareholders and profitability, measured by Tobin's Q and by the ratio of net income to the book value of equity. This hypothesis for the Italian market was tested by Perrini, Rossi, and Rovetta (2008) and the conclusions drawn are the same. These results are consistent with the theory that large shareholders decrease agency costs, which increases firm performance, however, these authors do not address the possibility of a non-linear relationship, hiding any negative effect that the ownership concentration may have on performance, very likely to happen in these European countries that have low investor protection.

Gedajlovic and Shapiro (1998) found, without controlling the endogeneity problem, a curvilinear relationship between ownership concentration and return on assets (ROA) for US and German firms. For US companies, ownership concentration has a positive effect on firm performance only after it reaches 38%, being negative until this point. For the German

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[4] Later Demsetz and Villalonga (2001) and Kapopoulos and Lazaretou (2007) found evidence of the endogeneity of ownership concentration.

sample, this point is even higher (70%), which means that ownership concentration does not have a positive effect on profitability unless German companies are highly concentrated.

Lehmann and Weigand (2000) found evidence of a negative relationship between ownership concentration and ROA in German firms, an effect that the authors attribute to costs associated with rent-seeking, infighting, and too much monitoring by large shareholders. Again, although the authors control the endogeneity of ownership concentration, a non-linear relationship is not addressed.

Demsetz and Villalonga (2001), controlling endogeneity, did not find a statistically significant relationship between ownership structure and firm performance for US firms. The authors argue that although diffuse ownership has disadvantages, it also has advantages, i.e. costs (agency costs) and benefits that outweigh each other, and because of this, there is no relationship between ownership concentration and firm performance. The possibility of a non-linear relationship was addressed, and the conclusions remained.

Thomsen and Pedersen (2000) found a U-inverted relationship between ownership concentration and firm performance, measured by the market-to-book value of equity and ROA, in the largest European companies. First, when the ownership structure is very dispersed, increasing the shareholding of only one shareholder will decrease the agency's problems, so that managers will work to fulfil the shareholder's interest which is maximize the company's profitability.[5] Second, when the shares begin to be too concentrated in the hands of a single shareholder, the owner enjoys private benefits of control over the company, which may lead to the expropriation of minority shareholders.[6] Thus, he can make decisions that, in general, are not the most beneficial for the company, such as restricting the issuance of shares (i.e. raising new equity) and not selling the existing shares but make decisions that are favourable to him (self-interest) and ignore some valuable investment opportunities, decreasing the company's performance, and deteriorating its value.

However, the authors do not test or control endogeneity. Thus, they may be seeing a relationship between ownership structure and firm's performance and it does not exist or be different from the results obtained.

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[5] This is consistent with the theory developed by Shleifer and Vishny (1986).

[6] According to Dyck and Zingales (2004), in countries with more private benefits of control, ownership is generally more concentrated and capital markets are less developed.

A more robust analysis of the relationship between the ownership concentration and the company's performance was carried out by Hu and Izumida (2008) for Japanese firms. Controlling endogeneity and the dynamic nature of the corporate governance-performance relationship, these authors found a little-reported U-shaped relationship between the shares of the ten and five largest shareholders and performance, measured by Tobin's Q and ROA. According to the authors, as the costs of the expropriation of minority shareholders and the benefits of monitoring of managers are proportional to the shares held by each shareholder, the expropriation effect is expected to dominate at low levels of ownership concentration while at high levels it is expected to be the monitoring effect.[7]

2.2. Additional Constraints to Managerial Discretion

According to Gedajlovic and Shapiro (1998), the impact of ownership structure on firm performance varies from country to country according to each national system of corporate governance. Since the relationship between ownership concentration and performance lies in the owner-manager conflict, the authors argue that there are internal and external constraints to the managerial discretion. The internal constraints have to do with the type of ownership structure of companies in each country, that is, more dispersed, with board directors being owners, outsiders or managers, and with the owner's identity. In external constraints, the role of monitoring managers belongs to the market, through takeovers, financial markets, and the power given to shareholders.[8] Thus, it is expected that in a country with both internal and external constraints the performance and ownership structure to be unrelated, as for countries with strong internal constraints. For countries with strong external constraints, this relationship is expected to be positive, because the effectiveness of the market for corporate control is doubtful.

Some studies suggest that when the board of directors is constituted by outsiders, the board's interests are more aligned with those of shareholders (Byrd, Parrino, & Pritsch, 1998). Outsiders are more receptive to policy changes when needed, such as those related to hiring and firing managers, so managers are more likely to work in the interests of shareholders when there are outsiders on the board.

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[7] More details about empirical studies can be found in Annex A.

[8] See Jensen (1989).

Takeovers can be a way of aligning managers' interests with those of shareholders and, therefore, can act as a mechanism for disciplining managers (Lel & Miller, 2015). The target company in a takeover is usually a company that is not operating as efficiently as possible and therefore has worse performance than it should actually have. Thus, value improvements can be obtained by replacing managers who operate inefficiently or by correcting their behaviour, after the takeover. Hostile takeovers are harmful processes for managers as they may lose their positions or jobs, and to avoid such situations, they pursue the goal of maximizing the value of the company (Burkar & Panunzi, 2008). Thus, it is expected that in countries with more restrictive takeover policies, managers will be better protected and will use decision-making power to pursue their interests in maximizing utility. However, in countries where there are no restrictions on takeovers, there are no agency conflicts, and thus there will be no impact of increased ownership concentration on company performance.

The type of investor (institutional investors, governments, nonfinancial companies, families or single individuals) seems also to have an impact on firm performance because each one will have their strategy of leading the company (Boone et al., 2011; Thomsen & Pedersen, 2000). Pound (1988) presented three different hypotheses by which institutional ownership can affect performance. First, the efficient monitoring effect, which by having more information and greater expertise, institutional investors will be able to monitor managers at lower costs, leading to a positive impact on performance. Second, the conflict-of-interests hypothesis, in which institutional investors are influenced in their decisions of monitoring managers by other profitable business relationships with the firm. The third and last hypothesis is that of strategic alignment, where it can be advantageous for institutional investors and managers to cooperate. In the second and third hypotheses, institutional investors do not play a good role in monitoring managers, so a negative relationship between institutional investors and company performance is expected.[9] However, as they have large portfolios, they are more predisposed to accept risky projects that are associated with large profits for a company, in addition to being focused on creating value, which means, in general, a positive relationship is expected.

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[9] McConnell and Servaes (1990) found evidence to support the efficient monitoring hypothesis. (Selarka, 2005) found evidence to support the conflicts of interest hypothesis.

Corporate ownership will facilitate knowledge sharing, as well as allowing the supply of products/services at a lower price. However, this type of ownership is more motivated by the solidification of business relations and not by the return on investments, which can harm firm performance.[10]

The relationship between government ownership and firm performance seems to have two different effects. First, governments have a preference for political and social goals, so they will act not to maximize firm value, but to achieve its goals, and thus it affects negatively firm performance (Borisova, Brockman, Salas, & Zagorchev, 2012). Second is the fact that these companies have advantages in terms of liquidity, cost of capital, and credit (Caves & Christensen, 1980), since governments are relatively wealthy.

The bank's ownership is expected to decrease firm performance, as they can be risk-averse and reject important projects, especially if they have provided loans to the company, despite the hypothesis of having privileged access to information, capital, and other services that banks have to offer (Cable, 1985).

Family firms are a way to mitigate agency problems, but they are generally more risk-averse and because of this, they can reject good investment opportunities, and expropriate minority shareholders (Maury, 2006). However, as families potentially have longer horizons than other shareholders and normally the company passes from generation to generation, they tend to invest in long-term projects that are more efficient and profitable (James, 1999).

An individual investor who holds a large percentage of shares has the advantage of being able to directly monitor managers leading to better performances. On the other hand, he suffers from higher monitoring costs which may lead them to not play this role. Additionally, and because in general, this type of investor has less wealth, they tend to be capital rationed and accept less risk leading to a decrease in diversification (Boone et al., 2011; Pound, 1988).

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[10] Studies reveal conflicting results (Boone et al., 2011; Lincoln, Gerlach, & Ahmadjian, 1996; Sarkar & Sarkar, 2000; Thomsen & Pedersen, 2000).

Laws vary from country to country, which affects corporate governance as well as investor protection. LaPorta et al. (1998) divided European countries into four categories of law: the common, the Germanic, the French, and the Scandinavian law.

The common law is presented in countries where the law is of English origin, which in Europe applies to the United Kingdom and Ireland. It is the one that most protects shareholders, as well as creditors, and, therefore, minority shareholders are protected from expropriation by large shareholders. The French law derives from Roman law and is the one with the worst legal protection of shareholders. In the middle of both are the countries with Germanic and Scandinavian laws, being investors in the last one more protected than in the first.

On the other hand, countries under French law have the most concentrated ownership, followed by countries under Germanic law and Scandinavian law. Thus, in French law countries, as well as in firms with Germanic origin law, we can see two different effects of ownership concentration, i.e., it can be used as a substitute to investor protection and increase performance, but as there is no protection of minority shareholders, it is expected that the large shareholders expropriate them and therefore exercise private benefits of control, which lead to worse performance at a certain level of ownership.

Hypothesis 2: Firm performance increases with ownership concentration at low levels (as a consequence of the monitoring effect) and decreases with ownership concentration at high levels (as a result of the effect of minority shareholders expropriation) for countries under French and Germanic origin law.

Hypothesis 3 Firm performance increases with ownership concentration at low levels and high levels for countries under Scandinavian and English origin law.

2.3. Capital Structure and Ownership Structure

The relationship between capital structure and performance is one of the most-studied topics, with vast literature. The reason why the theory that the choice of debt does not affect the company's performance in perfect capital markets defended by Modigliani and Miller (1958) is not supported is the importance that taxes, differences in information, and agency costs have on that choice (Myers, 1984). The empirical studies lead to very mixed results, founding a positive (Hadlock & James, 2002; Saeedi & Mahmoodi, 2011) and negative (Abor, 2005; Salim & Yadav, 2012) relation. The relation between ownership structure

and firm performance is not the focus of this study and because of this hypothesis about it will not be developed.

Grossman and Hart (1982) argued that debt can be a way of aligning the interests of managers with those of shareholders. According to the authors when there is debt in the company and managers do not maximize the value of the firm, it's possible that it goes bankrupt, and managers lose their perquisites. Thus, to avoid a potential loss of their benefits and positions, the only solution is to be more efficient and productive, i.e. to have a good managerial performance. Shareholders may use debt as a governance mechanism to control management's decisions.

The relation between managerial ownership and the capital structure was first addressed by Jensen (1986) who argues that managers prefer to use internal resources to finance projects than external resources, in order avoid the possibility of bankruptcy and maintain their discretion. However, to keep their positions, they tend to use higher debt levels, since it is associated with higher firm value and seen as a positive signal to shareholders. Thus, when managers become owners, they can more easily avoid high debt levels, and there is evidence that companies with managerial share ownership have lower debt ratios (Friend & Lang, 1988).

Later, Brailsford, Oliver, and Pua (2002) found that companies with large shareholders have higher debt ratios, associated with active monitoring of managers by shareholders. Boubaker, Rouatbi, and Saffar (2017) bring to question the interest of a large shareholder to avoid using debt (principally bank debt), for the fact that doing it, they can lose their private benefits of control, because they need provide a lot of insider information and are also controlled by the lenders. Thus, there is evidence that a company with more than one large shareholder tends to have higher debt ratios, than with only one large shareholder.

Zeckhauser and Pound (1990) argue that large shareholders, which are a way to mitigate agency problems, are already a signal that the company is being well managed, and therefore its value is being maximized. Hence, there is no need to use high debt levels as a sign of future success.

In this way, ownership structure and debt can be considered substitutes ((Zeckhauser & Pound, 1990)), or complementary, and thus acting simultaneously, mechanisms to reduce

agency problems (Paligorova & Xu, 2012). However, this doesn't eliminate the hypothesis of expropriating minority shareholders, with large shareholders increasing debt and using this financial source to their interests. Additionally, Paligorova and Xu (2012) tested the hypothesis of large shareholders increasing debt to enhance control and discipline, to reduce tax liability, or to share the risk, but don't find support for these theories, which reinforces the hypothesis of increasing debt for use of self-interest.

The relationship between these two variables will be driven by looking at the variation that will occur in the ownership structure coefficients when adding the variable that represents capital structure to the model. For debt to act as an alternative method of corporate governance to ownership concentration, the coefficient of the ownership concentration must cease to be statistically significant. Additionally, if the debt proves to be a way of aligning the interests of the managers with that of the shareholders, it is expected that the positive impact exerted by the ownership concentration would decrease, as a consequence of the decrease in agency costs.

3. Methodology

The corporate governance-performance relationship will be studied using a set of different variables identified in the literature as important to taken into account when analysing this relationship that will be detailed later. To study this relation two different models will be addressed: the fixed effects panel model, and the dynamic system GMM model.

The pooled OLS regression is widely used in the literature (Krivogorsky, 2006; Morck et al., 1988; Perrini et al., 2008) to study the relationship between corporate governance and performance and is the simplest method of estimation, however, a set of assumptions[11] are made in this model that when violated can bias the estimates. As is pointed out by many authors (Demsetz & Villalonga, 2001), there may be an endogeneity problem in this relationship, that violates the assumptions made and makes the OLS estimators inefficient. Depending on the type of endogeneity that exists, different methods can be used.

Wintoki et al. (2012) identified three types of endogeneity that can exist in the corporate governance-performance relationship. The first is the simultaneity, that according to the author, exists if the independent variable affects the dependent variable and vice-versa, that is ownership concentration and performance are simultaneously determined. A system of equations could be used to solve this type of endogeneity, however, the implementation of this method is very difficult, since it is required the use of an exogenous instrument, that is, a variable that affects ownership but do not affect performance. Many authors have been using firm-specific risk as an instrumental variable in the application of this method ((Demsetz & Villalonga, 2001; Himmelberg, Hubbard, & Palia, 1999) which is the best option that authors found, despite the weaknesses presented (Grosfeld, 2009). The second is the dynamic endogeneity and exists when the current corporate governance variables are affected by the firm's past performance. Unobserved heterogeneity is the last type and relates to unobservable factors that affect both dependent and independent variables.

The fixed effects panel model is a solution to the fixed (time-invariant) part of unobserved heterogeneity and is the first method that will be used in this study. Just like the OLS regression, fixed effects method is widely used in literature, however, this estimation

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[11] The pooled OLS model assumes that independent variables are strictly orthogonal to the errors and that these are independently and identically normally distributed.

can also lead to unbiased results when current values are affected by past values, since the lagged dependent variable is correlated with the error term, leading to coefficients estimators that are the opposite of the correlation between these variables (Wintoki et al., 2012). Thus, the fixed effects panel model does not control the other two sources of endogeneity: simultaneity and dynamic endogeneity and is likely to yields inconsistent estimates.

The second and last method that will be applied to estimate the model is a dynamic Generalized Method of Moments (GMM) model, a robust estimation process, that allows to capture the three sources of endogeneity. Holtz-Eakin, Newey, and Rosen (1988) and Arellano and Bond (1991) developed the dynamic difference GMM model, that allows to obtain consistent estimates for the coefficients in the presence of endogeneity since the estimates are robust to the sources of endogeneity, as well as to heteroscedasticity and serial correlation. This method allows the use of internal variables, that is, variables that are already available and incorporated in the study database, as instrumental variables, using them with values that are deferred in time and lagged. Also, this model allows to control the likely dynamic endogeneity by adding the lag of the dependent variable on the right-hand side of the equation.

Arellano and Bover (1995) and Blundell and Bond (1998), in order to improve the efficiency of difference GMM estimators, developed the dynamic system GMM model, also called the two-step system GMM model or BB system GMM. In this method of estimation, a system of simultaneous difference and level equations is used. This method allows to improve the precision of estimators when the autoregressive parameter is moderately high and when we have a small sample and a short period of time since according to Blundell and Bond (1998) the difference GMM model suffers from finite-sample bias and perform poorly in this type of sample for two reasons: for the fact that the lagged levels, in this case, provide weak instruments, and the fact that in samples with short periods, the lagged dependent variable remains correlated with the differenced residual, just like happens in the fixed effects model.

The best way to approach this relationship has been widely discussed in the literature, depending on the type of sample used. Given the characteristics of the sample under analysis: (i) finance panel data set with a relatively short period of time (T=9), (ii) low variation in corporate governance variables within the same company, (iii) a dynamic relation between

corporate governance variables and performance, with past performance affecting current ownership and capital structure, (iv) ownership concentration and leverage variables are considered endogenous and (v) unobserved factors caused by individual effects that may influence financial performance, the dynamic system GMM model emerges as the better choice.

According to some authors (Flannery & Hankins, 2013; Wintoki et al., 2012), the system GMM method outperforms the OLS, Fixed Effects, and difference GMM estimators, conclusions drawn from the use of Monte Carlo simulations. Therefore, we will apply the system GMM method involving a system of equations in differences and levels, considering the owner identity, firm size, sales growth, firm-specific risk, investment, and year dummies as exogenous variables. The Hansen-J test of over-identification of instruments will be conducted to test the validity of the instruments under the null hypothesis of no correlation between the error term and the instruments used. A very high significance level in the Hansen test is not required because of p-value inflation that may exist due to a very large number of instruments (Roodman, 2009). Additionally, in order to test the joint significance of the estimated coefficients, the Wald Test will be conducted. The autoregressive terms AR(1) AR(2) are also presented to verify the presence of first-order serial correlation and the absence of second-order serial correlation, as is desirable.

In summary, the corporate governance-performance relationship will be studied using the fixed-effects model that only accounts for unobservable heterogeneity and the dynamic BB system GMM, that provides efficient and consistent estimates that are robust to endogeneity and heteroscedasticity. These two different methods will be used only to highlight the difference in coefficients resulting from the use of an inappropriate method.

3.1. Variables Measurement

3.1.1. Dependent Variable

There are many doubts about the best way to measure the company's performance. In recent years, the use of Tobin's Q has been increasing (De Miguel, Pindado, & De La Torre, 2004; Demsetz & Villalonga, 2001; Kapopoulos & Lazaretou, 2007; McConnell & Servaes, 1990; Morck et al., 1988), as an alternative to accounting profit rates, because by using this, the correct risk-adjusted discount rate is considered, and distortions due to accounting conventions and tax laws are minimized (Wernerfelt & Montgomery, 1988). In this

way, Tobin's Q *(Tq)* is used to measure firm performance and is obtained by dividing the sum of the market value of equity with the book value of liabilities by the sum of equity and liabilities book value.

3.1.2. Variables of Interest

There are two main variables that are the focus of this study: ownership concentration and capital structure.

In order to understand the effect of ownership concentration (OC), two alternative measures are considered: the percentage of shares held by the largest shareholder (*OWN*) and the Herfindahl-Hirschman Index of the five largest shareholders (*HH*). The first measure will allow to understand the ability of the largest shareholder to make important changes without requiring the acceptance of the other shareholders, facilitating the process of monitoring managers. However, there are some counterparts in using this measure because larger shareholders can expropriate minority shareholders and, therefore, considering a measure with more shareholders is important to overcome this conflict (Overland, Mavruk, & Sjögren, 2012). Thus, the Herfindahl index is used because, in addition to overcoming this conflict, this indicator has the advantage of giving greater weight to the largest shareholders, accounting for an asymmetric dispersion of shares among them (Hay & Morris, 1979; Overland et al., 2012). Due to limited data problems, Herfindahl indices will be calculated only for the five largest shareholders and is defined as the sum of the squares of each of their share percentages.

Capital structure is represented by the variable (*LEV),* which is measured by the ratio of debt to total assets. This variable has been frequently used in studies of this relationship (Altaf & Shah, 2018; Demsetz & Villalonga, 2001; Kapopoulos & Lazaretou, 2007; Krivogorsky, 2006; Nguyen, Locke, & Reddy, 2015; Perrini et al., 2008).

3.1.3. Control Variables

The identity of the largest shareholder will be used to measure the identity of the owner, , in order to control the impact, previously mentioned, that it has on performance (Boone et al., 2011; Thomsen & Pedersen, 2000). There are 5 types of owners in the sample that will be identified using the following dummy variables: *OWN_Gov, OWN_Corp,*

OWN_Fam, OWN_Ind, and *OWN_Inst,* taking the value 1 if the largest owner is a government agency, a corporation, a family, an individual investor or an institutional investor, respectively, and 0 otherwise.

Firm size (*SIZE*) measured by the logarithm of total assets, is included not only to control economies of scale but also because larger companies are expected to have more diffuse ownership structures due to the need for greater investment by shareholders caused by higher market values (Demsetz & Lehn, 1985; Gedajlovic & Shapiro, 1998; Krivogorsky, 2006).

Growth sales *(SG)* is the annual percentage growth in sales used to capture the company's growth opportunities, which vary according to the market in which they operate and the growth phase of each company's product cycle. Many authors use this variable in the study of this relationship (Gedajlovic & Shapiro, 1998; Krivogorsky, 2006; Perrini et al., 2008; Thomsen & Pedersen, 2000)

Firm-specific risk *(Se)* is measured by the average standard deviation in the company's stock prices of the year and expresses the firm-specific risk or instability in the firm's environment ((Perrini et al., 2008; Schultz, Tan, & Walsh, 2010) High values in this measure, which means higher instability, are usually due to an inefficiency in the management of the company and in the management of conflicts that may arise unexpectedly, meaning that shareholders can obtain higher profitability by supervising managers closely (Demsetz & Lehn, 1985; Demsetz & Villalonga, 2001). As the value of monitoring managers is expected to increase with firm-specific risk, the relationship between this variable and ownership concentration is expected to be positive (Hu & Izumida, 2008).

Investment *(CPX)* is measured by capital expenditures normalized by net sales. This variable will allow to control for some accounting distortions that may appear in performance measures, a theory defended by many authors who study this relationship (Demsetz & Lehn, 1985; Demsetz & Villalonga, 2001; Hu & Izumida, 2008; Morck et al., 1988)[12].

The variable *(YEAR_Dum)* will be considered to control temporal effects, macroeconomic conditions, and regulatory changes, which affect the annual performance of all

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[12] In addition to this measure, these authors use the ratio to sales of Research and Development (R&D) expenses and advertising expenses to measure investment, however, the lack of this financial data does not allow adding these ratios to the study, which may bias the study toward the effect of intangible investment.

companies in the sample jointly (Altaf & Shah, 2018; Nguyen et al., 2015). This represents a vector of nine dummy variables for the years between 2010 and 2018.

Finally, the one-year lagged of the dependent variable, Tq, *(lagTq)* is added as an explanatory variable to control for potential impacts that performance past values could have on current values of performance and corporate governance, that is, to control for the dynamic nature of the relation studied (Bebchuk & Roe, 1999; Wintoki et al., 2012).

3.2. Model Specification

A general specification of the model underlying our generated data can be expressed by the following equations (3.1) and (3.2):

$$
\begin{aligned}
Y_{i,t} = {} & \alpha_1 + \alpha_2 lagY_{i,t-1} + \alpha_3 OC_{i,t} + \alpha_4 OC_{i,t}^2 + \alpha_5 Own\_Gov_{i,t} \\
& + \alpha_6 Own\_Corp_{i,t} + \alpha_7 Own\_Fam_{i,t} + \alpha_8 Own\_Inst_{i,t} \\
& + \alpha_9 Own\_Ind_{i,t} + \alpha_{10} SIZE_{i,t} + \alpha_{11} SG_{i,t} + \alpha_{12} CPX_{i,t} + \alpha_{13} Se_{i,t} \\
& + YEAR\_dummies_t + \eta_i + \varepsilon_{i,t}
\end{aligned} \tag{3.1}
$$

$$
\begin{aligned}
Y_{i,t} = {} & \beta_1 + \beta_2 lagY_{i,t-1} + \beta_3 OC_{i,t} + \beta_4 OC_{i,t}^2 + \beta_5 LEV_{i,t} \\
& + \beta_6 Own_{Gov_{i,t}} + \beta_7 Own\_Corp_{i,t} + \beta_8 Own\_Fam_{i,t} + \beta_9 Own\_Inst_{i,t} \\
& + \beta_{10} Own\_Ind_{i,t} + \beta_{11} SIZE_{i,t} + \beta_{12} SG_{i,t} + \beta_{13} CPX_{i,t} + \beta_{14} Se_{i,t} \\
& + YEAR\_dummies_t + \eta_i + \varepsilon_{i,t}
\end{aligned} \tag{3.2}
$$

where $Y_{i,t}$ represents firm performance measure of firm *i* at time *t*, with i=1,…, N and t=1,…,T and $lagY_{i,t-1}$ is the performance measure one-year lagged, α_1 and β_1 are the intercept or constants terms and the remaining are unknown estimated coefficients. $OC_{i,t}$ and $OC_{i,t}^2$ are the two alternative measures of ownership concentration (*OWN* and *HH*) and its squared values, respectively, η_i represents the unobserved firm-fixed effects and $\varepsilon_{i,t}$ are the residuals. The notation of the remaining variables is defined as in Annex B. In this study, as in most of the studies (Altaf & Shah, 2018; Hu & Izumida, 2008; Nguyen et al., 2015), is used one year lag of the dependent variable in the right-hand side of the models, that according to Zhou, Faff, and Alpert (2014) is the most likely to be used due to the limitation of the time dimension in corporate finance panel datasets.

In equation (3.2) the variable that represents capital structure *(LEV)* is added, in order to understand the relationship that may exist between ownership structure measures and capital structure in corporate governance, that is, to verify the changes, if any, in the significance of ownership structure variables by adding the LEV variable to the model.

3.3. Sample and Data

The relationship under analysis in this study is affected by additional constraints to managerial discretion, such as investor protection, and because of this, the European countries used were those from which information on the origin of the law is available in LaPorta et al. (1998) study. The final sample includes 846 publicly traded companies from 16 European countries for the period 2010-2018, with a total of 7614 observations. In order to eliminate possible distortions caused by government regulations, companies operating in the financial industry were excluded from the sample.

All the measures of the ownership structure, i. e., ownership percentage and type of investor come from Thomson Reuters and all the financial data are from Thomson Reuters Datastream. Data about ownership percentage is not easy to obtain, since the disclosure of this information by companies varies from country to country, and therefore, there are many companies with this information missing in the database. Thus, companies under analysis reflect the sample of non-financial firms in which this information is available without inconsistencies between the period of analysis, and that are listed on the ATX Prime Index, DAX100, SPI- Swiss Performance Index, Euronext Brussels, ATFMI- FTSE/ATHEX Market Index, AAX – AEX All Share Index, SBF120, Refinitiv Italy Price Return Index, Euronext Lisbon, Refinitiv Spain Price Return Index, OMXC All Price, OMXHPI- OMX Helsinki PI Index, OSLO SE All-Share Index, OMX Stockholm Mid Cap PI Index, ISEQ Overall Price Index and FTSE100, for Austria, Germany, Switzerland, Belgium, Greece, Netherlands, France, Italy, Portugal, Spain, Denmark, Finland, Norway, Sweden, Ireland, and the United Kingdom, respectively.

From the sample of companies under analysis, companies whose largest shareholders is a hedge fund, an investment advisor, an insurance company, a bank, a pension fund, private equity, a venture capital, an investment manager, or a sovereign wealth fund are classified by the database as an institutional investor. In addition, there are also in the sample of firms,

corporations, individual investors, families, and government agencies classified as owners; however, the database does not distinguish the shareholders who are managers of the company.

Annex C contains information on the number of companies and observations by country and by the four sub-samples: Germanic law, French law, Scandinavian law and English law. The countries with Germanic origin law under analysis are three, Austria, Germany and Switzerland, with a total of 161 companies and 1449 observations. There are seven European countries under analysis with French origin law: Belgium, Greece, Netherlands, France, Italy, Portugal and Spain, with a total of 387 companies and 3483 observations. Denmark, Finland, Norway and Sweden are the countries with Scandinavian origin law, with a total of 216 companies and 1944 observations. Ireland and the United Kingdom are the countries from English origin law, with 82 companies and 738 observations.

Table 1 presents descriptive statistics for all numerical variables for the full sample and sub-samples. Regarding the performance measure, Tq ranges from 0.04 to 16.7, with an average (median) value of 1.6 (1.26) for the full sample. More than 50% of the companies contemplated in the full sample have a market value above the book value, and the same happens with the sub-samples. The sub-sample with the highest performance is the sample of companies with English origin law.

On average, in the full sample, 29.3% of the total shares are held by the largest shareholder and the average sum of the squared percentage of the five largest shareholders is 14.8%. The descriptive statistics of the full sample reveals that Europe is a highly concentrated environment in which the largest shareholders show great interest in their companies.

In general, all sub-samples have a relatively high average of ownership concentration, when we look at the percentage of shares held by the largest shareholder, although the values of this variable vary substantially in all samples from 1.2 to about 96.6 percent, reflecting the heterogeneity of ownership concentration across firms. The data provided by this sample of companies is in line with the literature (LaPorta et al., 1998), with the sample of companies under French law having the highest average of ownership concentration for the two variables that measure it, followed by Germanic law, Scandinavian law and finally those of English law that have a more dispersed ownership.

Additionally, looking only at the average values of the performance and ownership measures, we can conclude that the positive relationship between ownership concentration and company performance that was expected is not the one verified since from the sample under analysis, the companies with the best performance are those with the greatest ownership dispersion (companies under English Law) and the one with the highest concentration of ownership (French Law) is the one with the lowest performance according to Tq. The lowest performance in the sample with the highest concentration of ownership may be a cause of expropriation of minority shareholders in countries with a high ownership concentration and low investor protection (Shleifer & Vishny, 1997).

Related to leverage, companies under French origin law are the ones with the highest average of the debt ratio, about 0.29, however, the average of this ratio remains very close in all samples. In the full sample, the variable leverage ranges from 0 to 9.35, however, the median value of this ratio is 0.25, which means that about 50% of the sample of companies under analysis have relatively low debt. There also appears to be a positive relationship between the debt ratio and the ownership concentration, since the countries with the highest average concentration of ownership are those with the highest average of the debt ratio, which contradicts the theory of Zeckhauser and Pound (1990) that when there are large shareholders there is no need to use high debt levels.

In general, the sample whose companies have the larger average size are those with the largest ownership dispersion (English law) as predicted in the literature (Demsetz & Lehn, 1985) and with the highest performance (Gedajlovic & Shapiro, 1998), however, the average size of firms remain more or less constant across countries. The average sales growth is positive, but the sample with the highest growth shows the worst average performance. The ratio of capital expenditures to sales is more or less constant, with the English law sample with the lowest average of investment. Relatively to firm risk variable, the positive relationship that was expected (Demsetz & Villalonga, 2001) between ownership concentration and firm risk is not the one verified, with countries with the highest average of ownership concentration being the countries with less average of volatility of the stock price.

Table 1: Descriptive statistics of the full sample and sub-samples.

	Tq	OWN	HH	LEV	SIZE	SG	Se	CPX
Full Sample								
Mean	1.60	29.2%	14.8%	0.26	6.15	0.57	5.09	0.12
Median	1.26	24.6%	8.5%	0.25	6.18	0.04	1.24	0.04
Maximum	16.7	96.6%	99.7%	9.35	8.65	2046.6	1545.9	49.9
Minimum	0.04	1.2%	0.0%	0.00	1.87	-7.42	0.00	-0.18
SD	1.24	20.8%	16.1%	0.23	0.95	25.11	28.21	0.73
Germanic Law								
Mean	1.79	28.1%	13.9%	0.23	6.33	0.09	12.77	0.10
Median	1.43	23.0%	7.0%	0.21	6.29	0.05	3.97	0.04
Maximum	11.09	96.6%	93.4%	1.18	8.65	10.00	331.31	2.97
Minimum	0.59	1.5%	0.1%	0.00	4.60	-1.00	0.05	0.00
SD	1.18	21.2%	16.6%	0.17	0.83	0.39	27.94	0.20
French Law								
Mean	1.33	35.1%	19.0%	0.29	6.15	0.92	2.85	0.15
Median	1.11	31.5%	14.0%	0.27	6.16	0.04	1.12	0.04
Maximum	15.90	94.7%	99.7%	9.35	8.58	2046.6	315.0	49.88
Minimum	0.04	1.2%	0.0%	0.00	1.87	-7.42	0.00	-0.18
SD	1.03	21.3%	17.1%	0.27	0.96	35.82	9.54	1.02
Scandinavian Law								
Mean	1.80	25.1%	11.3%	0.25	5.81	0.23	4.65	0.12
Median	1.35	21.1%	6.7%	0.23	5.79	0.04	0.78	0.03
Maximum	16.7	90.2%	81.5%	1.94	8.03	221.6	1545.9	12.00
Minimum	0.22	2.3%	0.1%	0.00	2.88	-1.00	0.01	0.00
SD	1.50	17.4%	12.7%	0.19	0.89	5.23	48.11	0.44
English Law								
Mean	1.98	14.7%	5.7%	0.23	6.71	0.81	1.69	0.05
Median	1.58	9.1%	1.7%	0.23	6.78	0.05	0.96	0.03
Maximum	10.76	81.9%	68.0%	0.91	8.58	527.0	17.04	6.25
Minimum	0.26	2.8%	0.2%	0.00	4.16	-1.00	0.00	0.00
SD	1.21	15.7%	11.2%	0.15	0.87	19.40	2.21	0.24

Note: The notation is as defined in Annex B. SD is the standard deviation.

Table 2 reports the percentage of each type of investor in each sample under analysis. The owner identity that predominates in the total sample is a corporation since 39.27% of the total observations have a company as its largest shareholder, followed by the institutional investor (28.00%) and individual investor (20.34%). In the sample of companies under Ger-

manic, French, and Scandinavian law, the type of investor that dominates is also a corporation, with more than 39%, while in the English sample, 73.04% of the shares are held by institutional investors. The French law sample is the one in which family ownership are most present, with more than 10% of companies being family owned. These descriptive statistics show that institutional investors tend to hold small shares in individual companies while corporate investors tend to hold large amounts of shares.

Table 2: Distribution of owner identity by sample.

Owner Identity	Full Sample	Germanic Law	French Law	Scandinavian Law	English Law
Government Agency	5.04%	3.04%	6.09%	6.58%	0.00%
Corporation	39.27%	41.41%	39.05%	46.30%	17.62%
Family	7.34%	7.32%	10.74%	4.06%	0.00%
Individual Investor	20.34%	19.32%	28.17%	11.27%	9.35%
Institutional Investor	28.00%	28.91%	15.96%	31.79%	73.04%

3.4. Correlations

Annex D reports the correlation matrix for the full sample under analysis. Most independent variables are statistically significantly correlated with the dependent variable *Tq*, except the sales growth (*SG)* and *OWN_Ind* variables. The correlation of *Tq* with the explanatory variables chosen indicates that, in some way, the independent variables interact with the dependent variable *Tq*, corroborating their use in the empirical models in order to mitigate bias caused by omitted variables. Additionally, the variables of interest that are significantly correlated with *Tq* presents a negative correlation

The correlation between ownership concentration measures and debt ratio is only significant for the shares held by the largest shareholder, with a positive relation. Additionally, the correlation coefficient between performance measure *Tq* and one year lagged *Tq (lagTq)* (0.86) is positive and statistically significant, supporting the proposition that firm performance is path-dependent (Altaf & Shah, 2018; Nguyen et al., 2015). Moreover, the statistically significant correlation of the lagged variable with almost all variables of interest reveals the dynamic nature of the corporate governance-performance relationship, having an important implication in the choice of the estimation method. Overall, the correlation coefficients between independent variables are not very high, none of them greater than 0.50, which means that multicollinearity will not be a problem in this study, which happens when

there is a correlation coefficient greater than 0.80 (Damodar N, 2004). The correlation matrix of sub-samples are reported in Annex E, F, G and H, and shows that multicollinearity is not a problem in the sub-samples.

4. Statistical Results

4.1. Ownership Concentration and Performance

Table 3 reports the estimation results of equation (3.1) for the full sample, with firm performance measured by Tobin's Q, using the two different methods: fixed effects, and BB system GMM. A Hausman test was conducted to differentiate between Fixed Effects (FE) and Random Effects (RE) approaches. The test p-values show that the null hypothesis that states that RE is the correct approach cannot be accepted at any conventional level of significance. Therefore, the fixed effects model is employed to control for time-invariant unobserved characteristics across firms.

Panel A reports the relation between corporate governance and performance when ownership concentration is measured by the percentage of shares held by the largest shareholder (OWN). The results of the fixed effects model suggest that the concentration of ownership does not significantly affect firm performance. The evidence is the same (Panel B) when the ownership concentration is measured by the sum of the squares of the percentages held by the five largest shareholders (HH). As already mentioned, the coefficients reported in the fixed effects model can be distorted, since this method do not control for the other sources of endogeneity that are likely to exist in this type of relation: the simultaneity and dynamic endogeneity (Wintoki et al., 2012). Additionally, the results of the BB system GMM highlights the inefficiency of the fixed effects model in capture all the endogeneity problems.

The results of the Durbin-Wu-Hausman test (DWH) presented in table 4, under the null hypothesis that endogenous regressors can be treated as exogenous variables, reveal that this hypothesis cannot be accepted at 1 per cent level of significance, which means that the OC and LEV variables are endogenous. Thus, the BB system GMM model will produce superior estimates in terms of consistency compared to the FE models.

The results after controlling the other two sources of endogeneity (BB system estimations) provide evidence for a non-linear relationship between ownership concentration and firm performance, but opposite results to those developed in Hypothesis 1. The estimators of the two-step system GMM, show that contrary to what was expected, firm performance decreases with ownership concentration at low levels, and increases at high levels. Despite not being a well-developed hypothesis or highly reported evidence, some authors

Table 3: The relationship between ownership concentration and Tobin's Q: evidence from the full sample.

	Panel A: OWN		Panel B: Herfindahl Index	
	FE	BB	FE	BB
lagTq		0.393**		0.614***
		(0.190)		(0.123)
OC	-0.452	-8.900**	0.160	-7.701**
	(0.371)	(4.223)	(0.381)	(3.925)
OC²	0.594	7.770**	-0.082	8.784**
	(0.424)	(3.947)	(0.530)	(4.442)
Own_Gov	-0.166	5.189	-0.163	2.414
	(0.123)	(7.482)	(0.123)	(6.748)
Own_Corp	-0.021	10.79*	-0.032	7.949*
	(0.047)	(6.170)	(0.047)	(4.295)
Own_Fam	-0.0515	2.004	-0.0696	7.243*
	(0.108)	(8.845)	(0.107)	(4.179)
Own_Ind	-0.17***	4.781	-0.17***	6.316*
	(0.0566)	(7.143)	(0.056)	(3.711)
Own_Inst	-	4.353	-	6.363
		(6.936)		(4.180)
SIZE	-1.02***	-0.356	-1.02***	-0.891
	(0.0554)	(1.023)	(0.055)	(0.594)
SG	1.29e-05	-0.004***	9.17e-06	-0.0010
	(0.0003)	(0.0012)	(0.0003)	(0.0014)
Se	0.003***	-0.0146	0.003***	0.00014
	(0.00046)	(0.0097)	(0.0005)	(0.0028)
Capex	0.0154	-1.519***	0.0155	2.333*
	(0.0122)	(0.551)	(0.012)	(1.201)
Constant	-0.237***		7.953***	
	(0.0326)		(0.350)	
Observations	7,614	6,768	7,614	6,768
R-squared	0.096		0.096	
AR(1) (p-value)		(0.000)		(0.008)
AR(2) (p-value)		(0.105)		(0.274)
Hansen test (p-value)		(0.110)		(0.108)
Wald Test		1799.58***		1047.14***

Note: This table reports the results of the fixed effects (FE) and two-step system GMM (BB) regressions for equation (3.1). The notation is as defined in Annex B. The dependent variable is Tobin's Q (Tq). Panel A reports the results when the ownership concentration (OC) is measured by the percentage of shares held by the largest shareholders (OWN), and Panel B reports the results when the Herfindahl index of the five largest shareholders (HH) is used to measure OC. Year dummies are included in all models, but are not reported. *, **, *** denote statistical significance at 10%, 5% and 1% levels. The dash (-) indicates variable omitted due to collinearity. Standard errors robust to heteroscedasticity are reported in parenthesis. AR(1) and AR(2) are tests for first-order and second-order serial correlation in the first-differenced residuals, under the null hypothesis of no serial correlation. The Hansen test of over-identification is under the null hypothesis that all instruments are valid. The Wald test indicates the joint significance of the reported coefficients.

Table 4: The Durbin-Wu-Hausman test for the endogeneity of regressors.

	H$_0$: Regressors are exogenous	
	I	II
DWH Test Statistic	125.10***	122.54***
P-value	0.0000	0.0000

Note: *** denote statistical significance at 1% level. Tobin's Q is the measure of performance. Full sample under analysis. The test is conducted for each performance measure and each equation, as in Table 3. I: equation (3.1) and OWN is the concentration measure. II: equation (3.1) and HH is the concentration measure. The null hypothesis states that all regressors are exogenous. The test follows a chi-squared distribution with the degrees of freedom equal to 3 (in equation (3.1)) and 4 (in equation (3.2)), which is the number of suspected regressors (lagTq, OC, OC², LEV).

have obtained similar results (Gedajlovic & Shapiro, 1998; Hu & Izumida, 2008).

The U-shaped effect of ownership concentration on performance found reveals that ownership concentration does not have a positive effect on performance unless the firm is highly concentrated. The results obtained are derived from the trade-off between the efficient monitoring effect and the expropriation effect at different levels of ownership. According to Hu and Izumida (2008), the expropriation effects dominate at low levels of ownership concentration, where the costs of this action are more distributed (costs are proportional to the ownership concentration, which is relatively low) but the benefits are exclusive to the controlling shareholders who engage in expropriation. Thus, at high levels of ownership concentration, the benefit-cost relation makes the expropriation of minority shareholders less advantageous and profitable than at low levels of concentration. Additionally, the monitoring effect also influences the positive impact that ownership concentration has in firm market valuation since the marginal benefits of actively monitoring managers outweigh their marginal costs at high levels of ownership concentration. Thus, at high levels of ownership concentration, the monitoring effect dominates and firm performance increases.

The U-shaped relation is found in the use of both measures of ownership concentration (OWM and HH), however, the marginal impact of the positive coefficient is higher, and the marginal impact of the negative coefficient is lower when HH is used to measure ownership concentration. This is in line with what was expected since the lowest value of the negative coefficient reflects the theory that the use of a measure that contemplates more than one largest shareholder helps to mitigate the effect of expropriation of minority shareholders (Overland et al., 2012). The higher value of the positive coefficient reflects the greater incentive of shareholders to monitor managers when more than one large shareholder is being

considered since monitoring costs are more distributed. Thus, the concentration of ownership is shown to be a mechanism of corporate governance in European companies, as expected, due to the institutional environment of these countries.

The tests conducted after estimating the BB system GMM, shows the joint significance of the estimated coefficients, with Wald tests significant at all levels. The validity of the instruments is supported by p-values of Hansen's tests of approximately 0.11 and by the absence of second-order serial autocorrelation (AR(2)).

4.2. Ownership Concentration and Performance: does investor protection matter?

As already mentioned, the effect that ownership concentration has on the company's performance is influenced by additional constraints to the managerial discretion. Thus, and also to understand the reason why the results found are contrary to what we expected, a more detailed analysis that takes into account some of these constraints is important. In this way, an analysis of the sub-samples is now carried out, in which the sample is aggregated according to the country origin law (LaPorta et al., 1998): Germanic, French, Scandinavian, and English origin law. In the interests of brevity, and because the bias in the estimations as a result of not controlling the endogeneity has already been verified, the results for the pooled OLS and fixed effects method will not be addressed in the sub-samples.

4.2.1. Empirical evidence for the Germanic law sample. The results of the two-step system GMM method for the sample of companies with Germanic origin law are reported in table 5, panel A. The coefficients show that the percentage of shares held by the largest shareholder increases performance at any level, having an even greater impact at high levels, where owners, instead of expropriating minority shareholders and exercising private benefits of control, more actively monitor managers, contradicting Hypothesis 2. This may indicate that the benefits to the largest shareholder from the expropriation of minority shareholders are not sufficient to outweigh the benefits of monitoring of managers.[13]

The sum of the squares of the percentages of shares held by the five largest shareholders (HH) shows a U-inverted relationship between ownership concentration and firm

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[13] This idea is reinforced when the relationship with the debt is addressed, in chapter 4.3.

Table 5: Two-step system GMM regression results: evidence from the sub-samples.

	Panel A: Germanic Law		Panel B: French Law		Panel C: Scandinavian Law		Panel D: English Law	
	Panel A.1	Panel A.2	Panel B.1	Panel B.2	Panel C.1	Panel C.2	Panel D.1	Panel D.2
lagTq	0.931***	0.914***	0.629***	0.694***	0.790***	0.767***	0.441***	0.461***
	(0.00330)	(0.00288)	(0.144)	(0.0146)	(0.00552)	(0.0422)	(0.0432)	(0.0909)
OC	0.116**	0.435***	-5.804	1.866***	-0.161	-0.451	-8.741***	-2.172
	(0.0591)	(0.0639)	(3.752)	(0.717)	(0.234)	(1.059)	(2.421)	(7.642)
OC²	0.322***	-0.210***	1.586	-1.186*	0.486**	0.710	7.821***	-3.451
	(0.0627)	(0.0724)	(3.421)	(0.693)	(0.222)	(1.772)	(2.777)	(11.52)
Own_Gov	0.186***	0.714***	15.94***	-0.197	3.727***	0.977***		
	(0.0429)	(0.0731)	(5.585)	(0.244)	(0.426)	(0.232)		
Own_Corp	0.148***	0.664***	14.98***	-0.192	1.776***	0.930***	8.718***	14.15**
	(0.0320)	(0.0513)	(5.218)	(0.249)	(0.132)	(0.206)	(2.051)	(6.113)
Own_Fam	0.300***	0.991***	16.18***	-0.0898	1.518***	1.121***		
	(0.0370)	(0.0501)	(5.631)	(0.254)	(0.132)	(0.226)		
Own_Ind	0.220***	0.683***	13.61***	-0.151	1.024***	0.906***	6.999***	14.14**
	(0.0374)	(0.0590)	(4.727)	(0.227)	(0.119)	(0.199)	(1.567)	(6.742)
Own_Inst	0.238***	0.771***	14.31***	0.102	2.270***	1.024***	9.017***	12.98**
	(0.0322)	(0.0632)	(4.976)	(0.178)	(0.128)	(0.198)	(2.459)	(5.534)
SIZE	-0.00965**	-0.143***	-1.948***	0.0436**	-0.305***	-0.0758***	-0.977***	-1.861**
	(0.00441)	(0.00798)	(0.698)	(0.0217)	(0.0215)	(0.0247)	(0.310)	(0.821)
SG	0.0390***	0.0293***	-0.000315	0.000217	-0.00213	-0.00239	-0.00763***	-0.0115***
	(0.00379)	(0.00597)	(0.000835)	(0.000418)	(0.00133)	(0.00242)	(0.00186)	(0.00418)
Se	0.00243***	0.00199***	-0.0922*	0.00580**	0.000412**	-0.000299***	-0.0208	0.0148
	(0.000193)	(0.000152)	(0.0553)	(0.00240)	(0.000161)	(0.000114)	(0.0449)	(0.0664)

Capex	-0.0273***	0.0776***	-0.0511	-0.00297	-0.0127***	0.231*	-0.504	4.076
	(0.00722)	(0.0168)	(0.571)	(0.0103)	(0.00491)	(0.121)	(0.959)	(6.273)
Observations	1,288	1,288	3,096	3,096	1,728	1,728	656	656
Number of groups	161	161	387	387	216	216	82	82
DWH Test Statistic	32.18***	31.38***	24.86***	34.25***	42.35***	40.05***	35.66***	36.72***
AR(1) (p-value)	(0.000)	(0.000)	(0.000)	(0.044)	(0.006)	(0.005)	(0.049)	(0.031)
AR(2) (p-value)	(0.513)	(0.499)	(0.316)	(0.542)	(0.173)	(0.166)	(0.120)	(0.772)
Hansen test (p-value)	(0.172)	(0.110)	(0.367)	(0.178)	(0.142)	(0.167)	(0.104)	(0.161)
Wald Test	2.09e+06***	3.48e+06***	15.58***	1016.91***	98896.86***	17194.92***	2142.75***	3879.89***

Note: The notation is as defined in Annex B. The dependent variable is Tobin's Q (Tq). Regression results of equation (3.1). Panel A: Relationship between ownership concentration and performance in the Germanic law sample. Panel B: Relationship between ownership concentration and performance in the French law sample Panel C: Relationship between ownership concentration and performance in the Scandinavian law sample. Panel D: Relationship between ownership concentration and performance in the English law sample. Panel A.1 (B.1) (C.1) (D.1): *OWN* is the measure of ownership concentration. Panel A.2 (B.2) (C.2) (D.2): *HH* is the measure of ownership concentration. Year dummies are included but not reported. *, **, *** denote statistical significance at 10%, 5% and 1% levels. Standard errors robust to heteroscedasticity are reported in parenthesis. DWH test statistics is the Durbin-Wu-Hausman test for the endogeneity of regressors. AR(1) and AR(2) are tests for first-order and second-order serial correlation in the first-differenced residuals, under the null hypothesis of no serial correlation. The Hansen test of over-identification is under the null hypothesis that all instruments are valid. The Wald test indicates the joint significance of the reported coefficients.

performance, meaning that firm market valuation increases with ownership concentration at low levels, as a consequence of monitoring managers (Shleifer & Vishny, 1986), and decreases with ownership concentration at high levels. The positive impact increases when ownership concentration is measured by HH, what was expected, reflecting the greater incentive to monitor managers when costs are more distributed. The negative effect caused by HH contradicts the theory that more than one large shareholder decreases the expropriation conflict (Overland et al., 2012), making it less likely that the negative effect verified is a result of the expropriation of minority shareholders, especially when considering only the largest shareholder this effect does not occur. Thus, the negative effect is more likely to be a result of conflicts between shareholders, that is, principal-principal conflicts, or even over-monitoring in which shareholders, who do not have the same competencies, make decisions that belong to managers to make (Burkart et al., 1997).

Once again, the ownership concentration proves to be a mechanism of corporate governance, as expected, due to the low investor protection in companies with Germanic origin law.

4.2.2. Empirical evidence for the French law sample. Table 5, panel B, reports the results for the French origin law sample. There is no evidence that the percentage of shares held by the largest shareholder affects firm market valuation at low and high levels, meaning that the largest shareholder does not have enough power/incentives to monitor managers and be considered a method of corporate governance in the companies with French origin law. These results are in line with the theory of Demsetz and Villalonga (2001) that diffuse ownership has advantages and costs that cancel each other and therefore does not affect the performance (Gedajlovic & Shapiro, 1998).

Interestingly, in this sample of firms, where the ownership concentration is most expected to play an important role in corporate governance, the largest shareholder does not affect performance and the expropriation of minority shareholders, which is also very likely due to the reduced protection of investors, does not exist. Similar results have been reported by Gedajlovic and Shapiro (1998) for French firms and are explained by the existence of an active monitorization of managers since, generally, the shareholders belong to the board of directors in these types of companies. Thus, agency costs are not so high for the benefits of active monitoring by a single largest shareholder to outweigh the costs of this.

On the other hand, when the measure of ownership concentration is HH there is empirical evidence to support Hypothesis 2 in which firm performance increases with ownership concentration at low levels and decreases at high levels (De Miguel et al., 2004). The difference in evidence with different measures of ownership concentration is a result of greater incentive for monitoring since the costs are more distributed for the positive effect, but the negative effect suggests over-monitoring or conflicts between shareholders and not expropriation of minority shareholders.

4.2.3. Empirical evidence for the Scandinavian law sample. In Table 5, panel C, is reported the relationship between ownership concentration and performance in countries with Scandinavian origin law. Panel C.1 shows that the largest shareholder does not exert an impact on firm market valuation, unless the shares are highly concentrated in his hands, when the marginal benefits of monitoring managers outweigh their marginal costs, encouraging him to actively monitor manager (Shleifer & Vishny, 1986). These results corroborate hypothesis 3, which predicts that ownership concentration in companies with Scandinavian origin law only affects performance positively, due to the relatively high investor protection.

Panel C.2 shows that when the measure of ownership concentration is HH, shareholders do not have incentives to monitor managers, because although their costs are distributed, so are the benefits. In addition, in this type of sample, investors are relatively protected, which together with the measure of ownership concentration used does not allow the expropriation of minority shareholders. Thus, there is no evidence that HH affects performance at any level of ownership.

4.2.4. Empirical evidence for the English law sample. Table 5, panel D, reports the results of the two-step system GMM for the English law sample. This supports evidence for a non-linear U-shaped relationship, in which, at low levels of the percentage of shares held by the largest shareholder, firm market valuation decreases, and at high levels it increases. The negative effect found cannot be entirely attributed to the expropriation of minority shareholders, since this is the sample in which investors are more protected (LaPorta et al., 1998), however, it is also the sub-sample in which the negative effect is more pronounced, with relatively large coefficients. The relationship found does not correspond to what was expected and developed in hypothesis 9.

English origin law firms are characterized by very dispersed ownership, and board of directors that are composed by outsiders and managers, and not by owners (Gedajlovic & Shapiro, 1998). This may explain that, at low levels of percentage of ownership, the negative effect found is derived from the owner-manager conflict, in which managers use the company's sources to maximize their utility and not the company's value, as they should (Berle & Means, 1932). The percentage of ownership at these levels does not provide enough benefits to encourage owners to control managers, which together with the fact that they do not belong to the board of directors gives managers greater freedom to control decisions made in the company. At high levels of ownership concentration, there is already an incentive for shareholders to monitor managers, which is visible in the positive effect that this variable has on performance.

When HH is the measure of ownership concentration, the percentage of shares held by the five largest shareholders does not affect performance, either at low or high levels. This empirical evidence shows that the benefits obtained from monitoring managers are not a sufficient incentive when they have to be divided among the five largest shareholders. Thus, the positive effect expected from hypothesis 9 is not seen in the presence of the five largest shareholders.

The Durbin-Wu-Hausman test for each estimation are reported together with estimated coefficients and reveals that the endogenous regressors cannot be treated as exogenous variables and that the BB system GMM is properly applied. Tests to prove the validity of the model were developed for all samples and models studied. The Wald test shows a 1% significance in all of them, confirming the joint significance of the estimated coefficients. The Hansen J-test yields p-values greater than 0.10 and lower than 0.58 that do not allow to reject at any level of significance the null hypothesis that all instruments are valid. The validity of the instruments is further enhanced by the absence of the second-order autocorrelation.

4.3 Ownership Concentration and Debt as Corporate Governance Mechanisms

In order to understand how debt affects the impact that ownership concentration exerts over performance, equation (3.2) were estimated for the samples under analysis. The results are reported in Table 6.

Panel A shows that the U-shaped relationship between the both measures of ownership concentration and performance found for the full sample remains statistically significant in the presence of leverage. However, there are a decrease in the coefficients of ownership concentration, revealing a decrease in the importance of shareholders in monitoring managers, which demonstrates the power of debt to align the interests of managers with those of shareholders and in reducing agency costs (Grossman & Hart, 1982). The levels of significance of the coefficients of ownership concentration and leverage show that they all play a role in corporate governance simultaneously, complementing each other in this function.

Panel B.1 shows that in the presence of debt, for companies with Germanic origin law, there are an incentive for the largest shareholder to expropriate minority shareholders, that does not exist in the absence of debt. Thus, the evidence suggest a U-inverted relationship between the shares held by the largest shareholder and performance, with the owner increasing debt and using this financial source to his interest (Paligorova & Xu, 2012), what is expected due to the low investor protection. The relationship remains when HH is the ownership concentration measure. In this sample, where leverage significantly and negatively affects performance, the coefficients of ownership concentration increase in the presence of debt, which means that ownership concentration has a greater importance in corporate governance when the debt negatively affects performance, as is the case. In conclusion, there is evidence that ownership concentration and debt are mechanisms of corporate governance in companies with Germanic origin law.

Panel C reports the role of ownership concentration and debt as corporate governance mechanisms in companies with French origin law. The largest shareholder still not playing a role in corporate governance, while debt does, however, we cannot say that debt is a substitute method of corporate governance, since there is no change in the statistical significance of the coefficients. Additionally, ownership concentration and debt are mechanisms of corporate governance of firms with French origin law when HH is used. Besides, there is a decrease in the positive coefficient of ownership concentration when the variable debt is added to the model, as a result of the decrease in agency costs in the presence of debt, and an increase in the negative coefficient, which means that the effect of the principal-principal conflict and over-monitoring increases in the presence of debt.

Table 6: The relationship between ownership concentration and debt as corporate governance mechanisms.

	Panel A: Full Sample		Panel B: Germanic Law		Panel C: French Law		Panel D: Scandinavian Law		Panel E: English Law	
	Panel A.1	Panel A.2	Panel B.1	Panel B.2	Panel C.1	Panel C.2	Panel D.1	Panel D.2	Panel E.1	Panel E.2
lagTq	0.317***	0.381***	0.941***	0.909***	0.523***	0.526***	0.754***	0.697***	0.600***	0.686***
	(0.110)	(0.096)	(0.00179)	(0.00198)	(0.0323)	(0.0170)	(0.00325)	(0.0402)	(0.0269)	(0.0485)
OC	-7.337**	-7.628**	0.359***	0.448***	-2.614	1.778**	-1.121***	-2.171	-6.635***	-4.059
	(3.734)	(3.342)	(0.0474)	(0.0351)	(1.866)	(0.834)	(0.126)	(1.631)	(1.899)	(3.454)
OC^2	6.414*	7.681**	-0.173***	-0.331***	2.923	-1.310*	1.449***	2.908	5.338***	2.654
	(3.590)	(3.802)	(0.0534)	(0.0407)	(1.818)	(0.789)	(0.132)	(2.341)	(2.019)	(4.795)
LEV	1.502***	0.949***	-0.594***	-0.621***	1.720***	1.400***	-0.363***	-0.149	1.923***	4.462***
	(0.236)	(0.273)	(0.0184)	(0.0166)	(0.0881)	(0.0505)	(0.0202)	(0.209)	(0.337)	(0.795)
Own_Corp	12.56***	13.37***	0.371***	0.971***	2.557***	-0.0819	2.363***	1.754***	5.333***	5.142**
	(4.707)	(3.703)	(0.0258)	(0.0474)	(0.862)	(0.310)	(0.0975)	(0.487)	(0.983)	(2.062)
Own_Fam	8.524*	17.43***	0.424***	1.252***	2.223	0.106	2.334***	1.875***		
	(5.122)	(5.599)	(0.0275)	(0.0623)	(2.452)	(0.324)	(0.0959)	(0.442)		
Own_Ind	6.147	8.545**	0.423***	1.026***	1.242	-0.0280	1.681***	0.625**	4.255***	5.043**
	(4.931)	(4.113)	(0.0247)	(0.0534)	(0.819)	(0.285)	(0.0916)	(0.309)	(0.770)	(2.320)
Own_Inst	7.580	11.30**	0.418***	0.941***	2.351***	0.317	2.899***	1.662***	4.706***	4.139*
	(5.176)	(4.459)	(0.0258)	(0.0520)	(0.854)	(0.247)	(0.111)	(0.412)	(0.873)	(2.140)
SIZE	-0.903	-1.685***	-0.0135***	-0.0825***	-0.233**	-0.00799	-0.376***	-0.156**	-0.588***	-0.851**
	(0.760)	(0.579)	(0.00371)	(0.00756)	(0.106)	(0.0297)	(0.0181)	(0.0611)	(0.107)	(0.377)
SG	-0.003***	-0.0012	-0.232***	0.0338***	1.04e-06	0.000230	-0.0387***	-0.00242	-0.00356***	-0.00238
	(0.001)	(0.0008)	(0.00888)	(0.00346)	(0.000245)	(0.000177)	(0.00431)	(0.00266)	(0.00058)	(0.00148)
Se	-0.0088	0.0003	0.00142***	0.000985***	-0.0520**	0.00759*	0.000693***	-0.00047**	0.0726***	-0.0138
	(0.0058)	(0.003)	(0.000120)	(6.05e-05)	(0.0257)	(0.00416)	(8.13e-05)	(0.00019)	(0.0212)	(0.0286)

Capex	-1.357***	-0.363	0.294***	0.318***	0.0218	0.183	0.0256***	0.424***	-0.553	11.08***
	(0.523)	(0.324)	(0.0149)	(0.0145)	(0.332)	(0.208)	(0.00333)	(0.144)	(0.588)	(3.497)
Observations	6,768	6,768	1,288	1,288	3,096	3,096	1,728	1,728	656	656
Number of groups	846	846	161	161	387	387	216	216	82	82
DWH Test Statistic	612.48***	608.323***	36.75***	35.62***	566.9***	571.10***	52.41***	50.06***	57.11***	58.38***
AR(1) (p-value)	(0.000)	(0.001)	(0.000)	(0.000)	(0.002)	(0.010)	(0.003)	(0.006)	(0.044)	(0.041)
AR(2) (p-value)	(0.304)	(0.908)	(0.552)	(0.449)	(0.676)	(0.554)	(0.166)	(0.168)	(0.218)	(0.102)
Hansen test (p-value)	(0.668)	(0.144)	(0.532)	(0.331)	(0.178)	(0.157)	(0.134)	(0.579)	(0.203)	(0.201)
Wald Test	1278.39***	459.30***	7.78e+06***	7.98e+07***	74.83***	362.00***	254839.99***	4099.51***	629.99***	5940.87***

Note: The notation is as defined in Annex B. The dependent variable is Tobin's Q (Tq). Regression results of equation (3.2). This table reports the relationship between ownership concentration and debt as corporate governance mechanisms for full sample (Panel A), for the Germanic law sample (Panel B), for the French law sample (Panel C), for the Scandinavian law sample (Panel D) and for the English law sample (Panel E). Panel A.1 (B.1) (C.1) (D.1): *OWN* is the measure of ownership concentration. Panel A.2 (B.2) (C.2) (D.2): *HH* is the measure of ownership concentration. Year dummies are included but not reported. *, **, *** denote statistical significance at 10%, 5% and 1% levels. Standard errors robust to heteroscedasticity are reported in parenthesis. DWH test statistics is the Durbin-Wu-Hausman test for the endogeneity of regressors. AR(1) and AR(2) are tests for first-order and second-order serial correlation in the first-differenced residuals, under the null hypothesis of no serial correlation. The Hansen test of over-identification is under the null hypothesis that all instruments are valid. The Wald test indicates the joint significance of the reported coefficients.

For companies with Scandinavian origin law, there are an incentive to expropriate minority shareholders in the presence of debt (Panel D). Thus, the shares held by the largest shareholders are related in a U-shaped to firm market valuation, in which the largest shareholder has incentives to use debt in his own interest at low levels of concentration (Paligorova & Xu, 2012), where the costs of this action are more distributed, while at high levels the incentive is to actively monitor manager. The positive coefficient increases in the presence of debt as a result of their increasing importance in corporate governance when debt negatively affects performance, just like in the sample of companies with Germanic origin law.

The role of debt in aligning the interest of managers with those of shareholders is even more remarkable when companies with English origin law is considered (Panel E). The negative effect that ownership concentration has in performance decreases in the presence of debt, due to the reduction in agency costs, which is different from the other sub-samples, in which the negative effect increases due to the greater expropriation of minority shareholders, or greater conflicts between shareholders and excessive monitoring. The shares of the largest shareholder and debt prove to be complementary corporate governance mechanisms. The relation of HH with performance remains statistically insignificant in the presence of debt.

Once again, the tests conducted to verify the validity of the instruments (Hansen H Test) and the applicability (Durbin-Wu-Hausman and Wald Tests) of the model corroborate its use. Additionally, the AR(2) shows the absence of the second-order autocorrelation.

The positive and significant coefficient of the lagged performance measure is indicative of the persistence of profits and validates the hypothesis that performance is path-dependent (Bebchuk & Roe, 1999).

Concerning the control variables, their coefficients vary according to the model and the sample under analysis, which is in line with the literature, that provides no consensus for the effect of all these variables in performance. Firm size significantly and negatively affects performance in most estimates (such as Nguyen et al. (2015) and Wintoki et al. (2012)), which can be associated with greater difficulty in managing larger companies and organizational problems (Ramasamy, Ong, & Yeung, 2005), or it does not affect performance at all (Altaf & Shah, 2018; Perrini et al., 2008). The relationship between sales growth (SG), firm-specific risk (Se), and capital expenditures (CPX) with performance vary according to the model, the

variables used and the samples, with evidence for a positive (Demsetz & Lehn, 1985; Gedajlovic & Shapiro, 1998), negative (Hu & Izumida, 2008), or no relationship (Perrini et al., 2008; Schultz et al., 2010).

5. Conclusions

This dissertation attempts to investigate the impact of ownership concentration on firm performance in countries with different control systems of corporate governance and to understand how debt affects its impact, that is, the role of ownership concentration and debt as mechanisms of corporate governance. The analysis is based on a total sample of 846 listed companies (7614 observations) that comprises 16 European countries during the period from 2010 to 2018.

The results provide several insights, revealing that the relationship under study depends on the sample and on the measure of ownership concentration. Given the robustness of the empirical evidence to the different sources of endogeneity, it can be concluded that ownership concentration-performance relationship is based on a trade-off, at different levels of ownership, between the efficient monitoring (Shleifer & Vishny, 1986), the expropriation of the minority shareholders (Shleifer & Vishny, 1997), the over-monitoring (Burkart et al., 1997), the conflicts between large shareholders (Burkart et al., 1997), and the agency costs (Jensen & Meckling, 1976) effects.

For the full sample, it was found that low levels of ownership concentration decrease firms' market valuation due to the effect of expropriation of minority shareholders, whereas the higher levels of ownership concentration increase firm performance, due to the monitoring effect.

In the Germanic law sample, the shares held by the largest shareholder increases performance at any level, however, in the presence of debt, high levels of ownership concentration decreases performance, revealing an incentive to increase debt and use it for his own interest (Paligorova & Xu, 2012). The percentage of shares held by the five largest shareholder are related in an U-inverted shape to performance.

In the French law sample the shares held by the largest shareholder has no effect in firms' market valuation at any level. Due to the low investor protection in the French law sample, the ownership concentration was expected to have a very important role in corporate governance, however, this is not verified. This unexpected evidence results from additional constraints to managerial discretion (Gedajlovic & Shapiro, 1998), which are additional

mechanisms of corporate governance. On the other hand, HH relates in an U-inverted shape to performance, suggesting more incentives to monitor managers when the costs are distributed.

For the Scandinavian law sample ownership concentration affects performance only when the shares are very concentrated in the hands of the largest shareholder. However, there are an incentive of the largest shareholder to increase debt and use it to its own interest, negatively affecting performance at low levels in the presence of debt.

In the English law sample, where investors are more protected, it is possible to verify that low levels of ownership concentration significantly deteriorate performance due to the high agency costs driven by low internal constraints to managerial discretion, while high levels increase it through the moniroting effect.

Thus, the ownership of the largest shareholder is a method of corporate governance in all samples, except for the French law sample. The ownership of the five largest shareholders is a corporate governance method for the full and Germanic and French law samples. Debt is a method of corporate governance for all samples, except for the Scandinavian law sample and only in the presence of the five largest shareholders.

Additionally, the results show that in the Germanic and French law samples, the negative effect that the percentage of shares held by the five largest shareholders exerts over performance is higher than that of the percentage of shares held by the largest shareholder, suggesting an over-monitoring or a conflit between shareholders (principal-principal conflict) (Burkart et al., 1997).

Overall, there is no evidence that debt is an alternative method of corporate governance to ownership structure since the coefficients remain statistically significant when the LEV variable is added to the model. The decrease in the coefficients of ownership concentration variables when capital structure measure is added to the model, and positively affects performance, reveals a decrease in the importance of shareholders in monitoring managers, which demonstrates the power of debt to align the interests of managers with those of shareholders and consequently its power to reduce agency costs. When debt negatively affects performance, ownership structure plays a more important role in corporate governance.

This study reveals that there are, in fact, different sources of endogeneity in the corporate governance-performance relationship that question the results of many previous surveys, highlighting the importance of using a model that correctly controls all types of endogeneity.

Finally, some practical guidelines for governance reforms in countries with relatively concentrated ownership can be taken from this study. First, policy makers should not underestimate the role of ownership structure in the improvement of efficiency and in corporate governance. Second, there is no "good" and universal ownership structure, its role depends on the corporate governance system in which the company operates. In this way, adopting the characteristics of the ownership structure of Anglo-Saxon countries, in European countries will not lead to the same results. Third, public authorities must develop reforms that make market mechanisms operate effectively, improving liquidity and the efficiency of stock markets.

5.1 Limitations of the Study and Suggestions for Future Research

The percentage of shares held by a shareholder does not always represent the control rights that the shareholder has, which leads to the main limitation of this study. During the study of this relationship, and due to data limitations, the percentage of shares held by each shareholder is assumed to be their control rights that, not being true, may lead to evidence of relationships that are not the most accurate. Another limitation of this study is that it does not include the percentage of shares held by managers, that are fundamental in understanding the relationship of ownership concentration with performance and debt.

Therefore, we suggest that future research seeks to understand the role of managerial ownership in corporate governance, as well as making a more accurate assessment through the use of control rights to measure ownership concentration. Additionally, future research should also take into account the board structure, since, besides being an additional constraint to managerial discretion, it may also have a role in corporate governance.

References

Abor, J. (2005). The effect of capital structure on profitability: an empirical analysis of listed firms in Ghana. *The journal of risk finance*.

Altaf, N., & Shah, F. A. (2018). Ownership concentration and firm performance in Indian firms: does investor protection quality matter? *Journal of Indian Business Research*.

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The review of economic studies, 58*(2), 277-297.

Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of econometrics, 68*(1), 29-51.

Bebchuk, L. A., & Roe, M. J. (1999). A theory of path dependence in corporate ownership and governance. *Stan. L. Rev., 52*, 127.

Berle, A., & Means, G. (1932). *The Modern Corporation and Private Property*.

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of econometrics, 87*(1), 115-143.

Boone, N., Colombage, S., & Gunasekarage, A. (2011). Block shareholder identity and firm performance in New Zealand. *Pacific Accounting Review*.

Borisova, G., Brockman, P., Salas, J. M., & Zagorchev, A. (2012). Government ownership and corporate governance: Evidence from the EU. *Journal of Banking Finance, 36*(11), 2917-2934.

Boubaker, S., Rouatbi, W., & Saffar, W. (2017). The role of multiple large shareholders in the choice of debt source. *Financial Management, 46*(1), 241-274.

Boubakri, N., Cosset, J.-C., & Guedhami, O. (2005). Postprivatization corporate governance: The role of ownership structure and investor protection. *Journal of financial economics, 76*(2), 369-399.

Brailsford, T. J., Oliver, B. R., & Pua, S. L. (2002). On the relation between ownership structure and capital structure. *42*(1), 1-26.

Burkar, M., & Panunzi, F. (2008). *Takeovers*. Handbook of European Financial Markets and Institutions.

Burkart, M., Gromb, D., & Panunzi, F. (1997). Large shareholders, monitoring, and the value of the firm. *The quarterly journal of economics, 112*(3), 693-728.

Byrd, J., Parrino, R., & Pritsch, G. (1998). Stockholder–manager conflicts and firm value.

Financial Analysts Journal, 54(3), 14-30.

Cable, J. (1985). Capital market information and industrial performance: the role of West German banks. *The Economic Journal, 95*(377), 118-132.

Caves, D. W., & Christensen, L. R. (1980). The relative efficiency of public and private firms in a competitive environment: the case of Canadian railroads. *Journal of Political Economy, 88*(5), 958-976.

Damodar N, G. (2004). Basic econometrics. In. New York: The Mc-Graw Hill.

De Miguel, A., Pindado, J., & De La Torre, C. (2004). Ownership structure and firm value: New evidence from Spain. *Strategic Management Journal, 25*(12), 1199-1207.

Demsetz, H. (1983). The structure of ownership and the theory of the firm. *26*(2), 375-390.

Demsetz, H., & Lehn, K. (1985). The structure of corporate ownership: Causes and consequences. *Journal of Political Economy, 93*(6), 1155-1177.

Demsetz, H., & Villalonga, B. (2001). Ownership structure and corporate performance. *Journal of corporate finance, 7*(3), 209-233.

Dyck, A., & Zingales, L. (2004). Private benefits of control: An international comparison. *The journal of finance, 59*(2), 537-600.

Flannery, M. J., & Hankins, K. W. (2013). Estimating dynamic panel models in corporate finance. *Journal of Corporate Finance, 19*, 1-19.

Friend, I., & Lang, L. (1988). An empirical test of the impact of managerial self-interest on corporate capital structure. *Journal of Finance, 43*(2), 271-281.

Gedajlovic, E. R., & Shapiro, D. M. (1998). Management and ownership effects: Evidence from five countries. *Strategic Management Journal, 19*(6), 533-553.

Grosfeld, I. (2009). Large shareholders and firm value: Are high-tech firms different? *Economic Systems, 33*(3), 259-277.

Grossman, S. J., & Hart, O. D. (1982). Corporate financial structure and managerial incentives. In *The economics of information and uncertainty* (pp. 107-140): University of Chicago Press.

Hadlock, C. J., & James, C. M. (2002). Do banks provide financial slack? *Journal of Finance, 57*(3), 1383-1419.

Hay, D. A., & Morris, D. J. (1979). Industrial economics: Theory and evidence.

Himmelberg, C. P., Hubbard, R. G., & Palia, D. (1999). Understanding the determinants of managerial ownership and the link between ownership and performance. *Journal of financial economics, 53*(3), 353-384.

Holtz-Eakin, D., Newey, W., & Rosen, H. S. (1988). Estimating vector autoregressions with panel data. *Econometrica: Journal of the econometric society*, 1371-1395.

Hu, Y., & Izumida, S. (2008). Ownership concentration and corporate performance: A causal analysis with Japanese panel data. *Corporate Governance: An International Review, 16*(4), 342-358.

James, H. S. (1999). Owner as manager, extended horizons and the family firm. *International Journal of the Economics of Business, 6*(1), 41-55.

Jensen, M. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *American Economic Review, 76*(2), 323-329.

Jensen, M. (1989). Eclipse of the public corporation.

Jensen, M., & Meckling, W. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of financial economics, 3*(4), 305-360.

Kapopoulos, P., & Lazaretou, S. (2007). Corporate ownership structure and firm performance: evidence from Greek firms. *Corporate Governance: An International Review, 15*(2), 144-158.

Krivogorsky, V. (2006). Ownership, board structure, and performance in continental Europe. *The International Journal of Accounting, 41*(2), 176-197.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. J. T. j. o. f. (2002). Investor protection and corporate valuation. *57*(3), 1147-1170.

LaPorta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (1998). Law and finance. *Journal of Political Economy, 106*(6), 1113-1155.

Lehmann, E., & Weigand, J. (2000). Does the governed corporation perform better? Governance structures and corporate performance in Germany. *Review of Finance, 4*(2), 157-195.

Lel, U., & Miller, D. P. (2015). Does takeover activity cause managerial discipline? Evidence from international M&A laws. *The Review of Financial Studies, 28*(6), 1588-1622.

Lincoln, J. R., Gerlach, M. L., & Ahmadjian, C. L. (1996). Keiretsu networks and corporate performance in Japan. *American sociological review*, 67-88.

Maury, B. (2006). Family ownership and firm performance: Empirical evidence from Western European corporations. *Journal of corporate finance, 12*(2), 321-341.

McConnell, J. J., & Servaes, H. (1990). Additional evidence on equity ownership and corporate value. *Journal of financial economics, 27*(2), 595-612.

Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance and the theory

of investment. *The American Economic Review, 48*(3), 261-297.

Morck, R., Shleifer, A., & Vishny, R. W. (1988). Management ownership and market valuation: An empirical analysis. *Journal of financial economics, 20*, 293-315.

Myers, S. C. (1984). Capital structure puzzle. *National Bureau of Economic Research*.

Nguyen, T., Locke, S., & Reddy, K. (2015). Ownership concentration and corporate performance from a dynamic perspective: Does national governance quality matter? *International Review of Financial Analysis, 41*, 148-161.

Overland, C., Mavruk, T., & Sjögren, S. (2012). *Keeping it real or keeping it simple? Ownership concentration measures compared*.

Paligorova, T., & Xu, Z. (2012). Complex ownership and capital structure. *Journal of corporate finance, 18*(4), 701-716.

Perrini, F., Rossi, G., & Rovetta, B. (2008). Does ownership structure affect performance? Evidence from the Italian market. *Corporate Governance: An International Review, 16*(4), 312-325.

Pound, J. (1988). Proxy contests and the efficiency of shareholder oversight. *Journal of financial economics, 20*, 237-265.

Ramasamy, B., Ong, D., & Yeung, M. C. (2005). Firm size, ownership and performance in the Malaysian palm oil industry. *Asian Academy of Management Journal of Accounting Finance, 1*, 181-104.

Roodman, D. (2009). How to do xtabond2: An introduction to difference and system GMM in Stata. *The stata journal, 9*(1), 86-136.

Saeedi, A., & Mahmoodi, I. (2011). Capital structure and firm performance: Evidence from Iranian companies. *International Research Journal of Finance and Economics, 70*, 20-29.

Salim, M., & Yadav, R. (2012). Capital structure and firm performance: Evidence from Malaysian listed companies. *Procedia-Social and Behavioral Sciences, 65*, 156-166.

Sarkar, J., & Sarkar, S. (2000). Large shareholder activism in corporate governance in developing countries: Evidence from India. *International Review of Finance, 1*(3), 161-194.

Schultz, E. L., Tan, D. T., & Walsh, K. D. (2010). Endogeneity and the corporate governance-performance relation. *Australian journal of Management, 35*(2), 145-163.

Selarka, E. (2005). Ownership concentration and firm value - A study from the Indian corporate sector. *Emerging Markets Finance and Trade, 41*(6), 83-108.

Shleifer, A., & Vishny, R. W. (1986). Large shareholders and corporate control. *Journal of*

Political Economy, 94(3, Part 1), 461-488.

Shleifer, A., & Vishny, R. W. (1997). A survey of corporate governance. *The journal of finance, 52*(2), 737-783.

Stulz, R. (1988). Managerial control of voting rights: Financing policies and the market for corporate control. *20*, 25-54.

Thomsen, S., & Pedersen, T. (2000). Ownership structure and economic performance in the largest European companies. *Strategic Management Journal, 21*(6), 689-705.

Wernerfelt, B., & Montgomery, C. (1988). Tobin's q and the importance of focus in firm performance. *The American Economic Review*, 246-250.

Wintoki, M. B., Linck, J. S., & Netter, J. M. (2012). Endogeneity and the dynamics of internal corporate governance. *Journal of financial economics, 105*(3), 581-606.

Zeckhauser, R. J., & Pound, J. (1990). Are large shareholders effective monitors? An investigation of share ownership and corporate performance. In *Asymmetric information, corporate finance, and investment* (pp. 149-180): University of Chicago Press.

Zhou, Q., Faff, R., & Alpert, K. (2014). Bias correction in the estimation of dynamic panel models in corporate finance. *Journal of corporate finance, 25*, 494-513.

Annexes

Annex A: Summary of the empirical findings of the effect of ownership concentration in firm performance.

Authors	Endogeneity	Non-linear relationship	Period and Sample	Firm performance measure	Ownership Measure	Results
Morck et al. (1988)	Not addressed	Addressed	USA 1980	Tobin's Q	-Managerial ownership	Non-monotonic relationship: - Positive between 0% to 5% and beyond 25% -Negative between 5% and 25%
McConnell and Servaes (1990)	Not addressed	Addressed	USA 1976-1986	-Tobin's Q	-Insider ownership	U inverted relationship
Gedajlovic and Shapiro (1998)	Not addressed	Addressed	-Canada -France -Germany -UK -USA 1986-91	-Return on Assets (ROA)	-% of shares held by the largest shareholder	-France and Canada: No relationship -Germany and USA: u-shaped relationship -UK: negative but statistically no significant
Thomsen and Pedersen (2000)	Not addressed	Addressed	Europe 1990-1995	-Market-to-book value of equity -Sales Growth -ROA	-% of shares held by the largest shareholder	U inverted relationship
Lehmann and Weigand (2000)	Addressed	Not addressed	Germany 1991-1996	-ROA -Return on Equity (ROE)	-Herfindahl index	Negative relationship

Demsetz and Villalonga (2001)	Addressed	Not addressed	USA 1976–1980	-Tobin's Q	-% of shares owned by management -% of shares owned by the five largest shareholders	No relationship
De Miguel et al. (2004)	Addressed	Addressed	Spain 1990-1999	-Tobin's Q	-% of common shares held by shareholders that own significant shares	U inverted relationship
Selarka (2005)	Addressed	Not addressed		-Ratio of market value of equity to net worth of the firm.	-Insider ownership	U-shaped relationship
Kapopoulos and Lazaretou (2007)	Addressed	Not addressed	Greece 2000	-Tobin's Q -ROA	-Shareholders with more than 5% of outstanding shares -managers with more than 5% of outstanding shares	Positive relationship
Perrini et al. (2008)	Addressed	Not addressed	Italy 2000-2003	-Tobin's Q	-Ownership (first, second, third, fourth, and fifth). -Shareholder control rights held by the 5 largest shareholders -Managerial Ownership	Positive relationship
Hu and Izumida (2008)	Addressed	Addressed	Japan 1980-2005	-Tobin's Q -ROA	-% of shares held by the 5 and 10 largest shareholders	U-shaped relationship
Grosfeld (2009)	Addressed	Not addressed	Poland 1991-2003	-Tobin's Q	-Share of voting rights of the largest shareholder	Positive relationship in "Mature" firms -Negative relationship in High-tech firms.

| Nguyen et al. (2015) | Addressed | Addressed | -Singapore -Vietnam 2008-2011 | -Tobin's Q | -Shareholders with more than 5% of outstanding shares. | Positive relationship |
| Altaf and Shah (2018) | Addressed | Addressed | India 2009-2014 | -Tobin's Q | -The % of common stocks held by promoters | U inverted relationship |

Annex B: Variables and definitions.

Variable	Description
OWN	Percentage of shares held by the largest shareholder.
HH	Sum of squares of the percentage of shares held by the five largest shareholders.
LEV	Total debt to book value of assets.
Tq	The numerator is the sum of the year-end market value of the common stock with the book value of liabilities. The denominator is the sum of the year-end book value of common equity and liabilities.
OWN_Identity	Vector of six dummy variables for the identity of the largest shareholder: Government Agency, Corporation, Family, Individual Investor, and Institutional Investor, which equals 1 for each type of investor and 0 otherwise.
SG	Annual percentage growth in sales: Net sales or revenues in t divided by net sales or revenues in t-1 minus 1.
CPX	Capital expenditures (additional to fixed assets) normalized by net sales or revenues.
Se	Average standard deviation in the company's stock prices of the year.
YEAR	Vector of nine dummy variables for the years between 2010 and 2018, that equals 1 in each year and 0 otherwise.
lagTq	The one-year lagged Tobin's Q ratio.

Annex C: Distribution of firms and observations by country.

Country	N	Obs	Stock Index
Austria	36	324	ATX Prime Index
Germany	53	477	DAX100
Switzerland	72	648	SPI- Swiss Performance Index
German Origin law	**161**	**1449**	
Belgium	68	612	Euronext Brussels
Greece	41	369	ATFMI- FTSE/ATHEX Market Index
Netherlands	60	540	AAX – AEX All Share Index
France	76	684	SBF120
Italy	67	603	Refinitiv Italy Price Return Index
Portugal	32	288	Euronext Lisbon
Spain	43	387	Refinitiv Spain Price Return Index
French Origin Law	**387**	**3483**	
Denmark	28	252	OMXC All Price
Finland	65	585	OMXHPI- OMX Helsinki PI Index
Norway	68	612	OSLO SE All-Share Index
Sweden	55	495	OMX Stockholm Mid Cap PI Index
Scandinavian Origin Law	**216**	**1944**	
Ireland	18	162	ISEQ Overall Price Index
United Kingdom	64	576	FTSE100
English Origin Law	**82**	**738**	
Full Sample	**846**	**7614**	

Note: N denotes the number of companies in each country, sub-sample and full sample. Obs denotes the number of observations in each country, sub-sample and full sample. The Stock Index is where the companies under analysis in each country are listed.

Annex D: Pair-wise correlation coefficients for the full sample.

Variables	Tq	OWN	HH	LEV	Gov	Corp	Fam	Ind	Inst	SIZE	SG	CPX	Se	lagTq
Tq	1.00													
OWN	-0.11*	1.00												
HH	-0.10*	0.96*	1.00											
LEV	-0.06*	0.03*	0.02	1.00										
Gov	-0.09*	0.05*	0.03*	0.03*	1.00									
Corp	-0.06*	0.29*	0.24*	0.05*	-0.19*	1.00								
Fam	0.05*	0.14*	0.12*	-0.02	-0.07*	-0.23*	1.00							
Ind	-0.02	0.09*	0.08*	-0.02	-0.12*	-0.41*	-0.14*	1.00						
Inst	0.09*	-0.51*	-0.4*	-0.05*	-0.14*	-0.50*	-0.18*	-0.32*	1.00					
SIZE	-0.12*	-0.20*	-0.20*	0.09*	0.19*	-0.05*	0.03*	-0.30*	0.21*	1.00				
SG	0.003	-0.002	0.00	-0.01	-0.01	0.01	-0.01	0.001	-0.01	-0.02	1.00			
CPX	0.07*	-0.003	-0.02	-0.02	-0.01	0.03*	0.03*	-0.005	-0.04*	0.04*	-0.001	1.00		
Se	-0.04*	0.03*	0.03*	0.06*	0.01	0.03*	0.00	-0.01	-0.03*	-0.01	-0.002	0.01	1.00	
lagTq	0.86*	-0.12*	-0.10*	-0.11*	-0.09*	-0.06*	0.05*	-0.02	0.09*	-0.09*	0.020	0.07*	-0.05*	1.00

Note: * shows significance at the 0.05 level. Gov, Corp, Fam, Ind and Inst corresponds to Own_Gov, Own_Corp, Own_Fam, Own_Ind and Own_Inst, respectively. The notation of the remaining variables is as defined in Annex B.

Annex E: Pair-wise correlation coefficients for Germanic Law sample.

Variables	Tq	OWN	HH	Gov	Corp	Fam	Ind	Inst	LEV	SIZE	SG	CPX	Se	lagTq
Tq	1.000													
OWN	0.042	1.000												
HH	0.040	0.960*	1.000											
Gov	-0.078*	0.053*	0.016	1.000										
Corp	-0.115*	0.444*	0.380*	-0.149*	1.000									

Variables	Tq	OWN	HH	Gov	Corp	Fam	Ind	Inst	LEV	SIZE	SG	CPX	Se	lagTq
Fam	0.170*	0.062*	0.054*	-0.050	-0.236*	1.000								
Ind	0.125*	-0.074*	-0.090*	-0.087*	-0.411*	-0.137*	1.000							
Inst	-0.052*	-0.474*	-0.371*	-0.113*	-0.536*	-0.179*	-0.312*	1.000						
LEV	-0.349*	-0.092*	-0.103*	0.045	0.082*	-0.138*	-0.074*	0.038	1.000					
SIZE	-0.154*	-0.302*	-0.267*	0.092*	-0.087*	-0.138*	-0.180*	0.296*	0.203*	1.000				
SG	0.071*	0.034	0.038	-0.010	-0.013	0.003	0.021	-0.001	-0.044	-0.051	1.000			
CPX	-0.177*	-0.073*	-0.073*	0.057*	0.004	-0.074*	-0.088*	0.093*	0.307*	0.060*	-0.018	1.000		
Se	0.272*	-0.020	-0.045	0.056*	-0.037	0.027	0.138*	-0.117*	-0.217*	-0.145*	0.035	-0.077*	1.000	
lagTq	0.926*	0.044	0.041	-0.079*	-0.111*	0.161*	0.124*	-0.049	-0.338*	-0.133*	0.096*	-0.176*	0.263*	1.000

Note: * shows significance at the 0.05 level. Gov, Corp, Fam, Ind and Inst corresponds to Own_Gov, Own_Corp, Own_Fam, Own_Ind and Own_Inst, respectively. The notation of the remaining variables is as defined in Annex B.

Annex F: Pair-wise correlation coefficients for French Law sample.

Variables	Tq	OWN	HH	Gov	Corp	Fam	Ind	Inst	LEV	SIZE	SG	CPX	Se	lagTq
Tq	1.000													
OWN	-0.056*	1.000												
HH	-0.041*	0.950*	1.000											
Gov	-0.089*	-0.018	-0.029	1.000										
Corp	-0.036*	0.202*	0.158*	-0.204*	1.000									
Fam	0.082*	0.146*	0.104*	-0.088*	-0.278*	1.000								
Ind	-0.044*	0.050*	0.059*	-0.159*	-0.501*	-0.217*	1.000							
Inst	0.091*	-0.442*	-0.352*	-0.111*	-0.349*	-0.151*	-0.273*	1.000						
LEV	0.169*	-0.044*	-0.052*	0.031	0.024	-0.054*	0.005	-0.012	1.000					
SIZE	-0.088*	-0.223*	-0.251*	0.212*	0.069*	0.114*	-0.371*	0.127*	0.054*	1.000				
SG	0.016	-0.007	-0.003	-0.006	0.017	-0.008	-0.001	-0.010	-0.010	-0.015	1.000			
CPX	-0.031	0.000	-0.001	0.003	0.010	0.002	-0.013	-0.002	0.033	-0.011	-0.003	1.000		

Se	0.167*	0.023	0.012	-0.033	0.012	0.135*	-0.098*	0.012	-0.030	0.071*	0.001	0.000	1.000
lagTq	0.861*	-0.053*	-0.039*	-0.089*	-0.035	0.075*	-0.038*	0.089*	0.056*	-0.073*	0.043*	-0.029	0.164*	1.000

Note: shows significance at the 0.05 level. Gov, Corp, Fam, Ind and Inst corresponds to Own_Gov, Own_Corp, Own_Fam, Own_Ind and Own_Inst, respectively. The notation of the remaining variables is as defined in Annex B.

Annex G: Pair-wise correlation coefficients for Scandinavian Law sample.

Variables	Tq	OWN	HH	Gov	Corp	Fam	Ind	Inst	LEV	SIZE	SG	CPX	Se	lagTq
Tq	1.000													
OWN	-0.168*	1.000												
HH	-0.163*	0.957*	1.000											
Gov	-0.076*	0.150*	0.104*	1.000										
Corp	-0.056*	0.257*	0.228*	-0.247*	1.000									
Fam	0.045*	0.055*	0.051*	-0.055*	-0.191*	1.000								
Ind	0.036	0.033	0.014	-0.095*	-0.331*	-0.073*	1.000							
Inst	0.057*	-0.400*	-0.330*	-0.181*	-0.634*	-0.141*	-0.243*	1.000						
LEV	-0.225*	0.275*	0.277*	0.009	0.150*	0.118*	-0.098*	-0.149*	1.000					
SIZE	-0.154*	0.004	-0.013	0.353*	-0.086*	-0.029	-0.277*	0.105*	0.102*	1.000				
SG	-0.014	0.034	0.024	-0.010	0.031	-0.007	-0.003	-0.022	-0.022	-0.009	1.000			
CPX	-0.060*	0.154*	0.155*	-0.014	0.137*	-0.001	-0.043	-0.110*	0.174*	0.036	0.004	1.000		
Se	-0.026	0.001	-0.021	-0.018	0.068*	-0.011	-0.029	-0.039	0.075*	0.119*	0.001	0.048*	1.000	
lagTq	0.832*	-0.187*	-0.181*	-0.078*	-0.061*	0.052*	0.040	0.058*	-0.253*	-0.118*	0.003	-0.037	-0.017	1.000

Note: * shows significance at the 0.05 level. Gov, Corp, Fam, Ind and Inst corresponds to Own_Gov, Own_Corp, Own_Fam, Own_Ind and Own_Inst, respectively. The notation of the remaining variables is as defined in Annex B.

Annex H: Pair-wise correlation coefficients for English Law sample.

Variables	Tq	OWN	HH	Corp	Ind	Inst	LEV	SIZE	SG	CPX	Se	lagTq
Tq	1.000											
OWN	0.054	1.000										
HH	0.068	0.972*	1.000									
Corp	0.020	0.585*	0.516*	1.000								
Ind	0.156*	0.281*	0.228*	-0.149*	1.000							
Inst	-0.119*	-0.686*	-0.592*	-0.761*	-0.529*	1.000						
LEV	-0.050	-0.276*	-0.257*	-0.134*	-0.247*	0.277*	1.000					
SIZE	-0.226*	-0.319*	-0.261*	-0.104*	-0.473*	0.400*	0.376*	1.000				
SG	-0.046	-0.013	-0.013	-0.017	-0.011	0.022	-0.058	-0.103*	1.000			
CPX	0.072	0.020	0.025	-0.002	-0.017	0.013	0.003	-0.077*	0.009	1.000		
Se	0.240*	0.117*	0.110*	0.105*	0.171*	-0.203*	0.013	-0.013	-0.025	-0.019	1.000	
lagTq	0.798*	0.061	0.080*	0.025	0.135*	-0.110*	-0.050	-0.181*	-0.034	0.073	0.251*	1.000

Note: * shows significance at the 0.05 level. Gov, Corp, Fam, Ind and Inst corresponds to Own_Corp, Own_Ind and Own_Inst, respectively. The notation of the remaining variables is as defined in Annex B.