Ownership structure, inside ownership and firm performance

Author: Jonas Madiwe
University of Twente
P.O. Box 217, 7500AE Enschede
The Netherlands
j.madiwe@utwente.nl

During the recent financial crisis, firms as well as investors were confronted with an extraordinary market situation. Given this context, this paper analyzes the effects of both ownership diffusion and inside ownership on firm performance. While the relationship between inside ownership and firm performance has been understood quite well by previous research, the study of a crisis period offers a unique opportunity to gain additional insights. Likewise, as research about the influence of ownership structure on firm performance and the underlying reasons have been inconclusive so far, a crisis period also offers a new opportunity to not only test if such relation exists, but also does it allow for conclusions about the underlying reasons. This paper analyzes 49 German, listed firms over the period from 2008 to 2011. In general, weak relations have been found, also after accounting for a time delay of effects. This paper therefore concludes that ownership structure is an endogenous variable that is not related to firm performance while a (weak) relationship between inside ownership and firm performance does exist, but inside ownership by the supervisory board is highly uncommon among German firms.

Supervisors:
Dr. X. Huang
Prof. Dr. R. Kabir
H.C. van Beusichem Msc.

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1. INTRODUCTION

Corporate governance or "the system by which companies are directed and controlled" (Cadbury, 1992) has an influence on firm performance – a relationship that has been verified by several authors (Bhagat & Bolton, 2008; Claessens, 1997; Gompers, Ishii, & Metrick, 2003). More specifically, most authors have studied one corporate governance mechanism or an index of multiple one. Yet, there still is inconclusive evidence, especially about the effect of ownership structure on firm performance. While Ross, Westerfield, and Jordan (2008) do not list ownership structure as, strictly spoken, a mechanism of corporate governance, it is widely known that ownership structure influences governance mechanisms in place (Thomsen & Conyon, 2012, pp. 123-125).

In this context, ownership of a firm can either be diffused (dispersed), meaning that the majority of shares is owned by multiple, small shareholders or concentrated, meaning that the majority of shares is owned by one or a few, larger shareholders. The difference in parties necessary to unify the majority of shares and, likewise, the controlling power in elections during annual shareholder meetings and the power to control managers, is then expected to have an influence on corporate governance and, ultimately, firm performance. As a result, Berle and Means (1932) argued for a negative relation between diffusion of ownership and firm performance because the (in diffused ownership situations) necessary negotiations and compromises between shareholders in order to form the majority are less effective, a hypothesis that has received much attention in literature. However, studies have yield contradicting results about both the presence of a relation and its reasons (compare Bebchuk and Weisbach, 2010; Demsetz and Villalonga, 2001). For those opposing the presence of a relation, the most prominent argument reasons that the relation cannot exist because the market reacts to forces that cause an optimal ownership. While the argumentation seems logical, it is difficult to verify market efficiency in this case. As previous studies (e.g. Lemmon and Lins, 2003) suggest, market efficiency is severely disturbed during a financial crisis as investors' investment opportunities are limited. As a result, both Lemmon and Lins (2003), Mitton (2002) and Gorton and Schmid (1999) have found a significant relation during the East Asian financial crisis and in Austrian banking sector with the special characteristic of strict regulations for changes in ownership, respectively. The recent financial crisis then offers a unique opportunity to gain new insights into the relation between ownership structure and firm performance, also in the context of a verification of both lines of argumentation by Lemmon and Lins (2003) or Demsetz and Villalonga (2001).

Furthermore, besides ownership concentration or dispersion, inside ownership which refers to the shareholdings of managers and directors has been found to influence firm performance. Logically, such inside ownership can also influence ownership structure, especially in the case of diffused ownership where insiders can easily become major shareholders or family-owned enterprises where a family representative acts as both dominant owner and director/manager. In contrast to the relation between ownership structure and firm performance, the one between inside ownership and firm performance is more clearly understood (McConnell & Servaes, 1990). Yet again, a financial crisis offers a unique opportunity to study the (assumed to be) well-known relationship in a different, irregular environment. Ultimately, this could also hint towards more effective corporate governance during crisis periods – an issue that has hardly been addressed by research so far (Daily, Dalton, & Cannella, 2003).

As a result, this thesis seeks to answer the following research question(s):

To what extent did ownership structure influence firm performance during the financial crisis from 2008 to 2011?

Sub questions:

1. To what extent did dispersion of ownership influence firm performance during the financial crisis from 2008 to 2011?
2. To what extent did inside ownership influence firm performance of during financial crisis from 2008 to 2011?

In this context, effects of the crisis differ between countries, not only in time but also regarding measures taken. Facing an unknown impact of the financial crisis on a country's economy, several countries took preventive measures. As a result, this study will focus on one country, namely Germany, as it is not possible to account for the impact of, for example, the Konjunkturpaket II. The Konjunkturpaket II was an investment program introduced by German government in November 2008 and included investments of €17.3 billion in infrastructure and other measures to boost demand, for example subsidies paid to end-consumers for replacing their old with a new car. Due to the country-specific influences during the crisis, also resulting from such investment programs, this study will focus on one single country. Additionally, the financial crisis is assumed to last from 2008 to 2011. This is supported Germany's GDP development where the growth rate decreased in 2008, was negative in 2009, constant in 2010 and strongly positive in 2011 where pre-crisis levels were reached. Therefore, these 4 years will be studied.

2. THEORY

This section seeks to describe the most important concepts of this thesis, namely firm performance, ownership structure and insider ownership. In case of the latter two, also the relation to firm performance according to relevant literature will be discussed.

2.1 Firm performance

While the concept of firm performance, in general, can be understood quite differently depending on a certain stakeholder's objectives, the main stakeholder of corporate governance are a firm's shareholders. In principal, shareholders invest money in a firm by buying shares. In return, they expect the firm to use the provided capital in order to generate a return on the shareholder's investment. In this context, Koller, Goedhart and Wessels (2010, as cited by van Hoorn and van Hoorn, 2011) state that: "The faster companies can increase their revenues and deploy more capital at attractive rates of return, the more value they create. The combination of growth and return on

invested capital (ROIC) relative to its cost what drives value. Companies can sustain strong growth and high return on invested capital only if they have a well-defined competitive advantage. This is how competitive advantage, the core concept of business strategy, links to the guiding principle of value creation" (p. 9). As corporate governance focuses on shareholders, value creation can be considered the most appropriate measure of firm performance. This understanding of firm performance is supported by most studies that operationalize firm performance as Tobin's Q, a measure of both market and book value.

2.2 Ownership structure

Following the definition by Thomsen and Conyon (2012), ownership structure, in the case of publicly listed firms, consists of two distinctive features: First, ownership concentration meaning if a firm is owned by one or few large owners (concentrated) or by multiple smaller owners (dispersed/diffused), and ownership identify, referring to the type of owner such as individuals/families, institutions or other firms. This study does, however, focus mainly on ownership concentration and diffusion as this is involves, in principal, all firms. In fact, ownership identity only is a factor of importance in case of concentrated ownership. Otherwise, the influence of ownership identity is offset by the limited influence of one specific owner in the context of the previously mentioned majority negotiations. As a result, ownership structure in this study then only refers to ownership concentration or dispersion and excludes ownership identity which is only included if explicitly mentioned. Additionally, the terms ownership diffusion and ownership dispersion are used interchangeably and a firm with diffused ownership is defined following Ragazzi (1981) as "one whose shares are owned by a large number of individuals none of whom is in a position to obtain direct or indirect benefits per share greater than those available to other shareholders and whose top managers do not receive either direct or indirect benefits other than a market salary" (p.262f), with the limitation that any salary shall be considered a "market salary (Ragazzi, 1981).

2.3 Ownership structure and firm performance

The influence of ownership structure on firm performance was first described by Berle and Means (1932, republished 1991) who argued that ownership diffusion negatively correlates with firm performance. The assumption is that large shareholders play a more active role in corporate governance and pursue constant monitoring of managers (Daily et al., 2003; Shleifer & Vishny, 1997) since they are more involved in the firm's performance and have spread less risk by means of diversification. Furthermore, concentrated ownership with only few parties involved in corporate governance decisions enables owners more easily to implement concerted actions since directors can, in the optimum case, be appointed instead of elected. As a result, the common agency problem caused by the separation of ownership and control is tackled by a unification of the interest in profit maximization and the power to exercise control (Shleifer & Vishny, 1997). Likewise, diffused owners need to form alliances in order to exercise control, which is less effective and can be undermined by managers. Therefore, as Bebchuk and Weisbach (2010) note, the nature of corporate governance problems (or costs) differs with regard to a firm's ownership structure. As noted before, large owners bear significantly higher risk due to their lack of diversification and dependence on the firm's performance (Demsetz & Lehn, 1985). In addition, opportunism by large shareholders who abuse their dominant position to follow their own goals may cause several problems for other, smaller owners: expropriation of smaller owners, managers and employees by a dominant shareholder, inefficient management caused by the pursuit of a large shareholder's non-profit maximizing (personal) objectives, or free-riding effects by minor owners who expropriate the controlling effort of larger owners (Bebchuk & Weisbach, 2010; Shleifer & Vishny, 1997).

Following the hypothesis of Berle and Means (1932), several studies have aimed to provide empirical evidence on the relationship between ownership structure and firm performance. In general, results have been contradictory. While Bebchuk and Weisbach (2010) note that "Morck, Shleifer, and Vishny (1988) and many follow-up studies have documented a robust empirical relation between large shareholdings and corporate performance" (p. 940), others such as Demsetz and Lehn (1985) found no significant relation. In fact, as Anderson and Reeb (2003) find in a study on (concentrated) family ownership and firm performance, the relationship differs between countries. In their study, firms with a major family-shareholder performed significantly better in the USA, while such relation was non-existent in the Canada. More generally, the relation between ownership structure and firm performance has also been verified by Klein, Shapiro, and Young (2005) and Himmelberg, Hubbard, and Palia (1999), but rejected by, for example, Gorton and Schmid (1999) who studied the Austrian banking sector,Shleifer and Vishny (1997), Han and Suk (1998) and Xu and Wang (1999). These contradicting outcomes have also led Bebchuk and Weisbach (2010) to conclude that "the underlying reasons, however, for this relationship between ownership structure and firm performance are not clear" (p. 941).

Yet, in order to identify the underlying reasons why such relation does (not) exist, Bhagat and Bolton (2008) conclude that a diffused ownership structure must have certain benefits as, otherwise, diffused ownership structures could not be present in the market. The authors argue that one benefit is increased liquidity of smaller holdings as such can be sold rather quick and easily, while selling large holdings is more difficult. Furthermore, a second reason for diffused ownership is seen by Bhagat and Bolton (2008) in public policy of investor protection. Following also Black (1990) and Roe (1994; cited by Bhagat and Bolton), the costs of holding large blocks of shares is increased by public laws that protect minor investors from expropriation. Following another view on the topic, especially the work of Demsetz (Demsetz & Lehn, 1985; Demsetz & Villalonga, 2001) argues that a relationship between ownership structure and firm performance is not possible to establish. They argue that ownership structure of a firm is endogenous, meaning that "ownership structure, whether diffuse or concentrated, that maximize shareholder expected returns are those that emerge from the interplay of market forces" (p. 212). Ownership structure, then, is the result of several actors' buy-or-sell decisions and, assuming a rational market, in line with perceived performance of a firm. Different

structures among firms are then due to varying circumstances with regard to, for example, scale economics, regulation and environmental certainty. Ultimately, this means that "there should be no systematic relation between variations in ownership structure and variations in firm performance" (p. 215). This does, however, not explain why several authors did find a significant relationship. One suggestion is given by Lemmon and Lins (2003) who suggest that ownership structure does matter especially during a crisis period because the market is severely disturbed and firms' investment opportunities are limited which stimulates the expropriation of minor owners by larger ones. This assumption has further been followed (and verified) by Mitton (2002) during the East Asian financial crisis and Mangena, Tauringana, and Chamisa (2012) during Zimbabwe's crisis. Furthermore, as many studies have only focused on Agency theory in their analysis, Douma, George, and Kabir (2006) propose a multi-theoretic approach (see Figure 1) where the relation between ownership structure and firm performance is influenced by, respectively, 3 main theories: Agency theory, Resource-based theory which refers the heterogeneity of owners' interests and Institutional theory which sees ownership structure as embedded in national institutions. This approach is supported by Daily et al. (2003) who also emphasize that only a multi-theoretical approach is able to account for all mechanisms that influence the relationship between ownership structure and firm performance. Yet, as stated before, the majority of research has focused on agency theory. Additionally, the existence of a relationship between ownership structure and firm performance has not yet been proven. While paying attention to this multi-theoretic framework, this paper will therefore add to the existing body of literature by focusing on the influence of agency theory.

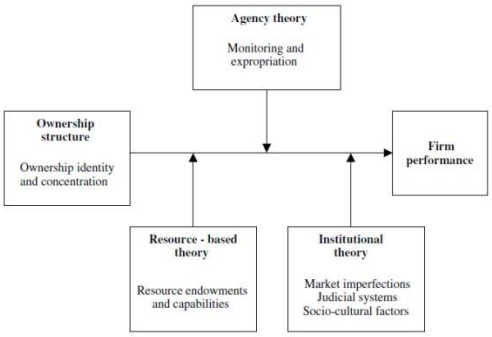

Figure 1: Multi-theoretic approach in explaining ownership-performance relationship among firms in an emerging economy context from Douma et al. (2006)

Based on the above-mentioned mechanisms in the relationship between ownership structure and firm performance and, especially, the diverse findings on this relationship, this study will investigate the inverted hypothesis of Berle and Means (1932), namely:

H1: Ownership concentration positively affects firm performance

2.4 Inside ownership

Insider ownership has been defined by Demsetz and Villalonga (2001) to consist of "shares owned by members of the corporate board, the CEO and top management" (p. 214). However, most research has focused on board ownership (Demsetz & Lehn, 1985; McConnell & Servaes, 1990; Morck et al., 1988) with only some including CEO ownership as well (Hermalin & Weisbach, 2001). Inside ownership in corporate governance is, besides board size (number of directors) and board independence (external/internal directors), part of the mechanism of board structure and has been found to relate to firm performance (Arslan, Karan, & Ekşi, 2010; Barnhart & Rosenstein, 1998). With regards to ownership structure, recalling the last part of Ragazzi's definition stating there should be no "direct or indirect benefits other than a market salary" (p.262f), inside ownership becomes of special importance. Following Ragazzi who specifically includes inside ownership in his definition of market salary (p.263), such inside ownership should relate to ownership structure.

Regarding the mechanisms behind inside ownership, agency theory has to be applied. Following this theory, divergent interests of managers, directors and shareholders may cause the first to take action against interests of the latter. Directors as the intermediate party seek to control managers and ensure proper representation of the interests of shareholders. However, directors also are subject to opportunism. Following Bebchuk and Weisbach (2010), studies found that if a CEO was to receive a grant with – as they call it – "lucky timing" (p. 945), directors were highly likely to receive one as well. Share options to both managers and directors then serve the purpose of tying bonuses to firm performance in order to, ultimately, approximate managers' interests, predominantly personal wealth, with shareholder's interests usually share price performance (Bhagat & Bolton, 2008; Han & Suk, 1998; Himmelberg et al., 1999).

2.5 Inside ownership and firm performance

Following the previously mentioned alignment of (director's) personal and shareholder's interests, one would expect a linear relationship between inside ownership and firm performance because more alignment of interests should cause higher performance, as this is the ultimate goal. However, the relation has been found to be inverted as displayed in Figure 2 (McConnell & Servaes, 1990). In recent literature, there are two predominant interpretations of the previously described relation: First, it is argued that low levels of inside ownership foster the alignment of interests following the basic method of share payments. For high levels of inside ownership, however, power of inside owners grows. As a result, there is the possibility of managerial and directorial entrenchment and pursue of personal interests without being disciplined by shareholders (Coles, Lemmon, & Felix Meschke, 2012). This can usually be observed in family-owned firms where the family is, at the same time, CEO or director. However, evidence here is inconclusive. While Morck et al. (1988) find lower firm performance in such situations in the 1980s, Anderson and Reeb (2003) find higher firm performance in the period from 1992 to1999. Therefore, a second interpretation has received some attention. Both Demsetz and Lehn (1985) and Coles et al. (2012) describe the relationship to be one of two endogenous variables that can be used to maximize value. More precisely, "if the empirical specification adequately captures the effects of

all relevant exogenous variables, i.e. those structural parameters that jointly drive both ownership and performance, that specification would be unlikely to detect any remaining relation between the jointly determined endogenous variables" (p. 150). While the determinants of ownership structure have already been described, inside ownership is determined by mainly industry fixed and firm fixed effects such as tax policy or regulation (Demsetz & Lehn, 1985; Himmelberg et al., 1999).

As for empirical evidence, this inverted form of relationship has been supported by multiple studies (compare Demsetz and Villalonga, 2001; John and Senbet, 1998), also for emerging markets (Chen & Yu, 2012) and crisis period (Mangena et al., 2012). Following Mangena et al. (2012) who studied the Zimbabwean political and economic crisis from 2000 until 2005, inside ownership increased during the crisis period increased while, at the same time, the relation between inside ownership and firm performance inverted from positive (pre-crisis) to negative (during crisis). As this contradicts with findings of other authors, one can doubt whether the inverted U-shaped relationship does hold during crisis periods. As a result, this study will investigate the following hypothesis:

H2: There exists an inverted relationship between inside ownership and firm performance

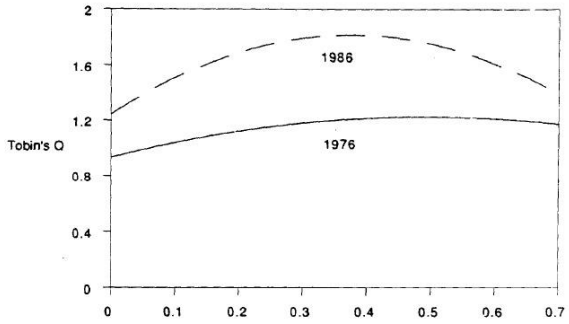

Figure 2: U-shaped relationship between inside ownership and Tobin's Q (firm performance), adopted from McConnell and Servaes (1990)

3. METHODOLOGY

3.1 Model

Based on the existing literature about ownership structure and firm performance (especially Berle and Means, 1932), this study expects a linear relationship between both variables. Such linear model can be described, including control variables, by the following regression model (model 1): $Q_t = \alpha + \beta_1 OS_t + \beta_2 Size_t + \beta_3 Lev_t + \varepsilon$. As one can also argue for a delay of the effect of ownership structure on firm performance, the following regression model which accounts for such delay will also be tested (model 2): $Q_t = \alpha + \beta_1 OS_{t-1} + \beta_2 Size_{t-1} + \beta_3 Lev_{t-1} + \varepsilon$. Likewise, the expected relationship between inside ownership and firm performance can be seen in Figure 2 as identified by McConnell and Servaes (1990). In this context, the model is not linear, but is expected to be quadratic and to be modelled by the following equation (from now: model 3): $Q = \alpha + \beta_1 InO^2 + \beta_2 InO + \beta_3 Size + \beta_4 Lev + \varepsilon$. The relationship between ownership structure and firm performance as a linear relationship will then be tested for correlation based on Pearson's R coefficient and, further, an OLS regression model. The relationship between inside ownership and firm performance as a quadratic one will be tested by a quadratic regression model.

3.2 Definition of variables

3.2.1 Firm performance

The variable "firm performance" is frequently used in empirical studies. In order to determine a firm's value, one can either rely on accounting-based measures or market-based measures. In this context, van Hoorn and van Hoorn (2011) have reviewed relevant literature with an empirical measurement of firm performance. As shown in Appendix I, both return on assets and Tobin's Q are by far the most popular measurements of firm performance, a conclusion which is supported by Demsetz and Villalonga (2001) who, when reviewing studies on the relation between ownership structure and firm performance, conclude that "all rely chiefly on Tobin's Q" (p.211). In this context, return on assets (ROA) as the ratio between profit/loss before tax and book value of total assets represents an accounting measure of firm value while Tobin's Q is calculated by the following formula:

$$Q = \frac{\text{book value of total assets} + \text{market value of equity} - \text{book value of equity}}{\text{book value of total assets}}$$

Tobin's Q therefore is a measure based on market value of equity or, in other words, the firm's publicly traded shares. As, for both inside ownership and ownership structure, share price maximization are assumed to be predominant goals of shareholders, Tobin's Q is more suitable than ROA which focuses solely on profitability. Furthermore, in accordance with Demsetz and Lehn (1985), Tobin's Q also has the advantages of, at first, taking into account the time dimension as future expectations are included in the share price and, secondly, objectivity as the market value is defined by "the community of investors constrained by their acumen, optimism, or pessimism" (p.5). As a result, Tobin's Q is used as a primary measure firm performance while ROA is used for a robustness check of results.

3.2.2 Ownership diffusion

The purpose of measuring ownership diffusion is to identify what fraction of the company is owned by influential investors. Following previous studies such as Mitton (2002), Demsetz and Lehn (1985), Jacoby and Zheng (2010) and McConnell and Servaes (1990), diffusion of ownership will be measured by two dimensions, namely the (total) percentage of shares owned by significant blockholders and the percentage of shares owned by the largest blockholder.

The total percentage of shares owned by block holders is derived in order to account for the percentage owned by shareholders that have both right and influence to represent their interests. In accordance with previous research (Anderson & Reeb, 2003; Jacoby & Zheng, 2010; McConnell & Servaes, 1990; Mitton, 2002), a blockholder is defined as a shareholder owning at least 5% of common equity shares. However, this number can be biased both by not accounting for the size of shareholders or by the existence of multiple shareholders with, for example, 4% of ownership. Therefore, a second dimension will be added in order to account for differences in ownership. By

including the percentage of shares owned by the largest blockholder, the analysis can account for, e.g. dominant owners and benefit from more depth in the analysis regarding the most powerful parties. This measurement is supported by Jacoby and Zheng (2010) and Mitton (2002). With regard to this study focusing on German companies, the measure of the largest shareholder is preferred to the measure of total shareholders or a similar measure accounting for a specific number of largest shareholders (compare Demsetz and Lehn, 1985; Demsetz and Villalonga, 2001) because Germany is a country with, traditionally, a high proportion of dominant owners (Thomsen & Conyon, 2012). As a result, it is more relevant and reliable to account for possible dominant shareholders than to account for multiple ones as one can expect one large and several smaller owners in many cases.

3.2.3 Inside ownership

Inside ownership will be measured by the fraction of shares owned by the supervisory board of a given company. This in line with all known research regarding inside ownership and firm performance, for example Demsetz and Lehn (1985), McConnell and Servaes (1990) or Morck et al. (1988) as there is no alternative and reliable measure of a board's interest in a firm's performance. In this context, it needs to be stated that some authors have included ownership of shares by managers of a firm and/or duality of functions. Due to the fact that firms are in no way obliged by law or encouraged by corporate governance codes to publish ownership of managers, there is no reliable data for the majority of cases. As a result, this dimension of inside ownership cannot be included. Additionally, German firms are required to apply a two-tier board structure with both supervisory board and board of directors. As the supervisory board is responsible for long-term strategic orientation and less for business operations, this study focuses solely on supervisory boards. Furthermore, all other measurements such as the independence of directors measured by internal and external directors or additional functions of a director do not relate to firm performance. In fact, these indicators only measure a director's involvement in the firm and relate to board composition (van Hoorn & van Hoorn, 2011). Further following van Hoorn and van Hoorn (2011), studies on board composition have only shown inconclusive results. Hence, these indicators need not to be included in this study.

3.2.4 Control variables

In order to control for other influences in the relationship between ownership structures or inside ownership and firm performance, two control variables are necessary. First, following Mangena et al. (2012) and Brown and Caylor (2006), firm size as the logarithm of total assets will be included in the regression analysis. This is due to the fact that large firms have the possibility to offset any larger impact of a crisis, as denoted by Mangena et al. (2012). Further, the logarithm is chosen to correct for the problem of heteroscedasticity. Total assets are suitable in this study as the main problem of this measurement, namely differences in reporting standards (Mitton, 2002), is not applicable to a one-country sample (see data collection). As a result, relying on the alternative measurement of net sales is not necessary. Secondly, creditors of a firm may also exert influence on a firm (Short & Keasey, 1999) with the degree of such influence increasing with higher debt. Therefore, the variable of debt to equity, more specifically the ratio of long-term debt to total equity, is included. Long-term debt is chosen as only long-term creditors are able to exert significant influence while short-term debtors are less interested in a firm's long-term development. This measurement is in line with Morck et al. (1988).

4. DATA

4.1 Sample Selection

This cross-sectional study uses data of German firms that were listed during the study period from 2008 until 2011. Furthermore, only industrial companies as classified by the NACE Rev. 2-code (eurostat, 2008) are included because the financial crisis had a different (especially timely) effect on banks, insurance companies and other financial companies. As it is not possible within the context of this study to account for such special characteristics for financial firms, these will be excluded. Based on the ORBIS database and after application of the filters for country, status and classification, this results in a population of 439 firms. In order to reduce selection bias in drawing a sample, random selection of 15% of cases is applied. This results in a sample of 66 cases. This sample is further reduced by excluding firms that do not publish relevant data for both ownership concentration and inside ownership. This may be the case if a firm itself only is a subdivision of another firm, if shares are not publicly traded or if a firm does not comply with the law.

4.2 Data collection

Data needed for measurement of the variables of firm performance, firm size, debt-to-equity ratio and industry has been extracted from the ORBIS database by Bureau van Dijk. Regarding ownership structure, both the percentage of shares held by blockholders and by the largest shareholder has been extracted from a firm's annual reports. In this context, German firms are legally obliged to, also in their annual reports, publish "any person […] whose shareholding in a listed company reaches, exceeds or falls short of 5 per cent, 10 per cent, 25 per cent, 50 per cent or 75 per cent of the voting rights" (§21(1), WpHG[1]). Therefore, assuming legal compliance by firms, the bias of false information can be excluded. Next, inside ownership by the board can also be extracted from a firm's annual report. In this context, there is no legal obligation, but the recommendation that "ownership of shares in the company or related financial instruments by Management Board and Supervisory Board members shall be reported if these directly or indirectly exceed 1% of the shares issued by the company. If the entire holdings of all members of the Management Board and Supervisory Board exceed 1% of the shares issued by the company, these shall be reported separately for the Management Board and Supervisory Board in the Corporate Governance Report" (Government Comission, 2013). In this context, it needs to be stated that this governance code is a voluntary declaration and every firm may decide to not follow this recommendation. Therefore, data was not available for some cases. Additionally, if a firm only states that shareholdings are

[1] An English translation of the German Wertpapierhandels-gesetz (WpHG) http://www.iuscomp.org/gla/statutes/WpHG.htm#21.

below a threshold of 1%, it is assumed that shareholdings are non-existent.

Furthermore, publicly listed firms are legally obliged to make their annual report available to the public. In this context, German firms are required to publish at least their last annual report. More specifically, as noted by the German federal, financial supervisory authority BaFin (2014), "the annual document must be accessible on the issuer's website at least until the next annual document is published" (§10, WpHG). Therefore, the data was not available if a firm decided to not publish their reports any more.

5. RESULTS

In order to analyze the influence of firm-specific determinants and their effect on a firm's performance, a statistical test will be carried out. Following a univariate analysis, for each hypothesis a bivariate analysis between independent variables and Tobin's Q (dependent variable) is executed to outline the correlation between both.

5.1 Univariate analysis

Descriptive statistics for all variables are given in Table 1. As one can notice, the mean of the dependent variable Tobin's Q remains rather stable. There are no major changes regarding mean or median throughout the study period. There is, however, an observable tendency for consolidation which can be observed in the decreasing standard deviation and the decreasing difference between mean and median. This, in combination with the all-time minimum of the study period being reached in 2009, allows for the conclusion that performance of firms during the crisis varies. This supports the previously described extraordinary performance of firms during crisis. Furthermore, return on assets remains relatively low during the study period which also indicates a poor performance of firms during the study period. Additionally, it needs to be mentioned that one extreme outlier was excluded from the analysis which results in a maximum of 49 valid cases.

Regarding independent variables, one can notice that there are only minor changes. The percentage of shares owned by blockholders slightly decreases while the percentage of shares owned by the single largest shareholder remains stable. One can therefore conclude that the number of blockholders (shareholders holding 5% or more of shares) has slightly decreased during the crisis. Nevertheless, values are significantly higher than observed by Jacoby and Zheng (2010) who used an American sample. This is in line with the previous argumentation that higher ownership concentration is more common among German firms. Furthermore, share ownership by the supervisory board is highly uncommon in German firms as, on average, 70.93% (2008) of supervisory boards do own less than 1% of total shares. Nevertheless, ownership of board members slightly increases during the study period.

In addition, the control variable of firm size remains, naturally, rather constant and equally distributed. In this context, one of course has to draw attention to the fact that the sample consists of large firms only. This is due to the fact that only large firms are listed on stock exchange(s). Furthermore, the second control variable of D/E-ratio almost doubles in 2009. This can be interpreted as a consequence from the financial crisis and is in line with the previously described limited access to capital and decreasing equity during crisis periods.

5.2 Ownership concentration

Recalling the first hypothesis saying that ownership concentration positively correlates with firm performance, both variables measuring ownership concentration are correlated with firm performance. In general, a positive correlation means that a positive change in one independent variable causes a positive change in the dependent variable. In this case, this means that a higher percentage of shares owned by blockholders (by the largest shareholder, respectively) lead to higher Tobin's Q as the measurement of firm performance. Pooled results for all years can be seen in Table 2 while a more detailed overview separated by year is shown in Appendix II. Pooled results reveal insignificant correlation between both variables and Tobin's Q and a significant one if Tobin's Q is substituted with ROA.

Furthermore, it needs to be mentioned that both measurements for ownership concentration are highly correlated and also significant. This is, of course, due to the fact that the largest shareholder usually holds more than 5% of shares and, therefore, also is a blockholder and included in the calculated percentage of shares owned by blockholders. Following this phenomenon of multicollinearity, both variables are correlated separately against firm performance. This separate analysis is also supported by Bebchuk and Weisbach (2010) and Shleifer and Vishny (1997) who stress the influence of very large shareholders on corporate governance of a firm.

Regarding the hypothesized relationship between ownership concentration and firm performance, one has to state that such relationship shows non-significant for both model 1 and 2. Pearson's R coefficient with 0.11 (shares blockholder) and 0.07 (shares largest) for the whole study period also remains insignificant. Although Appendix II indicates an increase in these values, none of these coefficients has been found significant at the 0.05 level. In addition, for this variable, there also was no continued development as values varied seemingly at random (see Table 2). Accounting for a time delay of effect, results still remain insignificant. In fact, Pearson's correlation coefficient turns out negative. This further questions the presence of the hypothesized relation. These results are supported by an ordinary least square regression model (OLS) which has been applied. Following the hypothesis and control variables, the following regression models were tested: $Q = \alpha + \beta_1 OS + \beta_2 Size + \beta_3 Lev + \varepsilon$ (model1) and $Q_t = \alpha + \beta_1 OS_{t-1} + \beta_2 Size_{t-1} + \beta_3 Lev_{t-1} + \varepsilon$ (model 2). For both models, there is no significant relationship with an adjusted R square between -0.01 and 0.041 (see Table 3). Having carried out a robustness check by substituting Tobin's Q for ROA, results show an increase in the values of adjusted R square, yet with an average value of 0.150 the model still cannot explain variations in firm performance. Therefore, one can conclude that no significant relationship between ownership concentration and firm performance was found. Concluding, H1 needs to be rejected.

This rejection of course supports the argumentation of Demsetz (compare Demsetz and Lehn, 1985) that such relation cannot exist due to the endogenous nature of both

variables. This is supported by the robustness check with ROA as dependent variable. ROA as an accounting-based measure does not include market value (as Tobin's Q does). This allows for the conclusion that the market does, as predicted by Demsetz, adjust to such changes and therefore a relationship does not exist.

5.3 Inside ownership

The second hypothesis stated that there exists an inverted relationship between inside ownership and firm performance. In this case, an example of an inverted relationship can be found in Figure 2. However, recalling that the majority of supervisory boards own less than 1% of shares, one can only conclude that inside ownership in German supervisory boards is highly uncommon. Also, such skewed sample distribution does not allow for meaningful statistical analysis. Further, excluding cases with zero ownership does not leave a sample size large enough for statistical tests. Therefore, time-sensitive variables are merged. Although the remaining analysis does not allow for any conclusions regarding the management during a crisis, a general tendency of the effects of inside ownership on firm performance can be drawn. In this context, it needs to be stated that such new data can be heavily biased as the dimension of time which is of vital importance during a crisis is lost. As a result, one is not able to account for variations in firm performance caused by certain events during the cause of the crises. Instead, only general indications can be drawn. The (new) descriptive statistics (excluding cases with 0% inside ownership) can be seen in Table 4.

Although the new variable for inside ownership is still skewed and correlation is insignificant (Table 5), regression analysis will be applied. With an adjusted R square of 0.65, the model is able to describe changes in inside ownership. However, with results being insignificant for Inside Ownership as well as its square, one still cannot conclude that a relation as observed by McConnell and Servaes (2003) exists. Instead, a more detailed analysis reveals that there exists no case with high inside ownership and high performance in the sample. Furthermore, correlation has also been found insignificant if data was categorized. Concluding, there is no evidence of a relationship between inside ownership and firm performance. Therefore, H2 needs to be rejected.

With this finding contradicting with previous research, one has to draw attention to the unlikely presence of inside ownership of German supervisory boards. While most previous research (compare Barnhart & Rosenstein, 1998; McConnell & Servaes, 2003; Han & Suk, 1998) has analyzed US or UK data, findings of this paper suggest that for German firms the level of inside ownership does not relate to firm performance. One could therefore conclude that, by the enforcement of a two-tier board structure, the influence of inside ownership at least by the supervisory board is reduced to an insignificant level. In this context, especially institutional theory may provide new interpretation possibilities.

5.4 Control variables

Following the previous analysis, the in section 3.2.4 described control variables of firm size and D/E-ratio were correlated with firm performance. While there are no significant correlations for Model 1 and 2 with Tobin's Q, correlations are significant for in some cases if ROA as a measurement of firm performance is chosen. Furthermore, regression analysis for ownership structure reveals an (in some cases) significant influence of firm performance (see Table 3). For the influence of inside ownership on firm performance, D/E-ratio shows a significant influence (see Table 6). Yet, accounting for the low r square-values of the applied models, these results do not allow for conclusions about the influence of firm size or D/E-ratio on firm performance.

6. DISCUSSION

First of all, the empirical results presented in this paper obtain extremely low R square values. For studies about the relation between ownership structure and firm performance, other studies have observed higher values between 0.36 and 0.51 (Barnhart & Rosenstein, 1998; Demsetz & Villalonga, 2001; Gorton & Schmid, 1999). However, as the influence of R square-values on regression analysis is limited, this in itself is not a problem. In this context, very low R square values in analyses on inside ownership are quite common as both McConnell and Servaes (1990) and Morck et al. (1988) have obtained R square values smaller than 0.1.

Furthermore, this paper suffers from sample bias. Due to the restriction on one country, Germany, special caution needs to be kept when generalizing results. In contrast, when analyzing multiple countries, difficulties arise due to legal differences in reporting standards and, more predominantly, due to different regional developments of the crisis. While the beginning of the financial crisis in Q3 of 2007 is widely acknowledged, the different regional and industry-specific effects as well as state-specific measures against these effects have not been researched and compared thoroughly. In this study, such country-specific effects have therefore been excluded by restriction on one country.

In addition, this study suffers from subjectivity in definitions of variables. Although this paper follows relevant literature in this subject, the operationalization of, especially, inside ownership and ownership structure can be discussed. In this context, one specifically has to mention that German firms are legally obliged to have two-tier board structure (supervisory board and board of directors). While this study focuses only on supervisory boards, other authors who study different countries are not able to make this distinction. Additionally, this study does not include the type of shareholders (e.g. financial institution, insurance company, etc.) as done in other studies.

7. CONCLUSION

This paper examined the effect of ownership diffusion and inside ownership on firm performance during the financial crisis from 2008 until 2011. More specifically, this paper analyzed a random sample of 66 (49 valid) German industrial companies over the period 2008 to 2011. This paper continues in the long line of studies on the above described relationships, but especially adds the extraordinary circumstance of a financial crisis.

The main motivation of this paper was to verify the argumentation of Demsetz and Lehn (1985) who argued against a relation between ownership diffusion and firm

performance. Reacting to the initial hypothesis by Berle and Means (1932), Demsetz and Lehn argued that such relationship cannot exist, especially due to the fact that ownership structure itself is an endogenous variable and determined by market forces. As a result, each listed firm should have an ownership structure corresponding to the expected returns. In this context, a crisis period offers a unique opportunity to observe the market in a situation where these market forces are severely disturbed. The results of this paper support the denial of a relationship between ownership diffusion and firm performance, also during crisis periods. Especially the consideration of a timely delay of effect by Model 2, which has received considerably less attention to far, shows that such relation is unlikely to exist. This suggests that ownership diffusion is indeed, as concluded by Demsetz and Lehn (1985) an endogenous variable and therefore cannot be related to firm performance.

Besides ownership structure, this paper also focuses on inside ownership and firm performance. At first, inside ownership can, in extreme cases, also influence ownership diffusion. Secondly, while the effect of inside ownership on firm performance is well-understood (McConnell and Servaes, 1990), the recent crisis period offered a unique opportunity to study the impact of inside ownership. The first conclusion that can be drawn from this sample is that inside ownership by the supervisory board in Germany is highly uncommon. Resulting from only a very limited number of cases with inside ownership, this was not able to observe differences and/or changes in inside ownership during the crisis. Instead, this study has observed a similar relationship to the study of Mc Connell and Servaes (1990), summarized for all years. The insignificance of this relationship can also, in this context, also be due to the small and skewed sample.

As for future research, it is suggested to replicate this study in other countries as the influence of county-specific factors especially during the crisis has not been studied so far. This is in particular relevant for inside ownership which seems highly uncommon in German supervisory boards. Regarding inside ownership, also a more specific analysis of institutional theory, especially the judicial system and socio-cultural factors may provide new insights. Regarding ownership structure and firm performance, a study solely focusing on their endogeneity and possible common factors will provide new insights. Furthermore, this study would benefit from a well-structured analysis of the effects of the financial crisis and the country-specific measures taken against its consequences. Additionally, a larger sample size may also produce more significant results.

	Mean	Median	Minimum	Maximum	Std. Deviation	Valid Cases
Dependent variables						
Tobin's Q 2008	1.47	1.25	0.38	4.07	0.62	49
Tobin's Q 2009	1.66	1.38	0.14	4.67	0.85	49
Tobin's Q 2010	1.72	1.51	0.33	5.21	0.86	49
Tobin's Q 2011	1.67	1.35	0.67	4.69	0.76	49
ROA 2008	0.01	0.04	-1.31	0.32	0.23	49
ROA 2009	0.03	0.04	-0.30	0.26	0.11	49
ROA 2010	0.02	0.04	-0.47	0.17	0.11	49
ROA 2011	0.00	0.04	-0.66	0.21	0.16	49
Independent variables						
Shares (blockholder) 2008	0.54	0.61	0.00	1.00	0.28	45
Shares (blockholder) 2009	0.54	0.57	0.00	1.00	0.28	47
Shares (blockholder) 2010	0.52	0.55	0.00	1.00	0.29	44
Shares (blockholder) 2011	0.53	0.55	0.00	1.00	0.29	44
Shares (largest) 2008	0.42	0.43	0.00	1.00	0.23	43
Shares (largest) 2009	0.43	0.43	0.00	0.93	0.23	45
Shares (largest) 2010	0.44	0.49	0.00	0.93	0.23	42
Shares (largest) 2011	0.41	0.42	0.00	0.93	0.25	43
Shares (board) 2008	0.10	0.02	0.00	0.75	0.21	21
Shares (board) 2009	0.06	0.00	0.00	0.75	0.16	39
Shares (board) 2010	0.07	0.00	0.00	0.75	0.17	37
Shares (board) 2011	0.08	0.00	0.00	0.85	0.18	35
Control variables						
Firm size 2008	19.71	19.57	15.45	25.78	2.31	49
Firm size 2009	19.72	19.48	14.76	26.09	2.44	49
Firm size 2010	19.71	19.73	13.26	25.75	2.45	49
Firm size 2011	19.72	19.65	13.27	25.75	2.49	49
D/E 2008	0.94	0.57	0.01	5.84	1.16	49
D/E 2009	1.86	0.81	0.00	45.00	6.44	49
D/E 2010	0.72	0.59	-4.00	6.92	1.29	49
D/E 2011	0.98	0.52	0.00	7.72	1.45	49

Table 1: Univariate analysis
This table gives mean, median, minimum, maximum, standard deviation and the number of valid cases (maximum: 49) for all variables.
a. independent variables: Tobin's Q is defined as $\frac{\text{book value of total assets+market value of equity−book value of equity}}{\text{book value of total assets}}$, ROA as the ratio of profit/loss before taxes and the book value of total assets. Both have been calculated based on data extracted from ORBIS.
b. dependent variables: shares (blockholder) is defined as the total amount of shares held by blockholders (≥ 5% of shares). Shares (largest) is defined as the percentage of shares held by the single largest shareholders. Shares (board) is defined as the percentage of shares held by members of the supervisory board. Data for all three variables has been extracted from annual reports of sample companies.
c. control variables: Firm size is defined as the logarithm of total assets. D/E is defined as the ratio of long-term debt and total equity. Both variables are calculated based on data extracted from ORBIS.

	Tobin's Q	ROA	Shares (blockholder)	Shares (largest)	Size	D/E
Tobin's Q	1					
ROA	0.22**	1				
Shares (blockholder)	0.11	0.17*	1			
Shares (largest)	0.07	0.15*	0.84**	1		
Size	-0.21**	0.23**	-0.14	-0.09	1	
D/E	-0.11	-0.11	-0.13	-0.11	0.04	1

Table 2

This table shows the correlation matrix for all variables of model 1 ($Q_t = \alpha + \beta_1 OS_t + \beta_2 Size_t + \beta_3 Lev_t + \varepsilon$) and model 2 ($Q_t = \alpha + \beta_1 OS_{t-1} + \beta_2 Size_{t-1} + \beta_3 Lev_{t-1} + \varepsilon$) which accounts for a timely delay of effect. The time dimension is excluded from this representation, but remain insignificant for all years (both model 1 and 2). For a more detailed discussion see section 5.2, for correlation coefficients see Appendix II. For a definition of variables see Table 1.
*/** correlation is significant at 0.05 or 0.01 (two-tailed), respectively

	Model 1 (t → t)				Model 2 (t-1 → t)		
Tobin's Q	**2008**	**2009**	**2010**	**2011**	**2009**	**2010**	**2011**
Shares (blockholder)	-0.153	0.138	0.160	0.395	0.121	0.389	0.413
	(-0.417)	(0.293)	(0.323)	(0.937)	(0.242)	(0.825)	(0.958)
Firm size	-0.030	-0.083	-0.083	-0.051	-.0.76	-0.089	-0.062
	(-0.655)	(-1.473)	(-1.403)	(-1.101)	(-1.216)	(-1.567)	(-1.201)
D/E-ratio	-0.122	-0.016	-0.113	-0.070	-0.115	-0.005	-0.100
	(-1.399)	(-0.799)	(-0.882)	(-0.862)	(-0.964)	(-0.241)	(-0.896)
Adjusted R square	-0.007	-0.001	0.021	0.030	0.003	0.011	0.041
Df	44	46	43	43	44	46	43
Shares (largest)	-0.226	-0.077	0.040	0.380	-0.225	0.420	0.144
	(-0.476)	(-0.131)	(0.062)	(0.758)	(-0.347)	(0.711)	(0.257)
Firm size	-0.026	-0.084	-0.085	-0.056	-0.071	-0.091	-0.068
	(-0.552)	(-1.467)	(-1.404)	(-1.201)	(-1.092)	(-1.567)	(-1.298)
D/E-ratio	-0.124	-0.017	-0.120	-0.077	-0.136	-0.006	-0.122
	(-1.391)	(-0.860)	(-0.908)	(-0.928)	(-1.113)	(-0.292)	(-1.054)
Adjusted R square	-0.010	-0.006	0.013	0.029	0.001	0.003	0.021
Df	42	44	41	42	42	44	41
ROA	**2008**	**2009**	**2010**	**2011**	**2009**	**2010**	**2011**
Shares (blockholder)	0.062	0.097	0.075	0.134	0.124*	0.062	0.162
	(0.515)	(1.697)	(1.357)	(1.480)	(2.011)	(1.172)	(1.763)
Firm size	0.034*	0.001	0.018	0.025*	0.002*	0.017*	0.022
	(2.276)	(0.203)	(2.732)	(2.528)	(0.246)	(2.649)	(1.963)
D/E-ratio	-0.082**	-0.003	0.003	-0.010	0.010	-0.006**	0.022
	(-2.860)	(-1.306)	(0.194)	(-0.567)	(0.674)	(-2.714)	(0.993)
Adjusted R square	0.195	0.048	0.113	0.098	0.050	0.236	0.083
Df	44	46	43	43	44	46	43
Shares (largest)	0.053	0.074	-0.002	0.176	0.086	0.002	0.240
	(0.340)	(1.160)	(-0.044)	(1.640)	(1.171)	(0.038)	(2.042)
Firm size	0.034	0.000	0.015	0.025	0.002	0.015	0.021
	(2.184)	(0.016)	(3.545)**	(2.502)	(0.254)	(3.607)**	(1.936)
D/E-ratio	-0.087**	-0.004	-0.007	-0.008	0.003	-0.007**	0.026
	(-2.952)	(-1.739)	(-0.708)	(-0.447)	(0.208)	(-4.627)	(1.093)
Adjusted R square	0.201	0.039	0.194	0.109	-0.036	0.435	0.106
Df	42	44	41	42	42	44	41

Table 3: Determinants of firm performance (regression)
This table shows the unstandardized coefficients, t-values within a 95% confidence interval (second row), adjusted R square-values and df for the regression models 1 and 2. For a definition of model 1 and model 2 see Table 2. For a definition of variables see Table 1.
*/** coefficient is significant at 0.05 or 0.01 (two-tailed), respectively

	Mean	Median	Minimum	Maximum	Std. Deviation	Valid Cases
Dependent variables						
Tobin's Q	1.75	1.44	0.33	5.21	0.96	81
ROA	0.00	0.0388	-1.31	0.26	0.20	81
Independent variables						
InO	0.12	0.02	0.00	0.85	0.21	81
Control variables						
Firm size 2011	19.59	19.91	15.70	25.54	2.16	81
D/E 2011	1.74	0.77	0.00	45	5.10	81

Table 4: Univariate analysis
This table gives mean, median, minimum, maximum, standard deviation and number of valid cases for each variable relevant for model 3. Inside ownership is defined as the percentage of shares owned by the supervisory board. For a definition of the remaining variables, see Table 1.

	Tobin's Q	ROA	InO	InO*InO	Size	D/E
Tobin's Q	1					
ROA	0.19	1				
InO	-0.02	0.17	1			
InO*InO	-0.05	0.15	0.96**	1		
Size	-0.24*	0.29**	0.34**	0.26*	1	
D/E	-0.11	-0.1	-0.05	-0.06	-0.1	1

Table 5: Influence on firm performance (correlation)
This table shows the correlation matrix for all variables of model 3 which is defined as $Q = \alpha + \beta_1 InO^2 + \beta_2 InO + \beta_3 Size + \beta_4 Lev + \varepsilon$. Inside ownership is defined as the percentage of shares owned by the supervisory board. For a definition of the remaining variables, see Table 1.
*/** coefficient is significant at 0.05 or 0.01 (two-tailed), respectively

	Unstandardized coefficient	t-value
InO*InO	-3.99	-1.58
InO	3.144	1.68
Firm size	-0.15**	-2.74
D/E	-0.03	-1.37
Adjusted R square	0.65	
Df	80	

Table 6: Influence on firm performance (regression)
This table shows unstandardized coefficients, t-values, adjusted R square and degrees of freedom for the regression model. The model is defined as $Q = \alpha + \beta_1 InO^2 + \beta_2 InO + \beta_3 Size + \beta_4 Lev + \varepsilon$. For definitions of variables see Table 4.
** coefficient is significant at 0.01 (two-tailed)

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APPENDIX

Appendix I: Measurement of firm performance in recent literature (van Hoorn & van Hoorn, 2011)

TABLE 2 - Firm performance variables used in empirical studies from 2003-2009

Study	ROA	Ind.ROA	Tobin's q	MB	Share return	ROS	Asset turnover	Sales efficiency	Net income efficiency	ROE
Guest (2009)	■		■		■					
Wintoki et al. (2007)	■	■				■				
Adams and Mehran (2005)	■		■							
Bennedsen et al. (2008)	■	■								
Cheng et al. (2008)	■		■							
Coles et al. (2008)			■							
Beiner et al. (2006)			■							
Haniffa & Hudaib (2006)	■									
Bozec (2005)	■					■	■	■	■	■
De Andres et al. (2005)	■		■							
Lasfer (2004)			■							
Van Ees et al. (2003)	■			■		■				■

Return on Assets (ROA) refers to the ratio of operating profit before depreciation and provisions (income before extraordinary items) divided by book value of total assets at the beginning of the fiscal year; Industry adjusted ROA (Ind.ROA) refers to a firm's ROA less the industry median ROA (where industry is defined by the 2-digit SIC code); Tobin's q (proxied) refers to the ratio of book value of total assets plus market value of equity minus book value of equity divided by book value of total assets; Market to book (MB) refers to the market value of equity divided by the value of assets minus liabilities; Share return refers to the annual share return over the 12 months preceding the financial year end; Return on sales (ROS) refers to the ratio of net income before extraordinary and unusual items divided by sales; Asset turnover refers to sales to total assets; sales efficiency refers to the ratio of sales divided by #employees; net income efficiency refers to the ratio of net income before extraordinary and unusual items divided by #employees; and finally, Return on Equity (ROE) refers to a firm's fiscal year net income (after preferred stock dividends but before common stock dividends) divided by shareholder's equity (book value excluding preferred shares).

Appendix II: Determinants of firm performance (correlation) for each individual year

	Model 1 (t → t)				Model 2 (t-1 → t)		
Tobin's Q	**2008**	**2009**	**2010**	**2011**	**2009**	**2010**	**2011**
Shares (blockholder)							
Pearson correlation	0.003	0.081	0.130	0.220	0.088	0.151	0.222
Sig. (2-tailed)	0.985	0.586	0.401	0.151	0.565	0.313	0.147
N	45	47	44	44	45	47	44
Shares (largest)							
Pearson correlation	0.024	0.001	0.089	0.196	-0.023	0.121	0.124
Sig. (2-tailed)	0.878	0.996	0.574	0.208	0.885	0.427	0.435
N	43	45	42	43	43	45	42
Shares (board)							
Pearson correlation	0.081	0.024	0.160	0.770	-0.070	0.025	0.087
Sig. (2-tailed)	0.728	0.884	0.924	0.660	0.762	0.881	0.607
N	21	39	37	35	21	39	37
ROA							
Shares (blockholder)							
Pearson correlation	0.188	0.270	0.116	0.158	0.281	0.166	0.172
Sig. (2-tailed)	0.217	0.066	0.455	0.300	0.061	0.265	0.264
N	45	47	44	44	45	47	44
Shares (largest)							
Pearson correlation	0.192	0.194	0.069	0.197	0.187	0.031	0.219
Sig. (2-tailed)	0.217	0.202	0.664	0.205	0.230	0.842	0.164
N	43	45	42	43	43	45	42
Shares (board)							
Pearson correlation	0.156	0.034	0.164	0.185	0.082	0.118	0.167
Sig. (2-tailed)	0.500	0.839	0.332	0.287	0.724	0.473	0.325
N	21	39	37	35	21	39	37

Table Appendix II: Determinants of firm performance (correlation)
This table shows Pearson's correlation coefficient, 2-tailed significance and the number of observations in relation to firm performance as measured by both Tobin's Q and ROA. Model 1 defined as $Q_t = \alpha + \beta_1 OS_t + \beta_2 Size_t + \beta_3 Lev_t + \varepsilon$ does not account for timely delay of effects. This possible delay is included in Model 2 defined as $Q_t = \alpha + \beta_1 OS_{t-1} + \beta_2 Size_{t-1} + \beta_3 Lev_{t-1} + \varepsilon$. For a definition of variables see Table 1.