

Weiß, Christian

Doctoral Thesis

The Ownership Concentration of Firms: Three Essays on the Determinants and Effects

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EUROPEAN BUSINESS SCHOOL
International University Schloß Reichartshausen

Inaugural Dissertation for the Academic Degree
Doctor Rerum Politicarum (Dr. rer. pol.)

The Ownership Concentration of Firms:
Three Essays on the Determinants and Effects

From: Dipl.-Kfm. Christian Weiß
Esperantostraße 37
60598 Frankfurt am Main

Supervisors: Prof. Ansgar Richter, PhD
Prof. Dr. Marcel Tyrell

Department: Strategy, Organization, and Leadership

Submission: February 26, 2010

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Christian Weiß

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LIST OF ABBREVIATIONS

2SLS	Two Stage Least Squares
ANOVA	Analysis of Variance
CapEx	Capital Expenditure
Cf.	Compare with
Coef	Regression Coefficient
df	Degrees of Freedom
e.g.	For example
EBIT	Earnings Before Interests and Taxes
etc.	Et cetera
F	F-Test
GDP	Gross Domestic Product
HHI	Herfindahl-Hirschman-Index
HLM	Hierarchical Linear Model
i.e.	Id est
ICC	Intraclass Correlation
LLSV	Studies by La Porta, Lopez de Silanes, Shleifer and Vishny
Max.	Maximum
Min.	Minimum
ML	Maximum Likelihood
N	Number of Observations
OLS	Ordinary Least Squares
p	Probability
Q	Tobin's Q
R ²	Coefficient of Determination
REML	Restricted Maximum Likelihood
RND	Research and Development
SD	Standard Deviation
SE	Standard Error
SK-Test	Skewness-Kurtosis Test
SS	Sum of Squares
SW-Test	Shapiro-Wilk Test
T1B	Thomson One Banker
UAI	Uncertainty Avoidance Index

1 INTRODUCTION

1.1 Background and Motivation

*“La propriété, c'est le vol!”*¹ – P. J. Proudhon (French politician and philosopher)

The Frenchman Pierre J. Proudhon (1809-1865) coined this expression in one of his first writings, claiming that any form of ownership has to be considered as theft. Proudhon concluded that as long as ownership is connected with privileges, which serve for the expropriation of others, society should inhibit the resulting accumulation of wealth and power. With the rejection of ownership per se, Proudhon became the first one to call himself ‘anarchist,’ and despite later disagreements, maintained a stimulating intellectual partnership with Karl Marx for several years. Accordingly, Proudhon is considered to have had an important influence on the later writings of Marx. Whereas the popularity of anarchistic and Marxist movements has been marginalized since their advent, the worldwide financial and economic crisis escalating since 2008 has refocused the public attention on the topic of ownership - not only, but particularly on its negative aspects, as already referred to by Proudhon. Recently, massive interventions by governmental institutions, including substantial nationalizations in the banking sector, as well as takeover battles, such as Schaeffler / Continental and Porsche / Volkswagen in Germany, led to severe criticism of the so called socialization of losses in contrast to the maximization of personal benefits in previous years. Within this scope, the question about who should own, monitor, control, and benefit from companies has attained wide public attention.

However, the fundamental topic of the “right or best form of ownership”, as implicitly asked by Proudhon, is neither new nor only related to economics. In fact, the question for the optimal distribution of ownership rights, and thus, implicitly for the ownership concentration, has been addressed for centuries and millennia by philosophy and theology. Accordingly, not only ancient authors, such as Plato or Aristotle, but also medieval writers, such as the priest Thomas Aquinas, as well as rather modern philosophers, like John Locke, Immanuel Kant, and Georg W. F. Hegel, discussed a broad range of ownership related topics in their writings (Waldron, 2004).

¹ *“Ownership is theft!”* (Proudhon, 1840).

Despite the long tradition of this topic of ownership, the form of organizations we consider today as normal when speaking about ‘ownership’ of companies, including different levels of management and separated owners, is relatively young and occurred for the first time in the late 19th century among the companies constructing the rail system of America (Chandler, 2001). Thus, ownership – as we know it today – and related research questions about the merits and downsides, have been dealt with for comparatively little time: in modern management research, the area of ownership, spearheaded by the work on the separation of ownership and control by the work of Berle and Means (1932), has been in vogue for a bit more than seven decades. Compared to the aforementioned philosophers and theologians, which took a rather normative perspective in their works, Berle and Means took an economic perspective on ownership, following the argument of efficiency and considering, unlike Proudhon, not only negative (costs), but also positive aspects (benefits).

In the relatively short period since the study of Berle and Means in 1932, we have witnessed substantial change in the global ownership landscape. On the one hand, these changes were induced by exogenous shocks, such as wars or governmental interventions, e.g., those caused by the 2008 financial crisis mentioned above. On the other hand, they were called forth by continuous developments, for example, through the pressure of market forces (Daily, Dalton, & Rajagopalan, 2003). These developments provided a wide range of opportunities to study the dynamics of ownership structures of firms, leading to a flurry of different streams of research following up on the ideas introduced by Berle and Means (1932).

The studies by Demsetz (1983) and Demsetz and Lehn (1985), partly challenging the view of Berle and Means (1932), established two of the most prominent topics in the ownership research of the last three decades. These topics are the identification of the determinants of ownership structure, and the evaluation of potential performance effects of alternative ownership structures, as addressed by Berle and Means.

In the first stream of research, dealing with the determinants and influence factors of the ownership structure of firms, Demsetz and Lehn (1985) set the cornerstone in the search for the key drivers of the level of ownership concentration. Building on these findings, Thomsen and Pedersen (1998), Van der Elst (2004) and La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1999), amongst others, came to the conclusion that not only firm, but also industry-, and country-specific factors significantly influence the ownership

structure of firms. However, not only did scholars investigate different types and levels of influence factors, but also various characteristics of the ownership structure of a firm. While Demsetz and Lehn's study focuses on the ownership concentration of a firm in general, others, such as Hansmann (1996), Delios and Beamish (1999), and Dong, Bowles, and Ho (2002), include the identity (e.g., employees or managers) of the owners in their analyses.

After all, it appears that much has been learned about the determination of the ownership structure of firms. However, whereas many studies have independently confirmed the effect of firm specific influence factors, relatively few authors included industry- and country-level determinants in their studies, and barely any study simultaneously accounts for firm-, industry-, and country-level determinants. Furthermore, the few existing studies of this kind yield partly ambiguous results and thus call for further investigation (La Porta, et al., 1999; Thomsen & Pedersen, 1997, 1998; Van der Elst, 2004).

The second stream of research, dealing with the performance effects of alternative ownership structures, directly dates back to Berle and Means (1932). They suggested a positive effect of ownership concentration on performance due to the increase in monitoring efficiency. Demsetz (1983) and Demsetz and Lehn (1985) challenged this view by arguing that the ownership concentration does not have a performance effect, since the ownership structure is endogenously determined, considering costs and benefits. Demsetz and Villalonga (2001) confirmed this view and added, corresponding to the first stream of research described above, that the ownership structure of a firm is multi-faced and several characteristics have to be considered, such as the identity of the owner. However, these publications far from ended the discussion regarding the performance effect of the ownership structure. To mention a few studies, Morck, Shleifer and Vishny (1988) found a significant curvilinear performance effect in general, and Thomsen, Pedersen, and Kvist (2006) found a significant performance effect only for countries with a relatively high ownership concentration. In total, the literature on the relationship of ownership concentration and performance is characterized by a remarkable incongruity when it comes to the question of whether there is a performance effect or not. The meta-analyses by Sanchez-Ballesta and Garcia-Meca (2007) and Van Oosterhout (2008) illustrate the respective results of existing studies and show that not only the results of studies vary, but also how, and to what

extent the studies account for the endogeneity, curvilinearity, and differences in performance measures.

This thesis relates directly to the two illustrated streams of research, taking an economic perspective on the topic of ownership concentration. The question for the concentration of the ownership structures of firms, i.e. whether the ownership rights of a firm are held by just a few shareholders, or by many, and what the relative size of the ownership stakes of different shareholders is, is of central concern in the governance literature. On the firm level, the level of ownership concentration and the connected blockholdings play a crucial role for the monitoring, and thus the risk oversight of a firm (Berle & Means, 1932; Holderness & Sheehan, 1988). Furthermore, in terms of the overall welfare of a society, ownership concentration in combination with pyramidal chains of control and entrenchment can have negative effects on the innovative strength and the dynamics of an economy. Finally, in terms of distributive justice, the overall ownership concentration in an economy has to be monitored as one of the key indicators (Morck, Wolfenzon, & Yeung, 2005).

Building on the status quo of current research, I particularly address the research gap of industry- and country-level determinants of ownership concentration. Furthermore, I combine the findings of the existing literature on the performance effects of ownership concentration in order to mitigate the ambiguity of the results of existing studies. Accordingly, the key objective within the scope of this thesis is to analyze and understand the determinants and effects of alternative levels of ownership concentration. In detail, I identify the key determinants influencing the ownership structure of firms, the relative importance of the industry- and country-level, and evaluate how much of the observed variance in ownership concentration can be explained with the help of the identified determinants. Additionally, I analyze the potential performance implications of alternative levels of ownership concentration while accounting for endogeneity, international differences, curvilinearity, and alternative performance measures. Accordingly, I address three guiding research questions contributing to the existing ownership research:

- Question 1: What is the relative importance of the industry- and country-level for the determination of the ownership concentration of firms?*
- Question 2: How much of the observed variance do the key firm-, industry-, and country-level determinants of ownership concentration explain?*
- Question 3: Does the level of ownership concentration have an effect on firm performance?*

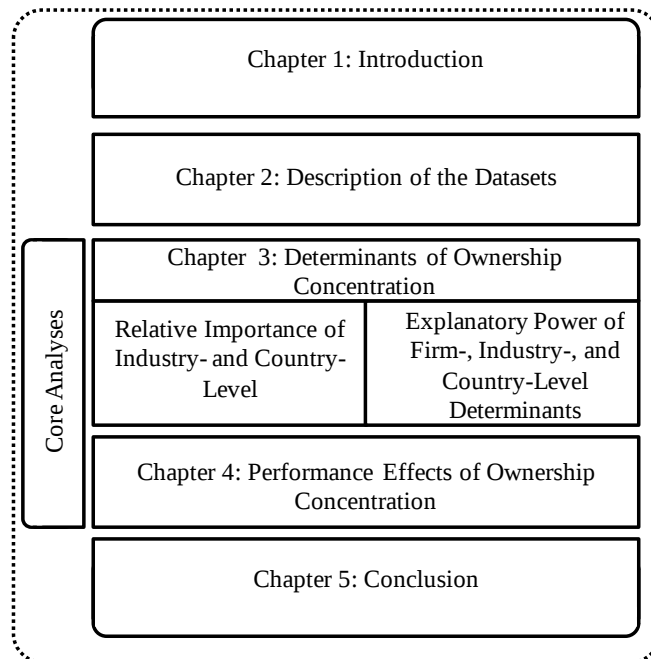
1.2 Outline

The first chapter of this thesis provides an overview on the motivation and basic concepts applied in the subsequent essays. In this chapter, I describe the structure of the thesis and the key questions addressed within the different sections.

The thesis encompasses three self-standing essays, two of which focus on the determinants and one on the performance effects of ownership concentration. The first two essays, dealing with the relative importance of industry- and country-factors for, and the key drivers of ownership concentration, have a combined literature review and theory section, but self-standing chapters for the hypotheses development, results, and discussion. The third essay comprises an independent literature review, theory development, results, and discussion part.

For the statistical analyses, I collected an initial dataset for all three essays. According to the requirements of the analyses within the three essays, I created respective subsamples of the initial dataset. Accordingly, as all three essays essentially rely on the same data set and the same key ownership variables, a detailed description of the data set, and the respective subsamples and variables is placed in front of the three essays. The last chapter of the thesis provides a conclusion, summarizing and discussing the key findings of the single essays. Figure 1 illustrates the structure of this thesis.

Figure 1: Outline of the Thesis



Looking at the existing literature of the last 25 years dealing with the topic of the determinants of ownership concentration, and thus addressing research questions one and two, significant advancements have been made in understanding the determination of the ownership concentration of firms. Demsetz and Lehn (1985) set the cornerstone in this area of research, investigating and identifying mainly firm-level determinants. Within the next years, other authors, such as Thomsen and Pedersen (1998), Van der Elst (2004), and La Porta, et al. (1999), significantly contributed to the understanding of the allocation of ownership rights. They provided more insights into the industry- and country-level and identified, for example, the legal origin of a country and the regulation of an industry as significant drivers of ownership concentration. A few studies, for example, those of Crespi-Cladera (1996), Lamba and Stapledon (2001) and Jong and Semenov (2006), followed this development and focused on confirming existing, and identifying new industry- and country-factors. However, although all these authors asked the question of the significance of a wide range of single determinants of ownership concentration, the question for the importance of the respective industry- and country-level has not been asked so far. Thus, we do not know how much these two levels contribute to the ownership structure of a firm. After all, it might not be reasonable to keep searching for groups of determinants that potentially explain only a small part of the variance in ownership concentration.

Accordingly, I complement the existing research and fill this gap by evaluating the relative importance of the industry- and country-level for the level of ownership concentration of a firm. In the scope of the analyses, I address the following questions in detail:

1a) Are all industries and countries significantly different from each other in terms of ownership concentration?

1b) How much of the observed variance in ownership concentration between firms can be attributed to the industry- and country-level?

In the light of the results of the analysis of the relative importance of the industry- and country-level, in the second essay, I readdress the question for the most important firm-, industry-, and country-level determinants of ownership concentration and their explanatory power.

Since the study of Demsetz and Lehn (1985), most of the studies [e.g., Pedersen and Thomson (1999), Bergstrom and Rydqvist (1990), and Gedajlovic (1993)] include firm-level determinants in their analyses. However, whereas many studies have analyzed the firm and industry effects in detail, a better understanding of the mode of action of the country-level has been the subject of relatively few studies, such as the one of La Porta, et al. (1999). Many studies solely contain firms from one country, such as Pittatore and Turati (2000) or Morck and Nakamura (2000), and therefore international differences are neglected. Additionally, some studies include the international perspective in their analyses but focus on particular geographic regions, for example, Europe (Pedersen & Thomsen, 1999; Thomsen & Pedersen, 1997, 1998, 2000). Furthermore, those studies accounting for international differences widely fail to account for firm-, industry-, and country-determinants simultaneously.

Thus, few studies have shown to what extent the ownership frameworks, mostly developed on observations based on the United-States (US) – and so the identified determinants of ownership concentration – are applicable in an international context. The second essay addresses this topic, answering the following questions.

2a) What are the significant drivers of ownership concentration on the firm-, industry-, and country-level?

2b) How much of the observed variance in ownership concentration can be explained by the identified firm-, industry-, and country-level determinants?

2c) How much of the explanatory power of the legal origin of a country can be attributed to so far identified country-level determinants of ownership concentration?

The third research question, dealing with the effect of ownership concentration on performance, directly relates to the discussion of Berle and Means (1932), Demsetz and Lehn (1985), Demsetz and Villalonga (2001), and Thomsen et al. (2006). The mentioned meta studies by Sanchez-Ballesta and Garcia-Meca (2007) and Van Essen and Van Oosterhout (2008) show that the inconclusive results of the existing studies might be attributed to whether studies account for endogeneity, curvilinearity, alternative performance measures, and differences between countries. The majority of the existing studies do not account for all of these issues. Accordingly, in the subsequent analyses, I close this research gap by considering the above mentioned findings regarding the relationship of ownership concentration and performance and address the following questions within the scope of the third essay:

3a) Is there a performance effect of ownership concentration when accounting for the endogeneity of the ownership structures of firms?

3b) Is the relationship between ownership concentration and performance curvilinear?

3c) Is there a different effect of ownership concentration for alternative measures of firm performance?

3d) Does the effect of ownership concentration on performance differ among countries, legal origins or different levels of concentration?

1.3 Abstracts

Having illustrated the background, motivation, and structure of this thesis, I subsequently describe the research approach and provide the abstracts of the three essays in sections 1.3.1–1.3.3.

Figure 2 provides an overview of the unit of analysis, the sample, the independent and dependent variables, and the methodology of the three essays.²

Figure 2: Overview on the Three Essays

	Relative Importance of the Industry- and Country-level	Explanatory Power of Key Determinants	Performance Effects
Unit of Analysis	- Firm - Ownership Structure	- Firm - Ownership Structure	- Firm - Performance - Ownership Structure
Sample	1,305 firms from nine countries	900 firms from nine countries	1,079 firms from eight countries
Dependent Variable	Ownership Concentration: Shares held by Top 5 Owners	Ownership Concentration: Shares held by Top 5 Owners	- Ownership Concentration: Shares held by Top 5 Owners - Firm Performance: Tobin's Q
Independent Variables	Industry, Country, Industry Regulation, Legal Origin	Firm Size, Risk, Industry Regulation, Industry Competition, RND Intensity, Lifecycle Stage, Stock market Size, Shareholder Protection, Culture	Firm Performance, Size, Risk, Industry Regulation, Shareholder Protection, Leverage, RND Intensity, CapEx expenditures, Ownership Concentration
Methodology	- ANOVA - Random-Intercept-Model - Variance Decomposition	- Hierarchical Linear Model - Variance Decomposition	- OLS 2SLS

All three essays address the same unit of analysis, namely the firm. However, whereas the first two essays include only a single characteristic of a firm – the level of concentration of the ownership structure – the third essay includes the level of ownership concentration and the firm performance as dependent variables in the analysis.

The sample sizes of the three essays vary from essay to essay due to the varying complexity of the applied statistical models and the different number of included variables.³

For all essays, I used the same dependent variables to measure the ownership concentration of a firm, and for the third essay, I included two different variables to

²For a detailed description of the sampling, dependent and independent variables, and the methodology refer to the respective chapters.

³Cf. chapter 2.2.

measure firm performance.⁴ In terms of independent variables, I included only two variables in the first essay, and substantially more (up to 16) in the second and third essays.

In terms of methodologies, for the first essay, I used analyses of variance (ANOVAs) and random intercept models without additional covariates in combination with variance decomposition techniques. For the second essay, I applied hierarchical linear models (HLMs). For the third essay, a two stage least squares regression (2SLS) in combination with ordinary least squares regressions (OLS) were the methods of choice.

1.3.1 Relative Importance of Industry- and Country-Level

In this essay, I analyze the relative importance of the industry- and country-level for the determination of ownership concentration. Using a sample of 1,305 firms from nine countries estimates of a random-intercept model show a high significance of the country-level (25.3% explained variance) and a subordinate role of the industry-level (2.1% explained variance). Further analyses show that the country-level also influences the effect of industry-level determinants and accordingly explains why single country studies of the determinants of ownership concentration frequently derive seemingly opposing results. The varying level of shareholder protection between countries with different legal origins (common law, French civil law, and German civil law) is identified as one of the main drivers causing differences in ownership concentration between countries.

1.3.2 Explanatory Power of Firm-, Industry-, and Country-Level Determinants

Within the scope of this essay, I analyze and identify the key determinants of ownership concentration on the firm-, industry-, and country-level. Furthermore, I evaluate the explained variance by the identified determinants on the respective levels. Building on the work of Demsetz and Lehn (1985), Thomsen and Pedersen (1999; 1997, 1998), and La Porta, et al. (1998, 1999), I derive hypotheses and test them on a sample of 900 firms from nine countries using hierarchical linear models. The results indicate that firm risk, firm size, legal origin, and shareholder protection significantly influence the level of ownership concentration. The industry-level in general, and the regulation of an industry in particular, play a subordinate role for the allocation of ownership rights. In

⁴Cf. chapter 2.1.

total, the estimated models can explain up to 32% of the observed variance on ownership concentration. Whereas the legal origin and the level of shareholder protection almost explain the complete variance in ownership structure between countries, up to 89% of the industry-, and only 8% of firm-level variance can be attributed to the tested determinants. The results suggest, first, identifying additional firm-level determinants of ownership concentration to yield models with a higher explanatory power and, second, decomposing the complex effect of legal origin to gain further insights in country-level determinants.

1.3.3 Performance Effects of Ownership Concentration

In this essay, I analyze the relationship between ownership concentration and firm performance while accounting for the endogeneity of the ownership structure of firms, curvilinearity, differences in corporate governance systems, and alternative performance measures. Using a sample of 1,079 firms from eight countries I find that ownership concentration has no effect on firm performance, after all. The results support the findings by Demsetz and Villalonga (2001) and cast doubt on the results of the study by Thomsen, et al. (2006), who argued that in countries with a German or French civil law background, corporate governance systems might push ownership concentration levels above and beyond the value-maximum point.

1.4 Research Scope

In the subsequent chapters, I describe the basic theoretical concepts used throughout all three essays, namely the concept of ownership applied and the underlying ownership framework for the determination of the level of ownership concentration.

1.4.1 Concept of Ownership

Generally, the concept of ownership is more complex than it appears on first sight and can be addressed from several different perspectives.

As mentioned in the introduction, many philosophers have addressed the topic of ownership. However, these scholars mostly took a normative perspective, discussing to what extent private, compared to public or collective ownership, should be allowed and supported, for example, in order to optimize distributive justice (Bergström, 1999; Christman, 1994; Waldron, 2004).

A second perspective, stemming from the field of psychology, is the so called ‘psychological ownership,’ which refers to “a state in which an individual feels as though the target of ownership is ‘theirs’ (i.e., ‘It is mine’)” (Pierce, Kostova, & Dirks, 2003, p. 86). This state of feeling is regardless of whether the individual actually possesses legal ownership rights or not (Pierce, et al., 2003; Pierce, Rubinfeld, & Morgan, 1991).

Within the scope of this thesis, however, I take a legal perspective on ownership and consider any individual or institution as an owner who holds the respective constitutive set of legal rights. Still, as pointed out by Learmount and Roberts (2006), in terms of rights, ‘ownership’ is a multifaceted term and encompasses a whole battery of attributes. It appears that in the literature, there is consensus about six essential rights – or dimensions – of ownership (Becker, 1977; Learmount & Roberts, 2006; Munzer, 1990; Reeve, 1986; Waldron, 1988). Christman (1994) summarizes them accordingly:

“First, the right to possess (the right of exclusive physical control that the nature of the thing admits, coupled with a claim-right to noninterference). Second, the right to use (a claim-right to exclusive use of the thing implying a general duty on the part of all others not to use the thing without the owner’s permission). Third, the right to the capital (the power to make valid disposition of the thing owned as well as the power to transfer title; this element can be separated into the rights of alienation, consumption, and modification). Fourth, the right to manage (a cluster of powers to contract with others concerning control over various uses of the thing). Fifth, the right to security (right against expropriation: applies as a qualifier of the first four elements) and sixth, the right to the income (the right to increased benefit from the ownership derived from others’ goods given in trade)” (p. 227).

According to Christman (1994), these six different rights of ownership can be grouped into two categories: *rights to control* and *rights to returns*. The first group encompasses the rights to use, possess, alienate, consume, and modify the owned assets, and the second one the rights to transfer and gain income from the owned asset. Singer (2000) comes to a similar conclusion; however, he terms the control and return rights as ‘Castle’ and ‘Investment’ concepts.

The property rights literature has already discussed these two fundamental sets of ownership rights. Accordingly, Grossman and Hart (1986), Hart and Moore (1990), and

Hart (1995) emphasize control rights more than return rights. In classical property rights theory though, Alchian and Demsetz (1972) define ownership mainly by the residual right to returns.⁵ I argue, however, that both sets of rights have to be considered. Equating ownership solely with the right to residual returns would not be reasonable, as owner managers would not necessarily have the control over their firm and the question of who actually controls a firm would be unanswered. Similarly, equating ownership solely with the right to control would not account for the possible separation of ownership and control, as described by Berle and Means (Jongwook & Mahoney, 2005).

Accordingly, in the following, I understand ownership, in accordance with Milgrom and Roberts (1992), Hansmann (1996), and Richter and Schroeder (2006, 2008), amongst others, by the two previously illustrated set of rights:

- (1) The right to the residual control of the asset being owned; that is, those control rights that are not held by other parties or assigned to them by contract.
- (2) The right to appropriate any residual returns that accrue from that asset; that is, those returns that remain once all legitimate claims of all other parties with which the firm maintains contractual relationships have been satisfied.

As mentioned in the introduction, I focus on the level of concentration of the ownership structure within this thesis. With the notion of ‘ownership concentration,’ I refer to the distribution of the ownership rights in an asset (e.g., a firm) among different parties. Thus, according to the two previously illustrated set of ownership rights, in firms with dispersed ownership structures, many parties own relatively small stakes, and thus, possess relatively limited rights to control and accrue residual returns of the firm concerned. At high levels of ownership concentration, relatively few parties own relatively large stakes in the respective firm, and thus, possess relatively strong control and residual return rights.

However, to cover the full complexity of ownership, it is not only the benefits, and thereof the rights illustrated above, that have to be considered, but the costs of

⁵In the initial property rights theory [e.g. Demsetz (1967)] the key ownership rights were termed *usus*, *usus fructus*, *abusus*, and *ius abutendi*. According to Christman (1994), these rights can also be grouped into control and residual return rights.

ownership as well. Whereas the right to control and to accrue earnings endows the owner with privileges, the holders of ownership rights can accrue a variety of costs. The costs of ownership include costs occurring with the transactions of becoming an owner, as well as costs connected with enforcing the ownership rights, such as monitoring, collective decision making, and general risk bearing (Hansmann, 1988; Jensen & Meckling, 1976).⁶

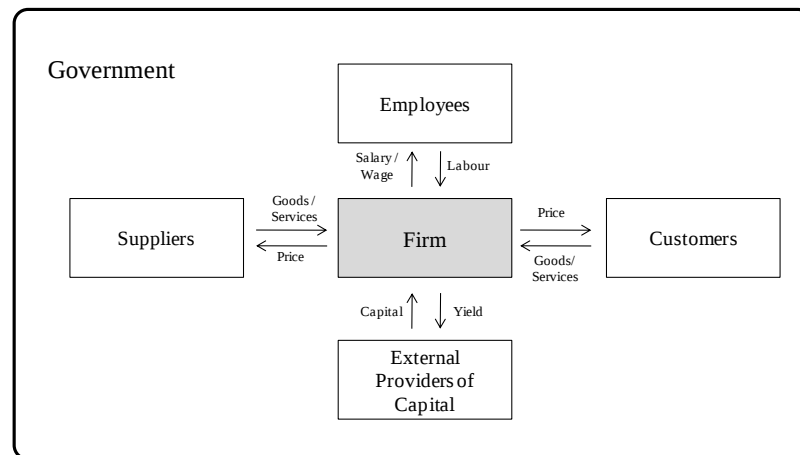
1.4.2 Ownership Framework

Several existing economic models dealing with the whys and wherefores of ownership have been developed, focusing on alternative perspectives and concepts. However, most of the developed frameworks deal with particular ownership related issues rather than with developing a general ownership framework. For example, Coase (1937), Williamson (1985), and Hart (1995) focus on explaining ownership as an alternative to market contracting. Williamson (1975) and Perry (1989) highlighted asset specificity in connection with transaction costs as a reason for vertical and related diversification. Jensen and Meckling (1976), Demsetz (1983), and Demsetz and Lehn (1985) developed a framework to identify determinants of ownership concentration. Hansmann (1988, 1996), however, took one of the few holistic approaches to developing an ownership framework, which has been used in a few studies in the recent years, and on which I base the analyses in the following essays (Greenwood, Deephouse, & Li, 2007; Richter & Schroeder, 2006, 2008; Thomsen & Pedersen, 1997, 1998, 2000, 2003; Von Nordenflycht, 2007).

According to Hansmann's framework, the ownership structure of a firm considers, and thus, optimizes the costs and benefits connected with, and influenced by alternative ownership structures. The framework considers all costs and benefits arising within the nexus of contracts a firm operates in. This nexus, as initially referred to by Jensen and Meckling (1976) and Williamson (1990), consists of four groups of patrons, namely employees, providers of capital and suppliers, customers, and the firm itself (Figure 3).

⁶Singer (2000, 2006) also refers to costs of ownership as liabilities related to the day-to-day business, such as the costs of the installation of handicap-accessible facilities.

Figure 3: Nexus of Contracts



Source: Hansmann (1996).

All four classes of patrons have a contractual relationship with the firm and any type of patron could become an owner of the firm by acquiring the respective set of ownership rights. The framework captures all types of costs occurring within this nexus of contracts. On the one hand, these are the costs of market making in connection with the transactions based on the contractual relationship, such as the costs of market contracting, (ex post) transaction costs and information costs. On the other hand, costs occur in connection with the ownership rights, as illustrated in the previous section (Tirole, 1988; Williamson, 1985).

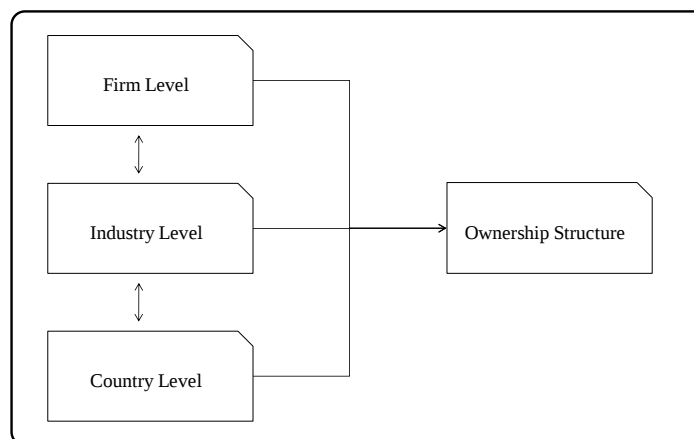
By assigning (more or less ownership) rights to a particular group of patrons, the costs of market making occurring within the nexus might be avoided by these changes in the ownership structure, but with the price of incurring ownership costs. Accordingly, the costs arising from assigning ownership rights to one of the classes of patrons equal the newly occurring costs of ownership plus the new level of costs of market making. Under the assumption of (semi) efficient markets, firms are urged to optimize any type of costs and benefits in order to survive in the mid- to long term, or they will otherwise be pushed out of the market by their competitors (Fama, 1970). The same holds true for the previously mentioned costs, which can be influenced by the ownership structure of a firm. Accordingly, the ownership concentration will level out at the level of concentration where the marginal costs and the marginal benefits of the current and

alternative ownership structures are equal.⁷ Thus, I agree with the idea initially proposed by Demsetz (1983) and tested by Demsetz and Lehn (1985) that the ownership structure of a firm is endogenously determined, minimizing costs occurring within the nexus of contracts. Accordingly, any factor influencing either the costs of ownership or the costs of market making arising within the nexus of contracts also influences the ownership structure of a firm, and thus, the level of ownership concentration. Consequently, these factors can be considered determinants of ownership concentration.

Whereas I consider a variety of costs and benefits arising within the nexus of contracts, the framework of Hansmann (1996) also distinguishes between the identities of the types of owners. I disregard this aspect in the subsequent essays in order not to increase the complexity of the respective models too much. Instead, I use the ideas of Hansmann (1996) and other authors mentioned in the respective parts of this thesis to create a more comprehensive framework than the one proposed by Demsetz and Lehn (1985) to explain the level of ownership concentration and respective performance effects.

Whereas the ownership structure, by its nature, is a firm-specific phenomenon, it is not only firm-specific characteristics that influence the level of ownership concentration. Figure 4 illustrates the different groups of potential influence factors and their interactions.

Figure 4: Determinants of Ownership Concentration



⁷In mathematical terms, the ownership structure minimizes the costs of ownership (CO) and the costs of market contracting (CC): $MINIMIZE(CO_j + \sum_{ij} CC_i)$ where i is an index of the firm's patrons and j is the form of ownership / the level of concentration.

As shown, in the subsequent essays I distinguish three groups of influence factors, namely firm-, industry-, and country-level determinants of ownership concentration. On all three levels, differences between firms, industries, and countries, can influence the relationships, and thus, the costs and benefits within the nexus of contracts, eventually altering the level of ownership concentration. Additionally, the three levels might not only influence the ownership structure directly, but also indirectly affect each other, and thus, influence the respective effects of the determinants.

In the subsequent essays, I identify several firm-, industry-, and country-level determinants of ownership concentration, evaluate their effects theoretically, and test them empirically. To derive the theoretical effects, I assess the influence of the respective firm-, industry-, and country-characteristics on the ownership concentration from several theoretical perspectives. Subsequently, I illustrate two exemplary detailed lines of arguments of different determinants of ownership concentration and elaborate on the application of alternative theoretical concepts.⁸

As a first example, I argue at the firm-level that the size of a firm will have a negative effect on the level of ownership concentration for several reasons to be illustrated next.⁹ The price of a certain ownership stake of a relatively small firm will be lower than the same ownership stake of a larger, more valuable firm. Theoretically, any private or institutional owner, if not in possession of the necessary funds, could take out a respective loan to acquire any ownership stake of a firm, irrespective of the price and the size of the firm. However, a significant stake of a large firm bought by an investor with relatively low funding capacities could come along with significant costs (Modigliani & Miller, 1963). First, taking out a loan is not free and, as any market transaction, connected with transaction costs (Coase, 1937, 1960; Williamson, 1981, 1985). Additionally, considering the financial restrictions and limited portfolios of (particularly individual) investors, according to portfolio theory (Markowitz, 1952), a significant stake in a large firm will almost inevitably lead to a suboptimal portfolio diversification. This suboptimal diversification will incur costs either by a decreased portfolio performance or by transaction costs connected with the reallocation of the

⁸The elaboration in the subsequent essays will be more condensed than these illustrative lines of arguments. Due to the exemplary nature of the line of arguments at this point of this thesis, I will refrain from referring to other authors following similar or a different lines of arguments. For a review for the existing effects, please refer to the literature reviews in the respective chapters.

⁹The firm size is analyzed in both the first and the second essay as a determinant of ownership concentration (chapter 3).

portfolio to restore the optimal diversification. The previously illustrated costs will increase the larger the firm size is, as the same share of a firm becomes more expensive. Eventually, all costs to the investor will be redirected to the firm in the form of increased expectations with respect to company performance / dividend payments / stock performance.

Accordingly, the larger the firm, the higher the costs connected with acquiring a specific ownership stake. The larger the costs for an owner connected with the acquisition of such an ownership stake, the less attractive larger stakes in a company will be, and thus, the smaller the stakes acquired by the owner. Consequently, the larger the firm is, the lower is the level of ownership concentration.

As a second illustration, this time at the country-level, I argue that the level of shareholder protection has a negative effect on the level of ownership concentration.¹⁰ The level of shareholder protection determines which rights (minority) owners have although they do not have control over the company, and how costly it is to carry out and enforce their rights. In terms of theoretical concepts, level of shareholder protection influences how severe the principal agent conflict between the owners and managers is, and how costly and efficient the respective resolution or mitigation of this situation is (Eisenhardt, 1989; Fama, 1980; Jensen & Meckling, 1976).

The lower the level of shareholder protection is, the fewer rights do minority owners have and the more difficult and costlier is the enforcement of these rights. Thus, the lower the level of shareholder protection, the less attractive the smaller ownership stakes are due to the relative increase in connected costs and the higher the risk of moral hazard by the management, even up to potential expropriation. Speaking in terms of property rights, the higher the level of shareholder protection, the more valuable the minority ownership stakes are and vice versa (Alchian & Demsetz, 1972; Demsetz, 1967; Grossman & Hart, 1986; Hart & Moore, 1990). Consequently, I argue that the higher the level of shareholder protection, the more attractive smaller ownership stakes are, and thus, the lower the ownership concentration.

¹⁰The level of shareholder protection is analyzed in the second and the third essays as a determinant of ownership concentration (chapters 3.5 and 4).

The two elaborations on the effect of firm size and shareholder protection on ownership concentration clearly show that I do not use just one, but a combination of several widely accepted guiding theories to evaluate the theoretical effect of the identified determinants on ownership concentration. In the subsequent essays, the lines of arguments will be related to principal-agent theory, transaction costs, property rights, institutional economics, and portfolio theory.

2 VARIABLES AND DATA

The empirical analyses in all three essays are based on subsamples stemming from the same initial data set. Subsequently, I first illustrate the variables used in the three essays. Second, I describe the data collection process of the initial sample and test the data for representativeness. Third, I present the three subsamples of the initial data set used for the statistical analyses within the essays.

2.1 Variables

Throughout the three essays in this thesis, I use several dependent and independent variables within the scope of the statistical analyses. In the subsequent chapters, I will describe the measures of all variables.

2.1.1 Dependent Variables

2.1.1.1 Ownership Concentration

The central operationalization in this thesis is the measure of the concentration of the ownership structure of a firm. This measure is particularly important as it is used in all three essays.

The ownership specific concentration measure *cr5*, and the log-transformed counterpart, *tcr5*, capturing the sum of the percentage ownership shares held by the five biggest owners, will be used as primary dependent variables.

In existing studies on the topic of ownership concentration, two different types of measures of concentration are used: ownership specific count measures, such as *cr5*, and universal concentration measures, such as the Herfindahl-Hirschman-Index (HHI).

In terms of ownership specific count measures, several alternatives can be found in the literature, ranging from the total shares held by the three, five, ten, or even twenty owners with the largest shares of ownership rights, up to block holdings of owners with more than 5% of the total ownership shares. The advantage of these measures is that the demands on the ownership data are rather low. At the same time, there is the disadvantage that all these measures only provide a small snapshot of the overall ownership structure. Also, increasing the number of considered owners does not enhance but rather decreases the precision of the picture of the ownership structure, as

the variance between firms is decreased. Hence, it is hard to determine whether to use the percentages of shares held by the top three, five, ten, or any other number or (Sanchez-Ballesta & Garcia-Meca, 2007; Van der Elst, 2004).

Among the universal ownership measures, the HHI is the most frequently applied approach in both ownership and non-ownership related fields. The sum of the squared percental shares of all owners calculates this index. On the one hand, the HHI has a strong advantage as measure of ownership concentration: The HHI takes all owners into consideration, thus, drawing a precise picture of the complete ownership structure. On the other hand, considering the complete ownership structure makes high demands on the ownership data used to calculate the HHI. Accordingly, for some firms, complete ownership information is available, and for others, only parts; therefore, the comparability of the calculated HHIs suffers (Sanchez-Ballesta & Garcia-Meca, 2007; Van der Elst, 2004).

All of the measures mentioned above have been applied frequently and successfully in the ownership literature. I believe that the advantages of the specific ownership count measures outweigh the advantages of the HHI measure. Especially the fact that in my sample, on average, 64.25% of the ownership structure is available with a relatively high standard deviation of 22.6%, so that disqualifies the HHI due to its aforementioned illustrated disadvantage.

Thus, in the subsequent analyses, I rely on one of the ownership specific concentration measures, namely *cr5*, and do not use the HHI. To account for the issue of decreasing variance with an increasing number of owners considered, I choose a medium number of owners and use *cr5* (ownership shares held by the top five owners) as the primary measure for ownership concentration, which has also been used, amongst others, by Demsetz and Lehn (1985) and Demsetz and Villalonga (2001).

However, as Table 1 shows, all of the previously illustrated ownership concentration measures correlate highly and significantly (on a 0.01 significance level) so that the importance of the choice amongst these ownership measure is relatively low, as also proposed by Van der Elst (2004).¹¹

¹¹Calculations at this point are based on the Initial Sample as illustrated in the subsequent chapters.

Table 1: Correlations of Dependent Variables

	<i>cr5</i>	<i>cr10</i>	<i>cr20</i>	<i>hhi</i>
<i>cr5</i>	1			
<i>cr10</i>	0.975***	1.00		
<i>cr20</i>	0.919***	0.979***	1.00	
<i>hhi</i>	0.847***	0.772***	0.699***	1.00
* $p < 0.10$	** $p < 0.05$	*** $p < 0.01$		

Due to the percentage values, the dependent variable *cr5*, is bounded. To account for this issue, I transform the bounded dependent variable into an unbounded variable by applying the following formula to *cr5* as suggested by Demsetz and Lehn (1985):

$$\log \frac{\text{percentage concentration}}{100 - \text{percentage concentration}}$$

The transformed variable is designated by prefixing a *t* (*tcr5*). However, since the transformed variable *tcr5* cannot be interpreted as easily as the initial *cr5* variable, containing the actual percentage values, I use the transformed variable only where necessary, for example, in regression analyses, and the untransformed variable for the descriptive statistics.

2.1.1.2 Firm Performance

In the third essay, the firm performance is the pivotal dependent variable of the second stage regression (chapter 4).

In the existing literature on the performance effects of ownership concentration, both market- and accounting-based measures have been frequently used. Both types of measures have different advantages, disadvantages, and meanings, and thus, might have different implications for the ownership concentration and firm performance relationship.¹²

Accounting-based measures, on the one hand, provide a past-oriented view on the firm performance, are subject to artifacts and distortion caused by differences in accounting systems, and can be easily manipulated by the management. Furthermore, accounting based measures tend to undervalue firms as intangible assets are only partly taken into account. Market-based measures, on the other hand, provide a view on the anticipated

¹²See Table 37 for an overview of the applied performance measures.

future performance of a firm, and are affected by the psychological and behavioral aspects of investors and the general economic environment, and so are subject to forces beyond management control.

Neither purely market nor accounting based is Tobin's Q, which is one of the most frequently used performance measures in the ownership literature. Tobin's Q is calculated by the market value of a firm divided by the replacement value of the assets (mostly approximated by the total assets of a firm).¹³ Tobin's Q has the advantage of combining the past-oriented view of the accounting profits with the future-oriented view of the market based measures, but it also catches the distortions and caveats of both types of performance measures (Demsetz & Villalonga, 2001; Richard, Devinney, Yip, & Johnson, 2009; Sanchez-Ballesta & Garcia-Meca, 2007).

Despite the different characteristics of the alternative performance measures, accounting-based and market-based performance measures are typically closely linked and, considering a certain time lag, are fairly highly correlated, as confirmed by Table 2.¹⁴ Furthermore, investors do not ignore the past performance, that is, the accounting measures, when evaluating investment opportunities (Demsetz & Villalonga, 2001).

Table 2: Correlation of *tobinsq5yr* and *roa5yr*

	<i>tobinsq5yr</i>	<i>roa5yr</i>
<i>tobinsq5yr</i>	1	
<i>roa5yr</i>	0.65***	1.00
* $p < 0.10$	** $p < 0.05$	*** $p < 0.01$

In the subsequent analyses, I will use two different types of performance measures to test the results of the analyses for robustness: Tobin's Q (*tobinsq5yr*), as a combination of market and accounting based measures, and return on assets (*roa5yr*) as a purely accounting based measure. To account for unsystematic variances and to alleviate one-time effects, I use the average of the last five years (2003–2007).

¹³See Table 37 for an overview of the applied performance measures.

¹⁴Calculations at this point are based on the Initial Sample as illustrated in the subsequent chapters.

2.1.2 Independent Variables

In the subsequent essays, I distinguish between firm-, industry-, and country-level determinants and variables, described in the three following subchapters.

2.1.2.1 Firm-Level Variables

At the firm-level, I measure three different independent variables, namely the size-, risk- and performance of a firm.

With the variable *logmarketcap* I measure the size of a firm by the logarithm of the total market capitalization at the end of 2007. In contrast to Demsetz and Villalonga (2001), I do not use the total assets as a measure of firm size, as I argue that the stock market value of a firm is the much more important characteristic for potential owners than the total assets, which do not necessarily correlate perfectly with the stock market value. To account for the decreasing effect of extraordinary high market capitalization on ownership concentration, I use the logarithm of the total market capitalization as the final measure.

To measure the risk of a firm, I use the variables *risk* and *risk_sqr*. As suggested by Thomsen and Pedersen (2000), I measure the sensitivity of a firm's stock price compared to the movement of an underlying index as risk measure. The sensitivity is calculated by the slope of a regression of the weekly stock market prices on a market portfolio over one year (2007) (Demsetz & Villalonga, 2001). To account for a potential curvilinear effect, I also include the variable *risk_sqr*, containing the squared value of *risk*.

In the third essay (chapter 4), I do not only use the firm performance as dependent variable, as described above, but also as an independent variable. Since the same variable cannot be used in both stages of the 2SLS, I had to choose a different performance measure than Tobin's Q and return on assets. Thus, I use the logarithm of the five-year average of the earnings before interests (EBIT), taxes, depreciation, and amortization (*logebit5yr*) as alternative measure. This measure is more robust to differences in accounting systems and influences by management than other accounting based performance measures due to the exclusion taxes and financing costs (Richard, et al., 2009). To account for the partly enormous EBITs of the most profitable companies, I use the logarithm to smoothen the effect of these outliers. As for the performance

measure as a dependent variable, I use the five-year average of the respective performance indicator (2003-2007).

2.1.2.2 Industry-Level Variables

At the industry-level, I measure the industry affiliation, industry regulation, industry competition, life cycle stage, information asymmetries, investments into intangible assets, and leverage.

In the subsequent essays, one essential measure is the industry affiliation of each company. The categorical variable *industry* captures the respective belonging. As measure for the industry, I use the two digit Standard Industrial Classification (SIC) code of the industry a company is primarily active in (according to Table 3).

Table 3: Coding of Variable *industry*

Industry	SIC codes	Industry variable
Agric, Forestry/Fishing	01-09	1
Mining	10-14	2
Construction	15-17	3
Manufacturing	20-39	4
Transportation	40-49	5
Retail / Wholesale	52-59	6
Finance, Insurance /Real Estate	60-67	7
Other Services	70-89	8
Public Admin	91-97	9

However, this measure comes along with the shortcoming that diversified firms will have a primary industry, but are actually doing business in several industries. Particularly in the samples I use, including exclusively the largest listed companies in a country, it is more than probable that the firms are highly diversified. Accordingly, the measure is rather a rough proxy for the industry affiliation of a company. A weighted measure would have been the much more precise assessment, for example, by sales, according to the extent a company is conducting business in different industries. Unfortunately, such a measure would have led to an extreme loss in observations due to the immense demand of data, and thus, could not be realized.

The measure of industry affiliation by means of the SIC codes has been frequently applied in existing ownership studies and has been shown to possess adequate

explanatory power (Ang & Cole, 2000; Bergh, 1995; Carlin & Mayer, 2003; Cho, 1998; Chung & Pruitt, 1996; Core & Larcker, 2002; Cui & Mak, 2002; Dai, 2007; D. J. Denis & Sarin, 1999; Douma, George, & Kabir, 2006; Leech & Leahy, 1991; Mak & Li, 2001; Maury, 2006; Mingfang & Simerly, 1998; Montgomery, 1982; Ramaswamy, 2001; Singh & Davidson Iii, 2003). Thus, in light of the wide acceptance of this measure, and additionally in default of an applicable alternative, I use the industry affiliation measure as described above in the subsequent essays.

I measure the industry regulation by the dummy variable *regulation*, which takes the value 1 (regulated) for SIC codes 60–67 (Financial Services), 49 (Utilities), and 0 (unregulated) for all other industries. This has been the method of choice of several publications in the ownership research (Thomsen & Pedersen, 1998; Van der Elst, 2004). Despite this measure has been frequently applied, it has several shortcomings, as for example, illustrated by Van der Elst (2004). First, the measure by means of a regulation dummy is rough at best, as it does not give indication about the type of extent of regulation. Second, the applied operationalization does not account for country differences in regulations. However, in due of a better alternative, as for example, an industry regulation index per country, and in the light of the wide acceptance of the applied measure, I rely on the previously illustrated method despite the presented shortcomings.

Within the scope of the second essay (chapter 3.5), I include the competition of an industry, the information asymmetries, and the life cycle stage of an industry in the analyses, following the suggestions by Thomsen and Pedersen (1998) for the measures.

Accordingly, the intensity of competition in an industry is represented by the variable *industrycompetition*, and captures the average profit margin (return on sales) in an industry (measured by the two digit SIC code) from 2003–2007. As suggested by Thomsen and Pedersen (1998), I argue that the profit margin in an industry decreases with an increase in competition and thus use the profit margin in the respective industry as a proxy for competition.

Due to the nature of the construct of information asymmetries, the level of asymmetries is hard to measure and can be approximated at best. I approximate the level of information asymmetries by the from 2003–2007 average research and development (R&D) expenses over sales ratio in an industry, which Aboody (2000) and Shastri and Clarke (2001) have confirmed as a representative proxy. According to the authors, the

higher the research intensity in an industry, the bigger the information asymmetries within the firms operating in the respective industry are, as the research and development efforts are hardly to monitor by the management due to the unforeseeable developments and the specific knowledge. The variable *industryrnd* represents this measure.

The stage of the life cycle of an industry is approximated by the average turnover growth in the industry from 2003–2007, which is captured by the variable *industrylifecycle*. According to Thomsen and Pedersen (1998), with an increasing maturity of an industry, the turnover growth will decrease. Thus, measuring the turnover growth will draw a picture of the maturity of an industry, whereas high turnover growth rates indicate a relatively young industry, with small growth rates indicating a relatively mature industry (Audretsch & Woolf, 1986).

I use the debt to asset ratio (*debttoassets*) to control for the leverage of a company and the according effects on the profitability of the firm, and thus, on the performance measures. The debt to assets ratio is calculated by the reported end of year total debts divided by total assets at the end of 2007 (Demsetz & Villalonga, 2001).

Furthermore, I use the investments into intangible assets to account for distortions in the accounting-based part of the performance measures. I measure the investments into intangible assets by the R&D over assets ratio, *rndtoassets*, as the R&D expenses are only partially / marginally activated due to restrictions of the accounting standards (Demsetz & Villalonga, 2001).

Also, I include the capital expenditure over assets ratio (*capextoassets*) to control for differences in performance measures caused by accounting artifacts stemming from the different methods and states of depreciation (Demsetz & Villalonga, 2001).

2.1.2.3 Country-Level Variables

At the country-level, I measure the country affiliation, the legal origin of a country, the level of shareholder protection, stock market development, and the uncertainty avoidance according to Hofstede (2001).

Similar to the measure of the industry affiliation, I determine the country of a firm by the location of a company's headquarters, which is captured by the variable *country*. This measure comes with the same issue as the industry measure, as companies might

be primarily registered in one country but are actually active in several countries. However, as in the case of the industry affiliation, most of the studies cited above for the industry affiliation widely also use the measure by means of the headquarters. Also, considering the availability of data an alternative, a more precise, weighted country measure is not available.

To account for country differences in terms of their legal background, I use the dummy variable *legalorigin*, taking the value 0 for countries with a common law background (the UK, the US, Australia, and Canada), 1 for countries with a German civil law background (Germany, Japan, and Brazil), and 2 for countries with a French civil law background (France and Italy).

To measure shareholder protection, I use the variable *shareholderprotection*, taking the value of one of the factors of the Economic Freedom Index by the Heritage Foundation (Kane, Holmes, & O'Grady, 2007). As there is no direct measure of the complex topic of shareholder protection, a proxy has to be used. One way is realized by the Heritage Foundation, which evaluates ten different measures of economic freedom for most of the existing countries annually. This shareholder protection index assesses the ability of individuals or institutions to accumulate private property, and how far laws go to protect private property of investors. Based on information from the Economist Intelligence Unit, Country Commerce, Country Profile, and Country Report, 2005 and 2006, US Department of Commerce, Country Commercial Guide, 2005 and 2006, and US Department of State, Country Reports on Human Rights Practices, 2005 and 2006, the index evaluates the shareholder protection between 0% (private property is outlawed and all property belongs to the state) and 100% (private property is guaranteed by the government, also for minority holders). The factor scores the degree to which a country's laws protect private property rights and the degree to which its government enforces those laws. It also assesses the likelihood that private property will be expropriated, and analyzes the independence of the judiciary, the existence of corruption within the judiciary, and the ability of individuals and businesses to enforce contracts. I use this assessment of the Economic Freedom Index 2007 to measure the level of shareholder protection for the country a firm is primary registered in (Kane, et al., 2007).

Furthermore, I measure the development of the stock market by the logarithm of the total turnover in 2007 of the biggest stock exchanges in the respective countries. The

variable *logstockmarket* takes the value for the respective country a firm is headquartered in (Thomsen & Pedersen, 1997).

To account for cultural differences, I use the uncertainty avoidance index, *uai*, as introduced by Hofstede (1980, 1991, 2001). The level of uncertainty avoidance in a country assesses how the people in the respective society cope and deal with uncertainty and ambiguity. Generally, the higher the uncertainty avoidance in a country, the more people tend to consider uncertain outcomes as undesirable and uncomfortable. This uncertainty avoidance index can take values between 0% and 100%, where 100% represents the highest uncertainty avoidance, and 0% the lowest.

2.2 Data

In the subsequent chapters, I describe the target population for the statistical analyses, how I collected the necessary data, and which respective databases I choose. Furthermore, I test the representatives of the initial dataset and describe the three subsamples used in the three essays.

2.2.1 Target Population and Method of Data Collection

To answer the previously formulated research question, two essential types of data had to be gathered: First, detailed information on the ownership structure of firms, and, second, various firm-, industry-, and country-characteristics, as illustrated in the previous sections.

To gain insights not only into differences between the ownership structures of firms, but also into industries and countries, a diverse international sample is required. In addition to that, as will be described in the individual essays, it is not only necessary that firms from different countries are included in the sample, but that the respective countries stem from different legal origins (common law, German civil law, and French civil law).

The total population eligible for the subsequent analyses would be all firms from any country. To collect the respective sample, different methods were considered, namely data collection via survey, interview, and existing ownership databases. However, due to the magnitude of the required sample and the sensitive type of information needed, I decided to use secondary data from existing ownership databases.

This collection method requires matching ownership information on firms with additional firm, industry, and country details stemming from different databases. The existing and available ownership databases typically provide detailed information on publicly listed firms from a variety of countries. The quality and availability of ownership information included in these databases is closely related to the size of the respective firm and the economic development of the respective country. Thus, for data availability reasons, I will, as for example, Thomsen and Pedersen (1999; 1996, 1997, 1998, 2000, 2003) did, focus on the largest publicly firms in the most economic developed countries. In addition to better data availability, focusing on these companies enhances the coverage of a country's economic activity (Thomsen & Pedersen, 1997). Moreover, Thomsen and Pedersen correctly point out that "more variation in ownership patterns [can be expected] for large [than for small] companies" (p. 766), which is consistent with the view of Faccio and Lang (2002) who indicate that "cross-country differences become less significant among small firms" (p. 381).

Unfortunately, the selected type of ownership information does not account for the issue of the separation of cash flow and control rights for some type of shares. As stated in the beginning, ownership is constituted by a set of two rights, namely cash flow and control rights. However, the distribution of control and cash flow rights can vary either by different classes of shares with different voting rights for given cash flow rights, or by pyramiding and chains of control (Faccio & Lang, 2002; Morck, et al., 2005). Whereas the chosen database provider tries to account for chains of control to a certain extent, the sample does not account for the differences between cash flow and control rights (dual-class shares). Accordingly, some of the owners included in the database might only possess cash flow rights without any right to control the firm. However, I argue that this will not affect the subsequent analysis in a substantial way, as the basic underlying ownership concept, considering costs and benefits of alternative form, holds true even if only parts of the potential costs and benefits are considered. Furthermore, for most countries, although becoming more and more popular, preferred stocks are relatively sparsely used and thus only a minor issue in my sample (Houston & Houston, 1990).

2.2.2 Initial Sample

To collect the respective sample from existing ownership databases, several database providers were available.

In terms of quality and availability of ownership information, I eventually decided to retrieve the ownership details from the ownership add-on of the Thomson One Banker (T1B).¹⁵ Similarly, company details were retrieved from the Thomson Datastream Advance (Datastream) and Thomson Worldscope database and merged with the ownership data. The composition of the sample followed a multi-step process described as follows.

In a first step, I confined the sample to firms from the ten largest economies by the size of their gross domestic product (GDP) in 2007: Australia, Brazil, Canada, France, Germany, Italy, Japan, Spain, the United Kingdom (UK), and the United States (US). Due to data unavailability, the inclusion of further countries (e.g., China, Russia, or India) would not have contributed to the quality of the sample and were excluded. On the one hand, the selection of these countries ensures the availability of the ownership information, and, on the other, provides more than two countries of each legal origin. For each of these ten countries, I sought to collect ownership information on the 150 largest (by turnover as of December 2007) publicly listed companies contained in the database.

In a second step, I cleaned the dataset from observations with missing or unreliable information. I deleted firms without any available information about their ownership structure from the sample, eliminating 22 of 1,500 firms.

Subsequently, for 12 firms, the identified owners held more than 100% of a firm. By comparing the identified ownership shares in 2007 with the previous and following year (2006 and 2008), I was able to correct for several issues caused by comma splices. However, for six firms, I was not able to identify the problem and consequently deleted them from the sample.

Afterwards, 19 firms with no clear indication of their primary industry or headquarters were deleted.

Lastly, double listings, that is, firms listed on more than one stock exchange, were deleted from the sample, keeping only the listing in the country the firm is headquartered in. This process led to losing another 41 firms from eight different countries, resulting in an overall population of 1,412 firms from ten countries. Table 4

¹⁵For a more detailed discussion regarding the quality and representativeness of the data, refer to section 2.2.3.

shows the number of firms per country included in the initial sample. Due to the data cleaning process, 13 firms from Brazil, 32 firms from Italy, and 43 firms from Spain dropped out of the sample.

Table 4: Observations per Country in the Initial Sample

Country	Australia	Brazil	Canada	France	Germany	Italy	Japan	Spain	UK	USA
N	150	137	150	150	150	118	150	107	150	150

Table 5 provides basic descriptive statistics of the initial sample and shows that on average, the five top owners own 42% of a firm. The median is lower than the mean, indicating outliers with a relatively high level of ownership concentration. The skewness and kurtosis show that the distribution differs from the normal distribution.

Table 5: Descriptive Statistics of *cr5* in the Initial Sample

N	Mean	Median	Skewness	Kurtosis
1,412	41.62	35.43	0.55	2.31

Table 6 and Table 7 provide further descriptive statistics of the ownership concentration variable *cr5* by industries and countries. The statistics show a fairly high variance in ownership concentration between both industries and countries. For the countries, the US and Japan are, at 24.71% and 24.75% respectively, similarly concentrated and have the lowest ownership concentration of the countries. Italy and Spain turn out to have the highest ownership concentration in the sample at 57.29% and 59.13% average holdings, respectively. For each country, firms with low (below 10%) and high (>60%) levels of ownership concentration are included in the sample.

For the industries, Mining turns out to have the lowest ownership concentration at 38.88% on average, and Construction, at 51.89%, the highest level of ownership concentration. However, the spread between the industries is not as high as between the countries. Similar to the countries though, firms with high and low levels of ownership concentration are present in all industries.

Table 6: Descriptive Statistics of *cr5* by *country* in the Initial Sample

Country	N	mean	min	max	sd
Japan	150	24.75	1.01	67.81	14.23
United-States	150	24.71	0.94	72.17	9.93
United-Kingdom	150	32.47	8.90	77.01	12.79
Canada	150	34.61	1.49	93.09	20.70
Australia	150	38.31	0.75	96.27	20.99
Germany	150	48.51	1.02	99.75	27.49
Brazil	137	51.24	0.94	100.00	28.72
France	150	54.41	1.42	99.87	26.07
Italy	118	57.29	0.12	98.22	19.56
Spain	107	59.13	8.24	99.34	19.43
Total	1,412	41.62	0.12	100.00	24.15

Table 7: Descriptive Statistics of *cr5* by *industry* in the Initial Sample

Industry	N	mean	min	max	sd
Mining	85	38.88	7.53	97.69	24.12
Finance,Insurance, Real-Estate	240	39.09	0.75	99.97	26.43
Manufacturing	517	40.64	1.35	99.75	22.87
Retail/Wholesale	171	41.40	0.94	98.24	23.75
Transportation	215	42.75	0.12	100.00	26.54
Services	123	44.66	4.58	94.02	20.93
Construction	41	51.89	10.89	97.23	23.80
Total	1,392	41.37	0.12	100.00	24.23

Figure 5 illustrates the distribution of the ownership measure *cr5* over the total sample and underlines the findings of the descriptive statistics by showing that the distribution is right / positively skewed, has a relatively high peak with fat tails, and differs from the normal distribution.¹⁶

¹⁶Refer to chapter 2.1 for a description of the measure of ownership concentration.

Figure 5: Distribution of *cr5* in the Initial Sample

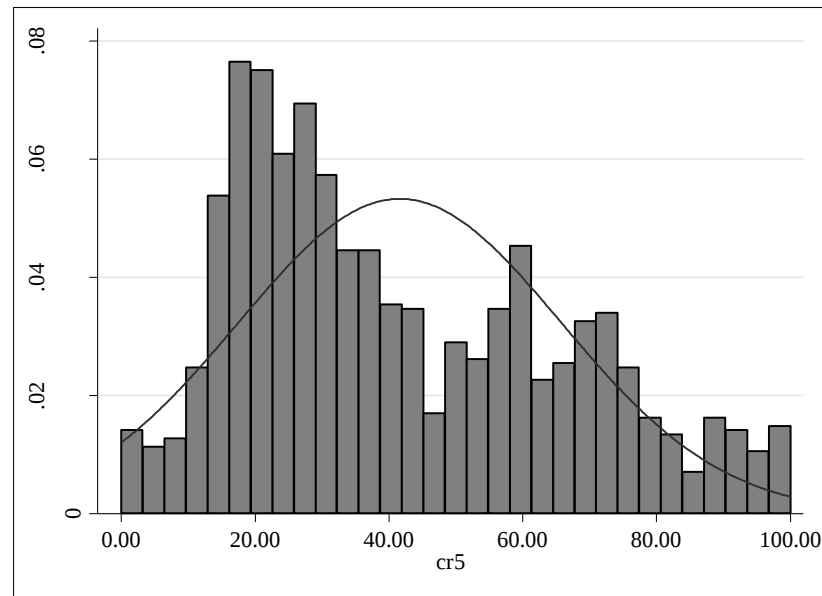
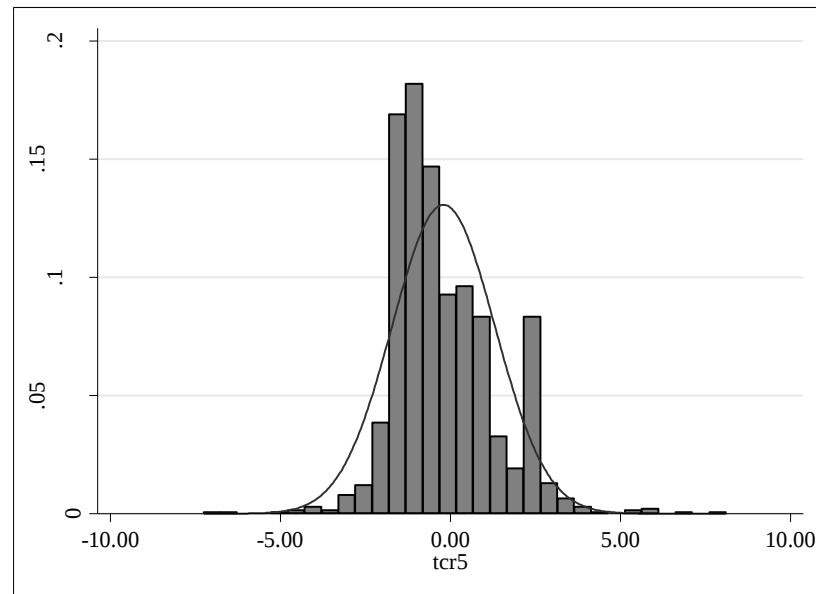


Figure 6 illustrates the distribution of the transformed ownership concentration measure *tcr5*. As the comparison with the in the in graphic integrated Gaussian function shows, is the transformed ownership measure much closer to the normal distribution than the untransformed ownership measure. However, being right skewed and high peaked, the histogram shows the same characteristics as the original ownership measure. Accordingly, as suggested by Figure 5 and 6, a Shapiro-Wilk-Test (SW-Test) and a Skewness-Kurtosis-Test (SK-Test) for normality clearly reject the null-hypothesis on a 0.01 significance level that either measure of ownership concentration is normally distributed (see Table A - 1 and Table A - 2 in the appendix).

Figure 6: Distribution of *tcr5* in the Initial Sample

The three individual essays require a different amount of additional information / variables, resulting in different subsamples of this initial dataset. I describe this additional data collection process and the respective resulting subsamples in section 2.2.4.

2.2.3 Representativeness of the Ownership Data

Several database providers offer ownership information of firms. For reasons of availability, quality, and representativeness, I eventually used the relatively new Ownership Add-on of the T1B.

The T1B ownership data combine and are retrieved from a variety of different sources. For institutional owners, these sources include official filings, mutual fund reports, and shareholder reports. The majority of the mutual fund data is sourced directly from the institutions with which Thomson Reuters has established lasting working relationships over the years. Ownership information is also sourced via stock exchanges and official regulatory bodies. For substantial and declarable stakes, the ownership data is also sourced from annual and interim reports, stock exchanges, official regulatory bodies, third-party data vendors, company websites, news sources, and through direct contact (via email and telephone) with established contacts at company investor relations

departments.¹⁷ The combination of the various sources should ensure a decent, and by other databases unmatched coverage of the ownership structure of the firms included in the database.

To my knowledge, the T1B ownership database itself has not yet been tested for reliability and representativeness. However, according to Thomson Financial, the ownership information provided in the T1B Ownership add-on is widely congruent with the discontinued Thomson “Compact Disclosure” and “Spectrum” databases, and similar methods are used to collect the ownership details. Thus, I use existing studies accessing the reliability of the data available in the Compact Disclosure and Spectrum database as a proxy for the T1B data.

Two studies by Kole (1995) and Anderson and Lee (1997) have analyzed various sources ownership sources, also including Compact Disclosure and Spectrum. However, the studies by Kole, Anderson and Lee focused solely on the management holdings of firms, and thus, possess limited explanatory power for the overall ownership data available in the T1B.

Kole (1995) tests three different sources of ownership data used in various papers, proxy statements, Corporate Data Exchange Volumes, and the Value Line Survey, and concludes that each of them is equally well suited for ownership research and that the nature of the database does not influence the statistical analyses.

When testing the managerial ownership information available in the Compact Disclosure, Value Line Survey, Corporate Text, and Spectrum, Anderson and Lee (1997) come to a different conclusion. They actually do find qualitative differences between the alternative data sources. Whereas they rate the Compact Disclosure data second and highly reliable, they find certain differences in the managerial holdings among a few databases, including Spectrum. Anderson and Lee base their results on the finding that they were not able to reproduce the curvilinear effect of management holdings on performance measures as Tobin’s Q, as proposed by McConnell and Servaes (1990). I argue, however, that this finding provides only weak evidence that the

¹⁷Information according to Thomson Customer Support. Table A - 3 provides a more detailed description of the data included in the ownership data. The illustration, however, is only exemplary and mainly includes detailed descriptions of the respective US SEC and UK RNS filings. The actual ownership data included in the database goes far beyond the listed sources.

data might not be representative. First, as illustrated in the literature review of the third essay in this thesis, the effects of ownership concentration on performance are far from consistent and the study of McConnell and Servaes is one of plenty studies, many of which yield conflicting results. Second, contrary to Anderson and Lee, I was able to reconstruct several effects of the existing ownership research, as you will see in the subsequent essays.

Furthermore, comparing my ownership data with existing studies using alternative sources, no reason is provided to doubt the representativeness of the ownership data available in the T1B. Table 8 shows the average ownership concentration of *cr3*, summing up the percental ownership rights held by the top three owners of the initial dataset and the data used in the seminal work of LLSV (1998).¹⁸

Table 8: Comparison of the Ownership Data with La Porta, et al (1998)

	CR3 (Mean) This Study	CR3 (Mean) La Porta et al (1998)
United-States	22	20
Japan	22	18
United Kingdom	27	19
Canada	32	40
Australia	35	28
Germany	44	48
Brazil	46	57
France	51	34
Italy	52	58
Spain	53	51

Despite the studies by LLSV (1998) being published over ten years ago, and thus the ownership data is even older, and although they only analyzed the ten largest firms in each country and excluded financial companies, the average ownership concentration of the top three owners is remarkably similar to the data used in this study.

Similarly, the ownership data gathered in 1999 for Van der Elst's (2004) study basically shows the same characteristics for those countries in common with this thesis (Table 9).

¹⁸Unfortunately, LLSV (1998) do not precisely mention their data source.

Table 9: Comparison of the Ownership Data with Van der Elst (2004)

	HHI (Mean) This Study	HHI (Mean) Van der Elst (2004)
United-States	350	402
United Kingdom	524	736
Germany	1,956	3,062
France	2,420	3,518
Spain	2,296	2,409
Italy	2,290	2,973

Although the differences between the two data sets are slightly higher than in the first comparison, in general, the countries show the same characteristics – that is, whether countries have typically a high or a low ownership concentration relative to each other. The change in ownership concentration in the last ten years and the number of the identified owners might explain the slight differences. As mentioned above, I could identify, on average, 60% of the owners of a firm. However, Van der Elst (2004) might have been able to identify more owners, which would have led to a higher HHI, explaining the higher values for all countries.

Summing up, the T1B Ownership-Add on appears to provide high quality and representative ownership data. Comparing the initial sample with the data of two existing studies shows only minor differences. These might be explained by that the data in the other studies were gathered over ten years ago and that different kinds of data were collected (only the ten largest firms, no financial companies). Furthermore, although not specifically testing the T1B and focusing solely on managerial holdings, the study by Kole (1995) does not find significant differences between alternative ownership sources. Still, Anderson and Lee (1997) mention discrepancies in managerial holdings among different sources. However, I argue that these findings provide only weak evidence and that they are not necessarily transferrable from managerial holdings to the complete ownership structure. In addition, I could not confirm the limitations brought forward by Anderson and Lee, since I was able to reproduce the results of existing studies, as you will see within the scope of this thesis. Furthermore, according to the Thomson Customer Support, the introduction of the T1B has further improved the quality of the ownership data. In addition, several existing studies in the ownership area rely on the Compact Disclosure and Spectrum databases for their analyses, yielding robust results (Asquith, Pathak, & Ritter, 2005; Bergh, 1995; Brush, Bromiley, &

Hendrickx, 2000; Cheung & Wei, 2006; Cornett, Marcus, Saunders, & Tehranian, 2007; Duggal & Millar, 1999; Gaspar & Massa, 2007; Holderness, Kroszner, & Sheehan, 1999; Holderness & Sheehan, 1988; Sias, Starks, & Titman, 2006; Thomsen & Pedersen, 2000).

2.2.4 Subsamples

Compared to the initial sample described above, the actual samples analyzed within the scope of the three individual essays vary due to different requirements in terms of variables. In the following section, I describe the samples used in the three essays and provide descriptive statistics.

2.2.4.1 Sample of the First Essay

In the first individual essay, the statistical analyses do not require additional information – and thus variables – than those included in the initial sample. Table 4 shows that the number of firms per country was reduced for Brazilian, Italian, and Spanish firms within the process of the data cleaning, as described for the initial sample. For Brazil and Italy, the number of missing firms is hardly significant and mediocre, respectively. In Spain, however, the number of firms per country was reduced by almost 30%. Accordingly, to ensure the comparability between the countries, Spain dropped out of the sample, resulting in a final sample for the first essay of nine countries and 1,305 firms. Table 10 shows the final distribution of firms per country in the first sample.

Table 10: Observations per Country in the First Sample

Country	Australia	Brazil	Canada	France	Germany	Italy	Japan	UK	USA
N	150	137	150	150	150	118	150	150	150

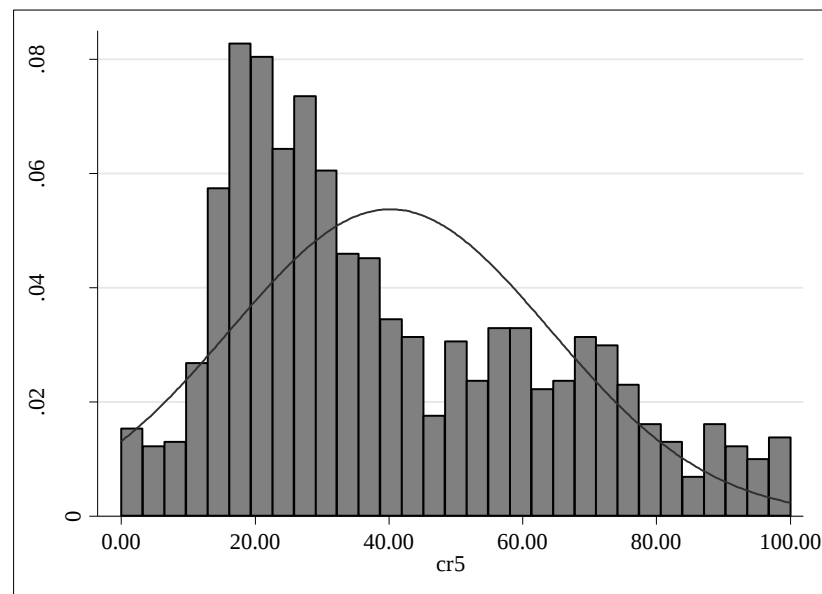
Table 11 provides basic descriptive statistics, which differ only slightly from the initial sample. Compared to the initial sample, only Spain dropped out of the sample, which is why the first sample has a similar mean and median ownership concentration as the initial sample and the distribution is similarly skewed and peaked. Figure 7 graphically illustrates the distribution of the ownership variable *cr5*. Again, the distribution is quite comparable to the one from the initial sample (Figure 5 and Figure 6). The distribution is right / positively skewed, has fat tails, and thus, differs from the normal distribution.

For further descriptive statistics of this sample, please refer to the respective section of the first essay (section 3.4.4.1).

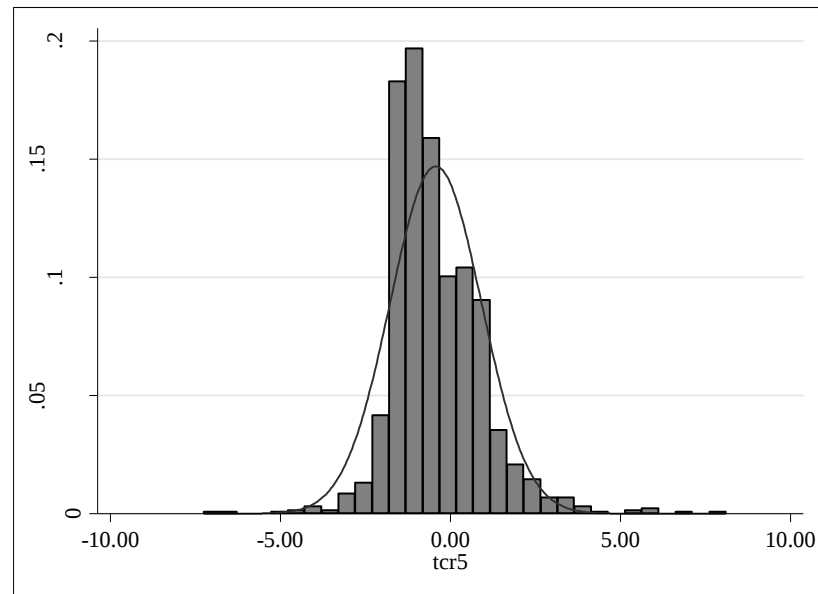
Table 11: Descriptive Statistics of *cr5* in the First Sample

N	Mean	Median	Skewness	Kurtosis
1,305	40.18	33.28	0.65	2.45

Figure 7: Distribution of *cr5* in the First Sample



As for the initial data set, Figure 8 illustrates the distribution of the transformed ownership concentration measure. Although the distribution of *tcr5* for this first sample appears to be closer to the normal distribution than the initial sample, it still differs significantly. Again, a SW-Test and a SK-Test for normality clearly reject the null-hypothesis of normality on a 0.01 significance level for both *cr5* and *tcr5* (see Table A - 1 and Table A - 2 in the appendix).

Figure 8: Distribution of *tcr5* in the First Sample

An analysis of variance (ANOVA) between the initial and the first sample, as reported in Table 12, shows that the sample of the first essay is, in terms of ownership concentration, with a p-Value of 0.12, not significantly different from the initial sample. Accordingly, the representativeness of the ownership data should be ensured.¹⁹

Table 12: ANOVA of *cr5* in the First and Initial Sample

Number of Observations		2717	R-Squared		0.001
Root MSE		24.048	Adj. R-Squared		0.001
Source	Partial SS	df	MS	F	Prob > F
Model	1397.43	1	1397.43	2.42	0.1202
sample	1397.43	1	1397.43	2.42	0.1202
Residual	1570112.26	2715	578.31		
Total	1571509.69	2716	578.61		

2.2.4.2 Sample of the Second Essay

For the second essay, also dealing with the determination of the level of ownership concentration, I used the first sample as a starting point. However, the statistical analyses required more variables than in the first essay.

¹⁹The results of the ANOVA were robust to using either *tcr5* or *cr5*.

Adding the necessary company, industry, and country details to the data set resulted in a significant reduction in observations per country due to the unavailability of the respective data for several companies. Including the additional information in the dataset and merging them with the respective ownership information led to the number of firms per country in Australia, Brazil, France, and Italy dropping close to 100. Accordingly, to ensure comparability amongst the countries, I restricted the sample to the 100 largest firms with complete information, leading to a final sample of 900 firms from nine countries for the second essay. Table 13 illustrates the observations per country in this sample.

Table 13: Observations per Country in the Second Sample

Country	Australia	Brazil	Canada	France	Germany	Italy	Japan	UK	USA
N	100	100	100	100	100	100	100	100	100

Figure 9 illustrates the distribution of this subsample, and Table 14 provides basic descriptive statistics. Both the mean and median of the second sample are slightly lower than in the first and the initial sample. The distribution is more right skewed and higher peaked than the previous samples. However, the distribution clearly shows the same characteristics as the two previously illustrated samples and differs from the normal distribution. For further descriptive statistics of this sample, please refer to the respective chapter of the second essay (section 3.5.4.1).

Table 14: Descriptive Statistics of *cr5* in the Second Sample

N	Mean	Median	Skewness	Kurtosis
900	38.71	30.98	0.73	2.51

Figure 9: Distribution of *cr5* in the Second Sample

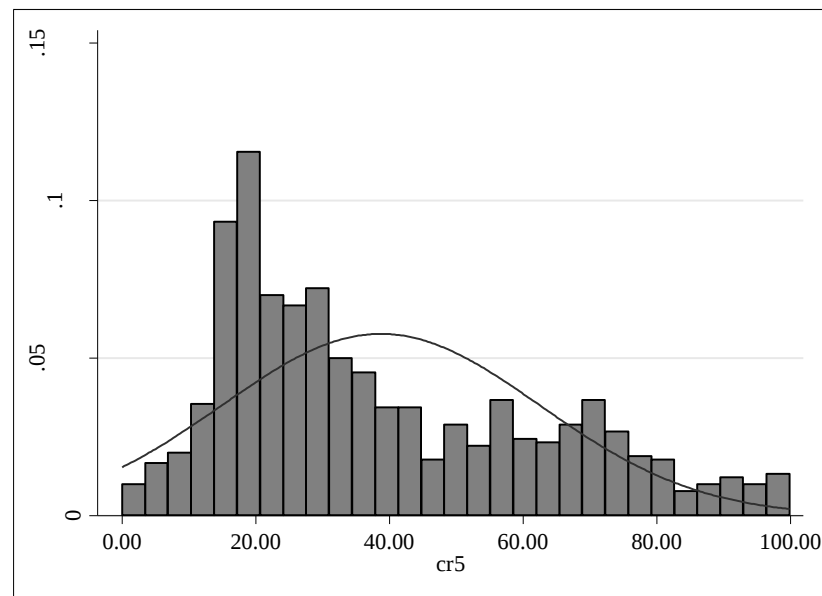
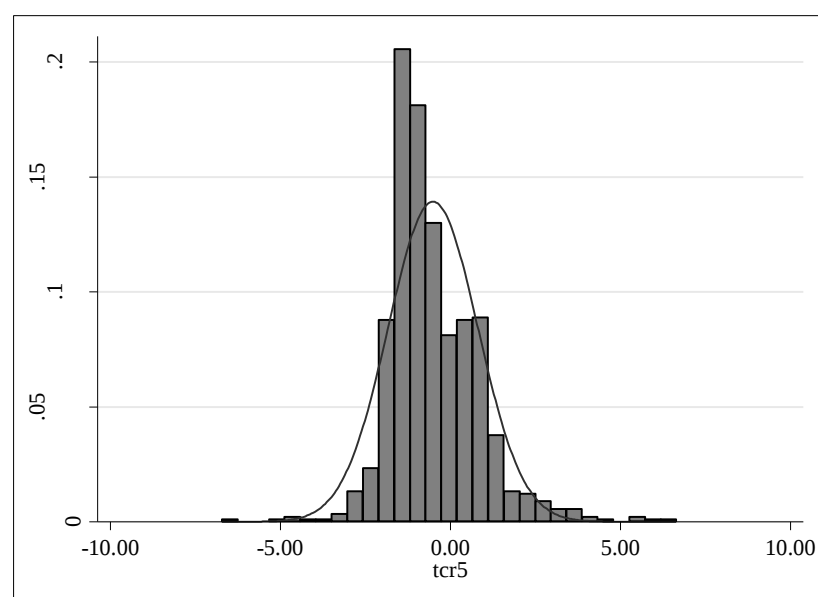


Figure 10 shows the distribution of the transformed ownership concentration measure for the sample of the second essay. As this sample was based on the first sample, the histogram unsurprisingly draws a similar distribution as for the first sample and the SW- and SK-Tests for normality reject normality on a 0.01 significance for both measures of ownership concentration (see Table A - 1 and Table A - 2 in the appendix).

Figure 10: Distribution of *tcr5* in the Second Sample



According to Table 15, which shows the results of an ANOVA of the ownership concentration between the initial sample and the sample of the second essay, with a p-value of 0.15 there is no systematic difference between this sample and the initial sample.²⁰

Table 15: ANOVA of *cr5* in the Second and Initial Sample

Number of Observations		2312	R-Squared	0.001	
Root MSE		23,885	Adj. R-Squared	0.001	
Source	Partial SS	df	MS	F	Prob > F
Model	1156.00	1	1156.00	2.03	0.1547
sample	1156.00	1	1156.00	2.03	0.1547
Residual	1256796.80	2310	570.49		
Total	1256952.80	2311	570.76		

2.2.4.3 Sample of the Third Essay

For the third essay, dealing with the performance effects of ownership concentration, the initial sample was used as starting point. However, as in the case of the second essay, several additional company details were necessary and added to the data set. Unlike the second essay, the third essay required the inclusion of various performance indicators for several years, which turned out to be particularly problematic in terms of data availability. In this process, compared to the initial sample, the number of firms for Australia and Italy dropped by 69 and 78, respectively, and thus I had to exclude both countries from the sample. Additionally, 36 firms from Brazil, and 29 firms from France had to be deleted due to missing information. Accordingly, Spain, Brazil, and France have significantly less firms per country. Thus, not to further decrease the number of total firms included in this sample, I decided to keep these three countries in the sample despite the lower number of firms. Dropping Spain, Brazil, and France from the sample particularly would have caused issues in terms of legal origin, as no country would have been left to represent the French civil law. The process led to a final sample of 1,079 firms from eight countries. Table 16 illustrates the composition of this data set.

²⁰The results of the ANOVA were robust to using either *tcr5* or *cr5*.

Table 16: Observations per Country in the Third Sample

Country	Brazil	Canada	France	Germany	Japan	Spain	UK	USA
N	101	150	121	150	150	107	150	150

Table 17 and Figure 11 provide basic descriptive statistics of the third essay and illustrate the distribution of the ownership concentration. The mean of 40% and the median of 35% are almost equal to those of the initial and first sample, and the right skewed and high peaked distribution is close to the one from the second subsample. For further descriptive statistics of this sample, please refer to the respective section of the first essay (section 4.5.1).

Table 17: Descriptive Statistics of *cr5* in the Third Sample

N	Mean	Median	Skewness	Kurtosis
1,079	40.41	34.52	0.75	2.74

Figure 11: Distribution of *cr5* in the Third Sample

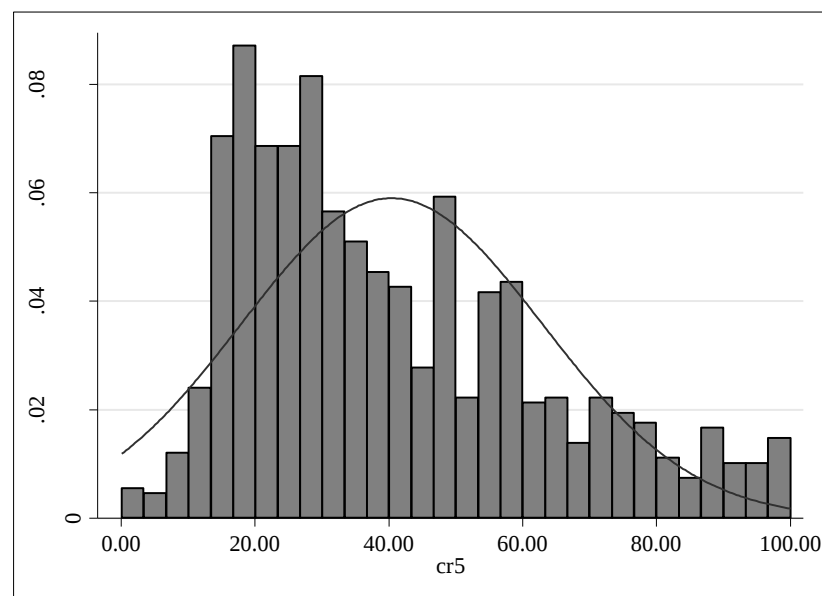
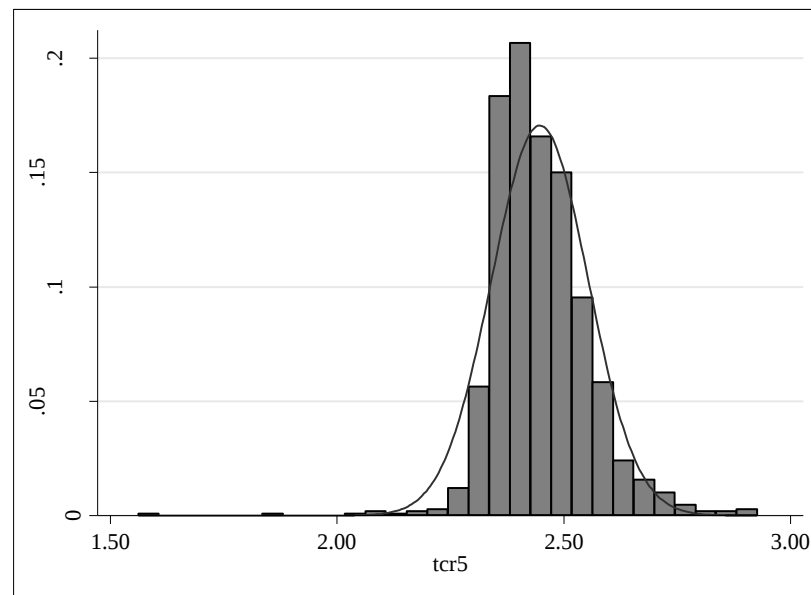


Figure 12 shows the distribution of *tcr5* for the sample of the third essay, which, so far, is the closest approximation to a normal distribution. However, the SW- and SK-Test for normality reject normality on a 0.01 significance for both measures of ownership concentration, still (see Table A - 1 and Table A - 2 in the appendix).

Figure 12: Distribution of *tcr5* in the Third Sample



As suggested by the descriptive statistics, according to an ANOVA, the sample of the third essay is not significantly different from the initial sample in terms of ownership concentration (Table 18).²¹

Table 18: ANOVA of *cr5* in the Third and Initial Sample

Number of Observations		2491	R-Squared	0.001	
Root MSE		23.45	Adj. R-Squared	0.000	
Source	Partial SS	df	MS	F	Prob > F
Model	889,221	1	889,221	1.62	0.2038
sample	889,221	1	889,221	1.62	0.2038
Residual	1369798.43	2498	550,340		
Total	1370687.65	2490	550.48		

²¹The results of the ANOVA were robust to using either *tcr5* or *cr5*.

3 DETERMINANTS OF OWNERSHIP CONCENTRATION

In this chapter, I address the first two research questions dealing with the determination of the level of ownership concentration of firms. In chapter 3.1, I provide an introduction into the field, and section 3.2 reviews the literature on firm-, industry-, and country-level determinants. Subsequently, I address the first research question dealing with the relative importance of the industry- and country-level in chapter 3.4, and the second research question, identifying the key drivers of ownership concentration and their explanatory power, in chapter 3.5.

3.1 Introduction

In the current ownership research, it appears commonly accepted that the ownership structure of firms, and so the level of ownership concentration, is endogenously determined following economics laws. Several studies, such as Demsetz and Lehn (1985), Thomsen and Pedersen (1999), and Demsetz and Villalonga (2001), yielded respective results that for the determination of the ownership structure of a firm costs and benefits are considered, resulting in an equilibrium structure. Demsetz and Lehn set the cornerstone in the search for the key drivers identifying factors influencing this equilibrium, leading to a higher or lower level of ownership concentration.

In the last 25 years of research on the drivers of ownership concentration, several studies have shown that the level of concentration, despite being a firm-specific factor, is not only influenced by firm-level, but also by industry- and country-level factors. Specifically, in their seminal work Demsetz and Lehn (1985) showed theoretically and empirically that the firm size, firm risk, and industry regulation influence the ownership concentration of a firm. Whereas Demsetz and Lehn focused mainly on the firm-level, Thomsen and Pedersen (1998) and Van der Elst (2004) identified exclusively industry-level drivers of ownership concentration, namely industry firm size, industry risk, and regulation. A third stream of research, spearheaded by LLSV (1998) and La Porta, et al. (1999), focused on country-level determinants of ownership concentration and reasoned that via the shareholder protection, the origin of a country's law influences the ownership concentration.

Despite the progress in the research of the determinants of ownership concentration, several questions remain unanswered. Whereas many studies include firm-level

determinants in their analyses, relatively few studies analyzed the industry-level and / or the country-level. Additionally, most of the studies focus only on one of these levels, disregarding a potential interaction of the different groups of determinants.

This gap in the existing research raises a question about the theoretical foundation of the existing ownership frameworks. Most studies focusing on the firm- and industry-level rely on the concepts developed by Demsetz and Lehn (1985), which is widely based on agency theory. With the insights gained from studies, such as Van der Elst (2004) and LLSV (1998), the institutional economics perspective gained constantly more importance. However, due to the wide default of studies combining both views, comparative assessments of both theoretical approaches are largely missing. In the two subsequent essays, I analyze the determinants of ownership concentration and simultaneously account for firm-, industry-, and country- level differences and their interrelation.

3.2 Theory & Literature Review

In the following section, I provide a review on the theoretical arguments and empirical results of existing studies analyzing firm-, industry-, and country-level determinants.

3.2.1 Firm-Level Determinants

The seminal study of Demsetz and Lehn (1985) focuses mainly on firm-level determinants of ownership concentration. The authors identify the risk and the size of a firm as the key drivers of ownership concentration.

According to Demsetz and Lehn (1985), a firm's risk has a curvilinear, inverted-u-shaped effect on the level of ownership concentration. With respect to the risk of a firm, Demsetz and Lehn (1985) propose on the basis of two considerations that risk has a curvilinear, bell-shaped effect on ownership concentration. First, they argue that relatively large ownership stakes provide incentives for blockholders to monitor the firm and its management (Alchian & Demsetz, 1972; Berle & Means, 1932). Equalling risk with volatility, the benefits of monitoring the management should be higher the more volatile a business is, as a high volatility necessitates frequent decisions and changes by the management. Thus, firms with a higher firm-specific risk favor a higher ownership concentration due to the increase in monitoring incentives.

Second, Demsetz and Lehn (1985) argue that at high levels, firm risk may have a decreasing effect on ownership concentration. The higher the risk of a firm, the smaller the stakes owners can acquire while maintaining optimal portfolio diversification. A suboptimal portfolio diversification leads either to decreased portfolio performance, or to costs connected with the reallocation of the assets in order to reestablish the optimal level of diversification. Therefore, increasing firm risk renders larger ownership stakes less attractive, resulting in a negative effect of firm risk on ownership concentration (Markowitz, 1952).

According to Demsetz and Lehn (1985), the marginal increase in monitoring incentives is relatively high at low risk-levels, but decreases with increasing risk. The marginal negative effect of risk on portfolio diversification is relatively small for low levels of risk, but rises with increasing risk. Therefore, at low risk levels, the ownership increasing effect of monitoring incentives will outweigh the decreasing effect of firm risk, whereas for higher risk levels, the opposite effect holds. Thus, on aggregate, the relationship between firm risk and ownership concentration is bell-shaped.

With regards to firm size, Demsetz and Lehn (1985) argue that the larger the size of a firm, the larger the investment required to obtain a particular fraction of equity. Increasing firm size will be associated with the acquisition of relatively smaller equity stakes by a greater number of investors, and hence with lower ownership concentration, for two reasons. First, acquiring a significant share in a large firm likely leads to a suboptimal portfolio diversification of the investor concerned. The investor will incur the resulting costs either in form of decreased portfolio performance or in form of transaction costs associated with reestablishing optimal diversification (Markowitz, 1952; Miles & Ezzell, 1980; Modigliani & Miller, 1963). Second, although an investor may use debt capital to acquire a given share in a firm, acquiring debt is connected with transaction costs and interest payments. These costs increase with the amount of debt necessary to leverage the acquisition of ownership stakes e.g., as debt providers may expect additional securities for the provision of larger amounts of debt (Leland & Toft, 1996). Both arguments support the hypothesis that, *ceteris paribus*, firm size should have a negative effect on ownership concentration. Testing their hypotheses on a sample

for 511 US firms, Demsetz and Lehn find significant evidence for both arguments discussed above.²²

Several authors have tested the hypotheses developed by Demsetz and Lehn (1985) in different settings and on alternative samples and have confirmed the results to a large extent. Bergstrom and Rydqvist (1990) confirmed the firm size and risk effects using a sample of about 600 Swedish, and Crespi-Cladera (1996) used panel-data of 193 Spanish firms and came to the same result. However, some studies yielded conflicting results. Gedajlovic (1993) found a significant firm-size effect using a sample of 500 Canadian firms. However, Gedajlovic did not find the predicted effect of firm-specific risk, which might be explained by the fact that he did not account for the potential curvilinearity of the relationship.

3.2.2 Industry-Level Determinants

In addition to the firm-specific factors, Demsetz and Lehn (1985) also investigated the regulation of an industry and argued that regulation has a negative effect on the level of ownership concentration. Demsetz and Lehn hypothesize that in the absence of regulation bigger ownership stakes ensure higher power of control for owners. Regulation, however, restricts the options available to owners and renders the benefits of majority ownership less attractive, and thus, as proposed by property rights theory, renders blockholdings less valuable (Coase, 1960; Demsetz, 1967). Accordingly, fewer owners will acquire blockholdings, which leads to a decrease in ownership concentration. Testing this hypothesis on a sample for 511 US firms, Demsetz and Lehn find significant evidence for their argument.

However, the effect of industry regulation on ownership concentration is disputable. Van der Elst (2004) argues that the industry effect varies between countries as the institutional conditions for the respective industries, for example the regulation, varies from country to country, and that the general conditions, as the possibility to accumulated private benefits in the light of the legal / corporate governance systems, are not the same in all countries either (Bebchuk, 1999). Using a sample of 2,204 European firms Van der Elst confirms his line of arguments and finds significant industry differences for some countries, and not significant differences for others.

²²For a more detailed theoretical elaboration on the effect of firm risk and firm size please refer to chapter 1.4.2.

Furthermore, whereas several other authors followed the suggestions of Demsetz and Lehn and tested and confirmed the initially developed hypotheses on alternative samples, others find contradicting results.

Bergstrom and Rydqvist (1990) confirm a significant negative effect of regulation on ownership concentration with a sample of 600 Swedish firms. Kole and Lehn (1999) analyze 22 years of the US airline industry after the Deregulation Act in 1978 and also find the predicted increase in ownership concentration after deregulation. Gedajlovic (1993), however, uses a sample of 500 Canadian firms and finds no statistically significant effect of industry regulation on ownership concentration. Similarly, Crespi-Cladera (1996) does not find an effect of regulation in 193 Spanish firms.

Aside from the regulation of an industry, Thomsen and Pedersen (1998) investigated the industry-level in detail and found further significant industry effects on ownership concentration. Using a sample of 1,200 European firms, Thomsen and Pedersen attribute the industry effect to the lifecycle stage of an industry, differences in information asymmetries between industries, and the intensity of competition.

Thomsen and Pedersen (1998) hypothesize that entrepreneurial ownership typically characterizes the early stages of an industry life cycle, that is, majority / highly concentrated ownership. Accordingly, the younger an industry is, the higher the ownership concentration is (DeJong, 1989; Mueller, 1972, 1988). In terms of information asymmetries, Thomsen and Pedersen hypothesize, in accordance with Zeckhouser and Pound (1990), that in R&D intensive industries the information asymmetries will be higher than in industries where R&D plays a less important role. R&D activities are typically hard to monitor as the progress and status is hardly to evaluate by not directly involved persons, such as the owners. Thus, the gain from larger ownership stakes in terms of increasing monitoring efficiency decreases with increasing research intensity, leading to a lower ownership concentration. Lastly, Thomsen and Pedersen propose that the intensity of competition is an industry inherent monitoring of the management of a company, and Frick (2004) argues that a higher competition enables the owners to monitor more efficiently by comparing the results of their firm with the competition. For both reasons a higher competition diminishes the agency problems of dispersed ownership. Accordingly, a high intensity of competition allows for a higher ownership dispersion (Nickel, Nilotisas, & Dryden, 1997; Stickney,

1993). Unfortunately, except for the study of Thomsen and Pedersen itself, no other study followed up on these hypotheses.

3.2.3 Country-Level Determinants

The youngest stream of research in the field of determinants of ownership concentration is the one dealing with the effect of country differences on the level of concentration. As one of the precursors in this field, Thomsen and Pedersen (1997) spearheaded the analysis. The authors reason that the degree of ownership concentration in a country is negatively correlated with the size of the stock market. They propose that companies in countries with well-developed stock markets search more financing via the stock market due to the decrease in capital costs. The better a stock market is developed, the stronger the decrease in capital costs is and the more firms will search financing via the stock market (Claessens, Klingebiel, & Schmukler, 2006). Going public itself will almost inevitably lead to higher ownership dispersion due to the significant increase in minority owners. Therefore, an increase in the probability for a firm seeking stock market financing will lead to higher ownership dispersion. Additionally, an important feedback loop further increases the effect. A higher stock market development leads to a disproportionate increase in investors compared to a relatively constant number of listed firms. The more investors participate in the stock market, the smaller the ownership shares of firms available for every owner. For both reasons, Thomsen and Pedersen propose a causal relationship from stock market size to ownership dispersion. Using a sample of 1,200 firms from 12 European countries, the authors find significant support for their hypothesis. Jong and Semenov (2006) followed up on the stock market hypothesis and also found confirmatory evidence.

Furthermore, in their seminal works LLSV (1999; 1998) argue that the legal origin of a country has a significant influence on the level of ownership concentration of a firm. LLSV find that countries with a common law background typically have a lower shareholder protection than countries with a civil law background, and that German civil law countries typically have a lower level of shareholder protection than French civil law countries.²³ According to Beck (2003a, 2003b), the shareholder protection is influenced by the legal origin, as common law countries adapt faster to their changing

²³Common law countries considered in this study: Australia, Canada, UK, and USA; German civil law countries considered in this study: Brazil, Germany, and Japan; French civil law countries considered in this study: France and Italy

environment than civil law countries do. According to Beck, common law – based on case law – adapts incrementally to meet the needs of the economy as they change over time. The civil law, however, based on codes and statutory texts, adapts significantly more slowly due to relatively infrequent revisions of the underlying concepts. Furthermore, whereas German civil law countries accepted the need for jurisprudence and designed the legal system to adapt incrementally, French civil law countries followed to a large extent the Napoleonic doctrine and thus refrained from interpreting the legal rules according to the development over time, but focused on applying the legal rules as they were. Accordingly, the authors argue that the protection of minority owners is a relatively new issue in terms of legislation, which is why the faster adapting common law countries will have integrated a better shareholder protection than the civil law countries, and that the French civil law countries possess a lower level of shareholder protection than the German civil law countries.²⁴ A high level of shareholder protection favors the rights of minority owners by protecting them from expropriation and strengthening their position to execute their ownership rights. Thus, the costs connected with the enforcement of minority owner rights decreases with an increase in shareholder protection. Accordingly, a higher level of shareholder protection renders small ownership rights more attractive and therefore leads to a lower level of ownership concentration (and vice versa).

LLSV (1998) successfully test their hypothesis on roughly 500 firms from 49 countries. La Porta, et al. (1999) confirm the negative effect of shareholder protection on ownership concentration using a sample containing up to 540 firms from 27 countries. Also, Faccio and Lang (2002) find similar results for 5,232 corporations from 13 Western European countries.

Despite the clear empirical evidence, the line of arguments brought forward by LLSV (1998, 1999), the legal origin hypothesis, is disputed (Braendle, 2006; Chirinko, Garretsen, Van Ees, & Sterken, 2004; Coffee, 1999, 2001a, 2001b). Braendle (2006) argues by a “convergence theory” that the effect of legal origin is not as distinct as assumed and has actually disappeared in the course of time; thus, different legal origins would never be able to influence shareholder protection and so the ownership concentration significantly. Also, Coffee (1999) doubts the findings of LLSV as the

²⁴For a detailed discussion see Armour, Deakin, Sarkar, Siems, & Singh (2009).

dispersed ownership arose in the US and UK in complete absence from what we know today as shareholder protection. Coffee even puts the consideration forward that the shareholder protection and ownership concentration relationship developed vice versa, that is, that first, the dispersed ownership structures emerged, and this, in a second step, led to the development of a corporate governance system with a strong protection for minority owners. Chirinko, et al. (2004) follow this idea and do not confirm an effect of shareholder protection on ownership concentration for the Netherlands. Unfortunately, all three authors fail to provide an alternative concept within their criticisms.

Using a different line of arguments than LLSV (1998; 1999), Roe (2004) provides an additional explanation for a similar country related effect on ownership concentration. According to Roe, the ownership concentration should be higher in Continental-European countries than in Anglo-American countries, which is largely congruent with the effect illustrated by LLSV (1998). Roe argues that in the Continental-European social democracies, the relatively strong influence by the states and employees might lead to suboptimal shareholder-value maximization. This calls for a higher influence of the shareholders on the company, realized by block holdings, leading to an overall higher ownership concentration. Roe argues that the influence of employees and politics on firms is lower in common law countries, allowing a more dispersed ownership structure. Except for the studies by Roe himself (Roe, 2004, 2006; Roe & Gordon, 2004), his approach has not been further investigated within the scope of the ownership literature. However, the empirical tests for the hypotheses brought forward by LLSV (1998) partly confirm the concept of Roe, as the legal origin of a country mostly coincides with the classification according to Roe.

Anyhow, even when focusing particularly on the Continental-European corporate landscape, Barca and Becht (2001) found significant differences in the median voting-block of the largest shareholder between the UK, Austria, Germany, and Italy. These results suggest that there must be even more to the country-level than predicted by the concept of Roe (2004), as his theory cannot explain these differences.

One additional country factor potentially explaining the so far unexplained country variance is analyzed by Jong and Semenov (2006), being the first study to analyze the effects of cultural differences on the level of ownership concentration. Jong and Semenov argue that the norms and values in a country, determined by its culture, determine the behavior of owners / investors, and by means of that, influence the

institutional environment in terms of legal framework and corporate governance, and so the level of ownership concentration.

The construct ‘culture’ is complex and hard to grasp and, as illustrated by Kim and Gray (2009), a variety of frameworks with different approaches have been developed. Jong and Semenov (2006) rely on the widely used cultural dimensions by Hofstede (1980, 1991, 2001).²⁵

Among the different dimensions introduced by Hofstede, according to Jong and Semenov, the level of uncertainty avoidance in a country²⁶ will have the most direct and thus strongest (positive) effect on the level of ownership concentration. In countries with a relatively high level of uncertainty avoidance, people feel more threatened by uncertainty and try to protect themselves against uncertain developments. In those countries, stock markets will be less developed, as more people will refrain from the uncertainty connected with investments into stocks, and the level of shareholder protection will be lower as the need for protection of the relatively few minority owners is not as high as in countries with more developed stock markets.²⁷ As argued above, a less developed stock market and a lower shareholder protection will lead to a higher level of ownership concentration, which is why Jong and Semenov predict the positive effect of uncertainty avoidance on ownership concentration. Jong and Semenov test the effect of uncertainty avoidance on ownership concentration with a sample containing the average ownership concentration of 27 countries and find confirmative evidence for their line of arguments.

²⁵Cf. Schwartz (1994, 2003), House, Hanges, Javidan, Dorfman, and Gupta (2004), and Kogut and Singh (1988) for alternative frameworks.

²⁶“The Uncertainty Avoidance Index (UAI) deals with a society’s tolerance for uncertainty and ambiguity; it ultimately refers to man’s search for Truth. It indicates to what extent a culture programs its members to feel either uncomfortable or comfortable in unstructured situations. Unstructured situations are novel, unknown, surprising, different from usual. Uncertainty avoiding cultures try to minimize the possibility of such situations by strict laws and rules, safety and security measures, and on the philosophical and religious level by a belief in absolute Truth; ‘there can only be one Truth and we have it. People in uncertainty avoiding countries are also more emotional, and motivated by inner nervous energy. The opposite type, uncertainty accepting cultures, are more tolerant of opinions different from what they are used to; they try to have as few rules as possible, and on the philosophical and religious level they are relativist and allow many currents to flow side by side. People within these cultures are more phlegmatic and contemplative, and not expected by their environment to express emotions” (Hofstede, 2001).

²⁷According to the discussion of LLSV and Braendle (2006), it remains unclear whether the size of a stock market influences the level of shareholder protection or vice versa.

3.3 Methodology

In the two subsequent essays, different econometric methods will be applied to answer the research questions.

In a first step, I use univariate statistics to describe the samples, illustrating the level of ownership concentration in the respective industries and countries. Afterwards, I apply analyses of variance (ANOVAs) to test the sample for significant differences in ownership concentration between various groups of firms, such as industries and countries. In a third step, I estimate hierarchical linear models (HLMs)²⁸, including fixed and random effects, to determine the significance of the individual determinants. Based on the estimations of the HLMs, I use variance decomposition techniques to assess the different models' explained variance.

Existing studies on the determinants of ownership concentration largely rely on ordinary least squares (OLS) regressions to evaluate the significance of the identified drivers. However, as soon as industry and country factors are included, OLS regressions do not account for the hierarchical / nested structure of the data. As standard errors of OLS regression coefficients are typically too small for clustered data, statistical significance tests of individual coefficients involving division by the standard error tend to exceed the level of Type I errors (alpha inflation). An intraclass correlation (ICC) as low as 0.01 or 0.05 can lead to significant distortion in estimation results of an OLS model, and the bias increases with ICC and sample size (Cohen, Cohen, West, & Aiken, 2002).

To account for the clustering of the data and to yield as unbiased results as possible, I use HLMs to address research questions one and two, determining the relative importance of the industry- and country-level and the key determinants of ownership concentration. For the first essay, a random-intercept model with two random intercepts will be estimated.²⁹ For the second essay, a fully-fledged HLM with two random intercepts and various covariates / fixed effects will be used.³⁰

Considering that I only included the largest firms of a country in the sample and taking the criticism of Holderness (2009) into account, the analyses of the largest firms might not be representative for smaller firms, and thus, the total population. Accordingly, I

²⁸Also referred to as hierarchical mixed model, depending on whether random and fixed effects are included or not.

²⁹Cf. section 3.4.3.

³⁰Cf. section 3.5.3.

refrain from generalizing the estimation results for the total population, and therefore use fixed effect models for the determinants of ownership concentration. With respect to the random intercepts, I argue that the average concentration per industry and country can vary from case to case, which is why I use random and not fixed intercepts in the models (Marchenko, 2006; Snijders & Bosker, 1999; Wooldrige, 2001).

To estimate the models, I use the Restricted Maximum Likelihood Method (REML), which provides more robust estimators than the Maximum Likelihood (ML) method, particularly when using an unbalanced dataset (different number of observations) per grouping variable (countries and firms) (Marchenko, 2006).

To determine the explained variance by the covariates, I use an established variance decomposition technique, similar to the one introduced by the discussion of Schmalensee (1985; 1989) and Rumelt (1991), to evaluate the importance of industries and business units for the performance of a firm. This method has been the variance decomposition technique of choice of several studies (Brush & Bromiley, 1997; Fitza, Matusik, & Mosakowski, 2009; Hawawini, Subramnian, & Verdin, 2003; Makino & Isobe, 2004; McGahan & Porter, 1997, 2002; Powell, 1996; Roquebert, Adrisani, & Philipps, 1996; Sea-Jin & Singh, 2000).

I follow the approach suggested by Snijders and Bosker (1999) and Rabe-Hesketh and Skrondal (2005) and use HLMs to calculate the respective Pseudo- R^2 to determine the explained variance by the respective variables. In OLS, the R^2 is approximated by the estimated residual variance of the null model minus the estimated residual variance of the full model divided by the estimated variance of the null model:³¹

$$R^2 = \frac{\sum_i (y_i - \bar{y})^2 - \sum_i (y_i - \hat{y})^2}{\sum_i (y_i - \bar{y})^2} \approx \frac{\hat{\sigma}_0^2 - \hat{\sigma}_1^2}{\hat{\sigma}_0^2}$$

For a random-intercept model, the residual variance is given by $Var(\zeta_j + \epsilon_{ij}) = \psi + \theta$, leading to the following calculation of the total R^2 by determining the proportional reduction in the estimated total variance by comparing the null model with the full model. $\hat{\psi}_0 + \hat{\theta}_0$ are the estimates for the null model, and $\hat{\psi}_1 + \hat{\theta}_1$ are the estimates for the full model to be evaluated:

³¹Example for a two level model with one random intercept.

$$R^2 = \frac{\hat{\Psi}_0 + \hat{\theta}_0 - (\hat{\Psi}_1 + \hat{\theta}_1)}{\hat{\Psi}_0 + \hat{\theta}_0}$$

As suggested by Raudenbusch and Bryk (2002), I consider the proportional reduction for each random intercept separately to determine the reduction in variance for the separate levels. Accordingly, it follows for a two level model:

$$R_2^2 = \frac{\hat{\Psi}_0 - \hat{\Psi}_1}{\hat{\Psi}_0} \quad and \quad R_1^2 = \frac{\hat{\theta}_0 - \hat{\theta}_1}{\hat{\theta}_0}$$

3.4 Relative Importance of Industry-, and Country-Level

In the previous sections, I provided a literature review on the determinants of ownership concentration and presented the statistical methods for the subsequent analyses. The following sections constitute the first of three essays in this thesis.

3.4.1 Introduction

Generally, the level of ownership concentration is a firm-level phenomenon. However, the literature review provides clear theoretical and empirical evidence that not only firm-, but also industry- and country-characteristics influence the ownership concentration. Looking at the existing ownership research, the analyses of the three levels of influence factors in general, and the choice of whether investigating the firm-, industry- or the country-level, seems quite deliberate and without clear guidance of which level(s) of determinants is / are the most important one(s). Accordingly, answering the research question for the relative importance of the industry- and country-levels for the determination of the actual firm-specific characteristic ‘ownership concentration’ seems to be particularly worthwhile for different reasons. First, and most importantly, determining the relative importance of the industry- and country- level will help to pave the way for improved theoretical frameworks for the determination of ownership concentration. Understanding the relative importance of the two levels enables us to focus future research on the most meaningful level of ownership determinants. Particularly in terms of institutional economics the insights from the subsequent analyses will shed light on the importance of the different institutional levels for the ownership structure of firms. Second, with respect to policy implications, understanding the respective influence of country- and industry-level on the ownership structure, and thus, corporate governance, can help to render respective laws and regulations more efficient.

Accordingly, the aim of this paper is to answer the question for the relative importance of the industry- and country-level and to analyze the interplay of both levels. The results help to pinpoint the path for future research, lay the foundation for further policy implications, and give practitioners further insights in the market dynamics regarding the ownership structure of firms.

The structure of the subsequent essay is as follows: Having provided the description of the data set, a literature review, and the econometric methods upfront, I first formulate expectations about the relative importance of the industry- and country-level on the basis of the existing ownership frameworks. Second, I provide an overview on the statistical model used in the empirical analyses. Third, I describe the results, and discuss their importance with respect to the theoretical propositions developed at the outset. Lastly, I derive implications and recommendations for future research.

3.4.2 Development of Hypotheses

The theoretical frameworks, such as those of Demsetz and Lehn (1985), Hansmann (1996), or LLSV (1998), have proven to possess significant explanatory power for the identification of firm-, industry-, and country-specific determinants of ownership concentration. However, none of these findings or frameworks provides a theoretical explanation how the industry- and country-level relate to each other and what the relative importance is, regardless of individually identified determinants of ownership concentration. To derive an estimate based on the already identified industry- and country-level effects, I will discuss the findings of the respective studies, subsequently.

Just by looking at the different industry-specific influence factors of ownership concentration identified in the literature review, it turns out that the industry regulation is the only solely industry-specific factor which has been identified so far; the other factors are actually firm-specific factors, also potentially influenced by the industry a firm is active in. Accordingly, I argue that the lion's share of these effects should be captured by the firm-level, and consequently industry-regulation will be the most significant driver of the industry-level. However, as for example, illustrated by Van der Elst (2004) or by the inconclusive results by Gedajlovic (1993) and Crespi-Cladera (1996), this supposedly strongest industry-effect appears not to be significant for all countries, suggesting that the total industry-effect over all countries is rather small.

The results of the existing studies on country-level determinants of ownership-concentration suggest that, according to LLSV (1998) and Roe (2004), the legal-origin, and respective effects on the corporate governance system, have a significant effect on the level of ownership concentration of firms. The results furthermore imply that even further important country-level drivers of ownership concentration, such as the cultural factors analyzed by Jong and Semenov (2006), exist but have not been identified yet.

Overall, even the identified country-level determinants – and so the country-level in total – appear to have a strong effect on the level of ownership concentration of a firm.

Summarizing the previous findings, the evidence of the existing research on the industry- and the country-level suggests that, whereas the country-level has a strong influence on the level of ownership concentration, the industry-level appears to play a subordinate role. These results indicate that institutional theory in general is an important instrument to explain the level of ownership concentration of firms and is a valuable addition to ownership frameworks solely based on principal agent theory. However, the institutional differences on the industry-level seem to be less striking and relevant for the ownership concentration than the highly significant country-level. Unfortunately, these results do not necessarily provide indication for the actual relative-importance of the two levels. Several potentially important drivers of ownership concentration of both levels might have been disregarded so far. Thus, in default of a respective theoretical framework I do not formulate specific hypotheses. Instead, I use explorative analyses to answer the research question of the relative importance of the industry- and country-level.

3.4.3 Statistical Model

In this chapter, I describe the statistical model applied in the subsequent analyses. The sample and the variables will not be explained as they have been illustrated in chapter 2.

As described in the methods section (section 3.3), a random-intercept model, that is, a HLM with two random intercepts and without additional covariates will be used. To assess the relative importance, I evaluate the by the two random intercepts explained variance. The analyses rely on the following (empty) random-intercept-model:³²

$$(1)y_{fic} = (\beta_1 + \zeta_{ic} + \zeta_c) + \epsilon_{fic}$$

In this equation, $c_{f,i,c}$ represents the ownership concentration of firm f , primarily active in industry i , and headquartered in country c . The first right-hand-side term is the constant term β_1 , the overall average concentration for all firms over all industries and all countries. ζ_{ic} represents the random intercept for an industry, capturing the effect for the respective industry i , in country c , on ownership concentration. Accordingly, I

³²Notation according to Rabe-Hesketh and Skrondal (2005).

assume that industries are nested in countries. On the one hand, firms are located in specific countries, as are the industries. On the other hand, most industries can be found across the world in almost any country, and so I could argue in favor of countries being nested in industries. However, I postulate that most industries have country specific characteristics, such as regulations, and Van der Elst (2004) empirically confirms this observation. Therefore, I treat the industries as nested in countries and not vice versa. Lastly, ζ_c represents the random intercept for each country to measure the ownership concentration effect of the country-level. The final term, ϵ_{fic} , is the residual / error term of the overall model.

3.4.4 Results

3.4.4.1 Descriptive Statistics and Analyses of Variance

Table 19 shows the number of firms in each country represented in the sample and respective descriptive statistics for the variable *cr5*. Looking at the mean, standard deviation, minimum, and maximum, I see that countries with a low, medium, as well as high average ownership concentration are included in the sample. Furthermore, whereas in all countries companies with highly dispersed and highly concentrated ownership are represented, mean values and standard deviations differ significantly. The US shows the lowest average concentration at 24.71%, and Italy the highest at 57.29%. Another interesting observation is that the standard deviation of the ownership concentration does not seem to correlate with the ownership concentration itself. Brazil, on the one hand, has, at 51.24%, a relatively high concentration, and at 28.72%, a quite high standard deviation. Italy, on the other hand, is, at 57.29%, similarly highly concentrated but has a much lower standard deviation of 19.56%.

Table 19: Descriptive Statistics of *cr5* by country

Country	N	mean	min	max	sd
Japan	150	24.75	1.01	67.81	14.23
United-States	150	24.71	0.94	72.17	9.93
United Kingdom	150	32.47	8.90	77.01	12.79
Canada	150	34.61	1.49	93.09	20.7
Australia	150	38.31	0.75	96.27	20.99
Germany	150	48.51	1.02	99.75	27.49
Brazil	137	51.24	0.94	100	28.72
France	150	54.41	1.42	99.87	26.07
Italy	118	57.29	0.12	98.22	19.56
Total	1,305	40.19	0.12	100	23.94

Looking at the industries (Table 20), the difference between highly- and lowly-concentrated industries is not as distinct as between countries, or even between single firms. With an average concentration of 46.74%, the Construction industry has the highest ownership concentration, and at 35.91% the Financial Service industry has the lowest average ownership concentration.

Table 20: Descriptive Statistics of *cr5* by industry

Industry	N	mean	min	max	sd
Mining	81	37.65	7.53	96.27	22.86
Finance, Insurance, Real-Estate	213	35.91	0.75	99.97	25.22
Manufacturing	487	39.92	1.35	99.75	22.87
Retail/Wholesale	163	40.74	0.94	98.24	23.91
Transportation	206	42.11	0.12	100	26.52
Services	123	44.66	4.58	94.02	20.93
Construction	32	46.74	10.89	97.23	23.42
Total	1,305	40.19	0.12	100	23.94

3.4.4.2 Analyses of Variance of Country Differences

Table 21 shows the results of an ANOVA testing for significant differences in ownership concentration between countries. The ownership concentration varies significantly between countries on a 0.01 significance level, which gives a first

indication for the relative high importance of the country-level for the level of ownership concentration.

Table 21: ANOVA of *tcr5* by *country*

Number of obs = 1,305		R-Squared = 0.1833			
Root MSE = 1.21993		Adj. R-Squared = 0.1783			
Source	Partial SS	df	MS	F	Prob > F
Model	429.66	6	53.7	36.09	0.0000
Country	429.66	6	53.7	36.09	0.0000
Residual	1,913.87	1,298	1.48		
Total	2,343.54	1,304	1,811		

Table 22 gives a more detailed view, showing pairwise ANOVAs of *cr5* for all countries. The first column provides the name of the country, the second column the average concentration in the respective country. Columns 3–8 provide the p-values of the ANOVAs. Any p-value lower than 0.05 indicates a significant difference in ownership concentration between the two respective countries. On first sight, the ANOVA table provides indication for two different groups of countries: Countries with relatively low ownership concentration (Japan, the US, the UK, Canada, and Australia) and countries with relatively high ownership concentration (Germany, Brazil, France, and Italy). Depending on the applied significance level, there is additional evidence for a third group of countries, comprising France and Italy, as on a 0.10 significance level their level of ownership concentration is systematically different from the one of Germany and the ownership concentration in Italy differs from the one of Brazil.

Table 22: Pairwise ANOVAs of *tcr5* by *countries*

Country	Mean	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Japan	24.75								
(2) US	24.71	0.98							
(3) UK	32.47	0	0						
(4) Canada	34.61	0	0	0.28					
(5) Australia	38.31	0	0	0	0.13				
(6) Germany	48.51	0	0	0	0	0			
(7) Brazil	51.24	0	0	0	0	0	0.41		
(8) France	54.41	0	0	0	0	0	0.06	0.33	
(9) Italy	57.29	0	0	0	0	0	0	0.05	0.32

Overall, these results provide confirmative evidence for the two concepts developed by Roe (2004) and LLSV (1998). As illustrated in the literature review, according to Roe,

the ownership concentration of Continental-European countries will be lower than in Anglo-American countries. The ANOVA table shows that Germany, France, and Italy have a significantly different (higher) ownership concentration compared to the US, the UK, Canada, and Australia. However, why the ownership concentration in the US and the UK appears to significantly different cannot be explained at this point.

According to LLSV's theory, the variance in ownership concentration between countries can be partly attributed to differences in shareholder protection stemming from varying legal origins, which allows a slightly finer grained differentiation than Roe's (2004) argument. Table 22 shows that, generally, the common law countries (the US, the UK, Canada, and Australia) have a lower ownership concentration than the German civil law countries (Germany and Brazil), which have a lower ownership concentration than the French civil law countries (Italy and France). Surprisingly, Japan has one of the lowest ownership concentrations among all countries included in the sample. Due to its German civil law roots, I would have expected a higher ownership concentration, and the frequently analyzed *Keiretsus*, controlling vast parts of the Japanese economy, seemed to confirm this idea. However, LLSV came to the same results as I did and reasoned that the legal system in Japan, despite its German civil law origin, was heavily influenced by the US after WWII, shaping a rather common law oriented legal system, with the according increase in shareholder protection, leading to a low ownership concentration. Furthermore, Miwa and Ramseyer (2002) actually found no evidence for significant cross holdings of the *Keiretsus*, and Kato, Lemmon, Luo, and Schallheim (2005) argued that the holdings by directors and managers are relatively low, as Japanese firms were not allowed to grant stock options until 1997, providing another reason for the low level of concentration. Overall, the low ownership concentration in Japan seems to be surprising, though reasonable.

The ANOVAs widely confirm the differences between the common law and civil law countries. However, there is limited evidence for the difference in ownership concentration between German and French civil law countries.

Table 23 gives more insight into ownership differences between the three types of legal origins. The results clearly show that common law countries have the lowest ownership concentration, German civil law intermediate concentration, and French civil law countries the highest ownership concentration. An ANOVA highlight the statistically

significant differences between these three groups of countries on a 0.01 significance level, and thus, clearly confirms the concept of LLSV (Table 24).

Table 23: Descriptive Statistics of *tcr5* by *legalorigin*

legalorigin	N	mean	min	max	sd
Common Law	600	32.52	0.75	96.27	17.5
German Civil Law	437	41.21	0.94	100	26.98
French Civil Law	268	55.68	0.12	99.87	23.43
Total	1,305	40.19	0.12	100	23.94

Table 24: ANOVA of *tcr5* by *legalorigin*

Number of obs = 1,305		R-Squared = 0.0911			
Root MSE = 1.30344		Adj. R-Squared = 0.0897			
Source	Partial SS	df	MS	F	Prob > F
Model	221.76	2	110.88	65.26	0.0000
legalorigin	221.76	2	110.88	65.26	0.0000
Residual	2,212.05	1,302	1.69		
Total	2,433.05	1,304	1.86		

3.4.4.3 Analyses of Variance of Industry Differences

The descriptive statistics by industries (Table 20) already gave an indication that the industry-level might not be as important as other factors influencing the level of ownership concentration, as the variance between industries was rather low. Still, an ANOVA (Table 25) confirms a significant difference between industries on a 0.05 significance level.

Table 25: ANOVA of *tcr5* by *industry*

Number of obs = 1,305		R-Squared = 0.0106			
Root MSE = 1.34175		Adj. R-Squared = 0.0059			
Source	Partial SS	df	MS	F	Prob > F
Model	24.75	6	4.12	2.29	0.0330
Industry	24.75	6	4.12	2.29	0.0330
Residual	2,319.79	1,298	1.80		
Total	2,343.54	1,304	575		

As for the countries, I calculated pairwise ANOVAs for the industries. Table 26 illustrates the results.

Table 26: Pairwise ANOVAs of *tcr5* by industry

Industry	Mean	(1)	(2)	(3)	(4)	(5)	(6)
(1) Mining	37.65						
(2) Finance, Insurance, Real-Estate	35.91	0.73					
(3) Manufacturing	39.92	0.44	0.1				
(4) Retail	40.74	0.24	0.09	0.44			
(5) Transportation	42.11	0.15	0.03	0.13	0.57		
(6) Services	44.66	0.03	0.01	0.06	0.31	0.74	
(7) Construction	46.74	0.05	0.06	0.08	0.22	0.48	0.46

Overall, the pairwise ANOVAs show a relatively diverse picture, which is not as clear-cut as the one for the countries. With the exception of the group of Financial Services companies (2), most of the industries do not differ systematically from each other in terms of ownership concentration. On a 0.10 significance level, the Financial Services industry has a different (lower) ownership concentration than all other industries, except for Mining. As Financial Services industry typically is one of most strictly regulated one (Demsetz & Lehn, 1985), this partly confirms the importance of regulation for the level of the ownership concentration. However, taking a closer look, the evidence turns out to be only mediocre. In the light of a 0.05 instead of a 0.10 significance level, most of the ANOVAs are not statistically significant. Still, an ANOVA on the full sample using the *regulation* dummy variable and *tcr5* confirms the significance of the regulation for the level of ownership concentration on a 0.05 significance level.

Table 27: ANOVA of *tcr5* by regulation

Number of obs = 1,305		R-Squared = 0.0047			
Root MSE = 1.33793		Adj. R-Squared = 0.0040			
Source	Partial SS	df	MS	F	Prob > F
Model	11.09	1	11.09	6.20	0.0129
Industry	11.09	1	11.09	6.20	0.0129
Residual	2,332.44	1,303	1.79		
Total	2,343.53	1,304	1.79		

Table 28 shows the results of ANOVAs of industry regulation and *cr5* for different countries, the average concentration per country in regulated and not regulated industries, as well as the number of regulated firms in each country.

Table 28: Comparison of *cr5* by regulation and country

Countries	ANOVA	Average <i>cr5</i>		Freq.
		regulated	unregulated	
United-Kingdom	0.01	22.76	25.24	32
United-States	0.02	29.22	33.28	30
Canada	0.04	32.18	35.56	42
Australia	0.00	31.51	40.78	40
Japan	0.37	22.81	25.25	31
Germany	0.13	53.08	47.37	30
Brazil	0.21	55.34	49.37	43
France	0.33	47.86	55.66	24
Italy	0.35	51.17	58.70	22

Although the number firms in regulated industries are similarly spread over all countries, the results show that only for the US, the UK, Canada, and Australia, industry regulation appears to have a significant effect on ownership concentration. Interestingly, all countries where industry regulation has a significant effect on ownership have a common law origin, which was not predicted by the theoretical concepts of Roe (2004) or LLSV and needs further discussion in subsequent parts of this essay.

3.4.4.4 Regression Analyses

The previous results of the analyses of industry- and country-level show the relevance of both levels for the determination of the ownership concentration of a firm. The results, however, are more distinct for the country-level than for the industry-level, which leads me to the conclusion that the relative importance of the country-level is higher than the one for the industry-level. Nevertheless, an empirical evaluation of the specific relative importance is still missing and to be addressed in the next paragraph.

In the following, the results of the estimation of model (1), and a variation of this model, using the legal origin and the regulation dummy as random intercepts instead of the country and the industry dummies, are presented. Calculating the ICC for both grouping variables *industry* (ICC of 0.01) and *country* (ICC of 0.19) strengthens the preliminary findings of previous analysis that the country-, compared to the industry-level, has a higher relative importance for the ownership concentration. On the other hand, both levels of ICCs highlight the necessity for a random intercept model to avoid the explained alpha inflation.

Table 29 shows the calculated variance components, standard errors (in brackets), and residuals for the random intercepts [*industry* and *country* for model (1) and *regulation* and *legalorigin* for model (2)].

Table 29: Variance Components of Random Intercept Model

	(1)	(2)
	<i>cr5</i>	<i>cr5</i>
industry	12.51 (6.89)	
country	150.18 (78.06)	
regulation ^a		11.80 (13.26)
legalorigin		118.56 (127.00)
Residuals	430.23	493.60
Total Variance	592.92	623.96

^a = Dummy Variable

Standard Errors in Parentheses

The overall variance of model (1) sums up to 592.92, whereas *country* explains 150.18, and *industry* (in interaction with *country*) 12.51 of the total variance of the model. This equals an explained variance of 2.11% ($12.51 / 592.92$) by *industry* and 25.33% ($150.18 / 592.92$) by *country*. The relatively low standard errors (6.89 and 78.06, respectively) of both *industry* and *country* highlight the significance of both levels for the determination of ownership concentration.³³ These results ultimately confirm the theory and the impression of the previously conducted analyses, and show the high importance of the country-level and the relative low importance of the industry-level.

Existing studies and the analyses of the previous paragraphs suggest that for the country-level the legal origin, and for the industry-level the regulation, are the key drivers of ownership concentration for the respective levels. Accordingly, model (2) uses two different random intercepts, namely the already previously used *regulation* dummy, and a new dummy variable, *legalorigin*. According to the estimated variance components, *legalorigin* explains 118.56 of the total variance, equaling 19% of explained variance. *Regulation*, in interaction with *legalorigin*, accounts for 11.80 or 1.9% of the total variance. Compared to model (1), model (2) shows that both dummies

³³The model with the alternative structure of countries being nested in industries did not converge (i.e., could not be estimated), which strengthens the assumptions underlying model (1).

account for major variance of the country- and industry-level; particularly regulation seems to explain most of the industry effect. Similarly, the *legalorigin* variable, explains a significant share of the country-level.

3.4.5 Preliminary Conclusion

3.4.5.1 Discussion

The aim of this essay was to assess the relative importance of industry- and country-level factors for the determination of ownership concentration. Within the course of the investigation I used ANOVAs and a hierarchical random-intercept model to determine the explained variance of the industry- and country-level. Using a sample of 1,305 firms from nine countries, there is theoretical and empirical evidence that both country and industry matter significantly for the determination of ownership concentration. However, the analyses show that whereas the country-level has with roughly 25% a strong effect on the ownership concentration, the industry-level has with 2% only minor impact. Furthermore, among the country-level determinants, the legal-origin of a country's corporate governance system (common law, German civil law, or French civil law) significantly influences the ownership concentration. On the industry-level, there is evidence that the industry regulation plays the most important role of all industry-level determinants; still, the total effect is weak.

Although the empirical results of the already existing studies partly suggested that the importance of the country-level outweighs the importance of the industry-level, the actual magnitude of the difference in the relative importance is somewhat surprising, as – compared to the influence of the country-level – the industry-level plays an almost negligible role. In the light of the results it is questionable, whether the analyses of the industry-level actually promise valuable insights into the allocation of ownership rights.

At the country-level, it appears that the differences between common-, German civil-, and French civil law strongly drive the ownership concentration in a country. However, as illustrated in the literature review, the hypothesis initially formulated by LLSV (1998) is not undisputed. Still, despite the criticism brought forward by both Braendle and Coffee, the theoretical hypotheses and the empirical evidence match too well than that I would dismiss LLSV's concepts, particularly since neither Braendle nor Coffee provide viable alternative concepts.

For the industry-level, the literature review identified several industry factors as having an influence on the ownership concentration. Despite the relative high number of factors, my analyses show that the total importance of industry factors for the determination of ownership concentration is relatively low, and that industry regulation appears to account for the largest part of the total industry effect. However, the effect of industry regulation appears to be statistically significant in common law countries only and not in German- or French civil law countries. This could be explained either by a particularly high regulation in the common law countries or by an alternative so far unobserved moderating country effect, which influences industry- and firm-specific drivers of ownership concentration. I argue that the differences in shareholder protection due to different legal origins outweigh the effect of industry regulation on ownership concentration. The ownership increasing effect of a lower shareholder protection in the civil law countries renders smaller ownership stakes so unattractive, that the ownership increasing effect of regulated industries has no significant effect. However, to address this question in detail, an industry regulation index for a variety of countries would be necessary.

When interpreting the identified industry-effect, an issue to be considered is the tested sample. All included firms are large and publicly traded firms, which are typically highly diversified, and thus, active in several industries. Accordingly, it is not too surprising that the identified industry-effect is rather small, as the high diversification necessarily dilutes the effect of single industries.

Evaluating the key contributions of this study, it was one of the intentions to pinpoint the direction for future research of the determinants of ownership concentration. On the one hand, looking at the results of the country-level analyses, compared to the relative high importance of this level, remarkably few studies have focused on this particular group of influence factors. On the other hand, despite the relatively low importance of the industry-level, many studies include the effect of industry-specific factors. This clearly shows that some of the existing studies focused exclusively on a group of influence factors hardly possessing explanatory power. Accordingly, to proceed with the research on determinants of ownership concentration, I suggest that more attention should be paid to the country-level determinants of ownership concentration. Particularly, a better understanding of the effects of corporate governance systems on ownership concentration, potentially in the light of the Braendle's (2006) criticism,

promises valuable insights with meaningful implications. Furthermore, additional determinants of ownership concentration might be identified, for example, the study of Jong and Semenov (2006), who focus on cultural differences and potential implications for ownership concentration.

Looking at the industry-level determinants, particularly the interplay of the country- and industry-level provides room for extensive research. Particularly, constructing the already mentioned industry regulation index could provide valuable insights in this area.

In terms of policy implications, the interdependence of industry and country rules and the respective moderating effects for the determinants of ownership concentration is the most important finding. Disregarding this significance of the national corporate governance system for regulation will lead to inefficient or even useless policy making in terms of regulation.

In terms of theory development, the analyses confirm what I indicated in the hypotheses development chapter. The results show that institutional economics is of significant importance for the determination of the level of ownership concentration of a firm and, besides the principal-agent view, has to be included in any future ownership framework. However, the institutional differences between industries are not as pronounced or are simply less important than the institutional differences between countries.

Looking at implications for practitioners, the results provide only limited guidance. In terms of corporate governance, my results question the effectiveness of industry regulation. Furthermore, it becomes clear that the country-level has to be considered for foreign expansions and investments. The ownership structures of firms can apparently differ substantially from those in the home country for good reasons.

3.4.5.2 Limitations

The study is subject to several limitations to be addressed in future research. First, as mentioned before, the measure of the *industry* and *country* variables is relatively imprecise. To get a better picture of the main industry and country a firm is active in, more details on the revenues generated in the respective industries and countries would have been helpful to create a weighted industry and country index. Unfortunately, to my knowledge, such a sample with this kind of information for a large sample of international firms is not available.

Second, the sample comprises only relatively large and publicly listed firms, and even for those the complete ownership structure is not available. An even bigger sample than the one used, including ownership information on smaller and not-listed firms would potentially provide further insights into the determination of ownership concentration.

Third, the sample includes mostly highly developed countries. Brazil is the only country included in my analysis, which is widely considered as an emerging economy. Future analysis might be able to gather more ownership information from less-developed countries, such as China, India, and Russia, and potentially gain valuable insights from analyzing the ownership structure under these circumstances. As there are more dynamics in a less developed market and the institutional environment is typically changing much faster, important insights in the allocation of ownership rights might be gained.

Fourth, additional country-specific determinants of ownership concentration should be included in the analyses. As described above, some authors identified industry-level factors based on firm-level factors (e.g., firm size and industry-specific firm size). The same technique can be applied to identify additional country-level factors. The industry regulation, for example, has attracted a lot of attention, but a country-specific regulation has so far not been analyzed.

Finally, the study relies on cross-sectional data. Adding a time-perspective, that is, using panel data over several decades would enable the research to gain valuable insights into the changes in ownership structure over time.

3.5 Explanatory Power of Firm-, Industry-, and Country-Level Determinants

The following sections constitute the second essay of this thesis. Building on the results of the previous chapter, this essay addresses the second research question dealing with the identification and analysis of the key determinants of ownership concentration and their explanatory power.

3.5.1 Introduction

Since the seminal work of Demsetz and Lehn, several studies, such as those of Thomsen and Pedersen (1998), Van der Elst (2004), and La Porta, et al. (1999), showed that not only firm-, but also industry- and country-specific factors drive the level of ownership concentration of firms significantly.

Comparing the relative importance of these different levels of influence factors, the analyses in the previous essay found that, besides the firm-level, the country-level has a strong influence on the determination on ownership concentration, whereas the industry-level plays only a subordinate role. Yet, a better understanding of the mode of action of the country-level has been the subject of relatively few studies. Many of the existing studies analyzed samples solely containing firms from one country [e.g., from the US in the study of Demsetz and Lehn (1985), or Japan in the study of Prowse (1992)], neglecting international differences at all. The few studies including several countries in their analyses frequently focused on particular geographic regions, for example, Europe (Pedersen & Thomsen, 1999; Thomsen & Pedersen, 1997, 1998, 2000). Additionally, most studies focused solely on one of the mentioned levels, while not controlling for the effects of the other two levels. Accordingly, we do not know how much the identified drivers of ownership concentration eventually explain of the observed variance in total, and on the firm-, industry-, and country-levels, respectively. Furthermore, in terms of statistical methods, most of the existing studies rely on OLS regressions. However, due the nested structure of firms, industries, and countries, OLS estimators can yield biased results, which is why I rely on HLMs to assess the explanatory power of the identified determinants.

The subsequent study accounts for the previously identified issues. In the following, based on the results of existing studies, I will identify the most significant drivers of ownership concentration of the firm-, industry-, and- country-levels. Afterwards, I

evaluate the by the identified factors explained variance. Using a cross sectional, international sample of 900 firms from nine countries, the empirical analyses will account for the nested structure of the data, and I will control for interaction effects of the respective levels.

The results of the analyses contribute to the existing research on the ownership structure of firms. Identifying the most important drivers of ownership concentration and their explanatory power will help to focus future research on the most meaningful factors, potentially decomposing the effect in separate parts to gain further insights in the allocation of ownership rights. The analyses will help to understand where we actually stand in the research of the determinants of ownership structure, and indicate how far we eventually might be able to go in explaining the observed variance in ownership structure across firms, industries, and countries. In terms of policy implications, the determination of the key factors will help to evaluate which regulatory measures might be effective and which might not.

The essay is structured as follows. In one of the previous sections, I reviewed the existing literature dealing with the determinants of ownership concentration and described the econometric methods used in the subsequent analyses. I also illustrated the data set for this essay in the beginning of the thesis. Thus, subsequently I derive hypotheses and explain the statistical model. Afterwards, I describe the results and discuss their importance with respect to the theoretical propositions developed at the outset. Lastly, I derive the key conclusions and implications, providing recommendations for future research.

3.5.2 Development of Hypotheses

Based on the theory and literature review in section 3.2, I formulate hypotheses for the firm-, industry-, and country-level determinants in this section. The hypotheses will be tested within the scope of the statistical analyses.

3.5.2.1 Firm-Level

From all three levels, the results illustrated in the literature review show that firm-level determinants of ownership concentration are the most consistent and least doubted ones. As mentioned in the review, several studies have confirmed both hypotheses initially brought forward by Demsetz and Lehn (1985) predicting a negative effect of firm size

and an inverted-u-shaped effect of firm risk. Since there is neither theoretical nor empirical evidence questioning the predicted effects, I agree with the presented line of arguments and accordingly formulate the following two hypotheses for the firm-level:

Hypothesis 1a: The size of a firm has a negative effect on the level of ownership concentration.

Hypothesis 1b: The risk of a firm has a curvilinear (inverted u-shaped) effect on the level of ownership concentration.

3.5.2.2 Industry-Level

Compared to the firm-level, a different picture is drawn for the industry-level determinants. Whereas several industry-influence factors of ownership concentration have been identified, empirical evidence and theoretical arguments are inconclusive.

As illustrated in the literature review, theory predicts a negative relationship between industry regulation and ownership concentration due to the decreased benefits of block / majority holdings. However, the empirical evidence is not conclusive for different countries (Crespi-Cladera, 1996; Gedajlovic, 1993; Van der Elst, 2004). Similarly, in the previous essay, I find a significant effect of regulation on ownership concentration in common law countries, only. I argue that, first, the effect of regulation can be influenced by country-level factors and, second, that the extent of the industry regulation can differ from country to country. Accordingly, since the sample I analyze contains various countries with different legal origins, it is unclear whether there will be a significant effect of industry regulation on ownership concentration, or not. Thus, I refrain from formulating a specific hypothesis regarding the effect of industry regulation.

Similarly, the overall effect of the industry-level determinants identified by Thomsen and Pedersen (1998) is uncertain. Looking at the hypotheses brought forwarded by Thomsen and Pedersen regarding the information asymmetries, competition, and life cycle stage of an industry, I argue that for all three factors opposing arguments can be formulated. In terms of information asymmetries, I argue that there is not only an ownership decreasing effect. Whereas the benefits of monitoring might decrease with higher information asymmetries, they can also lead to a higher need for thorough and effective monitoring, thus, resulting in a higher ownership concentration. Similarly, for

the effect regarding the competition in an industry, I could also argue by the “control potential” introduced by Demsetz and Lehn (1985). According to the control potential, a high competition requires fast and efficient decisions to ensure the competitiveness of a company, and thus, favors higher ownership concentration (Demsetz, 1973). Third, looking at the life cycle stage, young and entrepreneurial owned companies are unlikely to disclose their ownership concentration, and are normally not included in the ownership studies. Generally, since the companies mostly included in ownership studies are the biggest, publicly listed firms in a country, most of them can be found in rather mature industries, including relatively mature companies. In addition to that, there are no precise proxies for the constructs of information asymmetries and competition, further diluting the anyhow theoretically uncertain effects (Aboody & Lev, 2000; Shastri & Clarke, 2001). Furthermore, as shown by the previous essay, the total industry-effect, particularly in an international context, has a rather weak effect on the ownership concentration. Accordingly, the effect of any industry-characteristic, representing only a part of the total industry effect, can be marginal at best. In total, as in the case of the industry-regulation, the effect of the previously described industry-level effects is unclear, and in addition to that, difficult to measure due to its expected magnitude. Accordingly, I once more refrain from formulating specific hypotheses due to the default of a clear theoretical argument.

In total, I was not able to formulate an irrefutable hypothesis for any of the identified industry factors. Accordingly, investigating the industry effects will be subject to explorative analyses.

3.5.2.3 Country-Level

According to the literature review, LLSV (1998) and Roe (2004) identified the legal origin and the shareholder protection of a country as the key determinants of ownership concentration. Despite the criticism of Coffee (1999, 2001a, 2001b) and Braendle (2006), I follow the arguments by LLSV and Roe. I argue, in contrast to Coffee and Braendle, that the dispersed ownership structure in the common law countries did not develop in the absence of corporate governance systems, but that both, the dispersed ownership and the respective institutional framework, developed simultaneously. Furthermore, whether the level of ownership concentration influenced the legal system or vice versa would - at least empirically - not make a difference. Thus, I hypothesize in accordance with LLSV and Roe that the legal origin of a country will have a significant

effect on the level of ownership concentration by means of the level of shareholder protection and the employee influence on the firm. Accordingly, I argue that a high level of shareholder protection renders minority ownership stakes more attractive and thus increases the level of ownership concentration. However, I expect that the legal origin, as a rather rough measure, will pick up several other country effects potentially influencing the ownership concentration, and therefore, will have a stronger effect on the level of ownership concentration than the level of shareholder protection. Accordingly, I formulate the following hypotheses.

Hypothesis 2a: The legal origin of a country has a significant effect on the level of ownership concentration. In detail, the ownership concentration of firms will be the highest in French civil law countries, second highest in German civil law countries, and lowest in common law countries.

Hypothesis 2b: The level of shareholder protection has a negative effect on the level of ownership concentration, which is weaker than the one of the legal origin of a country.

Additionally, I agree with the argument brought forward by Thomsen and Pedersen (1997) and confirmed by Jong and Semenov (2006), that the development of a stock market in a country has a significant negative effect on the level of ownership concentration. The bigger the size and the more liquid a stock market is, the more likely the probability is for a firm to go public due to the decreasing cost of capital. Since going public typically multiplies the number of owners, the ownership concentration will decrease significantly, leading to a negative effect of the development of a stock market on ownership concentration. Thus, I formulate the following hypothesis.

Hypothesis 2c: The level of stock market development has a negative effect on the level of ownership concentration.

Lastly, whereas Jong and Semenov's (2006) study is the only analysis of cultural effects on ownership concentration so far, I agree with the arguments brought forward by the authors. According to Jong and Semenov, the higher the uncertainty avoidance in a country is, the less developed is the stock market and the lower is the level of shareholder protection, and accordingly, the higher is average level of ownership concentration. Although the culture in a country is highly complex with various characteristics, I include Hofstede's (2001) uncertainty avoidance index (UAI) only,

since, according to Jong and Semenov, the uncertainty avoidance has - among the cultural dimensions developed by Hofstede - the strongest effect on the level of ownership concentration in a country. Following this line of arguments, I formulate the last hypothesis for the country-level as follows.

Hypothesis 2d: The level of uncertainty avoidance in a country has a positive effect on the level of ownership concentration.

3.5.2.4 Explained Variance

As mentioned in the introduction, despite the substantial research on the determinants of ownership concentration, it remains unclear how much of the observed variance in ownership concentration between firms, industries, and countries can be explained by the identified influence factors. As there is no clear theoretical framework providing an answer to this question, I will address this question in an explorative way, and not derive explicit hypotheses.

Starting with the country-level, I expect that the estimated models will explain the largest part of variance between countries for two reasons. First, the determinants included in the model, and amongst those in particular the legal origin, pick up a wide range of factors having a direct or indirect effect on ownership concentration, such as the shareholder protection, development of a stock market, cultural effects, and other determinants we are not aware of, yet. Second, due to the restricted sample size, the relatively high number of variables (up to 16 in the full model) necessarily leads to an (artificially) high explanation in variance.

At the industry-level, I argue that a significant, though minor part of the observed variance will be explained by the estimations. As mentioned above, the total industry effect is relatively small and one of the identified major industry effects, industry regulation, is not even significant for all countries. I also take into consideration that differences in ownership concentration between industries are doubtlessly subject to random effects, it is probable that the previously identified variables can only explain a minor share of the systematic variance in ownership concentration. Additionally, the companies in the sample are rather large and significantly diversified, diluting the industry effect, thus making it even harder to identify systematic industry differences. Although the number of industry clusters is much higher than the number of country

clusters, the number of variables is relatively high, inflating the explained variance to a certain extent as for the country-level.

Looking at the firm-level, I argue that only a minor part of the variance in ownership concentration can be explained. After all, from all three levels, the variance in ownership structure is the highest on the firm-level, which is not surprising as ownership structure itself is a firm-specific phenomenon. Accordingly, on the firm-level, the part of the variance in ownership concentration suspect to random effects/unsystematic differences will be the highest and cannot be explained. The previously identified variables have been shown in existing studies to influence the level of ownership concentration. However, more influence factors have not been identified yet and potentially might be hard to test for [e.g., the private benefits mentioned by Lamba and Stapledon (2001) and Bebchuk (1999)]. Unlike for the country- and industry-level, the number of firms is sufficiently high that I do not expect an ‘artificial’ effect by the number of variables on the explained variance.

3.5.3 Statistical Model

In this section, I will describe the statistical model applied in the subsequent analyses. The sample and the variables will not be described as they have been illustrated in chapter 2.

The analyses in the subsequent sections rely on the following hierarchical mixed model with two random intercepts and several additional covariates³⁴:

$$(1) y_{fic} = ((\beta_1 + \zeta_{ic}) + \zeta_c) + \beta_2 x_{2fic} + \dots + \beta_n x_{nfc} + \epsilon_{fic}$$

In this equation, y_{fic} represents the ownership concentration of firm f , primarily active in industry i , and headquartered in country c . The first right-hand-side term is the constant term β_1 , the overall average concentration for all firms over all industries and all countries. ζ_{ic} represents the random intercept for the industry-level to evaluate the effect of the respective industry i in country c , on ownership concentration. Accordingly, I assume, as in the previous essay, that industries are nested in countries. ζ_c denotes the random-intercept for each country, capturing the ownership concentration effect of the country-level. $\beta_2 x_{2fic} + \dots + \beta_n x_{nfc}$ represent the fixed part of the model,

³⁴Notation according to Rabe-Hesketh and Skrondal (2005).

that is the covariates. The final term, ϵ_{fic} , is the residual / error term of the overall model.

3.5.4 Results

3.5.4.1 Descriptive Statistics

Table 30 to Table 32 report the descriptive statistics on the sample, including mean, maxima, minima, and number of firms per industry, country, and for the full sample. The statistics show that there is a high variance in ownership concentration between firms, industries, and countries. The US and the Mining industry show the lowest concentration at 22.32% and 35.20%, respectively, and Italy (56.48%) and the Construction industry (48.51%) the highest.

Table 30: Descriptive Statistics of *cr5* by *country*

Country	N	mean	min	max	sd
Australia	100	36.13	0.75	95.56	20.78
Brazil	100	46.7	0.94	98.8	28.4
Canada	100	31.75	1.49	93.09	20.48
France	100	52.48	2.17	99.87	24.22
Germany	100	48.44	1.02	99.75	27.77
Italy	100	56.48	0.12	98.22	20.71
Japan	100	23.19	6.36	64.47	12.87
United Kingdom	100	30.96	8.90	77.01	13.21
United States	100	22.32	0.94	51.21	7.72
Total	900	38.72	0.12	99.87	23.81

Table 31: Descriptive Statistics of *cr5* by *industry*

Industry	N	mean	min	max	sd
Mining	63	35.2	7.53	91.26	23.22
Finance, Insurance, Real-Estate	164	34.6	0.75	99.65	24.58
Manufacturing	343	38.16	4.85	99.75	22.49
Retail/Wholesale	88	39.39	2.17	95.56	22.92
Transportation	151	42.26	0.12	99.87	26.47
Services	67	42.58	4.58	94.02	22.54
Construction	24	48.51	18.73	97.23	22.24
Total	900	38.72	0.12	99.87	23.81

Table 32: Descriptive Statistics of all Variables

Variable	mean	max	min	sd
<i>logmarketcap</i>	9.23	16.64	4.28	2.41
<i>risk</i>	-0.91	0.3	-2.55	0.4
<i>firmrisk_sqr</i>	-0.99	0.1	-6.5	0.85
<i>shareholderprotection</i>	76.67	90	50	16.34
<i>logstockmarket</i>	14.84	16.57	13.89	0.79
<i>uai</i>	72	91	38	18
<i>industryrnd</i>	0.03	0.05	0.01	0.01
<i>industrycompetition</i>	0.07	1.99	0.0	0.17
<i>industrylifecycle</i>	11.27	25.29	3.03	3.97
<i>cr5</i>	38.72	99.87	0.12	23.81

Table 33 shows the correlation matrix for all variables used in the analyses. First, the correlation coefficients of *cr5* give an indication of the effect of the variables on ownership concentration. All correlation coefficients with the dependent variable widely carry the expected signs and significance levels.

Second, the size of few correlation coefficients of the independent variables merit a closer look (Mela & Kopalle, 2002). Apparently, the firm risk is highly correlated with the squared term of the firm risk (0.95). In addition, the level of shareholder protection and the level of uncertainty avoidance correlate highly with the dummy variable for the legal origin (-0.75 and -0.46). However, since correlation coefficients for continuous and categorical variables have only a weak significance, and, most importantly, I do not intend to include these variables in the same regression models, this will not lead to statistical problems (Mela & Kopalle, 2002). More problematic are the significant correlations of the firm size (*logmarketcap*) with the development of the stock market (*logstockmarket*) (0.50), and the level of shareholder protection (*shareholderprotection*) with the level of uncertainty avoidance (*uai*) (0.66). Content wise, the correlation of *logstockmarket* and *logmarketcap*, seems to be a mere statistical artifact stemming from taking the logarithm, as the initially variables (*stockmarket* and *marketcap*) are almost uncorrelated (0.05). In order to mitigate the effect of the high correlations, I address this issue within the scope of the regression analyses as described below.

Third, the generally high correlation of the different country variables suggests a close interaction with, and dependence on each other, meriting a closer look in the discussion part of this study.

I use three alternative techniques to account for the high correlations of several variables to ensure the reliability of the estimation results. First, I control for the size of the variance inflation factors of the models. Second, I use two separate techniques to mitigate the previously shown correlations, namely orthogonalization and marginal derivatives.

In detail, on the one hand, I orthogonalize the highly correlated variables *logstockmarket* / *logmarketcap* and *shareholderprotection* / *uai* (McCallum, 1970). As shown in the previous essay, the variance in ownership concentration is the highest on the firm-level, and significantly lower on the country-level. Thus, I use the firm-specific variable *logmarketcap* as primary variable and the country-specific variable *logstockmarket* as secondary variable for the orthogonalization. For the second pair of variables, I use the uncertainty avoidance as primary variable, as the culture in a country, according to Jong & Semenov (2006) and Hofstede (2001), is one of the most deeply rooted institutional characteristics in a country and thus will pick-up the main effect.

On the other hand, as robustness test to the orthogonalization, I use an alternative technique, namely marginal analysis, to control for the high correlations and compare the results with the estimation using the orthogonalized variables. To do so, I include multiplicative interaction terms for the respective variables in the regressions. Afterwards, I use marginal derivatives to determine the isolated effect on the level of ownership concentration. I derive these marginal derivatives by calculating the marginal effect of the respective variables, while holding the residual model, including the interaction terms constant.³⁵

³⁵The newest version of the statistical software used, Stata 11, comes with a special set of tools (“margins”) for marginal analysis which I used for the mentioned analysis.

Table 33: Correlation Matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) <i>logmarketcap</i>	1										
(2) <i>risk</i>	0.14***	1									
(3) <i>risk_sqr</i>	0.11***	0.95***	1								
(4) <i>legalorigin</i>	-0.19***	-0.17***	-0.18***	1							
(5) <i>shareholderprotection</i>	0.16***	0.18***	0.17***	-0.75***	1						
(6) <i>logstockmarket</i>	0.50***	0.12***	0.10***	-0.28***	0.42***	1					
(7) <i>uai</i>	-0.25***	0.18***	0.15***	-0.46***	0.66***	0.25***	1				
(8) <i>regulation</i> ^a	0.07**	0.02	0.03	-0.07**	0.02	-0.06*	-0.01	1			
(9) <i>industryrnd</i>	-0.01	-0.07**	-0.11***	0.10***	-0.06*	0.08**	-0.03	-0.23***	1		
(10) <i>industrycompetition</i>	-0.33***	-0.04	-0.03	0.14***	-0.13***	-0.26***	0.07**	-0.07**	0.05	1	
(11) <i>industrylicecycle</i>	0.02	0.31***	0.33***	-0.20***	0.18***	-0.06*	0.15***	0.05	-0.33***	0.05	1
(12) <i>cr5</i>	-0.41***	-0.20***	-0.15***	0.39***	-0.28***	-0.32***	-0.11***	-0.04	-0.01	0.20***	-0.06*

^a Dummy Variable* $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$

3.5.4.2 Regression Analyses

Subsequently, I provide the estimation results of the previously presented hierarchical mixed models and assess the in the beginning of this essay formulated hypotheses. In total, I will estimate five different models. First, the null model, containing just the random intercepts. The null model will be used as reference point to evaluate the by the in the subsequent models added covariates explained variance at the firm-, industry-, and country-level. Second, I estimate the Basic-Model-I, containing only the in other studies' frequently and successfully tested determinants of ownership concentration, namely firm size, firm risk, industry regulation, and legal origin. As a variation of the basic model, I exchange the legal origin covariate by the shareholder protection measure to compare the respective effects (Basic-Model-II). Third, I estimate the full model, containing all residual determinants identified in the theory section but not included in the models so far (Full-Model-I). Also, the same variation as for Basic-Model-I (shareholder protection instead of legal origin) is tested (Full-Model-II).

Table 34 shows the estimations of the Null Model, the Basic Model, and the variation of the Basic Model, including the measure for shareholder protection instead of the dummy variables for the legal origin.

Table 34: Estimations of the Null, Basic-Model-I, and Model-Basic-II Model

	Null-Model		Basic-Model-I		Basic-Model-II	
	coef	se	coef	se	coef	se
Firm-Level						
<i>logmarketcap</i>			-3.348***	(0.343)	-2.952***	(0.491)
<i>risk</i>			27.700***	(5.788)	28.172***	(5.851)
<i>risk_sqr</i>			-10.735***	(2.683)	-10.874***	(2.711)
Firm-Level Variance (% Explained)^c	420		24 (6 %)		34 (8 %)	
Industry-Level						
<i>regulation^a</i>			-0.101	(1.701)	-0.368	(1.776)
Industry-Level Variance (% Explained)^c	9		5 (56 %)		2 (22 %)	
Country-Level						
<i>1b.legalorigin^b</i>			0.001	(0.001)		
<i>2.legalorigin</i>			11.473***	(1.808)		
<i>3.legalorigin</i>			18.195***	(2.039)		
<i>shareholderprotection</i>					-0.311**	(0.125)
Country-Level Variance (% Explained)^c	135		135 (100 %)		103 (76 %)	
Constant	38.923***	(3.959)	76.616***	(4.057)	105.090***	(10.668)
Observations	900		900		900	
Total Variance (% Explained)	564		174 (31 %)		140 (25 %)	

* $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$

^a Dummy Variable

^b Reference Category: Common-Law

^c Random Intercept

The estimation of the Null-Model shows a variance of 135 at the country-level, nine at the industry-level, and 420 at the firm- (and thus also the residual) level, accounting for a total variance of 564 for the whole null-model. These results confirm the observation of the previous essays, highlighting the importance of the country-level and the subordinate role of the industry-level. Subsequently, this null-model is the reference point for all estimations; that is, all percentage values indicate how much of the variance of the respective level is explained by the included variables.

Basic Model I includes covariates on the firm-, industry-, and country-level in the model, whereas the legal origin is represented by three dummies (1 = common law = base case; 2 = German civil law; 3 = French civil law). In total, the model explains 31% of the overall variance. The included firm-level covariates explain almost 6% of the variance on the firm-level, and all three covariates are highly significant on a 0.01 level and carry the expected signs. The regulation of an industry is not significant, although reducing 56% of the industry variance. Interestingly, the country-level variance is explained to 100% by the two included dummies for the legal origins, which are correspondingly highly significant on a 0.01 level and indicate that the ownership

concentration is the highest in the French civil law countries, intermediate in German civil law countries, and the lowest in the base case for common law countries.

To further investigate the country-level effect on the level of ownership concentration, I exchange the legal origin dummies for the shareholder protection measure and estimate Basic Model II. The effects of the firm- and industry-level variables are robust to this change. The variable measuring the shareholder protection in a country (*shareholderprotection*) has a highly significant (0.01 level) negative effect on the level of ownership concentration. The total explained variance drops to 25%. On the country-level, the explained variance drops by almost 25%, and interestingly, the at the industry-level explained variance drops by over 30%. These results, on the one hand, confirm my expectation that the shareholder protection is one of the major drivers of ownership concentration in the light of the legal origin of a country. On the other hand, the results highlight that there is much more to the legal origin than just the shareholder protection, even influencing the effect of industry-level determinants on the level of ownership concentration.

Accordingly, evaluating the first of the previously formulated hypotheses, I find confirmatory evidence for hypotheses 1a, 1b, 2a, and 2b. First, on the firm-level, hypothesis 1a states that the firm size, measured by *logmarketcap*, has a significant negative effect on the level of ownership concentration, which is confirmed by both Basic-Model-I and Basic-Model-II. Similarly, the coefficients of the two variables measuring the risk of a firm (*risk* and *risk_sqr*) indicate a highly significant curvilinear, u-shaped / downwards sloping effect on the level of ownership concentration, as predicted by hypothesis 1b.

Second, for the country-level, I can confirm hypotheses 2a and 2b, stating that the ownership concentration will be the highest in French civil law countries, intermediate in German civil law countries, and the lowest in common law countries, and that the shareholder protection will have a similar though weaker effect as the legal origin. The legal origin dummy for the German civil law (*2.legalorigin*) has, compared to the ‘base case’ common law, a significant positive effect on ownership concentration, and the dummy for the French civil law (*3.legalorigin*) has an even stronger effect (Basic-Model-I). In the Basic-Model-II, the shareholder protection, as expected, has a significant negative effect on the level of ownership concentration. However, the total variance explained by the country-level drops from 100% to 76%, confirming the

second part of hypothesis 2b, stating that the effect of the shareholder protection will be lower than the one of the legal origin. Third, on the industry-level – although not formulated in a specific hypothesis – the not significant results of the industry regulation strengthen my expectation and the results of the first essay, that in an international context, the regulation of an industry does not have a significant effect.

In a next step, I include all previously identified determinants in the model, adding three industry-level covariates (*industryrnd*, *industrycompetition*, and *industryrnd*) and two additional country covariates (*uai* and *logmarketcap*) to construct Full-Model-I and Full-Model-II. Table 35 illustrates the results for these two models.

As discussed above, to account for relatively high correlations among a few variables I orthogonalized the two variables *logstockmarket* and *logmarketcap* for Full-Model-I, and *uai* and *shareholderprotection* for Full-Model-II.

In total, Full-Model-I explains 29% of the variance in ownership concentration. Comparing the explained variance on the firm-, industry-, and country-level, the explained variance at the firm-level did not change at all. Although none of the coefficients at the industry-level is statistically significant, the at the industry-level explained variance soared to 78%, which is significantly higher than for the Basic-Models. As in the Basic-Model I, the explained variance of the country-level sums up to 100%. The at the country-level added variable, the stock market development (*logstockmarket*,) does not have a statistically significant effect on the level of ownership concentration.

The results for Full-Model-II are similar to those of the Basic-Model-II. Once more, the firm effects, *logmarketcap*, *risk*, and *risk_sqr* are robust to the changes to the model and the total variance explained decreases for the Full-Models to 24%. Still, none of the industry effects has a statistically significant effect. As for the Basic-Model-II, the explained variance on the industry-level drops significantly to 33%. As before, the effect of the stock market development is not significant. Evaluating the effect of the two new variables on the country-level, *shareholderprotection* has significantly negative coefficient, and the effect of the level of uncertainty avoidance (*uai*) is, contrary to my expectations, not significant. The decline in the explained variance on the country-level (24%) can be compared to the Basic-Models. This suggests that the

additionally added country-level determinants did not significantly contribute to the explanatory power of the model.

To further confirm these results, as discussed, I use interaction terms to account for the high correlation of the stock market development, the firm size, and the shareholder protection. The effects of the respective covariates are determined by the marginal derivatives also provided in the table and designated by a ∂ . As before, I use the legal origin dummies in Model I and the shareholder protection measure in Model II. The results for Full-Model-I and II are provided in Table A - 4 in the appendix. In total, the results are consistent with the previously illustrated models using the orthogonalized variables, however, the explained variance is higher for the industry-, and country-level as well for the total model. Full-Model-I explains 32% of the total variance and Full-Model-II 30%.

Table 35: Estimations of the Full-Model-I and Full-Model-II

		Full-Model-I		Full-Model-II	
		coef	se	coef	se
Firm-Level					
	<i>logmarketcap</i>	-7.800***	(0.832)	-7.421***	(1.500)
	<i>risk</i>	26.959***	(5.784)	27.597***	(5.872)
	<i>risk_sqr</i>	-10.186***	(2.707)	-10.498***	(2.738)
Firm-Level Variance (% Explained)^c		24 (6%)		26 (6%)	
Industry-Level					
	<i>regulation^a</i>	-0.537	(1.684)	-0.615	(1.788)
	<i>industrycompetition</i>	4.304	(4.233)	5.158	(4.353)
	<i>industryrnd</i>	-0.642	(0.719)	-0.637	(0.769)
	<i>industry lifecycle</i>	0.095	(0.215)	0.032	(0.227)
Industry-Level Variance (% Explained)^c		7 (78%)		3 (33%)	
Country-Level					
	<i>logstockmarket</i>	-0.962	(0.794)	-1.469	(1.992)
	<i>1b.legalorigin^b</i>	0.001	(0.001)		
	<i>2.legalorigin</i>	10.910***	(1.896)		
	<i>3.legalorigin</i>	18.025***	(1.982)		
	<i>shareholderprotection</i>			-4.407**	(2.202)
	<i>uai</i>			-0.287	(2.085)
Country-Level Variance (% Explained)^c		135 (100%)		105 (78%)	
Constant		46.249***	(4.796)	54.866***	(5.146)
Observations		900		900	
Total Variance (% Explained)		164 (29%)		135 (24%)	

* $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$

^a Dummy Variable

^c Random Intercept

The results of the Full-Models confirm the assessment of the hypotheses evaluated in the first step. Looking at the so far disregarded hypotheses, I find mixed evidence for hypothesis 2c and hypothesis 2d in the light of the results. The hypotheses predict that, for the country-level, the level of uncertainty avoidance and the level of the stock market development will have a significant effect on the level of ownership concentration. However, neither *logstockmarket* nor *uai* are statistically significant. Still, in the models using the marginal derivatives, the interaction terms of *uai* (*uai* $\times$ *shareholderprotection*) and *logstockmarket* (*logstockmarket* $\times$ *logmarketcap*), have a statistically significant effect on ownership concentration (Table A - 4). Thus, it is actually possible that the stock market development and uncertainty avoidance have the predicted effect on ownership concentration and that the orthogonalization led to a misinterpretation of the results due to the change of information carried by the variables (McCallum, 1970).

On the industry-level, as expected according to the theory part of this essay, the results cast doubt on the findings of Thomsen and Pedersen (1998), as neither the life cycle stage of an industry (*industry lifecycle*), nor the level of information asymmetries (*industryrnd*), nor the intensity of competition (*industrycompetition*) have a significant effect on ownership concentration. However, as brought forward within the scope of the hypotheses development, it remains unclear whether that is because there is no effect of the factors on ownership concentration, or whether the effect is too small to be captured by the relatively rough measures.

Lastly, assessing the explanatory analyses regarding the explained variance by the firm-, industry-, and country-levels, I find confirmatory evidence for the formulated expectations.

Whereas the country-level variance is almost completely explained (up to 100%), the estimated models explain a significant part (up to 89%) of the industry-level, and only a marginal part of the firm-level variance (up to 8%). However, it has to be considered that the residual variance is also attributed to the firm-level. Thus, we do not know how much of the unexplained firm-level variance is systematic and thus can actually be explained or is subject to random influence factors, and thus, cannot be explained. Also, the explained variance of the country-level is artificially high due to the relatively high number of determinants included in the models and the relatively low number of

countries included in the sample. Overall, Full-Model II using the marginal derivatives possesses with 32% the highest explanatory power of all estimated models. However, depending on the statistical method used to account for the high correlation of *logstockmarket* and *logmarketcap*, the explanatory power drops down to 29%, which is similar or even worse than the explained variance of the Basic-Models.

3.5.5 Preliminary Conclusion

3.5.5.1 Summary and Discussion

The aim of this essay was to identify the key firm-, industry-, and country-level determinants of ownership concentration and to assess their explanatory power by evaluating the explained variance on the respective levels. Building particularly on the work of Demsetz and Lehn (1985), Thomsen and Pedersen (1999; 1997, 1998), LLSV (1998), and La Porta, et al. (1999), I derived hypotheses and tested them on a sample of 900 firms from nine countries using hierarchical mixed models.

Overall, I find confirmatory evidence for most of the formulated hypotheses, indicating that firm risk, firm size, legal origin, and shareholder protection significantly influence the level of ownership concentration. The regulation of an industry plays a subordinate role for the allocation of ownership rights. In total, the estimated models can explain up to 32% of the observed variance on ownership concentration. Whereas the legal origin and the level of shareholder protection explain almost the complete variance in ownership structure between countries, up to 89% of the industry-level and only 8% of firm-level variance can be attributed to the tested determinants.

The 3% change in explanatory power of the Full Models, depending on whether the orthogonalization or the marginal derivate technique was applied, can be considered as statistical artifact, as there is no theoretical explanation why the explanatory power for one method should be higher than for another. Comparing the Basic with the Full models, the in the Full-Models added covariates gained only marginal additional explanatory power.

The results suggest that new firm-level determinants of ownership concentration have to be identified to yield models with a higher explanatory power. Additionally, the findings concerning the legal origin of a country call for further investigation. The legal origin of a country explains a significant share of the variance in ownership

concentration. However, it appears that the legal origin picks up a whole range of effects we are not yet aware of, and thus calls for further investigation.

Comparing the findings of the previous analyses with those of the first essay, the results are widely congruent. However, the explanatory power attributed to the legal origin is within the scope of this essay with up to 100% significantly higher than the one yielded by the analyses of the first essay (79%). This gap, however, can be explained with the differences in the statistical models, as I included the legal origin in the first essay as random intercept, and in the second essay as dummy variables.

Although the conducted analyses yield valuable insights into the allocation of ownership rights, other questions are being raised at the same time. Whereas the results regarding the firm-level are quite clear, the industry-effects merit further discussion. After all, none of the industry variables had a significant effect in any of the estimated models, which might be for three different reasons: First, the industry effect in general is quite small, and thus, the industry characteristics analyzed do not have a significant effect indeed. Also, as discussed within the scope of the development of the hypotheses, the theoretical effect of the identified industry factors is not quite clear. Second, the significance might be – and surely is to a certain extent – influenced by the quality of the proxies used. Apparently, constructs as information asymmetries, are hard to measure and the used proxies are rough at best. Third, the sample used for the analyses exclusively contained fairly large companies, who are typically significantly diversified and are active, and several industries, diluting the industry effect.³⁶

At the country-level, I found for the basic, as well as the full models that although the shareholder protection had a significant effect on the ownership concentration, the legal origin dummies explained a substantially higher share of variance. Accordingly, two questions arise: What other factors the legal origin picks up drive the level of ownership concentration, and, according to the previously mentioned criticisms of Braendle (2006) and Coffee (1999, 2001a, 2001b), is it really shareholder protection that drives ownership concentration? I tried to analyze two isolated / additional country-level effects by including the level of uncertainty avoidance and the development of the stock

³⁶According to self-reported two digit SIC-codes, 801 of 900 companies are active in two or more industries.

market in the analyses. However, the high correlation of several of the country factors yielded difficult to interpret results, which illustrates a key issue in this concern: After all, it appears hardly possible to decompose the legal-origin effect by including a variety of potentially ownership-related country specific characteristics into regression models. Table 36 illustrates why a guiding framework, explaining the complex interactions and dependencies of the country characteristics, is needed first before decomposing the total effect of the legal origin.

Table 36: Correlation Matrix of Key Development Indicators

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) <i>unemploymentrate</i>	1.00						
(2) <i>shareholderprotection</i>	-0.58***	1.00					
(3) <i>efi</i>	-0.80***	0.92***	1.00				
(4) <i>loggdp</i>	-0.55***	0.47***	0.61***	1.00			
(5) <i>gdpcapita</i>	-0.73***	0.72***	0.68***	0.46***	1.00		
(6) <i>logstockmarket</i>	-0.42***	0.42***	0.44***	0.35***	0.37***	1.00	
(7) <i>uai</i>	-0.60***	0.66***	0.70***	0.46***	0.77***	0.25***	1.00

* p<0.10 ** p<0.05 *** p<0.01

The illustrated correlation matrix shows that most of the indicators, all of which represent a certain economic characteristic of a country, correlate fairly highly: Unemployment rate (*unemploymentrate*), shareholder protection (*shareholderprotection*), Economic Freedom Index by Heritage Foundation (*efi*), GDP per Capita (*gdpcapita*), stock market size (*logstockmarket*) and level of uncertainty avoidance (*uai*). All these variables appear to interact and influence each other significantly. This might also explain, why, contrary to my expectation, the uncertainty avoidance and the stock market development of a country did not have a significant effect on the level of ownership concentration, as the actual effect of the two variables might be concealed by the interrelation of all country factors and thus undetectable. These results shed further light on the criticism of Braendle (2006) and Coffee (1999, 2001), too. The high correlations of the country characteristics show that the question whether the corporate governance system, the level of shareholder protection, or the ownership structure in a country, developed first, is not a good one to ask, as the institutional conditions in a country are to a large extent highly interrelated and develop simultaneously. Accordingly, to understand the underlying effect of the legal origin on the ownership concentration, this network of characteristics has to be detangled first.

Also related to the country-level, the effect of the country covariates on the industry-level, becoming apparent when comparing the explained variance on the industry-level between the Basic and Full-Model I and II, calls for attention. Although no industry specific variable was added or removed from the models, the explained variance on the industry-level dropped significantly when exchanging the legal origin variable for the shareholder protection. As it appears, the close interaction and dependence of several factors influencing level of ownership concentration does not only appear to be true for the country-level, but extends to the industry-level. However, which factor on the industry-level is influenced by the country-level cannot be explained by the present analyses.

Talking about the explained variance, the question remains how far we eventually might be able to go in explaining the variance of ownership concentration. The explained variance by the presented models largely coincides with the results of existing studies, such as those of Demsetz and Lehn (1985) and Thomsen and Pedersen (1999), raising doubt whether quick-wins in this respect are possible at all. However, whereas the previous results clearly show that the potential in the industry- and country-level is rather limited, the firm-level, with only up 8% explained variance offers room for improvement. Taking into consideration that the ownership structure of a firm is exposed to a near infinite number of potentially random effects, it remains to be seen though if significant improvements in explanatory power are possible after all.

3.5.5.2 Limitations

The study is subject to several limitations, which should be considered when evaluating the presented results and should be addressed by future research as far as possible. Although the sample allows for a thorough study of the determinants of ownership concentration, even in an international context, it has two shortcomings: First, it contains cross-sectional data only, and, second, the sample comprises solely large, listed companies. Extending the sample to a time series might help to smooth annual one-time effects and thus yield improved estimation results. Furthermore, enlarging the sample by adding smaller, perhaps not listed firms, promises further insights. As mentioned previously, especially the issue that the in the sample included firms are highly diversified limits the insights into the industry effects on ownership concentration, which might be mitigated by including smaller, single industry firms in the sample. Furthermore, besides the issues regarding the sample, several proxies used in the

analyses, e.g., the measure for information asymmetries, are far from optimal and rather rough at best.

The primary focus of this study was to identify the key determinants of ownership concentration on the firm-, industry-, and country-level and to evaluate the explained variance at the respective levels. Future research should particularly focus on two aspects: First, the identification of further firm-specific determinants of ownership concentration, as the explained variance on the firm-level of about 8% leaves room for improvement. Second, particularly the decomposition of the effect captured by the legal origin of a country into separate components might gain valuable insights into the interplay of features of alternative corporate governance systems, culture, and other aspects. The high correlations of several of those country-characteristics, as illustrated in the discussion, call for an alternative approach to the standard regression analysis to assess their effects on the allocation of ownership rights. New insights in these factors might also help to understand the observed interplay of the country- and industry-level, potentially leading to important policy-implications.

3.6 Chapter Conclusion

The two preceding essays provided further insights into the determination of the level of ownership concentration of firms. Compared to the status quo of the research on determinants of ownership concentration, my analyses contributed to our knowledge about the determination of ownership concentration by showing that whereas the country-level explains a significant share of the variance in ownership concentration, the industry-level plays only a minor role. Furthermore, I found that the so far identified significant firm-level determinants could only explain a marginal part of the total firm-level variance. At the country-level, although the level of shareholder protection and legal origin of a country explain the lion's share of the country-level variance, they comprise a variety of effects. The results clearly show that the applied ownership framework possesses significant explanatory power and particularly highlights the importance of institutional differences for the level of ownership concentration.

Accordingly, despite having made progress in the understanding of the allocation of ownership rights, several questions remain unanswered or arise from the results at hand, and there is room for further improvement of the applied ownership framework. Particularly the significant unexplained variance on the firm-level calls for further identification and investigation of additional firm characteristics influencing the level of ownership concentration. Furthermore, the significance of the country-level for the ownership structure of the firm on the one hand, and the rough measures of country differences on the other, demand a new way of differentiating the institutional differences between countries to gain a better understanding of the respective effects on the level of ownership concentration.

However, in the light of the results of the recent study by Holderness (2009), the findings regarding the country differences in ownership concentration have to be reconsidered. As mentioned, the shareholder protection and legal origin hypotheses by LLSV (1998) are not undisputed and were criticized, for example, by Braendle (2006) and Coffee (1999, 2001a, 2001b). Holderness, however, questions my results and the findings by the seminal works of LLSV and others on a completely different level.

Conducting a study on 7,842 firms from 22 countries, Holderness (2009) challenges the ideas of a dispersed ownership structure in the US in particular, and differences in ownership concentration between countries in general. In contrast to the widely

accepted image of a highly dispersed ownership landscape in the US, Holderness finds that the average ownership concentration in the US is not significantly lower (or higher) than in any other country. Furthermore, the analyses of Holderness do not show any significant differences in ownership concentration between countries.

Holderness (2009) concludes that the theory proposed by LLSV (1998), explaining the effect of investor protection on ownership concentration, is not valid. He argues that the frequent studies confirming the hypothesis of LLSV are actually tracking faint traces and find only confirmatory evidence because of highly biased samples. Indeed, whereas most studies analyzing the effect of country differences on ownership concentration include only the biggest firms in a country in their sample – just as I did – Holderness takes a different approach by collecting a random sample.

Nonetheless, despite the intriguing findings by Holderness (2009), I argue that the theory of LLSV (1998), and so my findings, are meaningful and contribute to the understanding of the ownership structures of firms. I argue that Holderness himself mentions the key reasons for the different findings. First, as mentioned above, whereas I and most of the existing studies, such as those of LLSV and Thomsen and Pedersen (1999; 1996, 1997, 1998, 2000, 2003), include only the largest public companies, Holderness constructs a random sample. Second, the database used by Holderness includes on average 340 firms per country, and thus, significantly more than most of the existing studies. Both differences imply that the companies analyzed by Holderness are significantly smaller than those analyzed in my and in most of the other studies. Accordingly, as Faccio and Lang (2002) already argued, “cross-country differences become less significant among small firms” (p. 381). Third, unlike the data I use, Holderness exclusively includes block holdings with more than 5%. Thus, per definition, minority owners with less than 5%, potentially particularly contributing to a very diffuse ownership structure, are not covered by the data. Accordingly, I argue for those three reasons that Holderness (2009) is actually investigating an interesting facet of the ownership landscape in a country, which is different from what I did in the previous essays and from what authors, such as LLSV and Thomsen and Pedersen did, namely analyzing the largest companies in a country. Holderness’ conclusion that respective country differences actually do not exist is, in my opinion, premature. First, the results at hand for the influence of the country-level on the level of ownership concentration are just too striking to be attributed to random mistakes in the samples.

Second, Holderness does not take into account that the significant different firm sizes between countries, or the different levels of ownership concentration among the largest companies in countries, might actually be a country-specific ownership characteristic. Nevertheless, the question arises as to why the institutional differences on a country-level appear to affect only the largest firms in a country, but not a random sample, including also small and medium sized enterprises.

4 PERFORMANCE EFFECTS OF OWNERSHIP CONCENTRATION

The subsequent chapters represent the third essay in this thesis. Accordingly, this essay addresses the third research question dealing with the effects of ownership concentration on firm performance.³⁷

4.1 Introduction

The discussion of the relationship between ownership concentration and firm performance has attracted significant attention in the corporate governance literature. By investigating the contribution of majority shareholders to the solution of agency problems through active monitoring, the respective stream of literature has been unable to come to a consensus on whether there is a performance effect of ownership concentration or not (Demsetz & Villalonga, 2001; Sanchez-Ballesta & Garcia-Meca, 2007; Thomsen, et al., 2006).

The discussion itself dates back to the study of Berle and Means (1932), who suggested a positive relationship between ownership concentration and performance. Since the publication of this study, a number of authors have discussed and analyzed the performance effect of ownership concentration. To mention one of the most important studies in this research area, Demsetz and Lehn (1985) challenged the view of Berle and Means. In their seminal work, Demsetz & Lehn found that the ownership structure of a firm is endogenously determined, optimizing the benefits and costs of alternative levels of concentration. They conclude that no systematic effect on firm performance exists. This result was confirmed by the study of Demsetz and Villalonga (2001). In contrast, Morck, Shleifer and Vishny (1988) suggested a curvilinear relationship between ownership concentration and firm performance, for which they also found empirical evidence.

A new stream of research, spearheaded by Thomsen et al. (2006), investigates the performance effects of ownership concentration in different countries and finds that there is no influence of ownership concentration on firm performance in countries with relatively low ownership concentration (such as the US and the UK). However, Thomsen et al. (2006) argue that there may be conflicts of interest between blockholders

³⁷Please note that Stefan Hilger contributed to this essay, particularly with respect to the literature review and the theory development.

and minority investors in countries with higher levels of ownership concentration, and therefore expect negative effects of ownership concentration on firm performance.

Two of the most recent studies on the topic of ownership structure and firm performance, the meta-analyses of Sanchez-Ballesta and Garcia-Meca (2007) and Van Essen and Van Oosterhout (2008), which are based on 33 and 69 studies, respectively, highlight the scattered results. The studies suggest that these differences in the findings stem from differences in performance measures, and whether studies control for endogeneity, curvilinearity, and differences in corporate governance systems or not. To my knowledge, the majority of the existing studies fail to include these effects simultaneously. In particular, the influence of country difference, for example, in terms of corporate governance systems, as illustrated by Thomsen, et al. (2006), has been disregarded widely.

This essay fills this gap. Hence, the aim of this study is to conduct a comprehensive analysis on the effects of ownership concentration on performance. The analyses account for the potential endogeneity of the ownership structure, curvilinear effects, alternative measures of firm performance, and country differences. In particular, I investigate the effects of varying types of corporate governance systems. Accordingly, this study contributes to the extensive stream of literature on the effect of ownership concentration on performance, as to my knowledge no existing study accounts for all of the above mentioned issues in a satisfying way.

The study is structured as follows. First, I provide an overview of the existing literature and derive hypotheses. Second, I describe the statistical methods used in the empirical study. Then, I present the results and discuss their importance with respect to the theoretical propositions developed at the outset. Finally, I derive implications and recommendations for future research.

4.2 Theory and Literature Review

The theoretical effect of ownership concentration on performance, as illustrated by Thomsen and Pedersen (2003), is ambiguous. On the one hand, an increasing ownership concentration can have a positive impact on firm performance. An increase in ownership concentration arises from an increase in ownership stakes held by individual owners relative to the total share capital in a firm. The bigger these stakes, the stronger

the incentive for the owners to make use of their control rights and enforce performance maximizing decisions by means of thorough monitoring (Burkart, Gromb, & Panunzi, 1997; Jensen & Meckling, 1976; Zeckhouser & Pound, 1990).

On the other hand, higher levels of ownership concentration can also have a negative effect on firm performance. An increasing level of block holdings raises the probability of entrenchment and opportunistic behavior by majority owners. The bigger the block holdings of single owners, the easier for them to divert benefits to themselves rather than to the company, as the majority owners can overrule the minority owners. Thus, the higher probability of opportunistic behavior leads to a negative performance effect (Fama & Jensen, 1983; Morck, et al., 1988; Shleifer & Vishny, 1997).

Accordingly, at this point I cannot tell which of the two previously illustrated effects is stronger than the other, or if they potentially just cancel out. Additionally, to further complicate the relationship of concentration and performance, Demsetz and Lehn (1985) argue that alternative levels of ownership concentration will not lead to systematic performances differences due to the endogenous determination of the ownership structure. According to this perspective, market forces push costs and benefits of different concentration levels towards efficiency, preventing sustaining performance effects.

As these complementary approaches show, the relationship between ownership concentration and firm performance is a complex one. Accordingly, the results of the existing studies show great variance. Table 37 summarizes the findings of the existing research on the topic of ownership concentration and performance.

Studies using single equation OLS models come to mixed results. Except for the studies by Hill and Snell (1989), Gedajlovic and Shapiro (2002), and Oswald and Jahera (1991), they tend to find no relationship between ownership concentration and accounting-based performance (Demsetz & Lehn, 1985; Holderness & Sheehan, 1988; Lehmann & Weigand, 2000; Mehran, 1995; Pedersen & Thomsen, 1999) and a positive, curvilinear (in most cases inverted u-shaped) relationship between ownership concentration and market-based performance (Anderson & Reeb, 2003; Edwards, Nibler, Berglof, & Franks, 2000; Gorton & Schmid, 2000; McConnell & Servaes, 1990; Morck, et al., 1988). However, these studies do not consider the possibility of

endogeneity. In addition, results vary for different countries, sample sizes, and when the identity of blockholders is taken into account.

Simultaneous Equation Models (2SLS) and other analyses accounting for endogeneity (Granger Causality test) widely do not find a relationship between ownership concentration and performance (Agrawal & Knoeber, 1996; Cho, 1998; Demsetz & Villalonga, 2001; Himmelberg, Hubbard, & Palia, 1999; Loderer & Martin, 1997; Miwa & Ramseyer, 2003; Thomsen & Pedersen, 2003; Welch, 2003). However, the results vary for different countries. Accordingly, Thomsen, et al. (2006) conclude that these differences originate from variations in average ownership concentrations across countries, resulting from different underlying corporate governance systems. Only two studies by de Miguel, Pindado, and Torre (2004) and Claessens and Djankov (1999) find confirmatory evidence for – according to de Miguel, et al. (2004) – a “weakly robust” performance effect of ownership concentration when using 2SLS regressions.

Table 37: Summary of Literature Review

Methodology	Authors	Sample	Performance Measure(s)	Results		
				Linear	Curvilinear	No relationship
Single regression (OLS)	Demsetz & Lehn (1985)	511 firms, 1980-81, US	ROE			x
	Morck et al. (1988)	371 Fortune 500 firms, 1980	Q, Accounting Profit Rate		x	
	Holderness & Sheehan (1988)	114 firms, 1979-84, US	Q, ROE			x
	Hill & Snell (1989)	122 Fortune 500 firms, 1980, US	Value added per employee	x		
	McConnell & Servaes (1990)	1173 firms 1976, 1093 firms 1986, US	Q		x	
	Oswald & Jahera (1991)	654 firms, 1982-1987, US	ROA, ROE	x		
	Mehran (1995)	153 firms, 1979-1980	Q, ROA			x
	Pedersen & Thomsen (1999)	518 firms, 1990, 12 countries within Europe	ROE			x
	Thomsen & Pedersen (2000)	435 largest European firms, 1990	Q, ROA, Sales growth		x	
	Gorton & Schmid (2000)	56-283 banks, 1985-86, Germany	Q, ROE		x	
	Lehmann & Weigand (2000)	361 firms, 1991-96, Germany	ROA, ROE			x*
	Edwards & Nibler (2000)	156 firms, 1992, Germany	Q		x	
	Gedajlovic & Shapiro (2002)	334 firms, 1986-91, Japan	ROA	x		
	Anderson & Reeb (2003)	403 family firms, 1992-1999, US	Q		x	
	Edwards & Weichenrieder (2004)	97 firms, 1992, Germany	Q			x**
Simultaneous equations/2SLS	Agrawal & Knoeber (1996)	383 firms, 1987, US	Q			x
	Loderer & Martin (1997)	867 firm acquisitions, 1878-88, US	Q			x
	Cho (1998)	326 Fortune 500 manufacturing firms, 1991	Q			x
	Himmelberg et al. (1999)	330-551, 1982-84, US	Q			x
	Claessens & Djankov (1999)	706 firms, 1992-1997, Czech Republic	Operating Profit over Assets	x		
	Demsetz & Villalonga (2001)	223 firms, 1980-81, US	Q, Accounting Profit Rate			x
	Pedersen & Thomsen (2003)	214 firms, 1991, Europe	Q			x
	Welch (2003)	114 firms, 1999-2000, Australia	Q, ROE			x
	Miwa & Ramseyer (2003)	637-710 firms, 1953, 1958, Japan	ROA			x****
	de Miguel et al. (2004)	135 firms, 1990-1999, Spain	Q		x	
Event studies	Lewellen et al. (1985)	266 merger events, 1963-81, US	Stock returns	x		
	Agrawal & Mandelker (1990)	372 charter amendments, 1979-85, US	Stock returns	x		
	Barclay & Holderness (1991)	106 block trades, 1978-82, US	Stock returns	x		
	Song & Walking (1993)	153 acquisitions, 1977-83, US	Stock returns			x
	Slovin & Sushka (1993)	85 deaths of corporate insiders, 1973-89, US	Stock returns			x
	Bethel et al. (1998)	244 block trades, 1980-89, US	Stock returns	x		
	Han et al. (1999)	301 manufacturing firms, 1988-92, US	Stock returns		x	
	Renneboog (2000)	165-186 firms, 1989-94, Belgium	Stock returns	x		
Granger Tests	Thomsen et al. (2006)***	598 firms, 1990-98, US, UK	Q, ROA			x
	Thomsen et al. (2006)***	278 firms, 1990-98, France, Germany	Q, ROA		x	

* positive effects are observed for listed German firms and negative effects for non-listed German firms

** higher control rights are found to lower the market value of German firms and higher cash-flow rights are found to enhance the market value

*** Results vary for Continental Europe and the Anglo-Saxon system of corporate governance

**** Miwa & Ramseyer did not specifically use 2SLS, but account for the problem of endogeneity by a particular type of study

Event studies and Granger tests produce ambiguous results. Some of them find positive effects of ownership concentration (Agrawal & Mandelker, 1990; Barclay & Holderness, 1991; Bethel, Liebeskind, & Opler, 1998; Han, Suk Hun, & Suk, 1999; Lewellen, Loderer, & Rosenfeld, 1985; Renneboog, 2000; Thomsen, et al., 2006), while others do not detect any effects (Slovin & Sushka, 1993; Song & Walking, 1993; Thomsen, et al., 2006).

To summarize, empirical studies based on OLS or event studies come to mixed results regarding the relationship between ownership concentration and performance. The analyses accounting for endogeneity mostly find no relationship between ownership concentration and firm performance. However, most of the studies work with single-country samples. Therefore, they do not cover moderating effects of country differences on the ownership concentration performance relationship. According to Thomsen, et al. (2006), the performance effect of ownership concentration is only significant in those countries where the institutional environment, in particular in terms of corporate governance systems, stimulates higher levels of ownership concentration. Thomsen, et al. argue that the level of ownership concentration can only exceed the value maximizing point when all influence factors, i.e. firm-, industry-, and country-characteristics, push the concentration to the extreme. Accordingly, in countries with an institutional environment favoring low levels of ownership concentration, the value maximizing point is unlikely to be exceeded. In countries with a corporate governance system favoring higher levels of ownership concentration, however, the levels of ownership concentration might exceed the optimal point and thus lead to a negative effect on performance.³⁸

According to the literature review, it appears that analyses of the performance effect of ownership concentration need to account for the possibility of an endogenous determination of the ownership structure, potential curvilinear effects, alternative performance measures, and institutional differences between different corporate governance systems. Building on the findings of the existing studies, in the following section, I will derive hypotheses regarding the effect of ownership concentration on performance and moderating effects, further detailing the findings by Thomsen, et al. (2006).

³⁸For a detailed description of the factors influencing the level of ownership concentration of a firm please refer to chapter 3.

4.3 Development of Hypotheses

4.3.1 Endogeneity

The argument put forward by Demsetz and Lehn (1985) states that alternative levels of ownership concentration can influence a variety of costs and benefits occurring within the firm as a nexus of contracts. Market forces push firms towards efficiency and to considering costs and benefits of alternative ownership structures. Accordingly, no systematic performance differences between alternative levels of ownership concentration should be observable. However, for example, Denis and McConnell (2003) and Thomsen, et al. (2006) argue that the endogenous determination does not always yield a value-maximizing, and thus performance neutral, ownership concentration. The authors reason that institutional factors can drive the level of ownership concentration beyond the value maximizing point, leading to a negative effect of ownership concentration on performance. Denis and McConnell hypothesize that when the endogenously determined ownership concentration exceeds the value maximizing level of concentration, blockholders might focus on increasing private benefits instead of shareholder value, leading to a negative effect on firm performance. However, only high levels of ownership concentration will lead to such an effect. Accordingly, I formulate the following hypothesis.

Hypothesis 1: At high levels of ownership concentration there is a (negative) effect on firm performance.

4.3.2 Country Differences

The previous essays of this thesis show, in accordance with studies such as those of Demsetz and Lehn (1985), Van der Elst (2004), Thomsen and Pedersen (1998), and LLSV (1998), that ownership concentration varies significantly across firms and is influenced by a variety of firm-, industry- and country-specific factors. However, Thomsen, et al. (2006) argue that the level of ownership concentration, which is necessary to cause negative performance effects, is most likely to occur in those countries that favor higher ownership concentration due to their institutional environment. Roe (2004) and LLSV provide alternative (although complementary) explanations for the observation why ownership concentration is the highest in Continental-European countries with German or French civil law backgrounds.

LLSV (1998) argue that the legal origin of a country affects the level of ownership concentration by influencing the level of shareholder protection. According to LLSV, countries with a common law background (e.g., the US and the UK) have a higher level of shareholder protection than countries with a corporate governance system rooted in the German civil law (e.g., Germany and Brazil) and countries with a French civil law background (e.g., France and Italy), which typically have the lowest shareholder protection. In countries with a low shareholder protection, the level of ownership concentration will be relatively high. Owners will tend to acquire larger blocks of shares since minority holdings are rendered less attractive because of the relatively high costs connected with the enforcement of ownership rights and the potential risk of expropriation and self-inflicted behavior by majority owners. In countries with better shareholder protection, minority owners are not as threatened by these issues as in countries with a relatively low level of shareholder protection and are thus not as hesitant to acquire smaller stakes of a company, leading to a lower ownership concentration.³⁹

Roe (2004) argues that in the continental European social democracies the relatively strong influence of the government and the employees on managers might lead to suboptimal shareholder-value maximization. Therefore, shareholders try to increase their influence via block holdings, which leads to a higher level of ownership concentration. In contrast, the influence of employees and politics on firms is much lower in Anglo-American countries, allowing for a more dispersed ownership structure.⁴⁰

Building on these concepts, I identify two effects of how country differences may influence the relationship between ownership concentration and performance. First, institutional differences significantly influence the ownership structure of firms and may drive the level of ownership concentration beyond the value maximizing point. Second, the level of shareholder protection varies among countries, moderating the effect of ownership concentration on performance. Subsequently, I illustrate the two complementary effects.

As developed in the section dealing with the topic of endogeneity, I argue that there is a (negative) effect of ownership concentration on performance only when the level of

³⁹ For a detailed description of the theoretical argument of LLSV (1998) please refer to chapter 3.2.3.

⁴⁰ For a detailed description of the theoretical argument of Roe (2004) please refer to chapter 3.2.3.

ownership concentration exceeds the value maximizing point. In accordance with Roe (2004), LLSV (1998) and Thomsen, et al. (2006), this critical level of ownership concentration will only be exceeded in Continental-European countries with a German or French civil law background.

At the same time, these countries are characterized by a comparably low level of shareholder protection. In combination with the relatively high ownership concentration, the low shareholder protection decreases the possibilities of minority holders for efficient monitoring due to relatively few/weak minority owner rights. Accordingly, it is easier for the majority of owners to maximize their private benefits in countries with a lower level of shareholder protection, further increasing the negative performance effect.

Both arguments underline the hypothesis that country differences significantly influence the ownership concentration performance relationship and suggest that a significant performance effect will materialize in countries with particular institutional environments. Accordingly, I formulate hypothesis 2.

Hypothesis 2: In Continental-European countries with a German or French civil law background, there is a negative effect of ownership concentration on performance.

4.3.3 Curvilinearity

Morck, et al. (1988), McConnell and Servaes (1990), Stulz (1988), and Hermalin and Weisbach (1988) argue that any effect of ownership concentration on firm performance is curvilinear (bell-shaped) and has to be treated as such in the regressions to test the relationship.

According to Berle and Means (1932), I would expect a positive effect of ownership concentration on firm performance. The dispersion of ownership rights among a large number of shareholders may induce free-riding behavior. This situation could be opportunistically exploited by the managers, for example, by pursuing business policies that do not maximize their firm's value but private benefits. For relatively low levels of ownership concentration, the counter-acting effects (free-riding and monitoring) will be stronger than for relatively high levels of ownership concentration. Thus, following the

line of arguments of Berle and Means, I expect a positive, decreasing marginal effect of ownership concentration on firm performance. Accordingly, there should be a positive curvilinear effect with a decreasing slope as an increase in ownership concentration reduces free-riding behavior and increases the monitoring incentives.

However, an increasing level of ownership concentration might also foster opportunistic behavior by owners themselves. This can lead to a curvilinear negative effect of ownership concentration on firm performance, contradicting the effect suggested by Berle and Means (1932). From a certain ownership level onwards, the interests of block or majority owners might change from the value-maximization for the entirety of all owners to self-inflicted behavior focusing on private benefits e.g., by empire building and entrenchment. With low or intermediate block holdings, the blockholders might be prevented from self-inflicted decisions due to the monitoring of other owners. Significant majority holdings, however, will enable owners to make according decisions, overruling potentially intervening minority holders. Contrary to the positive effect of ownership concentration, the negative effect of ownership concentration will be relatively weak on low/medium level and stronger on higher levels of ownership concentration. This increasing marginal negative effect leads to a curvilinear relationship with increasing slope.

Combining the positive as well as the negative effect of ownership concentration leads to a curvilinear, bell-shaped relationship between ownership concentration and performance (Morck, et al., 1988).

As illustrated in the previous chapter, I argue that there is a significant (negative) effect of ownership concentration on firm performance for high levels of ownership concentration only. Thus, at these high levels of concentration the performance increasing effect will be outweighed by the performance decreasing effect. Still, the marginal negative effect of ownership concentration is increasing. Hence, I argue that the negative performance effect of ownership concentration for high levels of concentration is curvilinear with increasing slope.

Hypothesis 3: The negative performance effect for high levels of ownership concentration is curvilinear (downwards-sloping) with increasing slope.

4.4 Methodology

In this chapter, I describe the methodology and the statistical model applied in the subsequent analyses. The sample and variables will not be described as they have been illustrated in chapter 2.2. Table A - 5 in the appendix provides an overview on all variables used in the first and second stage regressions.

4.4.1 Statistical Method

For the subsequent analyses, I considered two different econometric methods, both of which were mentioned within the literature review: First, as so far applied by most of the studies included in the literature review, two stage least squares (2SLS) and, second, the Granger test as applied by Thomsen, et al. (2006). Both methods are characterized by advantages and disadvantages. The key issue for the 2SLS method is the identification of powerful instruments. For the Granger test there is no need for instruments, however, the causality the Granger test assesses is a specific one and particularly in the light of multivariate relationships, involving three or more variables, the results can be misleading (Granger, 1969; Hacker & Hatemi-J, 2006). I followed the studies by Loderer and Martin (1997), Cho (1998) and Demsetz and Villalonga (2001), and decided to use the 2SLS method to assess the effect of ownership concentration on performance for the following reasons. First, the determination of the ownership structure of a firm involves a variety of influence factors, which renders the results of the Granger tests less powerful and makes them hard to interpret. Second, following existing studies, as Demsetz and Villalonga (2001), I can rely on established 2SLS models and use similar instruments. Third, as the majority of the existing studies use 2SLS models, using the Granger test would lead to difficulties in terms of the comparability with the findings of other studies.

Accordingly, as in the studies by Loderer and Martin (1997), Cho (1998), and Demsetz and Villalonga (2001), I will use simultaneous equation analysis to assess the effect of ownership concentration on performance while accounting for endogeneity of the ownership structure. The two stages least squares (2SLS) models consists of two equations: The first equation (1) determines the level of ownership concentration and the second equation (2), the firm performance. In the following, I will describe models (1) and (2) in detail.

The central and most frequently criticized issue when using 2SLS models is the identification of viable instruments to yield consistent and meaningful results. To derive consistent estimates, the instruments must satisfy two conditions: First, the instruments must be highly correlated with the dependent variable of the first-stage regression. Second, the instruments must not correlate with the error term, ε , of the second stage regression. Whereas, I can clearly test for the first condition (all chosen instruments correlate highly and significantly in their predicted direction on a 0.01 or 0.05 significance level), I cannot directly test for the second condition, as ε is unobservable (Baum, 2006). As pointed out by Himmelberg, et al. (1999) and Thomsen, et al. (2006), it is difficult to identify instruments for which the assumption of zero-correlation does completely hold. However, as illustrated in the literature review, several authors have successfully conducted 2SLS analyses on the ownership concentration / performance research, yielding consistent and robust results. Accordingly, I widely rely on previously successfully applied instruments. Additionally, as I will show later on, several post-estimation tests confirm the consistency of the model and the adequacy of the instruments used. For these reasons, I believe that the 2SLS approach with the subsequently suggested model will yield meaningful results and contribute to the understanding of the relationship between ownership concentration and firm performance.

Still, the criticisms brought forward, for example, by Thomsen, et al. (2006), are valid and the instruments cannot be perfect. However, in due of a clearly superior methodology, I rely on the previously illustrated 2SLS technique with the subsequently presented models.

4.4.2 Statistical Model

4.4.2.1 First-Stage Regression

The first stage regression uses equation (1) with the level of ownership concentration as the dependent variable. To determine the level of ownership concentration, I rely on an adapted version of a model initially developed by Demsetz and Lehn (1985), and also used for 2SLS regression analyses by Cho (1998) and Demsetz and Villalonga (2001). Subsequently, I describe the first stage regression, including the instrumented variable and the instruments, in detail. The complete first stage regression model looks as follows:

$$(1) \text{ Ownership Concentration} = f \left[\begin{array}{c} \text{firm performance,} \\ \text{firm size,} \\ \text{industry regulation,} \\ \text{shareholder protection,} \\ \text{firm risk,} \\ \text{(firm risk)}^2 \end{array} \right]$$

Model (1) is estimated two times with two different dependent – thus, instrumented – variables, namely ownership concentration and squared ownership concentration, respectively. The latter one is necessary to measure and test for a curvilinear effect of ownership concentration on performance.

In terms of instruments, I include the firm performance in the model, as I argue that firm performance is as likely to influence ownership structure, as ownership structure is to influence performance. According to Demsetz & Villalonga (2001), this relationship is the reason that renders standard OLS models inadequate for determining the effect of ownership concentration on performance. Insider trading, corporate takeovers, and in particular events, such as leveraged buy-outs, clearly show that the firm performance and differences in the anticipated future firm performance, for example, caused by information asymmetries, can strongly influence the ownership structure of a firm.

The size of the firm is included in the model due to its decreasing effect on ownership concentration.⁴¹

To control for industry effects, I include the industry regulation shown to be the most important influence factor on ownership concentration on the industry-level (Thomsen & Pedersen, 2003). As initially advanced by Demsetz and Lehn (1985), industry regulation has a negative effect on ownership concentration, as in the absence of regulation, higher ownership stakes ensure higher control powers for owners. Regulation, however, restricts the options available to owners, and thus, renders the benefits of majority ownership less attractive, which leads to a decrease in ownership concentration.⁴²

The firm risk and the squared firm risk are included into model (1) to account for the curvilinear, bell-shaped effect of firm risk on ownership concentration. To explain this effect, Demsetz and Lehn (1985) state that one of the main advantages of a higher ownership concentration is the higher incentive for large blockholders to monitor the firm. The higher the risk of a firm, the more volatile is the business. The more volatile a

⁴¹Cf. section 3.2.1 for a more detailed elaboration on the respective effect on ownership concentration.

⁴²Cf. section 3.2.2 for a more detailed elaboration on the respective effect on ownership concentration.

business is due to frequent decisions and unforeseen developments, the greater the need to monitor managerial performance is. This effect favors a higher ownership concentration for firms with a relatively high risk due to the increase in monitoring incentives. At the same time, Demsetz and Lehn argue that risk has a decreasing effect on ownership concentration. The higher the risk, the smaller the stakes owners can acquire while maintaining an optimal portfolio diversification. This effect renders larger ownership stakes less attractive and results in a negative effect of risk on ownership concentration (Markowitz, 1952; Putterman, 1993). Taking these two opposing effects of risk into account, Demsetz and Lehn reason that risk has a curvilinear, bell-shaped effect on ownership concentration. The marginal increase in monitoring incentives is relatively high at low levels of risk, but decreases with increasing risk. The marginal negative effect of risk on portfolio diversification is relatively small for low levels of risk, but increases with higher levels of risk. Therefore, at low risk levels, the concentration increasing effect of monitoring incentives will outweigh the decreasing effects of risk. At higher levels of risk, the concentration decreasing effect will outweigh the concentration increasing effect, which results in a bell-shaped effect of risk on ownership concentration.⁴³

Lastly, I include the shareholder protection in the model to control for country differences. LLSV (1998) argue that in countries with lower shareholder protection, owners will acquire larger ownership stakes to exercise their control rights and avoid being expropriated by managers. Accordingly, an increase in shareholder protection leads to a decrease in ownership concentration.⁴⁴

4.4.2.2 Second-Stage Regression

The second-stage regression uses equation (2) with firm performance as the dependent variable. As in the case of the first stage regression, I use an adapted version of the models used by Cho (1998) and Demsetz and Villalonga (2001). Having determined the ownership concentration with the help of model (1), the second stage model includes the ownership measure, as well as various control variables. Estimating model (2) will give information about the relevance of ownership concentration on firm performance. In the following, I describe model (2) in detail. The complete second-stage regression model looks as follows:

⁴³Cf. section 3.2.1 for a more detailed elaboration on the respective effect on ownership concentration.

⁴⁴Cf. section 3.2.3 for a more detailed elaboration on the respective effect on ownership concentration.

$$(2) \text{ Firm performance} = g \left[\begin{array}{l} \text{debt} - \text{to} - \text{asset ratio}, \\ \text{capex} - \text{to} - \text{asset ratio}, \\ \text{rnd} - \text{to} - \text{asset ratio}, \\ \text{ownership concentration}, \\ (\text{ownership concentration})^2 \end{array} \right]$$

As suggested by Demsetz and Villalonga (2001), I include the research and development expenditures, capital expenditure, and debt over assets ratio to control for the investments in intangible assets, differences in methods of depreciation, and leverage of a firm. On the one hand, these variables control for variations across firms in terms of performance; on the other hand, they reduce differences in the performance measures caused by accounting artifacts.⁴⁵

Finally, the ownership concentration and the squared ownership concentration are included in model (2) to test the effect of ownership concentration on firm performance, accounting for a potential curvilinearity. The final, combined model looks as follows:

$$(1 + 2) \text{ Firm performance} = g \left[\begin{array}{l} \text{debt} - \text{to} - \text{asset ratio}, \text{capex} - \text{to} - \text{asset ratio}, \text{rnd} - \text{to} - \text{asset ratio}, \\ f \left[\begin{array}{l} \text{firm performance}, \text{firm size}, \text{industry regulation}, \\ \text{shareholder protection}, \text{firm risk}, (\text{firm risk})^2 \end{array} \right], \\ \left\{ f \left[\begin{array}{l} \text{firm performance}, \text{firm size}, \text{industry regulation}, \\ \text{shareholder protection}, \text{firm risk}, (\text{firm risk})^2 \end{array} \right] \right\}^2 \end{array} \right]$$

4.5 Results

4.5.1 Descriptive Statistics

Table 38 and Table 39 report descriptive statistics for the sample, including the number of observations, mean values, standard deviations, and maxima and minima of the full sample and by country and industry.

The descriptive statistics show that over all variables, industries, and countries, there is a high variance in ownership concentration. For all industries and countries, firms with a relatively high and relatively low ownership concentration are included in the sample. At 59.13%, Spain has the highest average ownership concentration, and at 25.12%, Japan the lowest. In terms of industries, the difference between the highest and the

⁴⁵For a more detailed description of these control variables please refer to chapter 2.1.2.

lowest average ownership concentration is not as high as for the countries. The firms in the Construction industry have the highest average ownership concentration, at 48.50%, and the Mining industry has the lowest ownership concentration, at 34.91%.

Table 38: Descriptive Statistics of *cr5* by *country*

Country	N	mean	min	max	sd
Japan	150	25.12	6.36	67.81	13.62
United-States	150	25.84	11.79	72.17	10.27
United Kingdom	150	33.21	8.90	77.01	12.09
Canada	150	37.11	1.49	93.09	20.73
Germany	150	49.12	1.35	99.75	23.45
Brazil	101	49.84	2.05	100.00	25.87
France	121	55.29	1.42	99.87	23.8
Spain	107	59.13	8.24	99.34	19.43
Total	1,079	41.83	1.35	100.00	18.66

Table 39: Descriptive Statistics of *cr5* by *industry*

Industry	N	mean	min	max	sd
Mining	51	34.91	7.53	97.69	24.06
Insurance, Real-Estate	207	43.48	1.42	99.65	22.38
Manufacturing	462	38.03	1.35	99.75	21.21
Retail/Wholesale	145	42.13	2.17	95.41	21.16
Transportation	165	41.08	1.49	100.00	25.77
Construction	49	48.50	10.89	97.23	22.53
Total	1,079	40.42	1.35	100.00	22.85

Table 40 shows descriptive statistics of all variables used within the analyses of this essay and Table 41 illustrates the correlation matrix for all variables. Several correlation coefficients merit a closer look (Mela & Kopalle, 2002).

Table 40: Descriptive Statistics of all Variables

Variable	mean	sd	max	min
<i>cr5</i>	40.39	23.67	100.00	1.35
<i>tcr5</i>	-0.40	1.38	6.64	-4.29
<i>tobinsq5yr</i>	0.98	0.78	7.03	-0.20
<i>roa5yr</i>	6.50	5.74	51.03	-64.89
<i>logebit5yr</i>	50.27	359.20	7741.76	-65.23
<i>debttoassets</i>	0.11	0.17	2.06	0.00
<i>capextoassets</i>	0.03	0.06	0.71	0.00
<i>risk</i>	0.87	0.41	2.93	-0.91
<i>logmarketcap</i>	8.86	2.60	16.64	1.00
<i>rndtoassets</i>	0.01	0.02	0.24	0.00
<i>shareholderprotection</i>	7.84	1.29	9.00	5.00
<i>regulation</i> ^a	0.10	0.31	1.00	0

^a Dummy Variable

First, the two different performance measures (*tobinsq5yr* and *roa5yr*) correlate highly. This correlation, however, is neither unexpected nor does it cause any problems for the statistical regressions, as the two measures will not be included in the same stage regression model. More problematic are the correlations of *tcr5*, *logebit5yr*, and *logmarketcap*, although I eventually decide not to exclude any of these variables from the sample. Since I argue that firm size, measured as market capitalization, is one of the strongest influence factors for ownership concentration, the observed high correlation between the size of the firm and the ownership concentration seems to be reasonable. Similarly, it appears plausible that the logarithm of market capitalization is correlated with the performance measure, *logebit5yr*. The correlation of *tcr5* and *logebit5yr* (-0.18) is unlikely to cause any problems in the regression analyses. Lastly, I ran variance inflation tests for all regressions to follow up on the correlation of *logmarketcap* and *tcr5* (-0.35) and *logebit5yr* and *logmarketcap* (0.35). However, the magnitudes of the variance inflation factors (<10) of the respective variables did not suggest multicollinearity issues, which is why I do not exclude any of the variables from the regression analyses. Furthermore, the small and mostly not significant correlation coefficients of the overall dependent variable, *tobinsq5yr*, with the instruments (*tobinsq5yr*, *logebit5yr*, *logmarketcap*, *regulation*, *shareholderprotection*, *risk*, and *risk_sqr*) do not suggest any problems with the validity of the instruments.

Table 41: Correlation Matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) <i>tcr5</i>	1												
(2) <i>tcr5_sqr</i>	0.19***	1											
(3) <i>tobinsq5yr</i>	-0.01	-0.06*	1										
(4) <i>roa5yr</i>	0.01	-0.01	0.66***	1									
(5) <i>logebit5yr</i>	-0.18***	0.04	0.01	0.04	1								
(6) <i>debttoassets</i>	-0.05	0.04	-0.25***	-0.08***	0.05*	1							
(7) <i>capextoassets</i>	-0.02	-0.02	0.13***	0.21***	-0.05*	0.06**	1						
(8) <i>risk</i>	-0.20***	-0.15***	0.01	-0.02	0.13***	-0.01	0.14***	1					
(9) <i>risk_sqr</i>	-0.10***	-0.07**	0.02	0.01	0.12***	-0.02	0.14***	0.92***	1				
(10) <i>logmarketcap</i>	-0.35***	0.02	0	-0.08**	0.35***	0.01	0.02	0.21***	0.13***	1			
(11) <i>rndtoassets</i>	0.04	-0.01	0.23***	0.07**	0.03	-0.22***	-0.32***	-0.05*	-0.06**	-0.14***	1		
(12) <i>shareholderprotection</i>	-0.19***	-0.11***	0.16***	-0.04	0.09***	-0.05	-0.02	0.13***	0.10***	-0.14***	0.20***	1	
(13) <i>regulation</i> ^a	0.07**	0.14***	-0.22***	-0.12***	0.19***	0.19***	-0.10***	0.04	0.07**	0.07**	-0.11***	-0.11***	1

* $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$

^a Dummy Variable

4.5.2 Regression Analyses

Subsequently, I provide the results of the regression analyses (OLS and 2SLS). To assess my hypotheses, I run the analyses on various (sub-) samples, too. All results of the second stage regression shown in the text use *tobinsq5yr* as the dependent variable. Results for the analyses using *roa5yr* as alternative dependent variable are provided in the appendix of this thesis.

In the first analysis I use the full sample. Table 42 presents the results of the OLS and 2SLS regressions. The second two analyses use two subsamples including only the firms of the sample with the highest ownership concentration (Table 44 and Table 46). Third, the subsample (Table 49) is restrained to firms with a German civil law or French civil law background. Lastly, Table 50 shows the results of the regression analyses for two single countries (Spain and France).

As suggested by Wooldrige (2001) and Baum (2006), all analyses were tested for several statistical issues, including heteroscedasticity (Pagan-Hall and White / Koenker tests), weak- or under-identification (Anderson-Rubin test), endogeneity / appropriateness of 2SLS (Hausmann-Wu test), and over-identification (Sargan-Hansen statistic). None of the tests reported on a 0.10 significance level results which would indicate problems for the validity of the models. The Sargan-Hansen test tests the instruments of the analyses for over-identification; that is, that the instruments are uncorrelated with the error term of the second stage regression, and thus, are valid. Rejecting the Sargan-Hansen test would cast doubt on the validity of the used instruments (Hayashi, 2000). The Anderson-Rubin test tests if the instruments under- or only weakly identify the model (Anderson & Lee, 1997; Anderson & Reeb, 2003). The appropriateness of the 2SLS model in general, that is, that an OLS model would yield inconsistent estimates, is addressed by the Hausmann-Wu Test for endogeneity (Hausman, 1978; Wu, 1973). The Pagan-Hall test and White / Koenker test assess whether there is heteroscedasticity among the instrument variable estimations (Koenker, 1981; Pagan & Hall, 1983; White, 1980).

Subsequently, I present the results of the estimated models. Table 42 reports the results of the regression analyses using the full sample.

Table 42: Regression Results of Full Sample

	Full Sample							
	OLS		First Stage		Second Stage			
Dependent Variable	<i>tobinsq5yr</i>		<i>tcr5</i>	<i>tcr5_sqr</i>	<i>tobinsq5yr</i>			
Exogenous Variables								
<i>debttoassets</i>	-0.696***	(0.113)	-0.039**	(0.019)	0.526	(1.085)	-0.707***	(0.142)
<i>capextoassets</i>	3.713***	(0.340)	0.039	(0.063)	1.306	(1.513)	3.873***	(0.464)
<i>rndtoassets</i>	15.989***	(0.900)	0.223	(0.179)	5.835	(6.179)	16.751***	(2.141)
Instruments								
<i>logebit5yr</i>			-0.001*	(0.001)	0.001	(0.001)		
<i>risk</i>			0.104***	(0.033)	4.954**	(1.877)		
<i>risk_sqr</i>			-0.042***	(0.011)	-1.780**	(0.658)		
<i>logmarketcap</i>			-0.013***	(0.002)	0.064	(0.054)		
<i>shareholderprotection</i>			-0.017***	(0.005)	-0.207	(0.139)		
<i>regulation^a</i>			-0.023	(0.016)	-1.296**	(0.481)		
Instrumented Variables								
<i>tcr5</i>	-0.220	(0.177)					-0.426	(0.618)
<i>tcr5_sqr</i>	-0.008	(0.005)					0.031	(0.027)
Constant	1.281***	(0.437)	2.751***	(0.046)	5.072***	(1.355)	1.645	(1.530)
Observations	1079		1079		1079		1079	
F-Statistic	89.44***		28.41***		2.59**		50.79***	
R-squared	0.294		0.213		0.077		0.251	

* $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$

^a Dummy Variable

In the OLS model, the exogenous variables are significant on a 0.01 significance level and carry the expected coefficients and confirm the results of Demsetz and Villalonga (2001). Whereas the leverage (*debttoassets*) has a negative effect on performance, the capital expenditure and research and development ratios have positive effects.

The coefficients of the ownership concentration variables, *tcr5* and *tcr5_sqr*, are not significant and do not confirm an effect of ownership concentration on performance.

In the 2SLS model, except for *debttoassets*, all regression coefficients of the exogenous variables are not significant in the first stage regressions and carry the same signs as in the OLS model in the second stage regression. As in the OLS model, the ownership concentration measures do not carry significant regression coefficients.

Most of the instruments at the first stage regressions carry the expected signs and significance levels. For the ownership concentration variable *tcr5* the risk has a significant curvilinear effect (*risk* and *risk_sqr*), and the size of a firm (*logmarketcap*) and shareholder protection (*shareholderprotection*) have a significant negative effect.

The effect of regulation, as discussed in the previous essay, does not appear to have a significant effect. The performance measure *logebit5yr* has a small and weakly significant effect. In total, just as for the control variables, the results of the instruments widely confirm the estimation results of Demsetz & Villalonga (2001). As expected, for the second first stage regression, using *tc5_sqr* as dependent variable, the results for the instruments are similar as for the first second stage regression, however fewer variables have statistically significant effects as the instruments cannot explain the quadratic effect as well as the original variable.

In total, the OLS model is able to explain 29.4% of the variance (R^2) and the 2SLS model, 25.1% (R^2). The F-statistics confirm the good fit of the model.

As illustrated by Table A - 6 in the appendix, the results are widely robust to using an alternative performance measure, *roa5yr*. For this performance measure, there also is no significant effect of the concentration measures on performance. However, I see that the explanatory power of the models in terms of R^2 are significantly lower (up to 22%) for the OLS and Second Stage 2SLS model. Still, according to the *F*-tests, the models have a good fit.

Although there is no evidence for the full sample for an effect of ownership concentration, I argue that there might be a negative effect on performance for the highest levels of ownership concentration only, and thus, the coefficients of the ownership concentration measures are not significant for the full sample. Accordingly, I construct two subsamples containing exclusively firms with high levels of ownership concentration.

The first subsample contains solely 50% of firms with the highest ownership concentration of the full sample. Table 43 shows descriptive statistics for the subsample. If there is only a relationship between ownership concentration and performance for high levels of ownership concentration, it should be more pronounced in this subsample than in the full sample.

Table 43: Descriptive Statistics of *cr5* (50 Percentile)

	N	mean	min	max	sd
Low (50 Pctile)	540	22.25	1.35	34.52	7.04
High (>50 Pctile)	539	58.62	34.57	100.00	17.43

Table 44 provides the results of the regression analyses. The results for the exogenous variables and instruments are similar to those of the full sample. However, whereas the coefficient of *logmarketcap* is not significant any more, regulation has a significant negative effect.

Looking at the coefficients of the ownership concentration measures, the OLS models show weak evidence of a curvilinear relationship. In the 2SLS model, however, this effect is not significant and there is no evidence for an influence of ownership concentration on performance. In total, for this first subsample, the OLS model explains 30.2% of the variance (R^2) and the 2SLS model, 8.8% (R^2). The F -statistics confirm the good fit of the model.

As shown by Table A - 7 in the appendix, the results are robust when using *roa5yr* as alternative dependent variable for the second stage regression, although, as for the full sample, the R^2 is significantly lower.

Table 44: Regression Results of Subsample (50 Percentile)

Dependent Variable	High Ownership Concentration (50 Percentile)				
	OLS		First Stage		Second Stage
	<i>tobinsq5yr</i>		<i>tcr5</i>	<i>tcr5_sqr</i>	<i>tobinsq5yr</i>
Exogenous Variables					
<i>debttoassets</i>	-0.604*** (0.137)		-0.025 (0.018)	-0.514 (1.220)	-0.633*** (0.200)
<i>capextoassets</i>	3.047*** (0.436)		0.056 (0.065)	2.642 (3.988)	3.485*** (0.391)
<i>rndtoassets</i>	16.688*** (1.300)		0.295 (0.263)	17.795 (16.038)	17.507*** (2.548)
Instruments					
<i>logebit5yr</i>			-0.001 (0.001)	0.001 (0.001)	
<i>risk</i>			0.132*** (0.037)	6.827*** (2.347)	
<i>risk_sqr</i>			-0.051*** (0.014)	-2.480*** (0.819)	
<i>logmarketcap</i>			-0.001 (0.002)	0.067 (0.111)	
<i>shareholderprotection</i>			-0.009** (0.004)	-0.255* (0.146)	
<i>regulation^a</i>			-0.053*** (0.014)	-2.643*** (0.812)	
Instrumented Variables					
<i>tcr5</i>	0.358 (0.492)				-5.053 (3.491)
<i>tcr5_sqr</i>	-0.016* (0.009)				0.101 (0.068)
Constant	-0.177 (1.235)		2.659*** (0.038)	5.692*** (1.686)	13.261 (8.720)
Observations	539		539	539	539
F-Statistic	46.11***		10.21***	3.86***	9.09***
R-squared	0.302		0.189	0.155	0.088

* $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$

^a Dummy Variable

The second subsample has an even higher ownership concentration, using only the top 25% firms by ownership concentration. As Table 45 shows, the average ownership concentration is significantly higher than the first subsample. Therefore, any existing

performance effect of *tc5* and *tc5_sqr* should be even more pronounced in the subsequent regressions.

Table 45: Descriptive Statistics of *cr5* (25 Percentile)

	N	mean	min	max	sd
Low (≤ 75 Pctile)	809	29.66	1.35	55.29	12.49
High (> 25 Pctile)	270	72.65	55.29	100.00	13.21

Table 46 illustrates the results of the regression analyses. The results for the exogenous variables and instruments widely resemble those of the first subsample, however, the effect of *shareholderprotection* is not significant any longer. Both OLS and 2SLS regressions do not provide evidence for a performance effect of ownership concentration, neither linear nor curvilinear. The OLS model explains 42.8% of the variance for the second subsample, and the 2SLS model, roughly 40.9%. According to the F-statistics the model has a good fit.

The results are robust to using *roa5yr* as alternative dependent variable of the second stage regression (Table A - 8 in the appendix) but the R^2 decrease significantly with the alternative performance measure.

Table 46: Regression Results of Subsample (25 Percentile)

	High Ownership Concentration (25 Percentile)							
	OLS		First Stage				Second Stage	
Dependent Variable	<i>tobinsq5yr</i>		<i>tcr5</i>		<i>tcr5_sqr</i>		<i>tobinsq5yr</i>	
Exogenous Variables								
<i>debttoassets</i>	-0.371**	(0.169)	-0.019	(0.021)	0.245	(1.659)	-0.413**	(0.187)
<i>capextoassets</i>	3.395***	(0.662)	0.086	(0.059)	3.757	(6.773)	4.008***	(0.591)
<i>rndtoassets</i>	22.476***	(1.811)	0.267	(0.285)	25.769	(24.471)	24.734***	(2.963)
Instruments								
<i>logebit5yr</i>			0.001	(0.001)	0.001	(0.001)		
<i>risk</i>			0.122**	(0.045)	8.566**	(3.292)		
<i>risk_sqr</i>			-0.042**	(0.017)	-2.847**	(1.139)		
<i>logmarketcap</i>			0.002	(0.004)	0.164	(0.202)		
<i>shareholderprotection</i>			-0.006	(0.005)	-0.317	(0.245)		
<i>regulation^a</i>			-0.039***	(0.013)	-2.943***	(0.896)		
Instrumented Variables								
<i>tcr5</i>	0.792	(0.996)					-0.080	(3.316)
<i>tcr5_sqr</i>	-0.021	(0.014)					0.004	(0.045)
Constant	-1.442	(2.544)	2.657***	(0.050)	6.583**	(3.040)	0.665	(8.433)
Observations	270		270		270		270	
F-Statistic	39.35***		3.32**		3.26**		10.29***	
R-squared	0.428		0.179		0.186		0.409	

* $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$

^a Dummy Variable

With respect to the hypotheses, hypothesis 1 states that whereas low levels of ownership concentration will have no effect on firm performance, high levels of ownership concentration will have a negative effect on performance. The analyses suggest a significant effect neither for low, nor for high levels of ownership concentration. Accordingly, I reject hypothesis 1.

According to hypothesis 2, there will be only an effect of ownership concentration on firm performance in Continental-European countries with a German or French civil law origin, as the level of ownership concentration is significantly influenced by institutional differences. To assess this hypothesis, I run the models on two more subsamples containing firms from German civil law and French civil law countries, respectively. Table 47 shows descriptive statistics by different legal origins. As expected, ownership concentration is highest in French civil law countries, second highest in German civil law countries, and lowest in common law countries. ANOVA confirms the systematic differences in ownership concentration between the three legal origins on a 0.01 significance level (Table 48).

Table 47: Descriptive Statistics of *cr5* (by legal origin)

	N	mean	min	max	sd
Common Law	450	32.06	1.49	93.09	15.75
German Civil Law	401	40.32	1.35	100.00	24.08
French Civil Law	228	57.09	1.42	99.87	21.90

Table 48: ANOVA of *tcr5* and *legalorigin*

Number of Observations		1079	R-Squared	0.1266	
Root MSE		0.10	Adj. R-Squared	0.1250	
Source	Partial SS	df	MS	F	Prob > F
Model	1.54	2	0.77	77.97	0.000
sample	1.54	2	0.77	77.97	0.000
Residual	10.66	1076	0.01		
Total	12.12	1078	0.01		

Table 49 illustrates the results of the regression analyses on the French and German civil law subsamples. The results for the exogenous variables and instruments widely resemble those of the previous analyses.

For German civil law countries, there is a positive effect of *tc5* on ownership concentration in the OLS model, which is not significant in the 2SLS model. For the French civil law countries, no significant effect for ownership concentration can be found. The shareholder protection variable is not significant for the German civil law countries, as the shareholder protection is almost the same for the countries included in this subsample. For the French civil law subsample, the *shareholderprotection* variable drops out, as all countries in this subsample carry the same shareholder protection index. According to the R^2 and F -statistics, the models are well specified and have a good fit. With respect to the results for the alternative performance measure *roa5yr* (Table A - 9 in the appendix), the results of the 2SLS estimations are robust for the French civil law subsample, but I find a weak curvilinear effect of ownership concentration on performance for the German civil law. However, the coefficient is only significant on a 0.10 level, so the evidence is weak. If any, I would have expected a stronger influence of ownership concentration on performance in the French civil law subsample, as the average ownership concentration is higher in countries with a French than a German civil law origin. As there is no theoretical evidence why there should be a significant effect of ownership concentration on performance for countries with a German civil law origin only, and except for this one only weak significant coefficient, there is no evidence for other subsamples, so I do not attach particular importance to this observation and consider it as a statistical artifact.

Table 49: Regression Results of Subsample: Different Legal Origins

Dependent Variable	German Civil Law					French Civil Law				
	OLS		First Stage		Second Stage	OLS		First Stage		Second Stage
	<i>tobinsq5yr</i>		<i>tcr5</i>	<i>tcr5_sqr</i>	<i>tobinsq5yr</i>	<i>tobinsq5yr</i>		<i>tcr5</i>	<i>tcr5_sqr</i>	<i>tobinsq5yr</i>
Exogenous Variables										
<i>debttoassets</i>	-0.930*** (0.170)		-0.109** (0.055)	1.421 (2.740)	-0.960*** (0.253)	-0.283* (0.158)		-0.034 (0.043)	0.476 (2.154)	-0.508* (0.283)
<i>capextoassets</i>	2.974*** (0.561)		0.287*** (0.096)	-0.936 (4.330)	2.949*** (0.730)	2.915** (0.659)		0.095 (0.104)	-2.464 (3.887)	3.020*** (0.634)
<i>rndtoassets</i>	8.247*** (1.417)		0.400 (0.502)	23.048 (25.822)	5.230* (2.761)	19.232* (1.401)		-0.183 (0.189)	-7.100 (5.185)	19.575** (2.543)
Instruments										
<i>logebit5yr</i>			-0.001 (0.001)	0.001 (0.001)				-0.001** (0.001)	0.001 (0.001)	
<i>risk</i>			0.251*** (0.077)	11.162*** (3.723)				0.102** (0.042)	5.066* (3.043)	
<i>risk_sqr</i>			-0.112*** (0.036)	-4.853*** (1.671)				-0.040** (0.016)	-1.532 (1.149)	
<i>logmarketcap</i>			-0.010*** (0.002)	0.072 (0.103)				0.006 (0.008)	-0.029 (0.362)	
<i>shareholderprotection</i>			0.001 (0.004)	-0.025 (0.176)						
<i>regulation^a</i>			-0.051*** (0.019)	-1.378* (0.816)				-0.055** (0.022)	-1.726 (1.436)	
Instrumented Variables										
<i>tcr5</i>	0.588*** (0.215)				0.546 (0.732)	0.405 (0.307)				0.066 (0.891)
<i>tcr5_sqr</i>	-0.003 (0.006)				-0.006 (0.032)	-0.007 (0.007)				0.011 (0.028)
Constant	-0.668 (0.528)		2.654*** (0.050)	6.267*** (1.711)	-0.541 (1.730)	-0.469 (0.774)		2.532*** (0.049)	4.769** (2.315)	0.379 (2.199)
Observations	401		401	401	401	228		228	228	228
F-Statistic	24.60***		11.45***	2.41**	11.22***	42.52***		2.48**	2.52**	9.42***
R-squared	0.236		0.247	0.122	0.223	0.489		0.102	0.080	0.466

* $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$

^a Dummy Variable

As for the first two hypotheses, I created subsamples to further assess hypothesis 2. Potentially, the institutional environments of the selected countries of the three groups of legal origin do not favor high levels of ownership concentration to a similar extent, thus diluting the effect. To test for this issue, I run the regressions on the firms from the two countries with the highest ownership concentration (Spain and France), only. However, also for these two subsamples, there is no significant performance effect in the 2SLS models (Table 50). All results are robust to alternative performance measures as the dependent variable (Table A - 10). According to R^2 , the OLS and 2SLS second stage regressions are well specified. However, the results have to be interpreted with caution due to the relative low number of observations per country and relatively high number of variables, which becomes apparent for the second of the first stage regression, determining *tcr5_sqr*, as the *F*-statistic is not significant. Thus, the explanatory power of the *tcr5_sqr* and the test for a curvilinear relationship is limited. Also, the significance of the instruments and control variables is significantly lower than in the previous models, most likely due to the much smaller sample size.

In the light of the previously illustrated test results, I reject hypothesis 2, as I do not find a performance effect of alternative levels of ownership concentration. Furthermore, looking at individual countries and groups of countries, for example by legal origin, I only find evidence for a weak significant effect for the German civil law legal origin, which I consider a statistical artifact.

Table 50: Regression Results of Subsample: Spain and France

Dependent Variable	Spain				France			
	OLS	First Stage		Second Stage	OLS	First Stage		Second Stage
	<i>tobinsq5yr</i>	<i>tcr5</i>	<i>tcr5_sqr</i>	<i>tobinsq5yr</i>	<i>tobinsq5yr</i>	<i>tcr5</i>	<i>tcr5_sqr</i>	<i>tobinsq5yr</i>
Exogenous Variables								
<i>debttoassets</i>	-0.843*** (0.247)	0.027 (0.043)	1.433 (1.980)	-0.798** (0.355)	-0.114 (0.189)	-0.083 (0.078)	-0.357 (2.831)	0.071 (0.319)
<i>capextoassets</i>	3.666*** (0.917)	0.028 (0.132)	5.019 (5.396)	3.260*** (0.957)	2.290** (0.844)	0.049 (0.157)	-10.235 (8.707)	2.645*** (0.915)
<i>rndtoassets</i>	23.302*** (1.940)	-0.305 (0.258)	-1.345 (5.099)	25.917*** (5.278)	15.065* (1.806)	-0.213 (0.314)	-14.979 (9.407)	18.144*** (3.036)
Instruments								
<i>logebit5yr</i>		-0.001*** (0.001)	0.001 (0.001)			-0.001* (0.001)	0.001 (0.001)	
<i>risk</i>		0.081 (0.062)	7.799** (3.784)			-0.082 (0.058)	-1.513 (3.562)	
<i>risk_sqr</i>		-0.036* (0.021)	-2.684** (1.310)			-0.006 (0.031)	-0.661 (1.800)	
<i>logmarketcap</i>		0.011* (0.005)	0.213 (0.187)			0.009 (0.016)	-0.377 (0.737)	
<i>shareholderprotection</i>								
<i>regulation^a</i>		-0.030 (0.022)	-1.067 (1.098)			-0.082** (0.039)	-2.840 (3.381)	
Instrumented Variables								
<i>tcr5</i>	2.041*** (0.736)			1.719 (1.072)	-0.062 (0.315)			1.805 (1.649)
<i>tcr5_sqr</i>	-0.029 (0.019)			-0.022 (0.023)	-0.006 (0.006)			0.032 (0.046)
Constant	-4.393** (1.840)	2.496*** (0.045)	3.366** (1.316)	-3.642 (2.661)	0.670 (0.799)	2.523*** (0.097)	7.178 (4.786)	-4.242 (4.062)
Observations	107	107	107	107	121	121	121	121
F-Statistic	34.15***	5.22***	1.44	9.54***	16.27***	8.00***	0.76	9.36***
R-squared	0.628	0.216	0.269	0.617	0.414	0.120	0.064	-0.027

* $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$

^a Dummy Variable

Summing up, according to the results of the regression analyses on the full, and subsamples, I reject both hypotheses 1 and 2.

In light of the results, I clearly reject hypothesis 3, predicting a curvilinear effect, as I did not find convincing evidence for a significant performance effect. The only evidence for a (weakly) significant performance effect, found for the German civil law subsample, shows a positive, bell-shaped effect. However, because of the absence of any other significant performance effect for the other subsamples I decide to reject hypothesis 3.

4.6 Chapter Conclusion

4.6.1 Summary and Discussion

The aim of this study was to assess the relationship between ownership concentration and firm performance while accounting for endogeneity of ownership, potential curvilinear effects, and alternative performance measures. Building in particular on the work of Demsetz and Lehn (1985), Demsetz and Villalonga (2001), and Thomsen, et al. (2006), I formulated hypotheses and tested them on a sample of 1,079 firms from eight countries using OLS and 2SLS regressions.

Overall, my analyses cannot confirm a persistent, significant linear or a curvilinear performance effect of ownership concentration on performance. The results are in accordance with the findings of Demsetz and Villalonga (2001) that ownership is endogenously determined. In detail, not only the findings regarding the performance effect resemble those of the Demsetz and Villalonga study, but also the results regarding the control variables and instruments are widely congruent for almost all estimated models. I attribute the minor changes in significance levels of the instruments between the different models to the different, mostly decreasing sample sizes and differences between countries, e.g. the varying significance of the effect of regulation on ownership concentration.⁴⁶

Accordingly, all in all I cast considerable doubt on the findings of Thomsen, et al. (2006), who argue that in some countries, ownership concentration might exceed the optimal level and thus leads to a negative performance effect.

⁴⁶ For a detailed discussion of this issue refer to chapters 3.4 and 3.5.

Furthermore, I find that using alternative performance measures does not affect my overall finding as described above. In my analyses, the two alternative performance measures, *roa5yr* and *tobinsq5yr*, did not influence the ownership concentration / performance relationship, yielding robust results, except for one weak significant difference for the German civil law subsample. Accordingly, assuming that this result is representative for most of the existing studies, the contradicting results in the literature cannot be explained by the different performance measures. However, many of the studies do not measure firm performance over time, as I did, but at the end of one year, which potentially might have lead to more severe differences between the performance measures due to annual one-off effects.

Interestingly, throughout all analyses, the explanatory power of all 2SLS models using *tobinsq5yr* as a dependent variable was much higher than for the 2SLS estimations using *roa5yr*. As illustrated in the description of the variables, I argue that Tobin's Q provides a more adequate picture of the performance of a firm as it combines an accounting and a market based performance measure. The return on assets is influenced by accounting standards and accounts for intangible assets and the forecasted future development of a company. I reason that the explained variance for the models using Tobin's Q as dependent variable is significantly higher because the included independent variables explain the actual (market based) performance of a firm better as they are not able to control for accounting biases and managerial discretion to full extent. These distortions are much more pronounced for the purely accounting based return on assets measure than for Tobin's Q.

My analyses support the view that OLS models, as used by Demsetz and Lehn (1985) and Morck, et al. (1988), are inappropriate to test for a performance effect of ownership concentration due to the endogenous determination of the ownership structure. In the analyses a few OLS results report a significant effect of ownership concentration on performance, which is not significant in the 2SLS models. However, even in some of the OLS models there is no statistically significant effect of ownership concentration on performance. This raises the question, whether I actually found true evidence for the endogeneity of the ownership structure of firms, or whether there is just no relationship between ownership concentration and performance. I argue, however, that the ambiguity of the existing results, as highlighted in the literature review, clearly speaks in favor of the endogeneity. As more than 50% of the identified studies using OLS

techniques, and thus not accounting for endogeneity, successfully identified a performance effect on ownership concentration, it seems to be very unlikely that there is no relationship between ownership concentration and performance whatsoever.

Furthermore, I cannot offer a theoretical explanation why Thomsen, et al. (2006) found a significant relationship between ownership concentration and performance for countries with a high level of ownership concentration whereas I could not identify a significant effect for no concentration level and thus had to reject my hypotheses. Differences in the sampling and the statistical methods might explain the ambiguous results to a certain extent. Whereas similar countries were included in Thomsen, et al.'s and mine study, they used panel data and I did not. Furthermore, Thomsen, et al. applied Granger tests, whereas I used 2SLS models. As I did not have access to panel data, I could not apply to respective Granger tests to my results for robustness to these two alternative methodologies.

With respect to the theoretical argument underlying the rejected hypothesis, the results at hand clearly point out that even for firms which are located in countries with high levels of ownership concentration, and which are doing business in industries favoring high levels of ownership concentration, the ownership concentration does not lead to a sustaining performance effect. It appears that market forces yield efficient firm structures even for extreme levels of ownership concentration.

In terms of implications, being one of the most comprehensive studies in this research area, my study contributes to the ongoing debate about the relationship between ownership concentration and corporate performance, and thus, the value of monitoring owners. I find hardly any support for the view that large blockholders use their power at the expense of minority shareholders. In contrast to the findings of the study by Thomsen, et al. (2006), my results indicate that corporate governance systems actually do work more efficiently than expected.

4.6.2 Limitations

My study is subject to several limitations, which should be addressed in future research. First, I did not have access to panel data. Extending the data by observations over several years will help to further test the results for robustness and mitigate the influence of one-off effects in single years.

Second, as mentioned by Thomsen, et al. (2006), the applied performance measures do not capture private benefits to owners. Although difficult to measure, finding a proxy for private benefits would potentially increase the explanatory power of the models.

Third, I neglected in this study that, as it was termed by Demsetz and Villalonga (2001), ownership is a multi-dimensional phenomenon. In the previous analyses I focused exclusively on the ownership concentration of firms, neglecting the identity of owners. I argue that a possible performance effect should be observable for ownership concentration per se. Nevertheless, future studies should include the identity of owners in their analyses to gain more detailed insights into the differences between alternative types of owners and the respective performance implications.

Finally, I was not able to distinguish between control rights and cash flow rights of ownership. I believe that this does not pose a significant problem, as previous studies e.g., Edwards & Weichenrieder (2004), showed that including those two rights into the analysis might improve the validity of the results.

5 OVERALL CONCLUSION

In the following section, I will summarize the key findings of this thesis and discuss the overall implications of the presented results.

5.1 Overall Summary

The objective of this thesis was to gain further insights into the determination and effects of the level of ownership concentration. To achieve this objective, I addressed three overarching research questions within the scope of the analyses:

- Question 1: What is the relative importance of the industry- and country-level for the determination of the ownership concentration of firms?*
- Question 2: How much of the observed variance do the key firm-, industry-, and country-level determinants of ownership concentration explain?*
- Question 3: Does the level of ownership concentration have an effect on firm performance?*

Compared to the most studies on the determinants and / or effects of ownership concentration, I apply relatively complex models to determine the level of ownership concentration of a firm and use a much more diverse sample, including firms from a variety of industries and countries. Furthermore, to my knowledge, the previously presented essays are the first studies in the ownership research accounting for the nested structure of ownership data. Subsequently, I describe the key findings of the three essays and illustrate the structure of the conducted analyses.

Based on theories and concepts presented in section 1.4, I addressed question one and two in two separate essays within chapter 3 and question three in chapter 4.

Highlighting the motivation for research question one and two in section 3.1, I reviewed the relevant literature on the topic of firm-, industry-, and country-level determinants for both essays (section 3.2). In section 3.3, I illustrated the statistical methods, which I applied in the subsequent chapters. For both essays, beside descriptive statistics and

ANOVAs, I estimated HLMs to account for the nested structure of the firms. The existing studies on determinants of ownership concentration had so far disregarded this issue. To derive the explained variance of the analyzed determinants, I used variance decomposition techniques based on the results of the HLMs. Building on the conjoint literature review in section 3.2, I provide separate subsections for the development of hypotheses, results, and discussion for both individual essays in sections 3.4 and section 3.5.

Highlighting the motivation for the first research question in section 3.4.1, section 3.4.2 illustrates the theoretical foundation of the relative importance of industry- and country-determinants of ownership concentration. However, in default of a specific theoretical framework explaining the relative importance of different levels of influence factors, I did not formulate specific hypotheses and conducted exploratory analyses in the subsequent chapters. Section 3.4.4 shows the results of the descriptive statistics, ANOVAs, and of the estimation of the random intercept model. Using a sample containing 1,305 firms from nine countries, the statistical analyses show that, whereas the country-level, with 25.3% explained variance, has a strong effect on the level of ownership concentration of a firm, the industry-level explains only 2.1% of the observed variance, and thus, plays a minor role for the determination of the ownership concentration. Furthermore, the analyses show that of these 2.1%, the regulation of an industry explains the lion's share; however, the effect of industry regulation turns out to be significant for countries with a common law background only. The results clearly show that, although most of the existing ownership frameworks are built on principal agency theory, an institutional economics perspective – particularly on the country-level – has to be considered when analyzing the ownership structure of firms. Furthermore, analyzing the effect of the industry-level on the level of ownership concentration promises only weak additional insights in the allocation of ownership rights.

Section 3.5.1 focuses on the motivation of the second research question. Within section 3.5.2, I derive theoretical hypotheses for the key firm-, industry-, and country-level determinants. The analyses are based on a sample of 900 firms from nine countries. In section 3.5.4, I present the results of the HLMs. The empirical analyses show that firm risk, firm size, legal origin, and shareholder protection significantly influence the level of ownership concentration. For the industry-level, no significant determinant could be identified. In total, the models could explain up to 32% of the observed variance.

However, on the firm-level, only 8% of the firm-level variance was explained by the included determinants. On the industry-level, up to 89% could be attributed to industry-level determinants. On the country-level, the most advanced model could explain the full variance. According to the results, new firm-level determinants of ownership concentration have to be identified in order to build models with higher explanatory power. Furthermore, the identified country-level determinants, although explaining up to 100% of the country-level variance, call for further investigation of the relatively rough determinants and for disentanglement of the highly correlated country-level characteristics.

Chapter 4 addresses the third research question dealing with the performance effects of ownership concentration. Section 4.1 introduces the topic of performance effects of ownership concentration and highlights the motivation of this research question, namely the ambiguity of the results of existing studies on the topic of the ownership performance relationship. Based on section 4.2, providing a literature review, I derive respective hypotheses in section 4.3. The sample comprises 1,079 firms from eight countries when accounting for all variables and the OLS and 2SLS models used in the subsequent analyses. Section 4.5 provides the results of the analyses. The statistical analyses do not find persistent, significant performance effects of ownership concentration. The effect of ownership concentration on performance is neither for a high or low level of ownership concentration, nor for particular countries or alternative performance measures significant when accounting for the endogenous determination of the ownership structure. Figure 13 summarizes the previously described findings in an illustrative manner.

Figure 13: Summary of the Key Findings

Relative Importance of Industry- and Country-Factors	Key Drivers of Ownership Concentration	Performance Effects of Ownership Concentration
- Relative Importance of the Country Level: 25.3% Explained Variance - Relative Importance of the Industry Level: 2.1% Explained Variance - The Effect of Industry Regulation is only significant for Common-Law-Countries	- Significant Firm-Level Determinants: - Firm-Size - Firm-Risk - Significant Industry-Level Determinants: - N/A - Significant Country-Level Determinants: - Legal Origin - Shareholder Protection - Explained Variance - Total: 32% - Firm: 8% - Industry: 89% - Country: 100%	- Effect of Ownership Concentration on Firm Performance - Full Sample: <i>Not significant</i> for ROA & Q - Top 50% Subsample: <i>Not significant</i> for ROA & Q - Top 25% Subsample: <i>Not significant</i> for ROA & Q - Legal Origin Subsample: <i>Partially weakly significant</i> for ROA, <i>not significant</i> for Q - French Subsample: <i>Not significant</i> for ROA & Q - Spanish Subsample: <i>Not significant</i> for ROA & Q

The implications of this thesis are widely of theoretical nature and of particular interest for the further understanding of the determination and effects of the ownership structure of firms. Whereas most of the existing ownership frameworks, as for example, the one initially developed by Demsetz and Lehn (1985) are based on principal agent theory, my findings clearly show that the institutional economics perspective is at least as important and has to be included into holistic ownership frameworks. Furthermore, I put emphasis on the endogeneity of the ownership structure of firms, which appears to hold true even for extreme levels of ownership concentration, and thus, has to be considered under any circumstances in respective studies.

The practical implications of the findings are limited; however, they suggest that in terms of policy making under certain circumstances, industry regulations might be less

efficient than expected and can be influenced by the characteristics of the corporate governance system in the respective country. Furthermore, the results clearly confirm that the ownership structures in certain countries and industries have developed to the current status for particular economic reasons.

As mentioned in the introduction, the overarching perspective of this thesis is the economic view of ownership. I argued, and showed within the scope of the analyses, that the level of ownership concentration of firms follows certain economic laws and optimizes costs and benefits connected with alternative ownership structures. However, the analyses also show that highly concentrated ownership structures persist throughout all countries. Accordingly, following the criticism of Proudhon (1840), as mentioned in the introduction of this thesis, relatively few owners use the privileges connected with ownership to accumulate substantial wealth and power. Thus, the question arises whether the modern, capitalistic understanding of ownership really ensures a distributive justice, at least to a certain extent. Furthermore, despite the endogenous determination of the ownership structure, the recent – and with regularity occurring – economic crises show that market forces do not work flawlessly. Probably for these reasons alternative forms of ownership, particularly employee, customer and family ownership, have attracted more attention in recent years (Caspary, 2000; Ellerman, 1990; Nembhard, 1999). However, I argue that for the time being, capitalistic values are too deeply anchored and rooted in our society than it would be realistic to expect significant changes in the underlying system in the near future. Still, this does not mean that efforts should be reduced to gradually work towards a better understanding and alternative forms of ownership without inhibiting or abandoning the idea of free markets.

5.2 Outlook on Future Research

In the previous chapter, I summarized the key findings of the three essays. In sections 3.4.5.2, 3.5.5.2, and 4.6.2 of the respective essays, I illustrated the key limitations of the analyses. Combining the findings of the individual essays, the analyses provide several starting points for future research.

For the determinants of ownership concentration, addressed by the first two essays, the results suggest two different approaches to gain further insights into the allocation of ownership rights.

First, whereas in the last years, more and more studies focused on industry-, and country-differences and the respective effects on the level of ownership concentration, my results suggest that much can still be learned and understood from the firm-level perspective. Whereas the identified firm-level determinants of ownership concentration are highly significant, the lion's share of the firm-level variance cannot be explained so far. To tackle this issue, future research, besides the frequently applied regression analyses, might pursue alternative methods of analysis, such as in-depth case studies, to dig deeper and to identify additional drivers of concentration.

Second, whereas the scope of the analyses has further stressed the importance of the institutional environment, the understanding of the relationship between the ownership structure and institutional differences is marginal so far. Thus, I recommend that the institutional perspective has to be considered and added to the existing ownership frameworks. Accordingly, future research has to develop new and finer-grained concepts of the institutional characteristics of a country to take a next step toward a better understanding of the complex interrelations.

For the analysis of the effects of ownership concentration on performance, I suggest that future research should particularly focus on country differences on the one hand, and alternative statistical methods on the other hand. The third essay of this thesis and the work of Thomsen, et al. (2006) are two of the few studies so far particularly addressing the potential effect of country differences on the ownership concentration performance relationship. However, these two analyses already yield conflicting results and call for further investigation. Future research should particularly focus on alternative statistical models to the 2SLS and the Granger test to account for endogeneity.

For both field of studies mentioned above, the conducted analyses should be extended to other ownership characteristics. At this point, I disregarded the identity of the owner, and thus, the multi-dimensionality. Extending the analyses in this way will test the results for robustness, and potentially provide additional insights into the allocation of ownership rights.

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APPENDIX

Table A - 1: SK- and SW-Tests for Normality of *cr5*

	SK-Test	SW-Test
Initial Sample	0.000	0.000
First Essay	0.000	0.000
Second Essay	0.000	0.000
Third Essay	0.000	0.000

Table A - 2: SK- and SW-Tests for Normality of *tcr5*

	SK-Test	SW-Test
Initial Sample	0.000	0.000
First Essay	0.000	0.000
Second Essay	0.000	0.000
Third Essay	0.000	0.000

Table A - 3: Sources of Ownership Data

Filing Type / Source	Description
13D	This Schedule discloses beneficial ownership of certain registered equity securities. Any person or group of persons who acquire a beneficial ownership of more than 5% of a class of registered equity securities of certain issuers must file a Schedule 13D reporting such acquisition together with certain other information within ten days after such acquisition. Moreover, any material changes in the facts set forth in the Schedule generally precipitates a duty to promptly file an amendment on Schedule 13D.
13G	Schedule 13G is a much abbreviated version of Schedule 13D that is only available for use by a limited category of “persons” (such as banks, broker/dealers, and insurance companies) and even then only when the securities were acquired in the ordinary course of business and not with the purpose or effect of changing or influencing the control of the issuer.
Institutional Portfolios (IP)	Ownership sources included in this filing type are 13F, Aggregates, and Shareholder Report.

IP: 13F	Quarterly report of equity holdings filed with the SEC by institutional investment managers having equity assets under management of \$100 million or more. Included in this category are certain banks, insurance companies, investment advisors, investment companies, foundations and pension funds. Non-US institutional investment managers are required to file a Form 13F if they use any means or instrumentality of United States interstate commerce in the course of their business; and (2) exercise investment discretion over \$100 million or more in Section 13(f) securities.
IP: Aggregate	Institutional position derived from cumulative mutual fund holdings. An Aggregate position may represent only a portion of total shares held and while not a regulatory filing per se, is formulated based on filing data.
IP: Shareholder Reports	Complete portfolio holdings supplied directly to Thomson Financial or obtained through other means, e.g., investor website or annual report.
Other Declarable Stakes	Ownership sources included in this filing type are Substantials, Early Warning Reports, Alternative Monthly Statements, 10-K, and 20-F.
Substantials	Ownership data on non-US-traded obtained on through a number of sources including, but not limited to, the media and official company-issued statements.
Early Warning Reports	An initial declarable stakes report required when an investor acquires 10% or more of a class of securities (within 2 business days of the transaction). An update is required when the percentage held increases or decreases by 2% or more, or when the percentage held falls below the 10% reporting threshold (again, within two business days).
Alternative Monthly Reports	Essentially the same declarable stakes report as the Early Warning, except that the type of investors who are allowed to use this filing is limited to “eligible institutional investors” (investment managers, mutual funds, pension funds, etc.). An initial report is required within ten days after the end of the month in which an investor acquires 10% or more of a class of securities. An update is required within 10 days after the end of the month in which the percentage held increases or decreases by 2.5%, or when the percentage held falls below the 10% reporting threshold. The difference between those two types of filings in Canada is roughly similar to the difference between 13Ds and 13Gs in the US. The Alternative Monthly Report (13G) is an abbreviated version of the Early Warning Report (13D) that only certain filers are allowed to use.

10-K	Ownership positions obtained from company annual reports filed with the SEC.
20-F	Ownership positions obtained from foreign private issuer annual or transition report filed with the SEC.
Proxy	Ownership positions listed on a US company's annual proxy statement that lists holdings of owners over 10%, as well as shares held by directors, officers, and some board members.
Insider update	Position calculated using Form 4 holdings that have a more recent date than the proxy (13f, 13D/G) position.
Japanese 5% Shareholders	Any individuals or institutions that hold more than 5% of the total shares outstanding of Japanese listed companies. These holders have to report to local financial bureaus that are under control of the Ministry of Finance within five business days. If there is 1% or more of an increase / decrease in shares held after the submission, they must submit a subsequent report within five business days from the date of the change.
Registers	Shareholder positions in US-listed companies supplied to the company registrar by the registered owner. Disclosure is made in compliance with the UK Companies Act, an Act of the UK Parliament and this data is available to the public, including Thomson Financial to purchase or view. Included in this filing type are S212 and S213 filings. RNS: Investor purchases, sales, and holdings changes resulting from mergers, takeovers, or buybacks of UK listed companies and announced on the Regulatory News Service (RNS), the London Stock Exchange's official news outlet. Furthermore, SEC, DGAP, and other country specific registers.
Insider Filings (IF)	Forms 3, 4, 5, and 144, as well as RNS filings by Directors
IF: Initial Statement of Ownership	Form 3 is filed only once by an insider, for each company that he or she is affiliated with, and is usually filed within ten (10) days of the company going public, and/or within ten (10) days of an insider being appointed an executive officer or director.
IF: Statement of Changes in Beneficial Ownership	Form 4 is required any time there is an open market purchase, sale, or an exercise of options. It must be filed by the 10th of the month following the transaction and contains the details of all non-exempt transactions that exceed \$10,000 during that month.

Annual Statement of Changes in Beneficial Ownership	This form is required to be filed annually for those insiders who have had exempt transactions and had not reported them previously on a Form 4. It must be filed within 45 days after the close of the issuer's fiscal year.
Intention To Sell Restricted Securities	This form must be filed as notice of the proposed sale of restricted securities or securities held by an affiliate of the issuer in reliance on Rule 144 when the amount to be sold during any three-month period exceeds 500 shares or units or has an aggregate sales price in excess of \$10,000.
RNS	Director purchases, sales, and holdings changes resulting from mergers, takeovers, or buybacks of UK listed companies and announced on the Regulatory News Service (RNS), the London Stock Exchange's official news outlet.
Funds	Mutual funds, hedge fund portfolios, unit trusts, investment trusts, variable annuities, and other portfolios organized for retail and/or institutional investors and run by a professional money manager.
Indirect Holdings	Shares that are controlled by the insider, yet are held by another entity such as a family member, a trust, a company plan, or even a corporation to which the insider is affiliated. In many cases, the same block of indirect stock may be claimed by several insiders, such as a group of trustees over the same trust, or several partners in the same partnership.

Table A - 4: Estimations of the Full-Model-I and Full-Model-II (Marginal Effects)

		Full-Model-I				Full-Model-II			
		coef	se	∂ coef	∂ se	coef	se	∂ coef	∂ se
Firm-Level									
	<i>logmarketcap</i>	14.461*	(7.681)	-2.918***	(0.395)	22.623**	(10.308)	-3.310***	(0.501)
	<i>risk</i>	27.366***	(5.769)			28.449***	(5.871)		
	<i>risk_sqr</i>	-10.375***	(2.700)			-10.732***	(2.736)		
Firm-Level Variance (% Explained)^c		25 (6%)				26 (6%)			
Industry-Level									
	<i>regulation^a</i>	-0.736	(1.648)			-0.687	(1.759)		
	<i>industrycompetition</i>	6.731	(4.353)			6.135	(4.412)		
	<i>industryrnd</i>	-0.623	(0.702)			-0.561	(0.753)		
	<i>industry lifecycle</i>	0.060	(0.212)			0.050	(0.224)		
Industry-Level Variance (% Explained)^c		8 (89%)				5 (56%)			
Country-Level									
	<i>logstockmarket</i>	9.993*	(5.119)	-0.815	(1.154)	22.886*	(13.678)	1.005	(2.117)
	<i>1b.legalorigin^b</i>	0.001	(0.001)						
	<i>2.legalorigin</i>	11.486***	(1.859)						
	<i>3.legalorigin</i>	18.669***	(1.940)						
	<i>shareholderprotection</i>					1.985	(2.142)	-0.371**	(0.161)
	<i>uai</i>					1.173***	(0.340)	-1.51	-0.121
Country-Level Variance (% Explained)^c		135 (100%)				129 (96%)			
Interaction Terms									
	<i>c.logstockmarket#c.logmarketcap^d</i>	-1.171**	(0.514)			-1.748**	(0.694)		
	<i>c.uai#c.shareholderprotection^d</i>					-0.017***	(0.005)		
Constant		-73.997	(75.760)			-304.689	(188.651)		
Observations		900				900			
Total Variance (% Explained)		178 (32%)				169 (30%)			

* $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$ ^a Dummy Variable ^b Reference Category: Common-Law^c Random Intercept^d Interaction Effect

Table A - 5: List of Variables

	Description	Variable
First Stage Regression	Ownership Concentration	<i>tcr5</i>
	Firm Performance	<i>logebit5yr</i>
	Firm Size	<i>logmarketcap</i>
	Firm Risk	<i>risk</i>
	(Firm Risk) ²	<i>risk_sqr</i>
	Industry Regulation	<i>regulation</i>
	Shareholder Protection	<i>shareholderprotection</i>
Second Stage Regression	Firm Performance	<i>tobinsq5yr, roa5yr</i>
	Debt-to-Asset Ratio	<i>debttoassets</i>
	RnD-to-Asset Ratio	<i>rndtoassets</i>
	CapEx-to-Asset Ratio	<i>capextoassets</i>
	Ownership Concentration	<i>tcr5</i>
	(Ownership Concentration) ²	<i>tcr5_sqr</i>

Table A - 6: Regression Results of Full Sample

Dependent Variable	Full Sample				
	OLS	First Stage		Second Stage	
	<i>roa5yr</i>	<i>tcr5</i>	<i>tcr5_sqr</i>	<i>roa5yr</i>	
Exogenous Variables					
<i>debttoassets</i>	-2.806*** (0.990)	-0.039** (0.019)	0.526 (1.085)	-3.621** (1.663)	
<i>capextoassets</i>	24.762*** (2.978)	0.039 (0.063)	1.306 (1.513)	22.471*** (3.679)	
<i>rndtoassets</i>	39.384*** (7.874)	0.223 (0.179)	5.835 (6.179)	19.025 (19.421)	
Instruments					
<i>logebit5yr</i>		-0.001* (0.001)	0.001 (0.001)		
<i>risk</i>		0.104*** (0.033)	4.954** (1.877)		
<i>risk_sqr</i>		-0.042*** (0.011)	-1.780** (0.658)		
<i>logmarketcap</i>		-0.013*** (0.002)	0.064 (0.054)		
<i>shareholderprotection</i>		-0.017*** (0.005)	-0.207 (0.139)		
<i>regulation^a</i>		-0.023 (0.016)	-1.296** (0.481)		
Instrumented Variables					
<i>tcr5</i>	-0.348 (1.550)			4.752 (5.865)	
<i>tcr5_sqr</i>	-0.021 (0.044)			0.135 (0.246)	
Constant	6.993* (3.820)	2.751*** (0.046)	5.072*** (1.355)	-5.295 (14.428)	
Observations	1079	1079	1079	1079	
F-Statistic	17.85***	28.41***	2.59**	17.93***	
R-squared	0.076	0.213	0.077	0.049	

* $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$ ^a Dummy Variable

Table A - 7: Regression Results of Subsample (50 Percentile)

Dependent Variable	High Ownership Concentration (50 Percentile)						
	OLS		First Stage				Second Stage
	<i>roa5yr</i>		<i>tcr5</i>		<i>tcr5_sqr</i>		<i>roa5yr</i>
Exogenous Variables							
<i>debttoassets</i>	-1.941	(1.351)	-0.025	(0.018)	-0.514	(1.220)	-2.082* (1.230)
<i>capextoassets</i>	18.263***	(4.285)	0.056	(0.065)	2.642	(3.988)	19.703*** (2.409)
<i>rndtoassets</i>	43.198***	(12.775)	0.295	(0.263)	17.795	(16.038)	50.044*** (8.006)
Instruments							
<i>logebit5yr</i>			-0.001	(0.001)	0.001	(0.001)	
<i>risk</i>			0.132***	(0.037)	6.827***	(2.347)	
<i>risk_sqr</i>			-0.051***	(0.014)	-2.480***	(0.819)	
<i>logmarketcap</i>			-0.001	(0.002)	0.067	(0.111)	
<i>shareholderprotection</i>			-0.009**	(0.004)	-0.255*	(0.146)	
<i>regulation^a</i>			-0.053***	(0.014)	-2.643***	(0.812)	
Instrumented Variables							
<i>tcr5</i>	9.592**	(4.834)					21.196 (17.678)
<i>tcr5_sqr</i>	-0.187**	(0.092)					-0.242 (0.418)
Constant	-17.867	(12.130)	2.659***	(0.038)	5.692***	(1.686)	-47.124 (43.937)
Observations	539		539		539		539
F-Statistic	6.24***		10.21***		3.86***		31.00***
R-squared	0.055		0.189		0.155		0.036

* $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$ ^a Dummy Variable

Table A - 8: Regression Results of Subsample (25 Percentile)

Dependent Variable	High Ownership Concentration (25 Percentile)						
	OLS		First Stage				Second Stage
	<i>roa5yr</i>		<i>tcr5</i>		<i>tcr5_sqr</i>		<i>roa5yr</i>
Exogenous Variables							
<i>debttoassets</i>	-0.807	(1.862)	-0.019	(0.021)	0.245	(1.659)	-0.041 (1.657)
<i>capextoassets</i>	23.850***	(7.293)	0.086	(0.059)	3.757	(6.773)	26.332*** (5.535)
<i>rndtoassets</i>	73.418***	(19.944)	0.267	(0.285)	25.769	(24.471)	80.226*** (10.746)
Instruments							
<i>logebit5yr</i>			0.001	(0.001)	0.001	(0.001)	
<i>risk</i>			0.122**	(0.045)	8.566**	(3.292)	
<i>risk_sqr</i>			-0.042**	(0.017)	-2.847**	(1.139)	
<i>logmarketcap</i>			0.002	(0.004)	0.164	(0.202)	
<i>shareholderprotection</i>			-0.006	(0.005)	-0.317	(0.245)	
<i>regulation^a</i>			-0.039***	(0.013)	-2.943***	(0.896)	
Instrumented Variables							
<i>tcr5</i>	15.163	(10.971)					34.251 (24.141)
<i>tcr5_sqr</i>	-0.255*	(0.150)					-0.252 (0.311)
Constant	-33.194	(28.009)	2.657***	(0.050)	6.583**	(3.040)	-83.025 (61.315)
Observations	270		270		270		270
F-Statistic	4.92***		3.32**		3.26**		63.17***
R-squared	0.085		0.179		0.186		0.029

* $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$ ^a Dummy Variable

Table A - 9: Regression Results of Subsample: Different Legal Origins

	German Civil Law								French Civil Law							
	OLS		First Stage		Second Stage		OLS		First Stage		Second Stage					
Dependent Variable	roa5yr		tcr5		tcr5_sqr		roa5yr		roa5yr		tcr5		tcr5_sqr		roa5yr	
Exogenous Variables																
debttoassets	-4.273***	(1.640)	-0.109**	(0.055)	1.421	(2.740)	1.567	(3.377)	-1.391	(1.775)	-0.034	(0.043)	0.476	(2.154)	-1.877	(4.392)
capextoassets	27.436***	(5.430)	0.287***	(0.096)	-0.936	(4.330)	17.539**	(8.059)	2.537	(7.396)	0.095	(0.104)	-2.464	(3.887)	7.736	(8.979)
rndtoassets	31.220**	(13.706)	0.400	(0.502)	23.048	(25.822)	28.220	(18.805)	-21.924	(15.708)	-0.183	(0.189)	-7.100	(5.185)	-3.328	(39.619)
Instruments																
logebit5yr			-0.000	(0.000)	0.000	(0.000)					-0.000**	(0.000)	0.000	(0.000)		
risk			-0.251***	(0.077)	-11.162***	(3.723)					-0.102**	(0.042)	-5.066*	(3.043)		
risk_sqr			0.112***	(0.036)	4.853***	(1.671)					0.040**	(0.016)	1.532	(1.149)		
logmarketcap			-0.010***	(0.002)	0.072	(0.103)					0.006	(0.008)	-0.029	(0.362)		
shareholderprotection			0.001	(0.004)	-0.025	(0.176)										
regulation ^a			-0.051***	(0.019)	-1.378*	(0.816)					-0.055**	(0.022)	-1.726	(1.436)		
Instrumented Variables																
tcr5	4.006*	(2.081)					33.410*	(9.354)	3.990	(3.443)					3.072	(15.156)
tcr5_sqr	0.067	(0.056)					-0.691*	(0.337)	-0.141*	(0.075)					-0.140	(0.396)
Constant	-4.411	(5.110)	2.654***	(0.050)	6.267***	(1.711)	-75.408***	(22.233)	-2.483	(8.679)	2.532***	(0.049)	4.769**	(2.315)	-0.732	(37.502)
Observations	401		401		401		401		228		228		228		228	
F-Statistic	9.25***		11.45***		2.41**		10.81***		1.39		6.79***		2.52**		0.35	
R-squared	0.104		0.247		0.122		-0.770		0.030		0.102		0.080		0.022	

* $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$ ^a Dummy Variable

Table A - 10: Regression Results of Subsample: Spain and France

Dependent Variable	Spain					France				
	OLS		First Stage		Second Stage	OLS		First Stage		Second Stage
	<i>roa5yr</i>		<i>tcr5</i>	<i>tcr5_sqr</i>	<i>roa5yr</i>	<i>roa5yr</i>		<i>tcr5</i>	<i>tcr5_sqr</i>	<i>roa5yr</i>
Exogenous Variables										
<i>debttoassets</i>	-10.379*** (3.000)		0.027 (0.043)	1.433 (1.980)	-7.781** (3.105)	5.518*** (1.938)		-0.083 (0.078)	-0.357 (2.831)	6.810 (4.375)
<i>capextoassets</i>	1.100 (11.139)		0.028 (0.132)	5.019 (5.396)	2.217 (8.792)	5.105 (8.665)		0.049 (0.157)	-10.235 (8.707)	4.978 (11.655)
<i>rndtoassets</i>	-53.656** (23.569)		-0.305 (0.258)	-1.345 (5.099)	-66.172* (34.045)	25.152 (18.544)		-0.213 (0.314)	-14.979 (9.407)	38.169** (16.169)
Instruments										
<i>logebit5yr</i>			-0.001*** (0.001)	0.001 (0.001)				-0.001* (0.001)	0.001 (0.001)	
<i>risk</i>			0.081 (0.062)	7.799** (3.784)				-0.082 (0.058)	-1.513 (3.562)	
<i>risk_sqr</i>			-0.036* (0.021)	-2.684** (1.310)				-0.006 (0.031)	-0.661 (1.800)	
<i>logmarketcap</i>			0.011* (0.005)	0.213 (0.187)				0.009 (0.016)	-0.377 (0.737)	
<i>propertyrights</i>										
<i>regulation^a</i>			-0.030 (0.022)	-1.067 (1.098)				-0.082** (0.039)	-2.840 (3.381)	
Instrumented Variables										
<i>tcr5</i>	20.024** (8.946)				13.113 (13.569)	1.523 (3.236)				19.589 (19.089)
<i>tcr5_sqr</i>	-0.348 (0.230)				-0.041 (0.266)	-0.123* (0.066)				-0.193 (0.466)
Constant	-39.024* (22.356)		2.496*** (0.045)	3.366** (1.316)	-23.244 (33.567)	0.818 (8.201)		2.523*** (0.097)	7.178 (4.786)	-45.210 (47.154)
Observations	107		107	107	107	121		121	121	121
F-Statistic	4.29***		5.22***	1.44	2.36**	2.50**		8.00***	0.76	1.69
R-squared	0.175		0.216	0.269	0.145	0.098		0.120	0.064	-0.157

* $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$ ^a Dummy Variable

STATEMENT

I declare on my word of honor that I am the sole author of this thesis. The exceptions to this are the sections for which one or more co-authors were involved; these sections are explicitly identified and the names of the co-authors are completely and truthfully listed. I confirm that I made a significant contribution to the sections for which one or more co-authors were involved that justifies my own co-authorship. The work was completed using only the cited sources. All information taken directly from source material or ideas based on information taken from source material have been clearly identified through the cited references.

Frankfurt am Main, February 26, 2010