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The Impact of Supervisory Board Characteristics on Firm Performance

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Abstract

Corporate boards play an important role in shaping, steering, supervising and advising an organization. Thus it is likely that corporate boards have an impact on corporate performance. There is empirical literature which analyses the interrelation between board features and company performance. The results suggest that board characteristics have a measureable impact on the economic success of a firm.

Although the two-tier system prevalent in “Continental European” countries significantly differs from the one-tier regime as it separates management and supervision of an organization, there is little research done by now to examine, whether results from one-tier regimes persist in this alternative setting.

Previous empirical literature often does not discuss the underlying economic rationales in detail. But as this study is on effects in a formerly not empirically analyzed governance regime, we seek to build a theoretical reasoning for the impact of supervisory boards on corporate performance. Based on this our empirical study explores the interrelations between supervisory board characteristics and accounting as well as market based corporate performance by using a sample of German listed companies. We find that the average remuneration of supervisory board members seems to have a positive association with firm performance. Additionally and in contrast to previous results in different governance settings we find that board size does not negatively.

1. Introduction

This study seeks to examine theoretically and statistically interrelations between board characteristics and performance in large, publicly listed German corporations. Statistical results do not reveal the nature of their existence but past research has not always explained which forces drive the emergence of observed results. This is especially true for the potential impact of supervisory boards on performance as past research widely lacks for the German governance regime. Thus, in order to interpret statistical findings properly we also seek to establish a theoretical basis explaining potential interrelations between supervisory board characteristics and performance.

There is a vital and ongoing discussion whether good corporate governance can contribute to increase corporate performance. Several studies analyzed various questions in this context, albeit predominantly in the environment of highly developed capital markets such as the US or the UK. The system of corporate governance consists of several instruments or devices which are subject to country specific legislative policies. Although there are undisputed similarities and analogies between governance regimes of different countries in terms of employed instruments or minimum standards, there still exist obvious differences. These differences on the one hand don't allow for unconsidered transfer of insights obtained in one governance regime into another. On the other hand they establish a real-life experimental situation which enables researchers to observe how different regulatory settings may influence the whole system of corporate governance. Both aspects make regulatory differences a fruitful environment for governance research. Germany is such an interesting object for governance studies as law amongst others prescribes a two-tier board system and as the whole governance regime can be considered as more stakeholder-oriented than the US or the UK.

Governance instruments can be seen as incentive mechanisms which are set up to address, mitigate and solve conflicts of interest among different company stakeholders. Providing incentives for important protagonists involved in the business of a company on can expect these instruments to have an effect on corporate activities which in turn should reflect in overall corporate performance. Different specifics and characteristics in the design of governance instruments may differently interfere with corporate activity and success. Regulatory requirements might establish a minimum level of governance but companies seem to systematically exceed this level indicating that there are underlying economic rationales which influence corporate governance systems.

Corporate boards play an important role in shaping, steering, supervising and advising an organization. The Anglo-Saxon board of directors is a good example of an institution that incorporates all of the aforementioned functions. Besides others, its members decide on crucial business issues and staffing of important management positions. Thus it seems to be obvious that corporate boards should have an impact on corporate performance. The design and configuration of corporate boards varies heavily between different legal regimes. Moreover even within one legal regime boards do not always look the same but differ in particular features such as size, structure, diligence or expertise.

Existing literature mainly empirically addresses the question, whether board features drive company performance. The joint results provide evidence that board characteristics have a measureable impact on the economic success of a firm. However most of these studies focus on one-tier board regimes where the board of directors is the most important institution, which jointly controls and supervises the company. We doubt that results from one-tier regimes persist in different governance settings like the two-tier board system, prevalent in so called “Continental European” countries. A two-tier system separates management and supervision of an organization by assigning each task to another board.

As mentioned this study entails a theoretical and a statistical part. The theoretical considerations can be summarized as follows: Building on Hermalin/Weisbach (2003) we state that actions of corporate board members influence corporate activity which in turn is reflected in corporate performance. As we cannot systematically observe specific actions of directors, we have to rely on surrogates for these actions – board characteristics like incentives, structure, diligence and qualification usually serve as such surrogates. We further argue that the first order effect is rather from director actions to performance than vice versa. High quality boards are not overwhelmingly expensive to be only affordable for successful corporations. Characteristics like board independence or structure are not likely to have been caused by foregone corporate success. Good past performance does not induce high quality directors to enter the board as their individual reputation should not mainly be based on past success but on their work in the boardroom which contributes to future corporate performance. To theoretically link today’s characteristics with today’s performance we rely on an equilibrium assumption. The theoretical section ends with a categorization of favorable board characteristics and explanations how they might affect board activities.

In our statistical part we want to detect measurable effects which show an impact of supervisory boards on corporate performance. We use OLS regression technique and employ a sample consisting of 2006 and 2007 data for the 140 largest publicly listed German companies.

We find that monetary stimuli seem to provide strong incentives for outside directors to fulfill their duties properly which reflects in favorable company performance. We argue that this persistent effect across model specifications which is not likely to be due to reverse causality could be explained by a signaling function emerging from board compensation levels. Board size, which has been shown to systematically interact with corporate performance in one-tier board settings, and diligence do not seem to affect corporate performance in our sample. However the experience and expertise of a board significantly affects corporate performance. In line with results of recent studies busy directors as well as bank representatives seem to be negatively related with corporate success.

This study contributes to the existing literature in the following: To the authors' knowledge this is the first study which uses German capital market company data not having been widely accessible before 2006 and assesses interrelations between supervisory board characteristics and corporate performance. Germany is one of the major two-tier countries and studies in this environment might help to better understand the specifics of and interrelations within the two-tier system in general. Additionally, the mandatory division between supervision and management Germany allows examining certain characteristics of supervision which could not have been captured before in studies within one-tier regimes.

Besides employing novel data this study contributes to the literature as we seek to provide reasoning which adds to explaining the impact of governance mechanisms on corporate performance. Previous literature frequently does not dwell on the potential transmission mechanisms between certain specifics being representative for good governance and corporate performance. We particularly elaborate on the potential effects of outside director activity and hope to be able to widen the understanding of their influence on performance. This also contributes to discussions on the issue of endogeneity between governance and performance. Statistically almost irresolvable without reservation (Larcker/Rusticus (2007)) we argue that valid economic rationales have to be brought up and discussed which help to answer the question of causality or might help to distinguish first-order from second-order effects. Our study seeks to set at least an impulse for vivid further discussion and research.

Section 2 provides an overview of the specifics of German legal environment which are important for the understanding of this paper. Section 3 introduces the theoretical reasoning and also refers to previous literature. The empirical model as well as our hypotheses are developed in section 4 which is followed by the presentation and discussion of our empirical results in section 5. Section 6 concludes.

2. Specifics of the German Corporate Governance Regime

SEPARATION OF MANAGEMENT AND SUPERVISION

A unique characteristic of the German corporate governance regime is its two-tier board structure. Publicly listed and large limited liability companies are by law obliged to have separate institutions for managing and supervising the firm. For publicly listed firms these boards are the management board (“Vorstand”), which comprises the firms’ top executive directors who steer and control the corporate business, and the supervisory board (“Aufsichtsrat”), whose members have no direct executive power themselves but are supposed to monitor, supervise and consult the managing board. Thereby, the two-tier board system provides a strict institutionalized separation between the company’s management and its monitors, leading to an enhanced organizational transparency.

ROLES AND RESPONSIBILITIES

Although both the management as well as the supervisory board jointly contribute to increasing the value and success of the company, a direct consequence of the separation between them is that their roles and responsibilities differ. Executive directors, including the CEO, are members of the “Vorstand” and solely manage the firm by controlling and steering the company’s business. Active executive directors strictly are not allowed to serve on the supervisory board of the company they manage and vice versa. In consequence this regulatory requirement leads to a predefined organizational separation of the CEO and the chairman of the supervisory board, albeit successful CEOs frequently become chairman of the supervisory board after having completed their tenure as CEO.

The supervisory board is not empowered to directly involve itself in the management of the firm. Yet, it still can impose rules requiring its approval on a specific predefined set of major business decisions and activities, thus exercising indirect control over the management. Moreover, it appoints and dismisses the members of the management board including the CEO and conducts remuneration negotiations. Since 1998 the supervisory board is also obliged to take the main role in cooperation with the external audit firm. It suggests an auditor to the general assembly, determines the focus of the audit and negotiates on audit fees. Its members are important recipients of the audit report. Yet, in Germany the understanding of the supervisory board has changed over the last decade. Having been focused on monitoring the management board, it is now also seen as an advisor or consultant for the management who

does not only supervise but support the executive management in fulfilling its tasks and duties.

CODETERMINATION AND SIZE OF THE SUPERVISORY BOARD

Another specific of the German corporate governance regime is the concept of codetermination, which is an internationally unique setting. It can be seen as an organizational construct balancing the interests of company shareholders and employees. German corporate law requires companies to include workforce or union representatives in the supervisory board, when a certain threshold is reached. The concept is of further interest for our analysis, as size and composition of the board are closely linked to codetermination as follows: Companies with 2.000 – 10.000 employees are obliged to have min. 12 supervisory board members. 10.000 – 20.000 company employees set the board's size to at least 16, and companies with more than 20.000 employees have to have a supervisory board with at least 20 members. Actually our data suggests that companies never exceed this prescribed minimum size. Half of the board's members have to be either employee of the company or union functionary. Companies who do not reach this threshold and are not codetermined have to have at least three members of the supervisory board or any other number divisible by three.

To the authors' knowledge, no other governance regime allows a comparably high participation of workforce representatives in supervising the management. [Historically, the development of codetermination is a result of the significant influence and impact unions in Germany have had and still have on companies.] A reason for having employee representatives on the supervisory board is that they can serve as information carriers in two directions: from the supervisory board to the employees and vice versa. This helps, e.g., to prominently address workforce topics like remuneration, job cuts or labor conditions. One economic rationale for setting up this unusual form of "company democracy" is that the involvement of employees in fundamental company decisions might help motivating the workforce for a goal which is commonly accepted by all stakeholders.

SUPERVISORY BOARD REMUNERATION

The supervisory board's remuneration in Germany is set by the general assembly. Board members often receive a solely fixed compensation. If variable compensation is granted, it is often linked to the company's dividend payment. In contrast to the management board, members of the supervisory board are not allowed to receive stock options as compensation com-

ponent. Unionized employee representatives on the board have to pay their remuneration exceeding a certain base amount to a union trust.

For a long time the remuneration of supervisory board members was rather a reimbursement of their opportunity costs than a compensation meant to induce proper and diligent work. Supervisory board members received only a comparably small compensation in comparison to their executive colleagues. In the 90s supervisory board member compensation only slightly increased. However, this changed remarkably over this decade. Between 2003 and 2006, along with the increasing importance and prominence of corporate governance issues in Germany, the salary of supervisory board members was raised significantly. In DAX30 boards', e.g., total compensation increased by 23.5% on average each year (Towers Perrin 2004-2006). Albeit still being lower than executive director compensation, this increase represents a considerable adjustment.

2006	16%
2005	17%
2004	11%
2003	50%

Table 1: Increase of supervisory board compensation

Since 2005 German publicly listed companies are obliged to disclose personalized information on the amount and structure of yearly remuneration of management board members. Along with this, most of the firms now also disclose the supervisory board members' remuneration, so this data is also largely available since 2005.

GERMAN STOCK MARKET

The stock market in Germany is not as far developed as in the US or the UK. Table 2 shows market capitalization data for the world's three largest stock exchanges and in comparison for the German stock exchange.¹

Stock Exchange	Market capitalization in USD millions	No. of listed companies
NYSE Group	10 312 695	2 447
NASDAQ	2 579 456	2 934
London SE	2 042 145	3 156
Deutsche Boerse	1 097 030	840

Table 2: Development of supervisory board compensation
Source: World Federation of Exchanges, November 2008 Newsletter

¹ Data has been gathered after the world financial crisis already has begun in October 2008.

According to the *Deutsches Aktieninstitut* 15.2 percent of the German population owns stocks or funds and the number of stockholders decreases (DAI 2008²). Only 5.4 percent are direct shareholders. In the beginning of the millennium in the US 25.4 percent and in the UK 23 percent of the population were direct shareholders (DAI 2000).

THE SPECIAL ROLE OF BANKS

There is a considerable body of literature discussing the special role of commercial banks in the German corporate financing and governance system. Early research on this topic (e.g., Cable (1985)) mainly presents the standpoint that banks help to improve governance quality and in consequence also company performance. However, recent studies on the German banking system question this position (Agarwal/Elston (2001)) and also argue that the developments of the last decade weakened the special role of German banks. (Cf., Dittmann et al. (2008))

To the authors' opinion the role of German universal banks still differs from the situation in the UK or the US in the following aspects: Their role as debt providers in corporate financing is more pronounced than in other economies. Moreover German companies still tend to cooperate closely with one or a few "house banks" to carry out most of their financial transactions such as the placement of bonds or new stocks, mergers or acquisitions and the raising of long term debt. Maybe even more important than this is that banks are still able to exert influence on publicly listed companies. This influence was not surprising when banks were major blockholders in publicly listed companies, but along with regulatory changes their stockholdings in non-banking companies decreased significantly. (Cf. Dittmann et al. (2008)) Yet, their representation in terms of supervisory board seats remains almost unimpaired and in our sample merely 57 percent of the companies have at least one bank representative on their supervisory board. Banks and non-banking listed companies are still interwoven with each other especially in terms of corporate governance.

² Cf. http://www.dai.de/internet/dai/dai-2-0.nsf/dai_publicationen.htm; Access: 12/9/2008 (3:21 p.m.).

3. Theoretical Background and Literature

3.1 Reasoning for an impact of governance mechanisms on performance

IMPORTANCE OF CORPORATE GOVERNANCE

The system of corporate governance can be understood as a set of incentive mechanisms which are established and developed to address conflicts of interest between different stakeholders of a company. Relationships receiving attention by researchers as well as practitioners are, e.g., the owner-manager conflict or the owner-lender conflict. Although governance regimes vary among different institutional and legal frameworks such as the common law based systems in UK or US and the code law system prevailing in Continental-Europe, there are many similarities with respect to the employed governance mechanisms. They comprise, e.g., corporate boards, capital structure, compensation schemes or the auditor. All of these elements more or less interfere with important company decisions. Distinct decisions in turn have an impact on company success. Thus, it is likely that corporate governance institutions, being relevant factors in shaping the company and determining its activities, show systematic interrelations with long-term corporate performance.

THE GENERAL IMPACT OF GOVERNANCE CHARACTERISTICS ON PERFORMANCE

First glimpses on how corporate governance mechanisms might directly affect firm performance provide Fich/Slezak (2008). They empirically examine whether variations in the extent with which corporate governance mechanisms are used are associated with differences in bankruptcy risk. Analyzing a set of financially distressed firms they find that companies with properly established and intensely utilized governance instruments show a lower bankruptcy risk once they get into financially troublesome situations. This result is intuitive, as one could imagine that, e.g., well acting corporate boards whose members are properly incentivized and experienced show greater skills and effort in avoiding bankruptcy and company breakdown. In difficult and critical economic circumstances governance mechanisms seem to be of importance, but does this still hold true when a company is not in adverse situations?

Taking a broader perspective Agarwal/Knoeber (1996) try to assess whether there are systematic effects of different governance mechanisms on corporate success. Using a wide sample of listed US companies they examine the governance mechanisms of shareholder structure, debt, director independence as well as the markets for corporate control and managerial labor. Their results show that several of the mentioned governance mechanisms seem to significant-

ly influence corporate performance when considered isolated. Applying a simultaneous equations model they additionally find that in affecting success interdependencies between those mechanisms are likely to exist.

As other studies before and after did Agarwal/Knoeber (1996) report a general statistical association between the whole governance structure of companies and their performance. However many empirical studies focus on presenting their findings and do abstain from providing detailed reasoning to explain them. Although these correlations have been obtained regularly in empirical research it remains widely unclear which causality is at the bottom of it: do governance mechanisms affect performance or is their configuration a reaction on corporate performance? Admitting that this is not a one-way street but that there are interdependencies we argue that it is rather the specification of a governance mechanism that affects performance and that repercussions from performance on governance mechanism are second order effects. For the purpose of our study we seek to present and discuss reasoning in favor of this kind of causality between corporate boards and performance in general and especially for the German supervisory board.

THE IMPACT OF CORPORATE BOARDS ON PERFORMANCE

As mentioned above corporate boards are an important element in the governance system of corporations as they play a major role in steering, advising and supervising companies. Thereby board activity might affect company performance on two ways of transmission: First, decisions made in corporate boards are usually related to crucial matters of the companies' daily business or strategy and, thus, directly initiate more or less beneficial business activities. Second, monitoring and advice by non-managing directors have a more or less pronounced influence on the decisions and actions of managing directors inside and outside the boardroom. This can also be supposed to have an indirect effect on many elements of business activity. Taking these aspects into consideration, it not surprises that corporate boards recognize undiminished attention by researchers.

The two aforementioned ways of transmissions are assigned to two different corporate boards within the German governance regime: The control of operative business as well as the development of underlying tactical and strategic reasoning is assigned to the management board. Staffing, supervision and stewardship of the management board are main duties of the supervisory board, which moreover has to agree upon important decisions such as mergers or major investments. Without ignoring the indisputable importance of the management, we concentrate our investigation on effects that supervisory boards have on corporate performance.

Whereas the impact of managing director activities on corporate performance is rather intuitive, it needs to be further illustrated how non-managing, supervisory board directors' activities are directly and indirectly connected with corporate performance. We will therefore introduce additional rationale elucidating and underlining the existence of these effects.

DETERMINATION OF THE COMPANY'S RISK-RETURN POSITION

Taking a general perspective, one could divide the responsibilities between management and supervisory board as follows: The management is responsible for bringing up and realizing investment projects in order to increase – or put more stringently maximize – the expected value of the firm. The sum of all investment projects a company is engaged in determines the risk-return-position of the shareholders' investment.³ Management is incentivized to behave in best interest of the shareholders by (the governance mechanism) contracts which amongst others include specifically adapted remuneration schemes. However, contracts are imperfect and cannot solve agency conflicts completely as they for instance might fail to align different time horizons of investors and managers.

The task of other governance mechanisms in general is to contribute to addressing and further mitigating these agency conflicts. In this context the particular function of supervisory boards can be classified in the following five components. Firstly, it co-selects, appoints and releases the members of the management board including the CEO, thereby strongly influencing a company's management culture. Secondly, members of the supervisory board negotiate with managers upon their compensation contracts and the supervisory board is also responsible for evaluating the target achievement respectively success of management board members. Thirdly, the supervisory board may limit the management's room of maneuver by its right to decide on a predefined catalogue of major company decisions. Fourthly, it further limits the available options for managerial action by supervising the management's work itself and by controlling the process of external supervision by an auditor. This duty comprises fee-negotiations with the auditor, the determination of audit focuses and receipt of the audit report. Auditor selection is also mainly driven by the supervisory board as it suggests an auditor, which then is formally appointed by the general assembly. The fifth and final component of supervisory board members' activity is the exertion of influence as important advisors and consultants of the management.

Based on this and given that the management maximizes the expected firm value by engaging in investment projects, the supervisory board can be understood as a mechanism which is able

³ This risk-return position also affects the expected benefits of other stakeholder groups of the company.

to adjust the company's risk-return-position on behalf of company shareholders as well as other stakeholders. It does so by co-determining or limiting the risk taken in managerial investment projects. This may happen on several ways, e.g.: CEO appointment and dismissal, provision of more or less pronounced variable compensation incentives, rejection of venture-some investment projects or advice and consultancy towards low-risk business activities. While these ways limit the risk inherent in investment projects, supervisory board's determination of internal and external control primarily addresses fraud risk. The overall extent of control emanating from the supervisory board by using own resources or assigning the auditor to do so can also be understood as an incentive mechanism to managers. It deters them from exploiting company resources for their own benefits (e.g., by earnings management, extensive fringe benefits) and from providing fraudulent information.

Each supervisory board has the aforementioned responsibilities, duties and rights but not all of them exercise their rights in the same way or manner. However, different ways of cooperation and collaboration with the management board should differently affect the management's behavior, decisions, actions and, hence, company performance.

INSTITUTIONS, STEADY STATE AND LONG-TERM EFFECTS ON PERFORMANCE

The described ways of transmission are rather indirect than direct. Additionally, transmission cannot be observed steadily and permanently as, e.g., a supervisory board may heavily influence the management in one occasion and not at all in another one. Even CEO activities cannot be expected to affect corporate performance immediately but its ramifications will become visible in the middle- or long-run. Accordingly repercussions of the more indirect influence that originates from supervisory board activities will almost always be of long-term nature. Similar arguments and objections can be raised for the impact on performance which emanates from other governance mechanisms like capital and ownership structure or the market for corporate control. Nevertheless alongside other studies we try to assess the characteristics of these effects empirically without being able to clearly relate a certain governance activity in the past to a distinct proportion of today's performance. In order to do so, our empirical study and model design are based on another often not explicitly mentioned assumption. This assumption constitutes the theoretical link between today's governance characteristics and today's corporate performance, albeit transmission mechanisms of one in the other rather work in the long run.

Governance mechanisms at large and as such the supervisory board can be considered as institutions. Once having been established, it is a time-taking transitory process to develop the

optimal mode of functioning which goes along with a slight change in the characteristics of the institution. This process converges towards a steady-state which is dependent on the environment the institution operates in. Modifications of the environment irrespective of their origin, trigger or dimension take time to be incorporated, as they alter the steady-state to which the institution converges. Such environmental shocks might, e.g., be regulatory or personal changes.

Publicly listed companies have to have a supervisory board from the first day of their foundation on. Therefore supervisory board characteristics we can obtain today are the result of a development over the past years towards a distinct steady state; they should amongst others reflect the specific environment of a company as well as the constellation of individuals acting in and around the company. As company environments vary and as decision makers which shape company institutions are divers, different supervisory boards could converge towards different steady states. Put differently, the present institutional characteristics are a rough but valid indicator for the steady state to which the institution is converging. Given that supervisory board activities affect company performance in the long run, then differences in board characteristics which drive board activities should have an impact on performance as well. Under the assumption that variations in presently observable board characteristics are an indicator for different steady states, then these characteristics allow for capturing the real underlying associations between specifics of a governance mechanism and performance. Summing up this important assumption one can state the following: Governance mechanisms can affect performance in the long run, but as individual governance institutions evolve towards a local equilibrium, present characteristics of these institutions enable us to assess differences in equilibriums and therefore in effects on performance.

Building on this theoretical frame we perform our study which analyzes the influence of supervisory board characteristics on corporate performance. We use specific board characteristics variables that are surrogates for the way with which a distinct supervisory board fulfills its tasks. More detailed information on the variables incorporated in our model and how we expect them to influence corporate performance is given in section 4.2. But first we provide a brief overview of the previous literature on which our study settles and which it furthers.

3.2 General Literature Review

This study investigates the link between a set of supervisory board characteristics and measures of firm performance. To our knowledge, this is the first attempt to analyzing the relation in a two-tier board system while previous work has exclusively focused on the Anglo-American one-tier system. Therefore, in setting up our empirical model we can only refer to these studies performed within different governance regimes. In the following, we will briefly introduce this literature and also show important differences to our approach.

INDEPENDENCE

Over the past two decades there has been a variety of studies considering the interrelation of board characteristics and performance. One of the main issues in these studies has been board composition and especially board independence which is an important challenge in the monistic setting. Board composition is typically measured by the proportion of outside directors on the board. Outside directors are non-managing directors, not involved in the firm's operational business. Frequently questioned is if an increased presence of outside directors improves firm performance. Although having been widely discussed this question has not finally been answered yet.

Two different dependent variables are most commonly employed to measure the relationship between board characteristics like composition and firm performance in the empirical literature. The first measure is the accounting based return on assets (ROA) which is the ratio of the firm's net income to the book value of the firm's total assets. The studies of Mehran (1995), Klein (1998), and Bhagat/Black (2002) all find no significant relationship between accounting measures and board composition. It is generally questionable, if accounting based measures are the right proxy for firm performance. Being a backward-looking indicator of the firm's historic activities, these measures seem not to be able to fully proxy for the influence of a strategically oriented institution like the board of directors. Therefore empirical studies frequently use market based measures as a second proxy for performance and test for the relationship between board characteristics and them. Widely used is Tobin's Q which can be found in a couple of different variants but usually aims at relating the market value of the firm's equity to the replacement cost of its tangible assets. Like the accounting based measures, these market based measures are questionable to fully proxy firm performance and were therefore broadly discussed in the literature. The main advantage of market based measures is that they better reflect future expectations and incorporate intangible factors such as governance.

Being one of the initial studies in this field, Hermalin/Weisbach (1991) explore the relationship between the proportion of outside directors and Tobin's Q for 134 NYSE firms between 1971 and 1983 and find no significant interrelation. The study of Bhagat/Black (2002) examines the effect of board composition on market based measures (Tobin's Q) as well as accounting based measures (ROA and Ratio of sales to assets) for 934 of the largest US firms between 1985 and 1995. Similar to Hermalin/Weisbach (1991) they find no significant evidence. Instead they find an insignificant negative association and argue that in contrast to the conventional wisdom according to which greater board independence is supposed to improve firm performance, it may even impair it. Bhagat/Black (2002) explain this inverse relationship with the firm specific knowledge and skills inside directors are bringing to the board as this should be of help to make adequate strategic decisions.

The issue of board independence is different in Germany where the supervisory board is by definition a separate institution which is staffed by outside and sometimes grey directors. Therefore our study does not control for board independence but closely looks at further characteristics of an institution which is fairly independent.

SIZE

Another widely discussed board characteristic which might influences its effectiveness and thus firm performance is board size. Small boards could facilitate information- and workflow between board members and the management and in that sense improve the board's effectiveness. Additionally small boards reduce agency costs by making it more difficult for board members to act as free riders. On the other hand large boards could add value by providing a broader knowledge base through the increased number of members, processing decisions more carefully and speaking more reflective then small boards. In his empirical study Yermack (1996) finds support for the first hypothesis as he detects a significant negative relationship between Tobin's Q and board size. In contrast to the one-tier governance system, board size is regulated in the German two-tier regime. Companies that reach certain thresholds are obliged to have a board of a legally defined size. We therefore might yield findings which are different to those of prior studies.

DILIGENCE

The questions whether boards fulfill their duties with differing intensity and whether this has an influence on performance have also been discussed in previous literature. Vafeas (1999), for example, investigates the relationship between the number of board meetings and the per-

formance of the firm. He finds that the number of board meetings is increasing with the decline of firm performance. After a period of declining firm performance the number of board meetings increases. This improves the firm's performance. In that sense board meetings are reactive rather than proactive tools to changes of firm performance. According to Vafeas (1999) the effect of an increased number of board meetings is twofold. On the one hand they cause more control of the management, on the other hand they have a positive effect on the firm's operational business.

INCENTIVES

Directors can only add value to the board, if they are committed to their mandate and this dedication can be influenced by appropriate incentives which comprise amongst others reputation and also monetary stimuli. Yermack (2004) investigates several possible incentives for outside directors and finds clear evidence that reputation as well as monetary compensation constitute strong incentives for outside director activity.

The commitment of a director to his monitoring function and also to a specific mandate could be measured by the number of other directorships directors hold. The managerial labor market provides incentives to directors to gain reputation as an expert monitor (Fama 1980; Fama/Jensen 1983). This theoretical hypothesis has been tested by a number of recent empirical studies and results differ. In their event study Harris/Shimizu (2004) find that overboarded directors, defined as directors with more than five other directorships, do not miss more board meetings than not overboarded directors and that firms with more overboarded directors tend to perform better. In contrast the results of Fich/Shivdasani (2006) show, that firms with a majority of busy outside directors, directors who hold three or more directorships, on the board perform significantly worse in terms of market-to-book ratio and in terms of operating performance. Perry/Payer (2005) find a more differentiated and subtle result. If an outside director with prior directorships is added to the board and comes from a firm with high potential agency problems, proxied by board independence and executive ownership, investor reaction is negative. If, however, the sender-firm's agency problems are low, the investor reaction is positive. The authors argue that under the first circumstances the director has a high marginal value of time and that the acceptance of the additional directorship can be interpreted as a form of perquisite consumption. Under the second condition the benefit from networking opportunities, learning or the signaling of managerial quality outweighs the costs of time consumption for an additional directorship.

The commitment of a director to his mandate could also be measured by his attendance at board meetings. Adams and Ferreira (2008) show in their empirical study, that directors can be motivated to attend board meetings with even relatively small incentives. They show for US firms, that on average roughly 1.000 USD meeting fee increase the director's board attendance significantly. This result argues against the standpoint that outside director remuneration is too small compared with overall director income or wealth that they can provide no real stimulus for directors.

Adams/Ferreira (2008) is one study out of a small but growing body of analyses which seek to examine effects of outside director remuneration on performance. Cordeiro et al. (2000) examined a positive relationship between outside director remuneration and earnings per shares growth and Lee et al. (2008) find that differences in director remuneration provide incentives which affect firm performance. Moreover they show that remuneration differences are sensitive to the governance environment of a corporation.

Germany law on supervisory board remuneration differs from rules in the US as it prohibits the inclusion of stock based components. This regulation influences the nature of feasible monetary incentives for outside directors and induces the question whether monetary stimuli are effective at all?

4. Research design and hypotheses

4.1 Empirical Model

Based on the theoretical considerations and previous literature outlined in Section 3 we set up our empirical model. The model is constructed in order to measure effects of intensity and quality of governance mechanisms in general and of the supervisory board in particular on corporate performance. Thus the general model structure is as follows:

$$\text{Corporate Performance} = f [\text{Supervisory Board Characteristics, Controls (Governance, Management, Company)}]$$

In the following we introduce the set of employed dependent and independent variables in detail. For a brief overview please consider Table 3.

SURROGATES FOR PERFORMANCE

Corporate performance as well as the goodness or excellence of specific governance mechanisms are qualitative constructs and cannot easily be represented in one single, distinct variable. Therefore we have to find surrogates to quantify both sides of the structural regression equation.

There is a broad variety of potential measures that could be considered as representative for specific aspects of overall corporate performance: E.g. company growth in terms of employees, capital or revenue; company market valuation; the strength to sustain economic crisis; cash flow figures; various kinds of earnings based ratios like earnings per share, return on equity, return on assets; absolute earnings or relative ones in comparison to a certain peer group etc.. Furthermore the measurement of performance crucially depends on the time frame one is looking at. Short- and long-term success can differ at a large scale. Purely focusing on past achievements of a firm differs heavily from incorporating the future prospects of a company.

Taking a general perspective, one can define corporate performance as the consolidated sum of all (immediate or delayed) welfare affecting outcomes of corporate activity for every stakeholders of a company. Anyhow, no existing measure completely captures all welfare-affecting effects of corporate activity. A more functional but by far tighter perspective is that corporate performance can be seen as the return shareholders receive on their investment.

While the first measure cannot be obtained in a real setting, the latter one leaves many aspects of performance out of consideration.

This brief analysis already points out, that all given measures have shortcomings thus failing to depict corporate performance in terms of the above mentioned general understanding. For our study we decided to use two surrogates to capture corporate success: Return-on-Assets (ROA) and Tobin's Q. The first is a mainly backward looking, accounting based measure which might be as well biased by earnings management. Nevertheless it represents success in the form of a monetary based figure which is often used to determine claims of a variety of company stakeholders – among these are the management and employees as bonuses are frequently tied to it and shareholders as dividends are commonly set in reaction to annual earnings. The latter measure additionally incorporates market based performance aspects which especially account for the expected future development of a company. However, the underlying mechanism of incorporation of those aspects is rather noisy as it for example interferes with market trends or improperly specified expectations of market participants due to information asymmetries. It also focused on aspects of company performance which mainly benefit shareholders.

The approach to use more than one performance measure might yield systematically different result, which would at best allow for interpretation and further insights in the underlying dynamics.

SURROGATES FOR SUPERVISORY BOARD ACTIVITY

In order to obtain performance effects of beneficial supervisory board activity we need to find board characteristics which capture certain aspects of beneficial activities. Prior research introduced the term of board quality and considers high quality boards to positively affect the company. In the early 1990s researchers and practitioners brought forward specific characteristics which reflect this quality. According to Lipton/Lorsch (1992) and Jensen (1993) important aspects to assess the quality of a board are its size and structure as well as the independence and diligence of its members. Subsequent research supplemented this list by adding the aspects of board member expertise and busyness.

Starting from this point we have to adapt that classification to the specifics of the German governance regime. First of all, independence is a completely different issue compared to the situation in one-tier systems. Supervisory board directors all have to be non-executives of that very same company by definition; moreover the fact that former CEOs might be board chairman should not make them puppets of the present management board. We thus argue that

independence is only a minor issue in the German setting and therefore do not include specific variables to address this aspect. Unless not considering independence, we pay attention to the other aspects brought up by previous literature and listed above. We additionally include variables which explicitly point on aspects of compensation incentives for supervisory board members. In summary, we classify supervisory board characteristics in these four categories structure, diligence, expertise and incentives.

Variables addressing structural aspects comprise a variable for board size (MEMB) as well as two binary variables which indicate the existence of an audit committee (AC) and a compensation committee (CC). To proxy for the expertise of board members, we include BANK which measures the presence of bank representatives on the board.⁴ Besides acting on behalf of the bank, bankers are also expected to possess financial expertise. Furthermore we include the variable MAND which is calculated as average number of other supervisory board mandates per board member⁵ and expect this variable to proxy for the overall busyness as well as experience and consequently expertise of the board members on a distinct board. The diligence of board members in terms of time invested into the mandate is supposed to be roughly approximated by the number of meetings in a respective fiscal year (MEET). Finally we seek to assess whether monetary incentives for supervisory board members have an effect on performance. Our model design accounts for this by introducing two compensation variables into the model: the fraction of variable to total compensation (Supervisory Board Compensation Ratio: SBCRatio) and the average compensation of board members (Supervisory Board Compensation Average: SBCAvg).

CONTROLS

As supervisory board characteristics can at best explain a part of the overall company performance our model incorporates variables which control for other aspects which might influence corporate performance.

The first group of controls accounts for company characteristics. We do not include a variable which purely accounts for company size as both dependent variables are size adjusted ratios, i.e. they are calculated by including a measure of company size. Yet we include the natural logarithm of the total number of a company's subsidiaries (LnSUB) assuming that this variable can absorb potential effects of complexity on performance beyond corporate size. Ac-

⁴ In sensitivity analyses we also run estimations including the absolute number of bank representatives. This variable however turned out to be size related as if at all only larger boards turned out to have more than one rank fellow. Moreover we don't expect a linear relation with performance when including more bank delegates.

⁵ Mandates as non-executive director in boards of directors are treated as supervisory board mandate. The measure is the average number of mandates for all directors and includes mandates of workforce representatives.

accounting based leverage (LEV) is included as basic control for effects of corporate financing and capital structure on performance. Industry dummies, which are in accordance to the German stock exchange classification, complete the set of company control variables.

The second group of controls consists of variables which reflect managerial (especially CEO) incentives and experience which might as well affect company performance. CEOTenure might have an effect on performance as a CEO with comparatively long tenure has proved to be successful and has had time to modulate the company according to his own vision which could reflect in performance. The binary variable CEOChange indicates the replacement of an old CEO by a new one. This proxy is implemented as we particularly want to check for the effects of a potential “Big-Bath-Accounting” a new CEO has taken over control. Finally we include a measure to control for potentially performance affecting managerial compensation incentives (MCRatio); the variable is calculated as the ratio of variable to total annual management compensation.

Variables	Explanation
ROA	Return on Assets (Operative Income / Assets)
Tobin's Q	(Market value of equity + book value of liabilities) / book value of total assets
LnSUB	Natural logarithm of the number of overall subsidiaries
LEV	Liabilities divided by total assets
CEOTenure	Tenure of the present CEO (in full years)
CEOChange	Binary variable; 1 if CEO has changed in the corresponding fiscal year
MCRatio	Sum of variable management compensation / sum of total management compensation
MEMB	Number of members on the supervisory board
MEET	Number of supervisory board meetings in the fiscal year
MAND	Average number of other mandates of supervisory board members
SBCRatio	Total variable supervisory board compensation / Total supervisory board compensation
SBCAvg	Average compensation per supervisory board member
BANK	Binary variable; 1 if at least one bank representative is on the supervisory board
AC	Binary variable; 1 if supervisory board has set up an audit committee
CC	Binary variable; 1 if supervisory board has set up a compensation committee

Table 3: Variable Descriptions

4.2 Hypotheses

The subsequently introduced hypotheses are based on the assumption, that characteristics of the supervisory board could have an effect on firm performance in terms of market or accounting based measures. Settling on the arguments presented by Hermalin/Weisbach (2003)

we presume the following economic reasoning by which supervisory board features may affect corporate performance. Without doubt, company performance is affected by the actions of the executive management. Its actions are in turn affected by the work of the supervisory board which is set up to advise and supervise the management directors. As we can hardly capture these actions by quantifiable variables within a cross sectional data set, we have to employ feasible surrogates for them. Board characteristics are such surrogates.

BOARD COMPENSATION

The work of supervisory board members is likely to be influenced by provided incentives which can be either monetary or nonmonetary. One could argue that nonmonetary incentives like reputation should be the more important category as monetary incentives are rather small compared to the overall income of average supervisory board members. Nevertheless, Cordeiro et al. (2000) examine the relevance of monetary incentives and the results provide first glimpses on the existence of an impact that outside director compensation might have on performance. Supplementary, Yermack (2004) finds that both reputation and remuneration of outside directors can be supposed to constitute remarkable incentives for directors. Recent studies further emphasize that characteristics of monetary incentives are governance characteristics and seem to affect corporate performance. Lee et al. (2008) find evidence that compensation differences among outside directors vary together with other governance mechanisms and contribute to explaining differences in corporate performance.

Adams/Ferreira (2008) examine board meeting attendance fees and find that these have a significantly positive effect on the participation ratio of directors. This is noteworthy as attendance fees are at a particularly low level, roughly averaging 1.000 \$ per meeting and director. In order to explain this finding Adams/Ferreira (2008) argue that attendance fees do not only and primarily serve as monetary incentive. Instead they could also function as a signal which is clearly perceived by outside directors indicating that attendance is expected and a natural part of supervisory board culture and work ethics. Not acting in accordance with established and “signaled” board culture might result in adverse effects on a respective directors’ reputation. This suggested close link between outside directors’ monetary incentive structure and reputation adds a new perspective in order to explain the functioning of respective stimuli.

With a median value of 47,000 Euro per year mean supervisory board member compensation in Germany can arguably also be considered small in comparison with overall director income or wealth. Additionally the components of supervisory board compensation differ from those allowed in other legal environments as stock based elements are prohibited. This regulation

alters the nature of monetary incentives for German directors and directly raises the question whether monetary stimuli can still induce favorable director activity as recent studies with US data suggest.

For the purpose of our analysis the mentioned previous results jointly indicate at least that even small monetary incentives for board members could have an effect on directors' behavior and that properly set monetary incentives do affect director activity and thereby corporate performance. Despite the differences in regulatory environment we still expect these incentives to affect board member actions which in turn should reflect in corporate performance. We try to separately capture the effects of amount and structure of monetary incentives by using two variables: The average total compensation per board member and the ratio of variable to total compensation. Concerning these variables we hypothesize:

H1: Higher average compensation and a higher fraction of variable to total compensation have a positive effect on firm performance.

BOARD STRUCTURE

Activities of the supervisory board are also affected by other factors which influence the style and efficiency of its work, especially by those factors which may interfere with the ability of certain board members or the board as a whole to perform its duties properly. As already mentioned in sections 2 and 3.1 there are several tasks which the supervisory board has to cope with. The complexity and constant process of change within companies even additionally raise the bar for board members. Thus the structure of a board, which can partly be determined by the board itself, can play an important role in either helping or handicapping the supervisory board and its members in fulfilling their duties.

One structural factor that remains in the discretion of each board is the establishment of committees that are responsible for working on specific issues for instance by preparing and bringing up proposals concerning certain decision problems the supervisory board faces. Besides, committees offer board members an opportunity to qualify themselves as experts for certain issues such as auditing or compensation. Beyond that, committee membership frequently is compensated and each committee has its own chairman – a position which might qualify its possessor for further future responsibilities. Taken together, this implies that reputational incentives arise by setting up committees. This may in turn attract high quality board members and provides additional stimuli to current directors to exercise their mandate properly.

Although the German Corporate Governance Code recommends the establishment of appropriate committees, boards can easily decide not to set them up without facing direct consequences.⁶ We thus presume this decision not to be accidental but intentional or even strategic and hence expect boards which structure themselves by introducing certain committees, given all else remains equal, to be better capable to act in favor of the company's success.

A second aspect of board structure is its size. Supervisory boards include representatives of major company stakeholders. They are also supposed to comprise directors which are able to execute the various roles and challenging responsibilities it is confronted with. Too few members on the board might come along with the problem of underrepresentation of important interests, standpoints and perspectives. Too small boards are also more likely to lack the expertise and experience needed for a certain task or situation. However, prior literature refers to problems which are associated with oversized boards and even provides evidence for adverse effects on corporate performance. (Cf., e.g., Yermack (1996)) Too many experienced, expert directors who represent too many different interests and opinions in a process which evolves towards a rather democratic decision finding may significantly hamper board efficiency and thereby corporate success.

Anyway, we don't believe this reasoning to hold true in the German setting. First, management's daily business and decision making processes should not be affected by the number of directors on the supervisory board as it is separated from the management board. Second and even more striking is the fact that board size is to a large extent prescribed by law as the minimum number of directors closely depends on the size of the company. Our data suggests that empirically the prescribed minimum board size is not exceeded⁷ which implies that the number of supervisory board directors in a certain company is not the result of optimization considerations but a merely regulatory prescription which has to be followed. We therefore don't expect this aspect to show a significant impact on corporate performance.

Consequently we hypothesize the following for aspects of board structure:

H2: The existence of board committees positively affects corporate performance whereas board size does not at all.

⁶ Our data shows that a considerable number of companies do not have audit committees and even more don't have compensation committees; the variation in these variables implies that they could potentially carry explanatory power and the correlation between which is far away from being perfect indicates that they do not explain the very same phenomenon.

⁷ Another observation which underlines this is that companies who recently changed their legal form from the German AG into the European SE (e.g., BASF, Fresenius) almost immediately decreased the number of directors from 20 to 12 which is the minimum required for SEs by European law.

BOARD DILIGENCE

The eagerness and effort, the preciseness and scrupulousness, the accuracy and carefulness with which single directors and the board as a whole execute their task all can be considered to contributing to and being aspects of the term diligence. From this perspective it seems appealing to expect an impact of diligence on supervisory board activities and thereby on corporate performance. Amongst others, diligence could affect board activities and performance on these ways: First, diligent directors should be able to better consult the management and to more accurately interfere with management decisions. Second, diligent board member work can also serve as a signal towards management conveying the information that neglectful or self-serving work as well as fraud will most likely be detected by the supervisory board and lead to adverse consequences for the management.

We employ the number of board meetings as rough proxy for board diligence with respect to the time spent by directors on preparing for and sitting in board meeting, albeit we have to admit that this variable cannot fully capture the above mentioned aspects associated with the term diligence. Another caveat has to be mentioned: the number of board meeting is also partly determined by law as a minimum of two meeting per six month is mandatory. However companies frequently exceed this minimum level which indicates that meeting frequency is freely chosen by at least a considerable number of companies. Taken together, we still expect the number of board meetings to be an indicator for the involvement of the supervisory board in decisions affecting company future prospects and performance and thus hypothesize:

H3: Diligent work of the supervisory board in terms of number of meetings positively affects firm performance.

BOARD QUALIFICATION

As already mentioned supervisory boards are confronted with various different duties and responsibilities requiring directors to be able to understand the complex situation and environment a company faces. Already difficult for company internal protagonists, this becomes an even more challenging task for outside directors on a supervisory board. In assessing whether a respective board should be able to better cope with these challenges than another, one could try to infer the qualification of the board, i.e. the conjoint qualifications of all board members. Qualification again is a multidimensional concept but it arguably entails the aspects of experience and expertise.

The transmission of experience and expertise into beneficial, performance increasing influence might happen as follows: On the one hand, the influence of supervisory board members on the management depends on their ability to establish themselves within the frequent interactions with management. Moreover the influence will be more pronounced, when directors can represent opinions out of their own professional experiences and when a director represents an expert standpoint. On the other hand, given that supervisory boards possess an influence then experienced and expert boards can be supposed to have a more favorable one than inexperienced, incapable groups of directors. More experienced board members should be able to more adequately react in difficult situations as they might already have experienced a similar situation during their career. Certain professional skills of board members may also be advantageous when facing difficult circumstances and making tough decisions. Distinguished expertise in relevant areas will arguably be a part of the professional skills required to contribute beneficially in those situations.

Besides measuring whether there are financially skilled bank representatives on the board we employ the average number of further mandates directors of a specific board hold. This type of variable has received considerable attention in recent literature as researchers have discussed that it not only measures experience but also the busyness of directors. If directors are too busy they can be distracted from properly fulfilling their monitoring function although their other mandates provide them with experience. Fich/Shivdasani (2006) find evidence that more than three mandates have negative performance effects whereas Ferris et al. (2003) do not observe adverse such an adverse relationship.

While previous literature remains undecided which effect prevails, we adhere to the potential positive effects of experience and expertise on performance and hypothesize:

H4: More experienced supervisors on the boards as well as the presence of experts positively affect firm performance.

5. Data & Results

5.1 Data Set

SAMPLE

Our initial sample is based on company data of all German companies that were publicly listed in one of the four major indices of the German stock exchange (Deutsche Börse) DAX, MDAX, SDAX or TecDAX at the end of December 2007. Of these 160 companies we collected data for the years 2006 and 2007. Due to missing data and companies with headquarters not located in Germany and thus not being obliged to follow German regulation especially with respect to the governance regime we had to exclude firm years. Our final sample includes 266 firm year observations.

Currently there exists no complete database with all the information necessary for our study. Therefore our data sources are heterogeneous. Balance sheet and P&L data are from DAFNE and Hoppenstedt database. Governance data and other board characteristics were hand-collected from the companies' annual statements or the companies' homepage. Data on CEO's age and tenure was as far as not being on-hand in the companies' annual reports hand-collected from executive databases, CVs and also from press releases available on the internet.

DESCRIPTIVE STATISTICS AND CORRELATIONS

Table 4 provides descriptive statistics for both the dependent and independent variables employed in our study. Please note that we report descriptive for all variables before being transformed into the format used in the models in order to fulfill statistical prerequisites of the OLS methodology.

The average company in our sample has about 135 subsidiaries indicating that we examine rather large companies. These companies possess a mean leverage of 62 percent. Present CEOs are in office slightly less than six years albeit the standard deviation is rather high suggesting that there are many CEOs with either shorter or longer tenure. The CEO Change variable supports this as it indicates that 17 percent of the companies replace their CEO in a respective firm year of our sample. Some basic figures for supervisory board characteristics reveal that an average board entails ca. 11 members which meet between five and six times per year. Average supervisory board members hold 2.2 further board seats. 79 percent of the supervisory boards have an audit 69 percent a compensation committee in a respective firm

year. Remarkably, 57 percent of the companies have at least one banker on their supervisory board which is far beyond their blockholder activity in major German companies. (Cf. Dittmann et al. (2008))

Considering board compensation the figures show that directors earn a mean of 64,013 Euros and receive about 30 percent of their remuneration on a variable basis. Of further interest is the considerable variation in our compensation variables with compensation per member ranging from 4,374 to 431,111 Euros and variable payment components to vary between zero and 96.4 percent among supervisory board in our sample.

Variables	N	Mean	Std.dev	Median	Min	Max
ROA	288	0.055	0.077	0.045	-0.239	0.611
Tobin's Q	287	1.720	1.120	1.385	0.637	11.228
SUB	283	134.740	239.898	51	2	1,998
LEV	288	0.620	0.189	0.633	0.092	0.985
CEOTenure	283	5.900	4.760	5	0	23
CEOChange	283	0.170	0.379	0	0	1
MCRatio	274	0.516	0.184	0.541	0.000	0.880
MEMB	288	11.220	5.880	12	3	21
MEET	286	5.530	1.906	5	3	14
MAND	273	2.205	1.027	2.200	0	6
SBCRatio	269	0.315	0.301	0.322	0.000	0.964
SBCAvg	285	64,013	56,312	47,083	4,375	431,111
BANK	288	0.570	0.496	1	0	1
AC	288	0.790	0.409	1	0	1
CC	288	0.690	0.461	1	0	1

Table 4: Descriptive Statistics

Table 5 lists correlations between all employed variables. The data reveals a couple of significant correlations between the independent variables. Whereas the absolute values of several figures are in the range between 0.3 and 0.5 there are only two pair wise correlations above 0.5. Namely AC (Audit Committee) and CC (Compensation Committee) are highly but far away from perfectly positively correlated. Moreover there is a high positive correlation between the number of subs and of members on the board. This can be explained as there is a size aspect inherent in the number of subsidiaries a corporation has and size is the regulatory determinant of board member quantity. The number of board members in general shows significant correlations with many variables but none of them indicates severe multicollinearity. The supervisory board compensation variables possess only low correlation levels with other

board characteristics and are amongst each other correlated fairly below 0.5. ROA and Tobin's Q also show a significant correlation of 0.485 which indicates that there is some variation between both measures and that they are not just two sides of the same coin.

Variable	ROA	Tobin's Q	LnSUB	LEV	CEOTenure	CEOChange	MCRatio	MEMB	MEET	MAND	SBCRatio	SBCAvg	BANK	AC	CC
ROA	1	0,485 ***	-0,105	-0,526 ***	-0,062	0,201 ***	0,131 **	-0,125 **	-0,102	0,012	0,195 ***	0,122 **	-0,106	-0,216 ***	-0,099
Tobin's Q	.	1	-0,260 ***	-0,441 ***	0,106	-0,096	0,005	-0,300 ***	0,031	-0,116	-0,036	0,053	-0,216 ***	-0,269 ***	-0,123 **
LnSUB	.	.	1	0,378 ***	-0,023	0,037	0,378 ***	0,597 ***	-0,051	-0,008	0,317 ***	0,415 ***	0,357 ***	0,297 ***	0,277 ***
LEV	.	.	.	1	-0,103	0,080	0,067	0,411 ***	0,019	0,049	0,054	0,113	0,352 ***	0,227 ***	0,129 ***
CEOTenure	1	-0,487 ***	-0,038	-0,039	-0,178 ***	-0,078	-0,008	-0,092	-0,097	-0,141 **	-0,089
CEOChange	1	0,007	-0,007	0,112	-0,048	-0,055	-0,022	-0,007	0,020	0,055
MCRatio	1	0,266 ***	-0,018	0,026	0,395 ***	0,252 ***	0,271 ***	-0,002	0,140 **
MEMB	1	0,009	-0,071	-0,299 ***	0,349 ***	0,474 ***	0,472 ***	0,408 ***
MEET	1	-0,039	-0,111	0,088	-0,041	0,046	0,058
MAND	1	0,026	0,109	0,140 **	-0,037	-0,076
SBCRatio	1	0,418 ***	0,177 ***	0,190 ***	0,220 ***
SBCAvg	1	0,175 ***	0,217 ***	0,192 ***
BANK	1	0,274 ***	0,174 ***
AC	1	0,523 ***
CC	1

Table 5: Correlation Matrix

5.2 Results of multivariate regressions

Table 6 contains OLS regression results with ROA as dependent variable and table 7 shows the same for Tobin's Q. Both tables comprise estimation results of model specifications with and without including industry dummies. Although there are some slight differences among the results for ROA and Tobin's Q, the main findings persist irrespective of the employed performance measure. The goodness of fit of all models is at a considerably high level compared with prior research. The ROA model is capable to explain 38 percent of the dependent variable's variation without including industry dummies respectively 45 percent after including them. Adjusted R² for the Tobin's Q models is lower but still at 0.248 and 0.230.

Independent Variables	Dependent Variable			
	ROA			
LnSUB	-0,101		0,014	
LEV	-0,550	***	-0,698	***
CEOTenure	0,112	*	0,050	
CEOChange	0,051		0,002	
MCRatio	0,162	***	0,055	
MEMB	0,112		0,201	**
MEET	-0,096	*	-0,096	
MAND	0,017		-0,064	
SBCRatio	0,062		0,037	
SBCAvg	0,175	***	0,177	***
BANK	0,031		-0,120	*
AC	-0,108	*	-0,128	*
CC	-0,031		0,056	

Industries		Included
Adj R ²	0,382	0,465
Obs	240	240

Table 6: Regression results ROA

Considering the set of control variables our analysis yields the following results which are relatively stable across our model specifications: There seems to be no significant effect of company complexity in terms of number of subsidiaries on corporate performance. We also do not find significant evidence for a systematic influence of the change of a CEO on corporate performance. This speaks against the existence of Big-Bath accounting practices in Germany at least among our sample firms and in the sample period. Only very vague support can be found for the structure of executive compensation and for an influence of the CEO tenure (and thus experience in the company)⁸ on performance. There is however a very strong relationship between the leverage of a company and its performance. Highly leveraged corporations show both a lower market based as well as accounting based corporate performance. This finding might be explained by the fact that too high leverage is often a sign for adverse

⁸ We also tried the CEO age as a control variable for overall experience and found no influence either. Both variables are highly correlated and we decided to include tenure as it seems to better capture experience in a respective company.

economic circumstances which are usually followed by lower accounting profits and market valuation. Only some of the controls for industry specific effects turn out to be significant: Media (ROA and Tobin's Q), Banking, Chemical, Financial and Technology (all for ROA only) seem to be the industries with significantly different performance patterns, while other industries do not seem to be characterized by systematic effects.

Independent Variables	Dependent Variable			
	Tobin's Q			
LnSUB	-0,104		-0,093	
LEV	-0,329	***	-0,330	***
CEOTenure	0,028		0,031	
CEOChange	-0,042		-0,047	
MCRatio	0,063		0,008	
MEMB	-0,095		-0,036	
MEET	0,001		0,012	
MAND	-0,019	**	-0,113	*
SBCRatio	-0,032		-0,043	
SBCAvg	0,239	***	0,273	***
BANK	-0,030		-0,044	
AC	-0,157	**	-0,175	**
CC	0,028		0,004	

Industries		Included
Adj R ²	0,248	0,230
Obs	239	239

Table 7: Regression results Tobin's Q

BOARD COMPENSATION

Supervisory board compensation incentives were hypothesized to have a positive effect on performance. While the structure of remuneration seems to have no statistically significant interrelation with performance the average compensation level per director turns out to heavily and consistently affect corporate performance. Companies which pay their supervisory board directors higher average salaries seem to be more successful. Based on the presented reasoning in sections 4.2 and 3.1, we argue that the provided monetary incentives are not too

small to be answered by higher quality of the board's work which translates into favorable influence on corporate activity and performance with the director compensation level serving as signal well-perceived by directors.

One might argue that the statistical relation holds true but with causality the other way around: Successful companies pay their supervisory board directors more as they can afford and also as the overall compensation rises with increasing variable components due to high profitability. We disagree for at least two reasons: First, profitable companies are not necessarily big ones which can easily afford to pay a higher average salary to supervisory board directors. Moreover, given the data compensation still is at a low level and can thus be afforded not only by profitable companies. Second, our data provides clear evidence that the interrelation between average compensation and performance is not caused by the amount of variable compensation in case of high corporate profitability – the fraction of variable to total supervisory board compensation (SBCRatio) shows no significant effect and has even a negative interrelation in the Tobin's Q model specification.

We thus argue that the supervisory board compensation level is a characteristic that has developed over time and represents the willingness of a company to incentivize and compensate high quality board work in order to positively affect its overall performance. Thus, our results support the first part of H1.

BOARD STRUCTURE

With respect to board structure our analysis yields on the one hand that board size does not seem to systematically affect corporate performance as the corresponding estimators turn out to be significantly positive only once at the five percent level within the ROA regression including industries. The association with Tobin's Q is negative albeit insignificant. Differing from findings of studies in other Governance regimes this result is in line with our expectation formulated in H2 which was based on the strict regulation of board size in Germany.

On the other hand we find surprising results for the impact of board committees. Compensation committees do not seem to be systematically interfering with performance while the existence of an audit committee is negatively associated with both, Tobin's Q and ROA. The corresponding estimators may only be significant at the five or ten percent level but they consistently turn out to have a statistical influence across all model specifications. Interestingly our finding for the German market in the years 2006 and 2007 to some extent corresponds to recent findings in the American context. Brown/Caylor (2009) analyze correlations between different measures of performance and 51 aspects of good corporate governance using a data

set from 2002 resp. 2003. In a former working paper version (Brown/Caylor (2004)) they also report negative statistical associations between firm operative performance and aspects which are said to represent good governance in terms of auditing.

One explanation particularly for our result can be derived from reasoning presented in section 3.1. Assuming that supervisory board activity amongst others limits the risk exposure of a company one can expect that intensely supervised companies incur lower losses in adverse economic periods but also lower profits in boom periods. 2006 and 2007 have been such years of prosperity for German stock companies. Given the existence of an audit committee is a proxy for thorough supervision our results might reflect the performance effects of limited risk during the recent boom. If this holds true we should find the opposite, i.e. a positive performance effect of audit committees, for recession years.

Taken together we do only find support for the second part of H2 and have to reject the first part, finding evidence for the opposite impact of board committees on corporate performance.

BOARD DILIGENCE

In our hypotheses development we considered higher diligence of the supervisory board to positively affect performance. Our results however show only a slightly significant negative impact on ROA in the specification without industries and a faint insignificant positive relation with Tobin's Q. These findings cannot support H3 and additionally there is no substantial evidence for an effect of board diligence on performance at least in our sample. This result does not unanimously suggest that diligence does not affect performance at all. It could also be due to the employed independent variable which may not be a perfect proxy for diligence. A few meetings more than minimally required by law can be representative for diligent, performance increasing board activity but in contrast to that a very high number of meetings rather occur when economic circumstances are difficult or when the company is in financial distress – both situations are likely to be associated with bad corporate performance.

BOARD QUALIFICATION

Our results for the impact of board expertise on corporate performance are ambiguous. The average amount of board mandates does not significantly affect the ROA of companies in our sample but it is significantly negatively related to their Tobin's Q. This suggests that a company whose board consists of busy directors that on average serve on many other boards suffer an adverse effect on their market based performance while it does interfere with the balance sheet figures based performance. At a first glance this finding is in contrast to the reason-

ing of beneficial performance effects by enhanced director experience and expertise outlined in sections 3.1 and 4.2. Being more cautious in interpreting this result, we argue that it rather provides evidence for the existence of adverse performance effects by too busy outside directors which outweigh the positive effects of increased experience at least in the perception of stock market participants. However we do not want to push the interpretation of these results too far especially in the light of the analysis by Perry/Peyer (2005) which draws a light on the complex and subtle nature of interactions between board mandates and corporate performance in the US setting. Amongst others this relation can be subject to the extent of agency conflicts or specifics of the companies in which a director attends a board – most of these aspects are not easily accessible data for German companies.

The second facet for board qualification in our study is the presence of bank representatives in a supervisory board. In three of four model specifications the respective estimator indicates a negative association but only in one of them it turns out to be significant at the ten percent level (ROA with industries included). Although being not overwhelmingly solid, these findings still support the results of a recent study by Dittmann et al. (2008), which examine a disadvantageous influence of bankers in German supervisory boards on corporate success.

Taken together our findings do not support H4 and even partly provide evidence for a negative effect of the employed measures of expertise and experience on corporate performance.

6. Conclusion

This study is one of the first attempts to analyze interactions between corporate boards and performance in Germany empirically. Our results reveal that there are significant interdependencies. The average supervisory board director compensation is consistently interrelated with market as well as accounting based performance measures. This supports the idea that compensation can function as a signal towards outside directors stimulating intense and proper work in and outside the boardroom. Moreover we find busy directors and the presence of bank representatives to have a negative impact on corporate performance – results which support recent findings. Interestingly the existence of an audit committee shows to be negatively related to corporate performance. Assuming that this variable is an explicit indicator for supervision by the supervisory board, this might be explained as follows: Enhanced control limits the risk position of a company and narrows the room of maneuver for the management. This can lead to comparatively lower corporate performance in boom periods like 2006 and 2007 but should also be associated with superior performance in economic downturns. Future research with panel data over the course of economic cycles may deepen our understanding of these processes. But our results also suggest that findings of studies within one-tier systems cannot be assumed to automatically hold within the two-tier regime. This aspect is especially documented in our results for board size and meetings as both do not turn out to be significantly related with performance.

Besides yielding empirical results we also wanted to establish a theoretical frame which furthers the understanding of transmission mechanisms between board characteristics and corporate performance and allows for better interpretation empirically obtained findings. In order to do so we adopted the theoretical reasoning provided by Hermalin/ Weisbach (2003) on the specifics of the two tier system. Thereupon we developed a classification of supervisory board activities which may directly or indirectly affect corporate performance and brought up economic reasoning to backup these effects as well as examples which cast light on a couple of detailed ways of transmission. The main goal of this part of the study is to enrich and contribute to the discussion on causality between governance instruments and performance. We might as well be able to add a new perspective as our explanations focuses on the role and responsibilities of the supervisory board.

Taken together this paper might be a starting point for research on the impact of governance mechanisms on performance in Germany. We are convinced that further studies in this field of research can bring up interesting insights and findings which supplement the governance research carried out in one-tier environments.

Of course this study is subject to some caveats. First of all we do not have panel data which would allow for further analyses to for example work on the issue of endogeneity with distinguished statistical means. The German capital market is rather small and so is our sample. But these issues can be resolved by future research which should be able to settle on a wider sample which covers a longer period. We also have to admit that some of the employed variables may not always perfectly capture the aspects of supervisory boards we theoretically wanted to measure. Future studies should be able to obtain additional variables and also further controls as scientific databases are likely to start gathering and providing newly accessible German data.

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