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The Impact of Management, Family and Employee Ownership Concentration on Firm Performance

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Abstract

This thesis investigates the relation between ownership structure and firm performance using a sample of 2,120 publicly traded European companies. The question of whether this relation should be positive or negative has been the subject of a wide-ranging discussion and was addressed by many researchers. Of particular interest have been management, family, and employee owners. Nevertheless, there is no consensus in the literature, and empirical studies on European companies are scarce.

Utilising data from the European Federation of Employee Share Ownership (EFES) and the Bureau Van Dijk Orbis database, this relation is analysed using multiple linear regression with continuous and categorical predictors. The results show that firms having a management owner concentration up to strategic levels report a significantly higher Tobin's Q than firms having a no or no significant management concentration. The same effect holds true for family owners and employee owners. Measuring the ownership structure as the fraction of shares of the largest shareholder does not yield a significant effect and highlights the value of management, family, and employee owners.

Keywords: Ownership concentration; family ownership; management ownership; employee ownership; firm performance.

1. Introduction

Ownership structures and their implications have been a widely discussed topic for almost a century and are still in the interest of the finance and management literature. Beginning with the argument by Berle and Means[1] in 1932 that an increasing separation of ownership and control will lead to a long-term deterioration in the value of a company, numerous other arguments for and against it have developed.

At the same time, ownership structures are changing worldwide. Employee Share Ownership Plans (ESOP), for example, are gaining popularity in the United States. But in Europe, too, growing numbers of financial participation schemes can be observed. Between 1999 and 2005, the share of companies offering broad-based ownership schemes rose from 13% to 18%.[2] In the case of profit-sharing plans, the share rose from 29% to 35%.[3]

However, the study of ownership structures is also of macroeconomic relevance. Family owners, in particular, have now accumulated an intangible value that can have a significant impact on the economy as a whole. In Sweden, for example, a single family, the Wallenbergs, controls about half of the market capitalization of the Stockholm Stock Exchange.[4] In Hong Kong, the most valuable 15 families control 84.2% of the gross domestic product.[5]

But is a higher owner concentration good for the performance of a company? There is no empirical consensus on that in the literature, and most studies focus on an isolated analysis of owner types. Most often discussed are management, family, and employee owners. The results, however, remain divided: Management owners should have positive effects in high concentrations because they combine control and ownership, thereby reducing agency costs.[6] However, more management owners also lead to a higher risk of entrenchment, allowing large shareholders to make decisions at the expense of minority shareholders.[7] Families should have a good impact on companies because they bring finan-

[1] See Berle and Means (1932).
[2] See Lowitzsch, Hashi, Woodward, and (Eds.) (2009), p. 22.
[3] See Lowitzsch et al. (2009), p. 23.
[4] See Agnblad, Berglöf, Högfeldt, and Svancar (2001).
[5] See Claessens, Djankov, and Lang (2000), pp. 107-109.
[6] See for example Ang, Cole, and Lin (2000), p. 83-84.
[7] See for example Villalonga and Amit (2006), p. 387.

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cial access and have an above-average incentive to monitor the company.[8] On the other hand, they are often accused of abusing their power and limiting management positions to family members.[9] Finally, Employee Owners should also have a positive influence on the company, as financial participation increases their motivation.[10] But the opposite may also be true, as more labour participation also leads to inefficient decision-making processes.[11]

This thesis analyses the relationship between three important owner types, i.e. management, family and employee owners, and firm performance. It is argued that a higher concentration of each of these owner types should lead to better firm performance. The results of several multiple linear regressions show a significant positive correlation up to a concentration level where strategic ownership is exceeded. An increase in owner concentration, therefore, is most beneficial up to a share of 20%.

Most existing studies are using exclusively American companies in their sample. This study focuses on European companies and thus contributes to the current literature by applying similar models to a less investigated environment. At the same time, this work breaks the frequently made assumption of a linear relationship and provides indications that there is an optimal concentration level for each owner. Practitioners conclude from this strategic implication that suboptimally structured firms can improve the performance of their firms by increasing the concentration of certain owner groups. What this study will not do is to compare different types of owners.

The rest of this work is structured as follows: Chapter 2 presents a set of criteria for characterizing ownership structures. By comparing the most common arguments, hypotheses about the influence owner concentrations should have on the company performance are derived. Chapter 3 introduces the methodology used in this study and describes the variables used and the regression models. The results of the regressions are then presented in Chapter 4 and evaluated in relation to the initial question. Since the models may have some weaknesses, possible issues and striking results are discussed further in chapter 5, where the robustness of the results is tested with the help of further models.

2. Ownership Structure and Firm Performance

2.1. Classifying Ownership Structures

In order to investigate the influence of ownership structures on firm performance, a clear method for differentiating between different structures must first be defined. The ownership structure of a company can be described under three different aspects: The identity of the owner, his share in the company, and finally, his involvement in the company.

The identity of an owner refers to the type of a shareholder and includes managers, families, employees, governments, banks, foreign investors and other companies. A classification by ownership identity is relevant as different owners can differ in terms of their interests, risk preferences, time horizons and strategies.[12] Shareholder value is not a universal goal of corporate strategy. For example, while family ownership may be associated with the goal of firm survival, state ownership is expected to pursue political goals such as low output prices and low unemployment rates.[13] Moreover, this also implies that hybrid ownership structures with multiple identities can be related to diverging interests.

The second aspect, ownership concentration, is determined by the proportion of an owner's shares in a company and is often divided into concentrated ownership and dispersed ownership.[14] It is not clear which threshold should be used to differentiate between these two types of ownership. There is agreement in the literature, however, that a stake of less than 50 per cent may be sufficient to give a block holder ultimate control over the company.[15] Often a threshold of 20 or 25 per cent is applied as a definition for concentrated ownership.[16] Accordingly, a structure in which no shareholder owns more than 20 per cent of the company's shares is defined as dispersed ownership.

A third aspect to describe the ownership structure of a company is the involvement of the owner which can be measured, e.g. as the number of an owner's votes or as the number of top executive positions filled by members of a certain identity. A typology to classify the interaction between the owner and the company is to differentiate between relational and transactional owners.[17] A relational owner is a long-term oriented shareholder with complex profit and growth goals for a company. Such a characteristic can often be found in families. A transactional owner, on the other hand, does not engage in further relations with the company except for obtaining returns. Such a characteristic can be often found in institutional investors.

As ownership involvement is difficult to measure, this aspect is neglected in most studies, and so it will be in this thesis. Hence, the ownership identity and concentration are the two most widely used aspects to classify a company's ownership structure.

2.2. Literature Review

The relationship between different ownership structures and firm performance has been the subject of numerous studies since Berle and Means[18] and has led to a widely discussed

[8] See Anderson and Reeb (2003), pp.1306-1307.
[9] See Anderson and Reeb (2003), pp.1301-1302.
[10] See for example Mazibuko and Boshoff (2003), p. 31, Kurtulus and Kruse (2017), p. 1.
[11] See Park, Kruse, and Sesil (2004), pp. 5-7.
[12] See Aguilera and Jackson (2003), pp. 450f.
[13] See for example Lins, Volpin, and Wagner (2013); Thomsen and Pedersen (2000).
[14] See Pedersen and Thomsen (1997), pp. 765-769.
[15] See Faleye, Mehrotra, and Morck (2006), p. 7.
[16] See for example Aguilera and Crespi-Cladera (2016); Lins et al. (2013); Pedersen and Thomsen (1997).
[17] See for example Aguilera and Jackson (2003); David, O'Brien, Yoshikawa, and Delios (2010), p. 638.
[18] See Berle and Means (1932).

disagreement about whether and what kind of relationship exists. Most studies have focused on an isolated consideration of individual owner identities and arguments for and against each individual identity emerge. The discourse on three of the most important ownership structures, i.e. management ownership, family ownership and employee ownership, will be the subject of this section. Based on the arguments presented, hypotheses about the relationship between ownership structures and firm performance will be derived.

2.2.1. Management Ownership and Firm Performance

An important and frequently cited argument that predicts a positive impact of managerial ownership on firm performance is the agency theory presented by Jensen and Meckling[19]. It analyses the relationship between a principal and an agent, with the principals representing the owners of the firm and the agents representing the managers. The assumption is that owners pursue the goal of maximizing the company's profit and thus, shareholder value. Opposed to this are the interests of managers who strive for personal perks, such as high compensation. Agency costs arise when the interests of those who run a company and have decision-making authority do not coincide with the interests of the company owners. Accordingly, companies that are wholly owned by the management have, by definition, no agency costs and thus an optimal match between principal and agent. At the other extreme are managers who do not own any shares in the company. Higher management participation should, therefore, lead to higher company success. The notion that agency costs vary inversely with the manager's ownership share was examined and confirmed by Ang, Cole and Lin[20] who took – as the theory requires – non-publicly traded firms into account in their study.

This theory is consistent with numerous empirical studies that show a positive correlation between a higher concentration of management owners and corporate success. Oswald and Jahera[21], for example, found a significant positive influence of officer's and director's stockholdings on performance variables such as excess stock return, return on assets (ROA) and return on equity (ROE) in a sample of 645 companies listed on the New York and American Stock Exchange.

Core and Larcker[22] argue that there is an equilibrium where managers are optimally involved in the company. They have focused their sample on companies that have introduced a target ownership plan, which stipulates that managers own a certain minimum number of shares in the company. They observed statistically higher stock price returns in the first six months of a fiscal year in which such a plan was announced. In addition, these companies showed statistically higher excess accounting returns in the two years following the introduction of the plan. An increase in the management's stake in the company, who have a below-equilibrium percentage of shares, therefore has a positive impact on performance.

On the other hand, the theory that a higher proportion of management owners leads to a higher company valuation has been challenged by the entrenchment hypothesis.[23] Managers who own at least a certain percentage of the company can become entrenched and exploit this situation at the expense of smaller shareholders.[24] More management ownership should, therefore, also lead to more entrenchment. A study by Morck, Schleifer and Vishny[25], however, does not find a clear answer to this hypothesis. Although Tobin's Q decreases at a management concentration between 5 and 25 per cent compared to the concentration category between 0 and 5 per cent, as soon as the management ownership exceeds 25 per cent, Tobin's Q increases again, which argues against entrenchment.

Demsetz[26] presented another argument that questions the relationship between management ownership and firm performance. The agency theory – also called the convergence-of-interest hypothesis – is based on the false assumption that all managers primarily strive for higher corporate profitability. However, since not all managers have the same objectives, they will work only for companies that fit their preferences. At the same time, companies compensate their managers to adjust for the agency costs incurred which, eventually, will lead to an optimal balance between management and non-management owners in every company. The ownership structure of a company is thus an endogenous consequence of the decisions of current and future shareholders and should therefore not have any influence on the company. For example, in a non-optimal dispersed ownership structure, a company would, if necessary, carry out an appropriate concentration of management shares itself to compensate for its ineffectiveness.

Empirical evidence of this idea can be found in studies by Demsetz and Villalong and, Yixiang.[27] Both conclude that there is no link between management shares and business success when the ownership structure is modelled as an endogenous variable. But even this approach is not consistently found in the literature. Kapopoulos and Lazaretou[28], for example, have applied the same model and for their sample have shown that a higher concentration of management owners is associated with higher firm performance. They looked at a sample of 175 companies listed in Greece and measured performance using ROA and Tobin's Q.

Based on the argumentation presented and the evidence hinted at in the literature, it can be concluded that there is still no clear position on the relationship between these two variables. However, since a tendency towards a positive influence is emerging, the following hypothesis can be made:

[19] See Jensen and Meckling (1976), pp. 312-319.
[20] See Ang et al. (2000), pp. 81-83.
[21] See Oswald and Jahera Jr (1991), pp 324f.
[22] See Core and Larcker (2002), p. 321, p. 338.
[23] See Morck, Shleifer, and Vishny (1988), pp. 294f.
[24] See Thomsen and Pedersen (2000), p. 690.
[25] See Morck et al. (1988), pp.299-302.
[26] See Demsetz (1983), pp. 382-385.
[27] See Demsetz and Villalonga (2001); Yixiang (2011).
[28] See Kapopoulos and Lazaretou (2007), pp. 149-153.

Hypothesis 1: Higher ownership concentration of executive employees (managers) is positively related to firm performance.

2.2.2. Family Ownership and Firm Performance

The second owner identity frequently discussed in the literature are families. In terms of the agency theory mentioned above, family businesses should do well, since owners and managers are often either the same persons or at least have a close relationship with each other.

In contrast to this, however, there is the view that families differ from typical managers in at least one essential characteristic: Unlike managers, who primarily aim for the profitability of the company, families have an interest in keeping the company going for many generations. This leads to a bias towards survival-oriented actions so that families are considered to make decisions that can come at the expense of other shareholders.[29] An example is the tendency of family businesses to limit executive management positions exclusively to family members. This limited pool of potential, qualified candidates can lead to a competitive disadvantage compared to non-family businesses.[30] Another example can be found in the investment decisions of family owners. In the course of an economic recession, family businesses reduce their investments much more than other companies, which leads to a stronger decline in stock prices.[31] According to Lins, Volpin and Wagner[32], family firms tend to underperform by 2.0 to 3.3 percentage points in a financial crisis. Moreover, when a family holds multiple companies and one of them is hit by a crisis, it can spread across the other healthy firms. It is, however, questionable to what extent these results can be generalized to other periods of the economic cycle.

This risk of power abuse by family managers implies that companies that are owned but not managed by a family should perform better than companies in which the family is actively involved in the management. Hence, the agency theory should not hold. Barotini and Caprio[33], however, provide evidence that when families take executive positions, they cannot be distinguished from non-family firms and perform at least as good as their peer groups. However, when they are not represented on the board, family firms perform worse than non-family firms. This result invalidates the argument that families should not be involved in the management of a firm.

In addition, an interest in the long survival of the company can also be interpreted just as well to the advantage of family businesses. The historical presence of the families, as well as their often non-diversified company portfolio and their control of management positions, provide an exceptionally good basis for monitoring of the company. The incentives of family owners to monitor more closely arise from the fact that the consequences of their actions directly return to them.[34] In addition, families face reputational damage in the event of poor performance.[35] There are also further advantages of the long-term orientation of families: James[36] argues that decisions made by managers who are members of the founding family are generally more efficient than in other companies. This is because their decisions are based on an altruistic foundation that takes into account the consequences for the entire family and also for future family members. For example, owner-managers of a family make more efficient investment decisions than comparable non-family managers when they know that they will one day hand over the business to another family member.

Another advantage of family businesses is their financial access. According to Morck, Wolfenzon and Yeung[37], most family businesses exist in a pyramid structure in which a family controls several companies, which in turn, control other companies. Companies in a pyramid control structure report higher ROA. In addition, they are often considered to have easier access to financing, as they can benefit from a common pool of resources which is created as a result of other firms under the family's control. Furthermore, family firms have a significantly lower cost of debt, which implies that bondholders trust family firms to protect their interests better, e.g. because of long-term survival.[38]

A study by Andersond and Reeb[39] concludes that family firms perform significantly better than non-family firms in terms of Tobin's Q and ROA. The result of the 403 firm sample is not only statistically but also economically significant since Tobin's Q of family firms is ten per cent higher. Numerous other studies show a positive influence of family owners on firm performance.[40] Thomsen and Pedersen[41], on the other hand, prove a negative influence on a data set of 435 public companies. According to Martínez, Stöhr and Quiroga[42], the negative influence identified by some studies is due to the fact that these studies only looked at public companies which generally perform worse. Relevant to the study of family ownership, on the other hand, are private companies that perform significantly better.

In summary, stronger arguments and more empirical evidence for a positive influence of family owners on the success of a company can be found. The following hypothesis emerges from the literature review presented here:

Hypothesis 2: Higher ownership concentration of founding family members is positively related to firm performance.

[29] See Lins et al. (2013), p. 2584; Anderson and Reeb (2003), pp. 1306f.
[30] See Anderson and Reeb (2003), pp. 1301f; Barontini and Caprio (2006), p. 690.
[31] See Lins et al. (2013), pp. 2595-2598.
[32] See Lins et al. (2013), pp. 2595-2598.
[33] See Barontini and Caprio (2006), pp. 720f.
[34] See Silva and Majluf (2008), p. 610.
[35] See Anderson and Reeb (2003), p. 1306.
[36] See James (1999), p. 44, p. 52.
[37] See Morck, Wolfenzon, and Yeung (2005), p. 661.
[38] See Anderson and Reeb (2003), p. 1306.
[39] See Anderson and Reeb (2003), pp. 1317-1322.
[40] See for example Martínez, Stöhr, and Quiroga (2007); Villalonga and Amit (2006).
[41] See Thomsen and Pedersen (2000).
[42] See Martínez et al. (2007), pp. 84-86.

2.2.3. Employee Ownership and Firm Performance

The third important owner identity to be investigated are employees. In both the US and Europe, employee financial participation has become increasingly important and popular. As stated in the report on the "Promotion of Employee Participation in Profits and Enterprise Results" (known as the PEPPER recommendations) by the European Commission, employee participation is tax-incentivized. This incentive is crucial in explaining the increase in the number of Employee Share Ownership Plans (ESOP), a form of employee ownership.[43] However, there are several other arguments that try to explain the interaction between employee ownership and firm performance.

It comes naturally to mind that employee share ownership should have an impact on their motivation. However, it is less clear whether this should be a positive or negative impact. One way of looking at this question is to model this as a game-theoretical problem.[44] The idea behind this argument is that the participation of employees in the company's success does not generate an incentive to work more since employees can profit from the success of others even without extra work. According to the logic of the "Prisoner's Dilemma", employees can generate more profit in absolute terms by working together cooperatively. However, they can generate more personal utility if they shirk and rest on the work of others. So, employees have an incentive to be a free rider and this incentive grows with the size of the group. This increasing incentive to shirk or the decreasing incentive to cooperate is also often called the 1/N problem because a worker in a group with N members receives only 1/N of the additional reward earned.[45] This becomes problematic if all employees follow this view because then all employees will get to the worst situation with minimal profit.

However, following Pendleton[46], this game-theoretical dilemma can be easily solved. On the one hand, there is a consensus in the literature that repeated playing motivates individuals to cooperate and pursue an optimal strategy. On the other hand, shirking from one employee leads to higher costs for all other employees. These costs would lead to a situation where employees who resist the expectation of working harder would be sanctioned by peer pressure, for example. An employee ownership structure, therefore, reduces the monitoring costs of a company. This view was confirmed in a study by Freeman, Kruse and Blasi[47], who evaluated the responses of over 41,000 employees from 14 companies. An anti-shirking index was calculated from the answers to the question of how one would react if one saw an employee working less than he or she should. The result shows that employees who own company shares are significantly more likely to respond to this observation actively.

The other view on the question of whether employee share ownership should have a positive or negative impact is that it will positively motivate employees. In fact, it has often been proven that such shares motivate employees to work harder to increase the value of their shares. In addition, they complain less, take advantage of more training opportunities, are absent less often, and there is generally lower labour turnover in the company.[48] Employee participation, therefore, leads to greater involvement of employees in the performance of the company they work for and in the implementation of their interests. Similar to family owners, employees have survival-oriented interests and additionally strive for employment stability.[49] It follows that companies with an employee ownership structure should survive longer than comparable companies with a different ownership structure. The empirical investigation of this hypothesis by Park, Kruse and Sesil[50] showed that companies that are at least five per cent owned by employees are only 76 per cent as likely to disappear in the same period as companies without employee ownership. This interest also leads to making certain decisions of the company more comprehensible. It is argued that employees are more willing to adapt and to accept change if the company is forced to do so by the economic situation.

The comparison of these two views, therefore, suggests a positive influence of employee share ownership on work motivation and is thus a first indication of a better performance of the company.

At this point, it should be noted that a higher interest of employees to become involved in the company can have a negative impact on other stakeholders. As will be shown later (see section 5.5.2), the interaction of different owners probably also plays a role in the evaluation of firm performance. This gives rise to the danger that too much employee involvement can have negative consequences for managers, for instance. In the literature, this is addressed by the influence of employee share ownership on decision making efficiency. Employee share ownership encourages employees to become too involved in the decision-making process, which leads to a collective decision-making problem and undermines managerial authority.[51] Yet, a higher level of involvement can just as well be understood positively. For example, it is not taken into account that it can also be helpful to include different competencies in the decision-making process. In fact, it is beneficial to involve employees in the company, as this encourages all levels of the hierarchy to consider how to improve the company. Frontline workers, who are often not involved in product process improvement plans, are experts in this field and their suggestions should be taken into account. In the long term, this will lead to an improvement in product quality and the production process.[52] It is also conceivable

[43] See Lowitzsch et al. (2009), pp. 13-21.
[44] See Park et al. (2004), pp. 5f.
[45] See for example Blasi, Freeman, and Kruse (2016); E. H. Kim and Ouimet (2014).
[46] See Pendleton (2002), pp. 108f.
[47] See Freeman, Kruse, and Blasi (2008), pp. 6-10.
[48] See for example E. H. Kim and Ouimet (2014); Kurtulus and Kruse (2017); Mazibuko and Boshoff (2003).
[49] See Kurtulus and Kruse (2017), p. 2.
[50] See Park et al. (2004), pp. 28-30.
[51] See for example Dow and Putterman (2000); Long (1978); Mazibuko and Boshoff (2003); Richter and Schrader (2017).
[52] See Park et al. (2004), p. 7.

that this effect can be mitigated by different implementations of the employee ownership structure.

Independent of work motivation and involvement, it is also possible to find arguments in favour of the general situation of the employees. Arguments that speak against the improvement of the employment situation are vanishingly small in the literature. Long[53] points out that employees can get the feeling that more work is expected of them through company shares. In the long term, this could damage productivity and the working climate. However, the sample used casts doubt on the generalizability of this result. Another point is that employees tend to have a poorly diversified portfolio due to the high proportion of shares in their own company.[54] Empirical evidence for this argument is not known.

In contrast, numerous studies prove a positive effect on employee attitudes. Kaarsemaker, Pendleton and Poutsma[55] reviewed more than 50 studies on this topic and summarised that more than two-thirds of them speak for a positive effect on attitudes. Frequent reasons for this result are that this builds up more trust in superiors and promotes pro-social behaviour as well as identification and responsibility with one's own company.[56] Companies with an Employee Ownership Structure consequently show a healthier corporate culture.

An empirical study such as the one that will be carried out here has already been dealt with frequently in the literature, albeit mainly in relation to American companies. Many studies conclude that a stronger concentration of employee owners is positively related to the financial performance of a company.[57] Fewer studies find empirical evidence to the contrary.[58] Based on these results and the discussion outlined above, it is expected that a similar effect can be found for European companies. Consequently, the next hypothesis follows:

> Hypothesis 3: Higher ownership concentration of non-executive employees is positively related to firm performance.

2.2.4. Concentrated Ownership and Firm Performance

In addition to managers, families and employees, companies can have numerous other shareholders who differ from one another in their initial motivation. Thomsen and Pedersen[59] make a broader analysis of various owners and compare their interests. Financial and insurance companies, for example, attach greater importance to shareholder value and portfolio diversification, corporate owners attach importance to business transactions and growth, and governments take social consequences into account in their actions in terms of jobs and social welfare. Even more extreme are foundation-owned companies, which are non-profit organizations without owner monitoring, and which pursue exclusively charitable purposes. Nevertheless, Thomsen and Rose[60] find that these companies are at least as efficient in terms of risk-adjusted stock returns, accounting returns and Tobin's Q compared to companies with other owner identities.

This raises the question of whether profit-seeking behaviour must be a necessary condition for a successful company. Corporate success could be a prerequisite for an owner to realize his individual interests so that each owner benefits from a higher firm performance. Consequently, the analysis of firm performance may be less concerned with the individual interests of the owner and more with his ability to realize these goals. A higher concentration of a single owner should result in that owner being able to realize his interests more efficiently than in an environment of many different shareholders with heterogeneous interests.

Theoretically, as discussed above, agency costs play an important role for block holders. In the literature, it is repeatedly emphasised that concentrated owners have economic incentives to minimize agency conflicts and actively monitor managers.[61]

Multiple studies provide evidence that a controlling block holder of any type has a significant positive correlation with firm performance.[62]

The arguments presented here, therefore, give rise to another hypothesis:

> Hypothesis 4: Firms having a concentrated ownership structure perform better than comparable firms with a dispersed ownership structure.

3. Methodology

In order to test the hypotheses empirically, this study conducts several multiple linear regressions using continuous and categorical predictors. The aim of this section is to describe the data used for the analysis as well as the structure of the applied models and their associated variables.

3.1. Data Sample

To investigate the effects of different owner identities on the performance of a company, a data set was compiled from three different databases.

The main data source is the database of employee share ownership in European companies from the European Federation of Employee Share Ownership (EFES).[63] It contains data from 31 European countries and comprises a panel of

[53] See Long (1978), p. 43.
[54] See Kurtulus and Kruse (2017), p. 3.
[55] See Kaarsemaker, Pendleton, and Poutsma (2009), p. 17.
[56] See for example Blasi et al. (2016); Richter and Schrader (2017).
[57] See for example Blasi et al. (2016); Haldar and Rao (2011); K. Y. Kim and Patel (2017); Park et al. (2004); Richter and Schrader (2017).
[58] See for example Faleye et al. (2006); Livingston and Henry (1980).
[59] See Thomsen and Pedersen (2000), p. 690.
[60] See Thomsen and Rose (2004), pp. 344f.
[61] See for example Demsetz (1983); Shleifer and Vishny (1986).
[62] See for example Lins et al. (2013); Thomsen and Pedersen (2000); Yixiang (2011).
[63] See EFES (2019).

2,709 companies from 2007 to 2016, including all listed companies with a stock market capitalisation of at least 200 million euros. It thus includes all significant European companies. The listed companies represent 25% of all European listed companies (excluding financial firms), but 99% in terms of capitalisation and 95% in terms of employment. In addition, non-listed enterprises with at least 100 employees and whose employees hold at least 50% of the company shares are included in the data set. The information in the EFES database is based on the annual reports provided by the companies themselves.

For the calculation of firm performance measures, the required financial data has been extracted from the Thomson Financial Worldscope database and attached to the companies contained in the EFES database.

Furthermore, the EFES dataset focuses exclusively on executive and non-executive employee ownership. From this, variables for determining employee and management ownership can be derived. To include additional information on family owners, the dataset was merged with the Bureau Van Dijk Orbis database, a continuously updated global database with extensive information on corporate ownership.

Finally, all companies without ISIN and all companies without employees were removed from the composite data sample. In addition, all financial firms (Groups 44 to 47) were removed using the Industry Portfolios by Fama and French[64]. The final sample contains 2,120 companies from 31 European countries. All numeric nonbinary variables have been winsorised at the 1st and 99th percentile to reduce the impact of outliers.

3.2. Variables

3.2.1. Firm Performance

In order to evaluate the performance of a company, researchers and practitioners utilize numerous different performance measures. This thesis focuses on Tobin's Q and ROA to evaluate the performance. The choice of these two variables is meaningful as they describe the company from two perspectives: market-based and accounting-based.

Tobin's Q is one of the most commonly used capital market performance measures.[65] It is calculated by dividing the market value of a company by the replacement cost of its assets based on the current market price of these assets. So, if the market value of the company is equal to its replacement cost, there is a balance between the market value and the intrinsic value, and Tobin's Q equals one. If the value is greater than one, the market attributes an additional value to the company. Tobin's Q can, therefore, also be interpreted as the expected future performance of a company. A higher Tobin's Q is consequently considered a better firm performance.

The second performance measure used in this analysis is the ROA ratio, which is calculated by dividing net income by total assets. It is an indicator of how profitable a company is relative to its assets. From this, it can be inferred how efficiently a company uses its available assets to generate earnings. Unlike Tobin's Q, ROA is an accounting-based performance measure and provides information about the historical performance of a company. ROA has also been widely used in the literature to examine the impact of ownership structures.[66]

3.2.2. Ownership Structure

As described in section 2.1, the ownership structure of a company is examined in this thesis based on ownership identity and owner concentration. In this analysis, it is not a question of comparing different owner types against each other in terms of their performance, but rather of examining the effect of the concentration of a single owner identity. For this reason, three separate analyses are carried out, one for management, one for families and one for employee owners.

When determining the owner identity, it should be noted that a distinction must be made between direct and indirect ownership. Family businesses, in particular, are often found to exist in a pyramidal control structure.[67] When using an indirect-ownership measure, a company that is owned by another company, which in turn in owned by a family, would be attributed to a family. Since indirect ownership is likely to have a different effect on company behaviour than direct ownership, only direct owners are considered in this study.

To determine the ownership concentration of an entity, multiple approaches are used. For management and employee owners, the concentration of the owner is measured based on their aggregated fraction of shares. The reason for this is that these owners are likely to pursue similar interests by taking comparable decisions (see sections 2.2.1 and 2.2.3). In families, on the other hand, the individual owners play a more important role. For this reason, their concentration is measured by the proportion of shares that the largest family member is holding. For the fourth hypothesis, the fraction of shares of the largest shareholder, who is commonly called 'Blockholder', is used.

The use of such continuous variables is based on the assumption of a linear relationship between the proportion of shares held by an owner and firm performance. However, some studies suggest that this relationship is non-linear. In order to adapt to these results, the ownership concentration is divided into five groups and represented by four dummy variables in an additional model. The first dummy variable covers ownership levels from at least 1% to less than 6%. The second runs from at least 6% to less than 20%, the third from 20% to 50% and the fourth variable comprises ownership levels of at least 50% of the total shares. According to Kim and Patel[68], the first group corresponds to significant ownership,

[64] See Fama and French (n.d.).

[65] See for example Anderson, Mansi, and Reeb (2003); Richter and Schrader (2017); Silva and Majluf (2008).

[66] See for example Barontini and Caprio (2006); Villalonga and Amit (2006); Xia and Walker (2015).

[67] See Morck et al. (2005).

[68] See K. Y. Kim and Patel (2017), p. 4.

the second to strategic ownership, the third to determining ownership and the fourth to controlling ownership.

Such a partition is too granular for blockholders, as the median blockholder owns 29.50% of all shares while, for example, the median management concentration in the sample is 0.18% (cp. Table 1). For this reason, two thresholds are used: One model uses a 25% threshold and the other one a 50% threshold.

3.2.3. Control Variables

Other potential determinants of firm performance are included as control variables. The first control variable is firm size which can be measured by the number of employees and by the market capitalization. As both of these variables are strongly correlated (Pearson correlation coefficient of 0.633), market capitalization is excluded from further analysis to reduce the impact of multicollinearity. Measuring firm size using the number of employees is found to fit this study design better because it is expected to be less volatile and less prone to other capital market interferences.

A firm's debt ratio can influence its net income which in turn affects the firm performance measures.[69] To account for this effect, leverage is included as a second control variable. It is calculated by dividing total debt by total assets.

To proxy for firm growth opportunities and future returns, research and development (R&D) intensity is also included as a control variable. It is calculated by dividing R&D expenditures by net sales. Including this variable is not common practice in the literature and has only been used by few researchers.[70] For this reason, R&D intensity is included in a separate model.

To control for year fixed effects, nine dummy variables are introduced representing the period range from 2008 to 2016. The dummies are 1 for a particular year and 0 otherwise. Furthermore, 347 dummy variables are added to control for an interaction of the country and the industry of a company.

3.3. Descriptive Statistics

Table 1 presents descriptive statistics for the dataset. By comparing the mean for the concentration variables, a strong positive skew can be noticed. As this also holds true for the performance measures and the control variables, all variables except for 'Blockholder Concentration', 'ROA' and 'R&D Intensity' are log-transformed in further analysis.

The median firm in this sample is rather small, with a market capitalisation of € 439 million and 2,545 employees. Half of the firms in this sample, have a Tobin's Q between 1.024 and 1.813 as well as ROA between 0.008 and 0.095, indicating interquartile ranges of 0.789 and 0.087, respectively.

It should be noted that there is a sharp decline in the number of observations for the control variable 'R&D Intensity'. The reason for this decline is a large number of missing values for R&D expenditures which may be caused by companies in which R&D does not take place. For example, companies from the textiles sector are less likely to undertake R&D investments than companies in the pharmaceutical industry.[71]

To further investigate the frequency of different owner concentration levels, Figure 1 provides a bar chart that depicts the number of firms in the sample that report corresponding ownership concentrations in 2016. It can be seen that the discrepancy in frequencies between different concentration levels is more pronounced for employee owners than it is for management or family owners. Of all sample firms in 2016, who report at least a significant concentration of employee owners, 84.51%[72] only have between 1% and 6% of shares held by employees. According to information provided by the latest PEPPER report[73], this situation can be explained by the fact that in many European countries financial participation emerged only in the mid-1980s and for new member states in Eastern Europe it is still a "recent phenomenon".

Nonetheless, in regard to the proposed hypotheses, the prevalence of low concentration levels among all investigated identities is conspicuous. If a higher concentration were optimal, a different distribution would be expected. This reasoning follows the argument by Demsetz and Villalonga[74], which states that if there was a systematic relation between ownership structure and firm performance, non-optimal dispersed structures should not survive.

3.4. Data Analysis

3.4.1. Multiple Linear Regression

The goal is to test the relation between ownership concentration of individual owner identities and firm performance. To test the proposed hypotheses, multiple linear regression is used. The model is constructed as follows:

$$\text{Performance}_i = \alpha + \beta_1\ \text{Concentration}_{is} + \sum \gamma' X_i + \sum \lambda_{1,t}\ \text{Year}_t + \sum \lambda_{2,j}(\text{Country}\ \times\ \text{Industry})_j + u_i + \varepsilon_{it}, \tag{1}$$

where Performance represents (log of) Tobin's Q and ROA, $i = 1, \ldots, N_s$ is the firm, $s =$ Management, Family, Employee, Block is the owner identity, $\text{Concentration}_{is}$ represents the (log of) fraction of shares of an owner type[75] and X_i refers to a vector of firm-specific control variables which include (log of) the number of employees, (log of) leverage, and R&D intensity. Moreover, $t = 1, \ldots, 9$ is the year of observation and $j = 1, \ldots, 347$ is an interaction of the country and industry of observation. Besides the unobservable random error term ε_{it}, the clustered error term u_i is used to account for correlation within each firm i.

[69] See Richter and Schrader (2017), p. 404.

[70] See for example Anderson et al. (2003); Haldar and Rao (2011); Yixiang (2011).

[71] See van Pottelsberghe (2020), p. 6.

[72] $453/(453 + 71 + 8 + 4) = 0.8451$.

[73] See Lowitzsch et al. (2009), pp. 207-209 and pp. 81-198.

[74] See Demsetz and Villalonga (2001), pp. 209f.

[75] Note that for management and employee owner the aggregated shares are used to calculate concentration, while for family and block owners the number of shares of the largest owner is used.

Table 1: Descriptive Statistics for Selected Numeric Variables

Variable	N	Mean	25th pctl.	Median	75th pctl.	SD
Management Concentration	18,768	6.983	0.009	0.176	2.22	16.464
Family Concentration	18,898	5.269	0	0.02	4.07	12.04
Employee Concentration	18,767	1.014	0	0.213	1.003	2.263
Blockholder Concentration	18,898	35.066	13.16	29.5	51.48	25.177
Tobin's Q	17,611	1.65	1.024	1.296	1.813	1.123
ROA	18,250	0.072	0.008	0.043	0.095	0.409
Number of Employees	18,915	12.339	0.765	2.545	8.743	29.274
Market Capitalization	18,895	2,869.45	161.3	439.095	1,656.97	7,817.60
R&D Intensity	7,462	0.305	0.005	0.021	0.068	1.558
Leverage	18,248	0.234	0.08	0.217	0.346	0.182

Concentration Levels in Per Cent, Number of Employees in Thousands, Market Capitalization in Millions

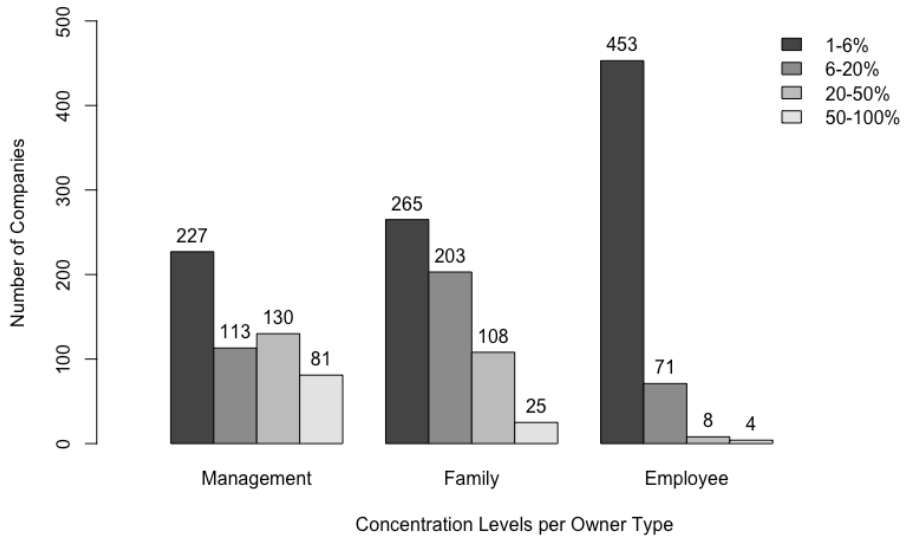

Figure 1: Number of Companies per Concentration Level per Owner in 2016

3.4.2. Multiple Linear Regression using Categorical Predictors

As referenced in section 3.2.2, there is reason to question the assumption of a linear relationship between the concentration of an owner type and firm performance. For this reason, a second model is used:

$$\text{Performance}_i = \alpha + \sum \beta' C_{isq} + \sum \gamma' X_i + \sum \lambda_{1,t} \text{Year}_t + \sum \lambda_{2,j} (\text{Country} \times \text{Industry})_j + u_i + \varepsilon_{it}, \quad (2)$$

where C_{isq} is a set of mutually exclusive dummy variables for each concentration level q = significant, strategic, determining, controlling of an owner s and a firm i. For instance, when the management's aggregated fraction of shares is 40%, C$_($is,determining) is 1 and all other dummies are 0. It should be noted that C_{isq} has been constructed using Concentration$_{is}$. All other variables remain unchanged.

The goal of this model is to break the continuous concentration variable into four categorical predictors. Doing so allows to compare each individual concentration level to the baseline group in which an owner is not at all or not significantly owning company. If the investigated relationship is indeed non-linear, different coefficients and significance levels are expected for each of these dummy variables.

4. Results

4.1. Management Ownership and Firm Performance

Table 2 shows estimates for equation 1 in which (log of) Tobin's Q is regressed on the continuous log-transformed fraction of shares of management owners. Control variables are included stepwise in the order of their expected importance, which has been drawn from existing literature (see section 3.2.3). The adjusted R^2 increases for every model and all control variables are significant at the 1%-level, highlighting their relevance. Furthermore, the predicted coefficients

for the control variables are consistent with similar studies.[76] 'Number of Employees' and 'Leverage' have negative signs and do not show unexpected effect sizes. For instance, using 'Model 4' a 1% increase in the debt ratio decreases Tobin's Q by 0.37%.[77] Further contributing to the explanatory value of the models, the F-test is highly significant for every model.

The model meets the first three assumptions needed for consistent regression results using ordinary least squares, while the fourth untestable assumption is commented (see Appendix B for detailed explanation).

Management owner concentration has a positive and significant effect on Tobin's Q in 'Model 1' up to 'Model 3'. However, although this effect is rather small: Using 'Model 3', an increase from 20% to 30% in the relative number of shares held by managers improves a company's Tobin's Q by 1.11%.[78]

In 'Model 4', the effect is not significant. An explanation for this is the sharp decline in the number of observations (from 17,523 to 7,316) when the variable 'R&D Intensity' is introduced because it excludes a substantial number of firms that changed their ownership structure and hence, a lot of variance. Noting that the magnitude remains unchanged, it can be expected that a more exhaustive data set would lead to significant results. To sum up, Table 2 provides evidence in support with hypothesis 1.

Table 3 presents regression results when ROA is used as a dependent variable. It stands out that all estimates are highly significant. Although the results would support hypothesis 1, Table 3 raises doubts as to whether ROA is an applicable proxy for firm performance in this study. A potential explanation for the odd results is the data source. This is supported by looking at how ROA is expected to behave in relation to Tobin's Q. As Richter and Schrader[79] point out, ROA and Tobin's Q tend to be highly correlated. However, for the data sample used in this study, both variables turn out to be not correlated (Pearson correlation coefficient of 0.113). Regressing ROA also on the dummy variables again yields highly significant results. As, however, the sample size and the variance are small for high levels of concentration (see section 3.3) it is improbable to observe such a

significant effect. As a last remark, investigating the distribution of the residuals, a clear deviation from a normal distribution can be seen (see Appendix C). Applying the ROA models to other owner types, yield similar significant results. Although they are not conflicting in terms of direction when compared to Tobin's Q, they are questionable in terms of validity and are therefore not reported for the rest of this thesis.

Estimates for regressing the log of Tobin's Q on categorical predictors (equation 2) are presented in Table 4. It can be seen that results for ownership levels between 6 and 20 per cent are consistently significant across the first three models. However, their magnitude decreased distinctly. The effect can be interpreted as follows: Switching from no or non-significant levels of management ownership to a strategic level predicts a 6.61% [80] increase in the geometric mean of Tobin's Q, according to 'Model 11'.

However, this effect does not hold for all concentration levels, indicating that the relation between owner concentration and firm performance is indeed non-linear. Management ownership at a determining degree is significant at the 10% level when controlling for firm size and debt ratio ('Model 11'). However, higher owner concentrations are not significant and are only half as large in terms of the magnitude. When 'R&D Intensity' is introduced, the magnitude remains robust at all concentration levels, although not significant. Following the argument stated above, it is likely that the lack of significance is the result of the sharp decline in the number of observations.

Using the first three models, it can be concluded that the impact of management owners is largest when they are concentrated at a strategic level, and it becomes smaller when further increasing their concentration. Hence, according to all models, hypothesis 1 has to be rejected in the sense that the highest possible managing owner concentration would yield the highest possible performance. Nonetheless, the significance levels and the magnitudes indicate that the relation follows a non-linear curve that has a maximum somewhere between 6 and 50 per cent. It can be concluded that an increase in the relative number of management shares is favourable up to a certain degree.

Due to the fact that the focus of this study lies on the complete model including all control variables and that the change in results when fixed effects are introduced is similar across all owner identities, in the following, regression results are reported more concisely.

4.2. Family Ownership and Firm Performance

Table 5 presents estimates for equation 1 ('Model 13' and 'Model 14') and equation 2 ('Model 15' and 'Modell 16'). In all models, the log of Tobin's Q is used as a dependent variable.

Using the proportion of family owner shares as a continuous variable to measure concentration ('Model 13' and 'Model 14'), in both models, the effect on firm performance is not significant and very small: A 1% increase in 'Family Concentration' predicts an increase of 0.006%[81] in Tobin's Q.

Breaking down this variable into four dummies ('Model 15' and 'Model 16'), again reveals that there is a non-linear relationship. According to 'Model 15', compared to a company in which a family owns less than 1% of all outstanding shares, a company with significant family ownership is predicted to only have a 0.50%[82] higher Tobin's Q. This value

[76] See for example Aguilera and Crespi-Cladera (2016); Barontini and Caprio (2006); Demsetz and Villalonga (2001); Faleye et al. (2006).

[77] $1 - 1.01^{-0.374} = 0.0037$.

[78] $(1 + 0.3/0.2)^{0.012} = 1.0111$.

[79] See Richter and Schrader (2017), p. 403.

[80] $\exp(0.064) = 1.0661$.

[81] $1.01^{0.006} = 1,00006$.

[82] $\exp(0.005) = 1.0050$.

Table 2: Regression Results of log of Tobin's Q on Management Ownership Concentration

Variable	Model 1	Model 2	Model 3	Model 4
Management Concentration (log)	0.020***	0.021***	0.012**	0.012
	(0.005)	(0.005)	(0.005)	(0.008)
Number of Employees (log)			-0.020***	-0.022***
			(0.003)	(0.006)
Leverage (log)			-0.297***	-0.374***
			(0.044)	(0.076)
R&D Intensity				0.032***
				(0.008)
Constant	0.898***	0.956***	1.116***	1.012***
	(0.007)	(0.006)	(0.026)	(0.047)
Year FE	No	Yes	Yes	Yes
Country × Industry FE	No	Yes	Yes	Yes
N	17,595	17,534	17,523	7,316
F-statistic	122.322***	17.048***	18.871***	14.756***
Adjusted R^2	0.007	0.328	0.353	0.404

Dependent Variable: Log of Tobin's Q. Standard Errors are clustered on firm level.
***p <0.01, **p <0.05, *p <0.1

Table 3: Regression Results of Return on Assets on Management Ownership Concentration

Variable	Model 5	Model 6	Model 7	Model 8
Management Concentration (log)	0.004	0.016***	0.027***	0.025***
	(0.004)	(0.005)	(0.005)	(0.008)
Number of Employees (log)			0.040***	0.031***
			(0.005)	(0.006)
Leverage (log)			-0.407***	-0.566***
			(0.047)	(0.087)
R&D Intensity				-0.075***
				(0.01)
Constant	0.069***	0.159***	-0.123***	0.253***
	(0.009)	(0.007)	(0.034)	(0.043)
Year FE	No	Yes	Yes	Yes
Country × Industry FE	No	Yes	Yes	Yes
N	18,197	18,132	18,121	7,442
F-statistic	3.137*	14.090***	16.161***	17.100***
Adjusted R^2	0.0001	0.278	0.31	0.439

Dependent Variable: ROA. Standard Errors are clustered on firm level.
***p <0.01, **p <0.05, *p <0.1

increases to 3.05%[83] in case of strategic ownership. However, it decreases again when the family share proportion is controlling (- 0.50%) or determining (2.33%). Moreover, 'Strategic Ownership' is the only level showing a significant effect. These results change to only a small extent when also controlling for 'R&D Intensity'. The p-value for the dummy variables increase, but likely due to the decline in the number of observations.

To conclude, 'Strategic Ownership' is the concentration related to the strongest firm performance. Hence, hypothesis 2 can only partly be accepted as higher family owner concentration is related to higher firm performance only up to a certain degree.

4.3. Employee Ownership and Firm Performance

Table 6 provides estimates for equation 1 ('Model 17' and 'Model 18') and equation 2 ('Model 19' and 'Model 20') when employees are the identity of observation. Again, all models

[83] $\exp(0.030) = 1.0305$.

Table 4: Regression Results of Tobin's Q on Management Ownership Concentration (Categorical Predictors)

Variable	Model 9	Model 10	Model 11	Model 12
Significant Ownership	0.056***	0.032**	0.007	0.001
($\geq$ 1% & $<$ 6%)	(0.016)	(0.014)	(0.013)	(0.023)
Strategic Ownership	0.121***	0.094***	0.064***	0.059
($\geq$ 6% & $<$ 20%)	(0.027)	(0.024)	(0.022)	(0.039)
Determining Ownership	0.051**	0.070***	0.041*	0.04
($\geq$ 20% & $<$ 50%)	(0.022)	(0.022)	(0.022)	(0.04)
Controlling Ownership	0.026	0.048*	0.021	0.03
($\geq$ 50%)	(0.027)	(0.026)	(0.026)	(0.053)
Number of Employees (log)			-0.020***	-0.022***
			(0.003)	(0.006)
Leverage (log)			-0.295***	-0.373***
			(-0.044)	(0.075)
R&D Intensity				0.032***
				(0.008)
Constant	0.896***	0.955***	1.116***	1.017***
	(0.007)	(0.006)	(0.026)	(0.047)
Year FE	No	Yes	Yes	Yes
Country × Industry FE	No	Yes	Yes	Yes
N	17,595	17,534	17,523	7,316
F-statistic	53.253***	17.050***	18.844***	14.666***
Adjusted R^2	0.012	0.33	0.354	0.404

Dependent Variable: Log of Tobin's Q. Standard Errors are clustered on firm level.
***p $<$ 0.01, **p $<$ 0.05, *p $<$ 0.1

present a significant F-test and adjusted R^2 between 35% and 41% and thus acceptable explanatory power.

Using the fraction of shares that are held by employees as an independent variable (log-transformed), results are highly significant ('Model 17' and 'Model 18'). This also holds true when controlling for 'R&D Intensity', which has not been the case for other owner types. Applying 'Model 18', an increase from 0.5% to 1% in the employee share proportion would result in an expected increase of 6.93%[84] in Tobin's Q. Hence, 'Model 17' and 'Model 18' imply that hypothesis 3 can be accepted.

Using dummy variables to approximate the relationship's non-linearity, this impact remains constant for significant and strategic employee owners. For example, according to 'Model 20' switching from companies with non-significant to companies with significant employee owner concentration, a 6.82%[85] increase in the geometric mean of Tobin's Q is expected. When comparing non-significant with strategic ownership levels, this number is 11.07%[86].

Employee owners with determining or controlling concentration are not significantly related to firm performance. Apart from that, they show a negative effect, indicating that companies which are held to more than 20% by employees perform worse than companies that do not issue any or only a few shares to their employees.

To summarise, employee share ownership and firm performance are only positively related when the ownership concentration of employees does not exceed the strategic level. Thus, hypothesis 3 can only party be accepted.

4.4. Ownership Concentration and Firm Performance

To test the hypothesis that firms having a concentrated ownership structure perform better than comparable firms with a dispersed ownership structure, three further models are introduced. First, Tobin's Q (log-transformed) is regressed on the fraction of shares the largest shareholder is owning ('Model 21'). 'Model 22' uses a dummy variable to indicate whether a company is concentrated according to a 25% threshold. 'Model 23' repeats this step but with a 50% threshold. Estimates are presented in Table 7.

The adjusted R^2 and F-statistic, as well as all control variables, remain almost unchanged across all three models. The concentration variables differ only marginally from zero and are not significant. Although the coefficient for concentrated firms at a 50% threshold is smaller than the coefficient at the 25% threshold, no considerable differences can be observed.

To conclude, firms having a concentrated ownership structure are not related to superior firm performance. Therefore, hypothesis 4 is rejected.

[84] $(1 + 0.01/0.005)^{0.061} = 1.0693$.
[85] $\exp(0.066) = 1.0682$.
[86] $\exp(0.105) = 1.1107$.

Table 5: Regression Results of Tobin's Q on Family Ownership Concentration

Variable	Model 13	Model 14	Model 15	Model 16
Family Concentration (log)	0.006	0.006		
	(0.004)	(0.007)		
Significant Ownership			0.005	0.015
($\geq$ 1% & $<$ 6%)			(0.012)	(0.02)
Strategic Ownership			0.030**	0.035
($\geq$ 6% & $<$ 20%)			(0.015)	(0.024)
Determining Ownership			-0.005	-0.018
($\geq$ 20% & $<$ 50%)			(0.019)	(0.03)
Controlling Ownership			0.023	0.022
($\geq$ 50%)			(0.034)	(0.068)
Number of Employees (log)	-0.021***	-0.023***	-0.021***	-0.022***
	(0.004)	(0.006)	(0.003)	(0.006)
Leverage (log)	-0.300***	-0.380***	-0.300***	-0.375***
	(0.043)	(0.076)	(0.043)	(0.077)
R&D Intensity		0.032***		0.031***
		(0.008)		(0.008)
Constant	1.122***	1.026***	1.123***	1.022***
	(0.027)	(0.047)	(0.028)	(0.047)
Year FE	Yes	Yes	Yes	Yes
Country × Industry FE	Yes	Yes	Yes	Yes
N	17,528	7,314	17,528	7,314
F-statistic	18.776***	14.704***	18.710***	14.630***
Adjusted R^2	0.352	0.403	0.353	0.404

Dependent Variable: Log of Tobin's Q. Standard Errors are clustered on firm level.
***p $<$ 0.01, **p $<$ 0.05, *p $<$ 0.1

5. Discussion

5.1. Hypothesis 1

One finding of using equation 2 to analyse the relationship between management share concentration and firm performance is that it is not linear. For this reason, the positive and significant coefficients estimated in Table 2 (equation 1) cannot be used as a valid criterion to evaluate the first hypothesis. Observing that the dummy variables 'Strategic Ownership' and 'Determining Ownership' remain significant across 'Model 9' to 'Model 11' and that their magnitudes remain stable across all models, it has been concluded that ownership at such levels reliably shows a positive effect on firm performance. However, this conclusion may be premature without further investigation of potential weaknesses of the model.

One concern that should be addressed is the following: The majority of firms in the total sample do not have any or only have less than 1% of their total shares held by managers.[87] The performance of such firms, however, does not have to be curbed as other beneficial owners can be in place. For example, a company with a less than significant proportion of management shares can have a high relative firm performance that is caused by a large fraction of family owners. Therefore, comparing different management owner concentrations to a baseline in which owner-managers may not be represented at all, is detrimental to the model's significance. For this reason, 'Model 11' and 'Model 12' have been retested using a filtered data set that exclusively contains firms with an aggregated management share proportion bigger than zero (see Appendix A.1). The results show little deviation from the initial models. All dummy variables have positive coefficients in both models ('Model 11.b' and 'Model 12.b'), and significant, strategic and determining levels are significant in 'Model 11.b'. Hence increasing the fraction of shares held by managers from non-significant to strategic levels yields a 6.50%[88] increase in Tobin's Q and a 4.39%[89] increase when shifting to determining levels.

To summarise, the initial models used supported the hypothesis that a higher concentration of management owners leads to higher firm performance up to strategic and determining levels. This section further investigated one potential weakness of these models and proposed a modification to ac-

[87] 1 minus all firms that have a management owner concentration of more than 1% divided by all firms in the sample $= 1 - (227 + 113 + 130 + 81)/2000 = 0.7245 = 72.45\%$.

[88] $\exp(0.063) = 1.0650$.

[89] $\exp(0.043) = 1.0439$.

Table 6: Regression Results of Tobin's Q on Employee Ownership Concentration

Variable	Model 17	Model 18	Model 19	Model 20
Employee Concentration (log)	0.049***	0.061***		
	(0.011)	(0.016)		
Significant Ownership			0.065***	0.066***
($\geq$ 1% & $<$ 6%)			(0.012)	(0.016)
Strategic Ownership			0.064*	0.105*
($\geq$ 6% & $<$ 20%)			(0.034)	(0.059)
Determining Ownership			-0.009	-0.023
($\geq$ 20% & $<$ 50%)			(0.037)	(0.045)
Controlling Ownership			-0.036	-0.038
($\geq$ 50%)			(0.063)	(0.061)
Number of Employees (log)	-0.026***	-0.029***	-0.026***	-0.028***
	(0.004)	(0.006)	(0.003)	(0.005)
Leverage (log)	-0.290***	-0.350***	-0.291***	-0.353***
	(0.043)	(0.076)	(0.044)	(0.076)
R&D Intensity		0.032***		0.032***
		(0.008)		(0.008)
Constant	1.146***	1.017***	1.158***	1.007***
	(0.026)	(0.046)	(0.026)	(0.046)
Year FE	Yes	Yes	Yes	Yes
Country × Industry FE	Yes	Yes	Yes	Yes
N	17,522	7,315	17,522	7,315
F-statistic	19.128***	15.054***	19.094***	14.943***
Adjusted R^2	0.357	0.409	0.358	0.409

Dependent Variable: Log of Tobin's Q. Standard Errors are clustered on firm level.
***p $<$ 0.01, **p $<$ 0.05, *p $<$ 0.1

Table 7: Regression Results of Tobin's Q on Blockholder Concentration

Variable	Model 21	Model 22	Model 23
Blockholder	-0.0002		
Concentration	(0.0002)		
Blockholder ($\geq$ 25%)		-0.004	
		(0.01)	
Blockholder ($\geq$ 50%)			-0.00004
			(0.01)
Number of Employees (log)	-0.022***	-0.022***	-0.022***
	(0.003)	(0.003)	(0.006)
Leverage (log)	-0.302***	-0.301***	-0.301***
	(0.044)	(0.044)	(0.044)
Constant	1.137***	1.136***	1.133***
	(0.026)	(0.027)	(0.025)
Year FE	Yes	Yes	Yes
Country × Industry FE	Yes	Yes	Yes
N	17,528	17,528	17,528
F-statistic	18.755***	18.750***	18.748***
Adjusted R^2	0.352	0.352	0.352

Dependent Variable: Log of Tobin's Q. Standard Errors are clustered on firm level.
***p $<$ 0.01, **p $<$ 0.05, *p $<$ 0.1

count for it. The results reinforce the conclusion that higher management concentrations are beneficial to a certain degree. A more in-depth examination to determine the position of this optimal level may be the topic of future research.

5.2. Hypothesis 2

The relation between family ownership and firm performance, again, turned out to be non-linear and emphasized the importance of equation 2 as a valid model. The results presented in section 4.2 support hypothesis 2 to the extent that firms having a strategic family ownership structure have a statistically significant higher Tobin's Q than firms with no or no significant family owners.

Nevertheless, this model suffers from the same interaction problem as the management model: The effect of low concentrations of family owners may be suppressed by the impact of larger, potentially well-performing owners. To address this concern, 'Model 15' and 'Model 16' have been retested using a filtered dataset that excludes firms without any family owners (see Appendix A.2). The results do not change, which highlights their robustness.

Comparing the magnitudes of the estimates for the concentration dummies with each other, an interesting pattern emerges. For instance, using 'Model 15', significant ownership does not lead to a noticeable effect in firm performance (0.005), strategic ownership leads to a significant positive effect (0.030), for determining ownership, the effect is not noticeable (-0.005), and for controlling ownership, it rises again (0.023). Thus, the relation indicates to have more than one optimal concentration level. This would mean that the simple bell-shaped curve, which has been proposed by Thomsen and Pedersen[90], is in fact more complex. Such a two-peak relation has been discovered by Morck, Schleifer and Vishny[91]. Although their finding was related to management owners, the argumentation can be applied to family owners as well. The initial increase in the effect on Tobin's Q can be explained by the increasing incentives of families to increase the value of their rising stakes. The special value of the families is demonstrated: synergies are used, information is shared, and resources are gathered.[92] After the first peak, however, entrenchment effects start to set in that exceed the benefits of the family owners. After a certain limit, however, there are no more limits for owners in a positive sense and a pure convergence-of-interest effect sets in, whereby the success of the company increases again.

It is questionable whether this effect actually arises from the interaction of entrenchment and convergence-of-interest effects and not from irregularities in the data set. The number of companies with a family concentration of more than 50% is low and last but not least the high p-values disprove a significant effect. Therefore, it is refrained from fully accepting the second hypothesis. The result remains that an increased concentration of family owners is only to some extent related to better performance. Hypothesis 2 is therefore only partially accepted.

5.3. Hypothesis 3

According to the results presented in 4.3, employee owner concentration and firm performance are positively related as long as the concentration levels do not exceed the strategic level. Hypothesis 3 is, therefore, partly accepted. This section will further explain why the results are significant for low concentration levels but not significant for higher concentration levels.

Using the decomposed dummy variables, it can be noted that employee ownership above a 20% threshold does not lead to better firm performance when compared to firms having no or less than significant levels of employee ownership. However, the sample size for firms representing such high concentration levels is far from sufficient to draw any meaningful conclusion. For example, for the year 2016, the sample contains only four companies, that are held to more than 50% by their employees. One possible explanation for this is that financial participation by employees, especially to a large extent, is not yet established (see section 3.3). The small number of examples that prove corporate success with controlling employee owners may be a self-fulfilling prophecy. The average capital held by employees has doubled in the last ten years, and there is currently no sign of this trend weakening.[93] Hence, it may take some time before an empirically valuable statement can be made about the impact of high employee concentrations on company performance. On the other hand, there are already some arguments against a good performance of very high concentrations. As already explained, the increasing interest of employees in the financial situation of the company can lead to a slowdown in decision-making processes and a decline in the productivity of the company.[94] An investigation of this hypothesis would be an interesting topic for future research, especially if the owner structure is measured by owner involvement and not by company shares.

If one looks at why employees are involved in companies in the first place (see section 2.2.3), it becomes clear that an important reason is to increase employee motivation, which is supposed to improve company performance. It is very likely, however, that even a low level of participation is sufficient to achieve this goal. The advantages that employees bring with them relate mainly to their knowledge around the product. This value cannot be compared with the value of access to capital and networks by, e.g. family owners. Moreover, some firms may introduce employee ownership only to materialize tax incentives, for which low concentrations are sufficient.

In summary, it can also be theoretically concluded that after a certain level, more employee ownership should not lead to further improvement in company performance.

[90] See Thomsen and Pedersen (2000).
[91] See Morck et al. (1988), pp. 301-302.
[92] See Silva and Majluf (2008), p. 613.
[93] Survey of Employee Ownership in European Countries 2017.
[94] See for example Park et al. (2004); Richter and Schrader (2017).

In order to test the robustness of the models used and to support the preliminary conclusion that employees have a positive influence on the company up to a strategic level, four further models were tested (see Appendix A.3). As with the other owners, the dummy models were tested with a filtered data set containing only records in which a company has at least a single employee owner ('Model 19.b' and 'Model 20.b'). The results show no noticeable difference, which confirms the validity of the models.

In order to examine hypothesis 3 further, the linear relationship was also tested at low concentration levels ('Model 17.b' and 'Model 18.b'). The goal was to refute the argument that the relation within low concentrations may not be positive. For this purpose, log of Tobin's Q was again regressed to the continuous variable 'Employee Concentration' (log-transformed). The difference is that the data set was previously filtered and contains only observations with an employee concentration between 0% and 6%. The result is highly significant at the 1% level and indicates that an increase in employee owner concentration is associated with better firm performance as long as no strategic level is exceeded.

In conclusion, the presumption is confirmed, and hypothesis 3 is accepted with one constraint.

5.4. Hypothesis 4

Hypothesis 4 looked at the relation between concentrated ownership structures in general and firm performance. Results for the continuous and both categorical models were insignificant, and hypothesis 4 was rejected.

This result is unexpected in that it contradicts numerous studies in the literature.[95] But it is also in line with the widely cited argument that underperforming ownership structures should not survive in the long run.[96]

It should be noted that the variable 'Blockholder Concentration' contains various owner identities besides managers, families and employees. The fact that evidence in favour of managers, families and employees has been found in this study highlights the value of these owners. They bring in special benefits that compensate their disadvantages up to a certain degree.

5.5. Limitations

5.5.1. Measuring Ownership

This study uses the fraction of shares of an owner (aggregated or by an individual) to measure the ownership structure of a company. The implicit assumption of this measure is that the proportion of shares directly translates to the possibility that an owner can realize his interests and improve firm performance. However, the number of shares is not necessarily equivalent to the power of an owner. Even owners with a high fraction of shares can be abused by owners with a small number of shares.[97] For instance, families may be able to exert a disproportionally strong influence even at low levels of concentration, while employees may face a lack of experience that would allow them to fully exploit their shares.

For this reason, the fraction of shares may not be an accurate proxy for ownership structure and measures that account for the involvement of an owner should be used. However, such data has not been available for this study and papers using different measures are not known.

5.5.2. Interaction Effects

It is a common approach in the literature to look at individual owner types in isolation, and most studies focus on a single owner identity. This, however, does not alter the fact that interaction effects can play an important role in explaining the impact of a single owner on firm performance. The existence of multiple different owner identities in a hybrid ownership structure gives rise to potential conflicts, in which case, the objectives of the dominant identity will prevail. For example, family owners may be sensitive to the existence of other owners.

As the initial models used in this study fail to address these effects, the models have been retested using a filtered dataset that requires the owner of observation to be present in all sample firms. But still, a labour stake of, e.g., 20% may not be of explanatory value when 50% of shares are held by managers. To account for this problem, a more rigorous approach has been chosen by Faleye, Mehrotra and Morck[98], who retested their results using a subset in which the owner of observation has to be the largest shareholder in all companies. This approach, however, is not applicable in this study, as the sample size of such a subset would be too small. A different solution would be the use of private firms that are held by a single owner type. Again, this is not applicable here due to data availability.

5.5.3. Endogeneity

The models used in this study fulfil the underlying assumptions that are needed for ordinary least squares regression to produce consistent estimates (See Appendix B for detailed description). The fourth assumption is empirically not testable, but the following can be noted.

Three potential sources have been identified, according to which this study would suffer from omitted variable bias. First, there exists the notion that ownership structure is the product of decisions made by current and future shareholders, e.g. the decision to offer new shares.[99] It includes the complexity of different interests that differ among owner identities. This concern is partly addressed in this study by modelling ownership structure as a set of different owner types to account for their difference in interests, analysed in separate regressions. The second source of endogeneity may be the implementation of the ownership structure. This issue is especially relevant for employee owners who often

[95] See for example Kapopoulos and Lazaretou (2007); Lins et al. (2013); Thomsen and Pedersen (2000); Yixiang (2011).
[96] See Demsetz (1983); Demsetz and Villalonga (2001).
[97] See Demsetz and Villalonga (2001), p. 215.
[98] See Faleye et al. (2006), p. 20.
[99] See Demsetz (1983), pp. 384-386.

become an owner in the course of ESOPs or other participation plans. The effectiveness of employee ownership depends on whether it is established in a collectivistic or in an individualistic society.[100] This issue is addressed by controlling for industry-country fixed effects.

Another omitted variable is the importance of experience and network effects that are gained when being a controlling owner for a certain time. According to Pedersen and Thomsen[101], as soon as one becomes owner, this owner will gain experience and build a network that will strengthen his position. For this reason, the ownership structure is the self-reinforcing result of different histories, cultures and trends in economic development. In Germany, for example, banks are often important blockholders of a company, as they used to play a significant supporting role during industrialisation.[102] To account for this issue, this study controls for industry-country fixed effects. However, following this notion, it can be argued that an optimal ownership structure has been reinforced and does not change much over time. Therefore, firms having a suboptimal ownership structure that changes over time affect this analysis.

In regard to simultaneity bias, it can be plausibly argued that either higher ownership concentration causes higher firm performance or that higher firm performance causes a higher ownership concentration. To further discuss the latter, it can be argued that ownership structure is the endogenous outcome of compensation contracting processes.[103] For example, if managers expect that the company in which they work will grow in value, their incentive to demand equity compensation is particularly high, and the ownership structure of the firm is adjusted.

As stated above the explanatory variables used in this study may be correlated with the unobservable, time-invariant variables of the error term, which is referred to as fixed effects.[104] To control for fixed effects, year and country-industry dummy variables have been introduced. Error-terms are clustered on firm-level to account for potential problems of autocorrelation and non-independence. To conclude, endogeneity concerns have been addressed using multiple approaches and are found to be minimised.

5.5.4. Data

The raw data used for this study show some weaknesses. Excluding owner concentrations of over 100% and companies without employees are just some of the filtering steps taken to correct these errors. A particularly important error, possibly due to reporting, is erratic changes in owner concentration. For example, in 52 family businesses, a family owner with more than 50% of all shares suddenly had no shares at all in the following year, but one or two years later almost the same number of shares as before. The same error happens for 120 firms with the dummy that indicates the 20% threshold. This is problematic in that it erroneously results in many major changes in the ownership structure, but hardly leads to any change in Tobin's Q. As a result, the impact of high concentration levels may be represented worse than it actually is. For this reason, the regressions were repeated for all models, with such jumps being corrected by the arithmetic mean of the adjacent values for the fraction of shares of an owner.

6. Conclusion

The relationship between ownership structure and firm performance has been the subject of a long-running discussion. However, whether this connection is positive, negative or even significant at all is still undecided in the literature. Researches have argued and found empirical evidence for every viewpoint. This quantitative study finds that (a) a higher concentration of management, family and employee owners is to some extent related to higher company performance, (b) this relationship follows a non-linear pattern, and (c) a concentrated ownership structure, ignoring the identity of the owner, does not influence firm performance.

The results show that when describing the ownership structure of a company, the identity of the owners must be taken into account. This is because different owner types have different interests and risk preferences. Ultimately, each owner brings certain benefits (e.g. financial and network access or information on product and process-specific optimization potential) but also disadvantages (e.g. entrenchment or inefficiency in the decision-making process). The optimal concentration of an owner is at the level where the advantages of an owner outweigh its disadvantages.

In this study, 2,120 companies from 31 European countries were examined using two different multiple linear regression models – one that uses a continuous variable to measure the fraction of shares held and one that divides this variable into five categorical concentration levels (non-significant, significant, strategic, determining and controlling). Using Tobin's Q as the primary performance measure, it is shown for management, family and employee owners, respectively, that companies that have such an owner at a strategic concentration level perform significantly better than comparable companies in which the owner is not or not significantly represented. Although significant, the effect is quite small, and practitioners must decide whether a change in the ownership structure yields a satisfactory high improvement in performance.

Future literature can make further interesting contributions to this. On the one hand, it is interesting to investigate more closely which factors are relevant for determining the optimal concentration levels. It can be assumed that every company must find an optimal ownership structure for itself. Given the possible measurement error, it is also interesting to conduct this study by including another measure for the ownership structure, which also takes involvement into account.

[100] See Caramelli and Briole (2007), pp. 297-300.
[101] See Pedersen and Thomsen (1997), pp. 761f.
[102] See Roe (1993), p. 1971, p. 1929.
[103] See Cho (1998), pp. 105-106.
[104] See Roberts and Whited (2012), p. 76.

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