Hard or Soft Regulation of Corporate Governance?[☆]

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Abstract

We examine whether soft regulation with standardized reporting following the comply-or-explain principle dominates hard regulation of corporate governance practices. Using the example of the German Corporate Governance Code we study (i) whether firms benefit from code compliance and (ii) which firms voluntarily comply with the code. Analyzing a novel, hand-collected panel dataset, we find that while widely-held firms benefit from high compliance, high levels of compliance jeopardize firm performance in dominated firms. In a second step, we show that firm-specific agency costs increase the compliance level, indicating that managers voluntarily use code compliance as a substitute for other governance devices.

Key words: Regulation, Corporate Governance, Codes of Good Governance, German Corporate Governance Code,

JEL classification: G1, G3, L1, K2

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Abstract: We examine whether soft regulation with standardized reporting following the comply-or-explain principle dominates hard regulation of corporate governance practices. Using the example of the German Corporate Governance Code we study (i) whether firms benefit from code compliance and (ii) which firms voluntarily comply with the code. Analyzing a novel, hand-collected panel dataset, we find that while widely-held firms benefit from high compliance, high levels of compliance jeopardize firm performance in dominated firms. In a second step, we show that firm-specific agency costs increase the compliance level, indicating that managers voluntarily use code compliance as a substitute for other governance devices.

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1. Introduction

It is generally claimed that corporate governance mechanisms are established to assure shareholders of their return on investment (Shleifer and Vishny, 1997). However, the well-known corporate scandals in the 1990s of the last century have produced serious concerns about whether the corporate governance environment of firms is sufficiently transparent and dispersed shareholders have the information and power necessary to establish good governance mechanisms. In response to these concerns, several codes of good governance have been established around the world (Aguilera and Cuervo-Cazurra, 2004). These codes generally aim to provide best-practice recommendations to strengthen shareholder rights and to increase transparency standards.

Thereby, codes of good governance often adopt the *comply-or-explain principle*. In such a setting, firms can choose for each rule of the code whether they voluntary adopt the rule or not. In the latter case, however, they have to explain why they do not follow the code. Thus, the comply-or-explain principle provides a flexible framework that allows firms to choose individual governance structures that – by the issuance of a *declaration of conformity* (DoC) – become transparent to all investors.[1]

Now, from a regulatory perspective, a central question arises: Does such a soft regulation approach actually dominate the standard hard regulation approach from a welfare perspective? Thereby, hard regulation refers to compulsory instructions, for example laws, while voluntary guidelines like codes of good governance are classified as soft regulation. To answer this question, this paper poses two sub-questions that can be tested empirically: (1) Are firms rewarded for code compliance by higher stock market valuations? and (2) Which firms do actually comply with codes of good governance, namely what are the determinants of code compliance?

We examine these two questions for the example of the German Corporate Governance Code (GCGC). Therefore, we use a novel and hand-collected panel dataset covering all non-financial German Prime Standard firms from 2002 to 2007. We opt for the example of the GCGC for three reasons. First, the GCGC provides an interesting setting for researchers, since German law requires firms to issue an annual compliance statement or, more precisely, a *Declarations of Conformity (DoC)*, which (assuming that firms comply with the law) allows researchers to examine unbiased samples. Second, the German corporate governance system is typically considered to be particularly weak (for example Kaserer and Wenger, 1998). This makes governance studies of German firms particularly interesting, since codes of good governance might be of first-order importance in such an environment.

[1] A DoC is a written report issued by the firm stating which rules of the corresponding code the firm actually adopts and which not (and why so). For German firms, §161 of the Stock Corporate Act (Aktiengesetz) obligates all listed German companies to issue a DoC at least once a year and to ensure that investors can permanently access the firm's declarations.

Finally, Germany represents one of the world's largest economies in terms of GDP (World Bank, 2008).

Codes of good governance increase transparency and – as a consequence – put managers under external pressure to establish governance structures that allow them to comply with the code. However, compliance with codes comes at a cost: First, there are direct costs of implementing the necessary processes and regulations within the firm. Second, there are indirect costs of increased transparency (for example, less room discretionary decisions of managers or restricted entrepreneurial freedom).

Accordingly, managers face a trade-off when deciding about whether or not to comply with the code. Thus, we bring forward two competing hypotheses to explain compliance behaviour, namely, the *substitution hypothesis* and the *complementary hypothesis*. The substitution hypothesis argues that code compliance is only beneficial for shareholders if firm-specific agency costs are high. Hence, managers of firms with high agency costs due to weak governance structures will opt for code compliance in order to mitigate agency costs. From this perspective, code compliance serves as a substitute for strong governance structures such as concentrated shareholdings, and soft regulation dominates hard regulation of corporate governance. The opposite is true under the complementary hypothesis, which states that compliance is always beneficial for shareholders, namely benefits always outweigh its costs. However, managers are reluctant to comply with codes of good governance as their "freedom" declines. Hence, this hypothesis raises the question of enforcement and claims that strong external shareholders are necessary to enforce code compliance.

Analysing two measures of compliance behaviour, we find strong support for the substitution hypothesis: On average, the capital market does not reward firms for code compliance. However, when we differentiate between firms according to their ownership structure, we find that widely held firms are rewarded for code compliance by a higher market-to-book multiple and a higher Tobin's Q. In contrast, high compliance in firms with large external blockholders leads to a discount. To address the potential problem of endogeneity, our base-case regressions apply an adjusted Granger causality setting and further use an instrumental variable approach, firm-fixed effects and dynamic panel methods as robustness tests. However, the results remain largely unchanged under these alternative test settings, indicating that the results are not biased by endogeneity in general or reverse causality in particular. analysis of which firms actually show high levels of code compliance reveals that firms with high agency costs comply more. Specifically, while firm size, cash holdings, intangible assets and board structures are positively correlated with compliance, inside ownership and external blockholders have the opposite effect. Hence, external blockholders do not lead to higher compliance, as predicted by the complementary hypothesis. In contrast, firms'

external blockholders seem to function as a substitute for high code compliance. These results remain valid even after controlling for founder involvement, industry competition, media coverage or firm opaqueness.

Overall, our findings suggest that a firm's governance structure is crucial when investors judge its compliance behaviour. While some firms benefit from higher compliance, others do not. This also has important consequences for regulators. *First*, the results suggest that soft regulation can work well, as firms with higher agency costs are more likely to comply with the code, even without powerful outside shareholders. *Second*, hard regulation of corporate governance has some serious drawbacks, since we find that high compliance jeopardises firm performance in well-governed firms. This result is in line with the findings of Bruno and Claessens (2010) indicating that stringent regulation environments can hinder the performance of well-governed firms. Consequently, we argue that soft regulation of corporate governance dominates hard regulation from a welfare perspective. Thus, our analysis provides a strong case against hard and for soft regulation of governance structures.

We contribute to the existing literature in several ways. *First*, we put forward two competing hypotheses to explain compliance behaviour with codes of good governance. *Second*, we provide a thorough analysis of compliance behaviour based on a novel, hand-collected panel dataset covering (basically the largest) 364 non-financial listed German firms from 2002 to 2007.[2] For the corresponding 1,619 firm-year observations, we collected compliance data but also data on ownership structures, board structures, founder involvement and industry competition. This comprehensive dataset allows us to examine which firms actually comply with codes of good governance and if their governance structure plays a role in this context. *Third*, we contribute to the on-going discussion about the effect of codes of good governance on firm performance. Aguilera and Cuervo-Cazurra (2009) for instance argue that "*a key puzzle that needs to be resolved in research on codes of good governance is whether they have an impact on firm performance.*"[3]. Using market valuations during the 2000 to 2008 period, which covers bull and bear phases of the stock market, we argue that our results are robust to different market phases.

The remainder of the paper is divided into five sections. Section 2 introduces the German corporate governance code. Section 3 develops our key hypotheses. Section 4 describes our data. Section 5 introduces our empirical methodology and presents our empirical results, which are then discussed and concluded in Section 6.

[2] Inspired by Drobetz et al. (2003), there have been several studies examining performance implications of code compliance in Germany. However, most of these studies rely on cross-sectional evidence. For an overview, we refer the reader to Bassen et al. (2006) and Bassen et al. (2008).

[3] Aguilera and Cuervo-Cazurra (2009), p. 384.

2. Codes of Good Governance and the German Corporate Governance Code

2.1. Codes of Good Governance

Becht et al. (2005) discuss six reasons for the increasing public interest in corporate governance regulation: (1) the world-wide wave of privatization over the past two decades, (2) pension fund reform and the growth of private savings, (3) the takeover wave of the 1980s, (4) deregulation and the integration of capital markets, (5) the 1998 East Asia crisis that shed light on governance structures in emerging markets and (6) corporate scandals in the U.S. and Europe.

An early European example for the regulation of corporate governance is the UK. There, the failures of Coloroll and Polly Peck led to the establishment of the Committee on Financial Aspects of Corporate Governance in May 1991. The committee was chaired by Sir Adrian Cadbury, the former CEO of the Cadbury Group. The committee published its first report in 1992 with the aim to enhance corporate accountability and confidence in financial reports (Mallin, 2006; Monks and Minow, 2004). At its core, the report called for independent directors, the separation of supervision and management and the establishment of board committees (Charkham and Simpson, 1999).

The series of highly publicised corporate scandals towards the end of the last century also triggered the issuance of a series of codes of good governance. Aguilera and Cuervo-Cazurra (2004), for instance, document an increase of governance codes from one code in 1978 issued by the U.S. to 194 distinct codes of good governance issued by 64 countries in 2008. By now, most countries have introduced governance codes. However, these codes differ along several dimensions. For example, firms that do not comply with (some elements of) the code do not always have to explain their non-compliance. Furthermore, the issuers of the codes differ substantially (for example the government or the stock exchange). Another aspect of governance codes that should be mentioned is that they are not static, but change significantly over time. However, a detailed description of all governance codes is beyond the scope of this paper. Excellent overviews on worldwide governance codes are, for example, provided by Aguilera and Cuervo-Cazurra (2004, 2009) and Zattoni and Cuomo (2008).

2.2. The German Corporate Governance Code

In Germany, the pressure to introduce a code of good governance also mounted after well-known corporate scandals such as WorldCom, Enron and Parmalat. The regulator set up several commissions to underscore its support for such an initiative. In May 2000, the German chancellor Gerhard Schröder appointed the first committee

under the chairmanship of Theodor Baums. The *Baums Commission*, as it is commonly referred to, focused on renewing German corporate law and suggested the installation of a follow-up committee in charge of drafting a German code of good governance. This follow-up commission was appointed by the German Federal Minister of Justice Hertha Däubler-Gmelin in September 2001 and is still active today. Initially, the commission was chaired by Gerhard Cromme who was the chairman of ThyssenKrupp AG at that time and now acts as the chairman of Siemens AG (Cromme, 2005).[4] It is made up of company representatives, representatives of the auditing commission, union representatives and academics in order to cover a broad range of interests (Nowak et al., 2006).

In December 2001 shortly after the formation of the Cromme commission (named after its former chairman), the first draft of the code was published. The final draft of the first version was issued on February 26, 2002. Then, in July 2002, the code received its legal basis through a modification of the German Stock Corporation Act (*Aktiengesetz - AktG*). The act (amended by the Transparency and Disclosure Law altering §161 AktG) required (and still requires) firms to publish annual declarations of conformity with the code.[5] Since then, the German Corporate Governance Commissions has met on a regular basis (at least once a year) to review the code and discuss possible adaptations. In fact, the commission seems to be quite active: In June 2009, they issued the ninth version of the code.

Throughout all versions, the GCGC addresses general aspects of corporate governance as well as country-specific peculiarities.[6] More specifically, it was the commission's goal to provide solutions for five issues that are criticised by international capital market participants (Cromme, 2001; Steinat, 2005): (1) the fact that shareholders' interests are deemed to be of second-order interest, (2) the dual board structure with executive board and supervisory board, (3) deficits in transparency, (4) insufficient independence of German directors (supervisory board members) and (5) a lack of auditor independence.

The code aims to address these issues within six subsections: (1) shareholders and the general meeting, (2) cooperation between management board and supervisory board, (3) management board, (4) supervisory board, (5) transparency and (6) reporting and auditing of the annual financial statements. Within each of the subsections, the code has various provisions and stipulations of which there are three types. First, some of them simply summarise

[4] Today, Klaus-Peter Müller, former CEO of Commerzbank, chairs the German Corporate Governance Commission.

[5] Throughout the text, we will use either conformity or compliance with the code to denote a firm's degree of conformity.

[6] The commission aimed to provide a framework to make the governance structure of German firms transparent to international investors. Thereby, the German board system warrants particular attention, since it provides two peculiarities: First, it is organised as a two-tier system and second, many firms are required to operate under codetermination. See appendix A.2 for details on the Germany board system.

applicable law. Obviously, firms have to follow them. The rationale for these passages of the code is to make the legal environment transparent to international investors. Second, there are so-called *recommendations*, which are characterised by the word *shall*. These are the comply-or-explain provisions, namely firms may deviate from these recommendations but have to report (and explain) that in their DoC. Finally, there are so-called *suggestions*. These passages are marked by the words *should* or *can*, and firms can deviate from them without public disclosure. To ensure a consistent analysis, we only consider deviations from *recommendations* in our empirical analysis.

3. Hypotheses

We argue that two questions have to be examined empirically in order to evaluate whether hard regulation of corporate governance dominates soft regulation or vice versa. First, it is important to understand whether (and under what circumstances) the capital market rewards firms for their code compliance. Second, it is crucial to see which firms actually comply with voluntary codes of good governance. In the following, we develop two competing perspectives on code compliance and their corresponding hypotheses concerning compliance rewards by the stock market and compliance behaviour. Our approach, which is inspired by LaPorta et al. (2000), Dey (2008) and Fahlenbrach (2009), results in a *complementary* and a *substitution* view of compliance behaviour.

Berle and Means (1932), Jensen and Meckling (1976), Fama and Jensen (1983) and many others claim that the separation of ownership and control may result in agency conflicts that come along with potentially large agency costs. The standard rationale for these conflicts is diverging interests between managers and owners, namely shareholders, fuelled by the problem of information asymmetries between the two parties. Now, codes of good practice generally claim to provide a set of rules intended to reduce this conflict by increasing transparency for shareholders and reducing room for discretionary decisions of the management. In sum, corporate governance codes proclaim to define a set of rules that - if adopted by a firm - will reduce agency costs originating from the separation of ownership and control.

This view is summarised in the following complementary perspective of code compliance:

Complementary perspective of code compliance: ***Compliance with codes of good governance is a complement to other governance devices.***

Under the complementary perspective, we expect that the capital market generally rewards high code compliance with higher market valuations. However, compliance of firms with weak external shareholders might be

a rather uninformative signal: Managers facing weak external shareholders could only adopt a strategy of high compliance, when compliance comes for only marginal costs. Without external monitors, managers might comply only with those recommendations that do not - or only marginally - reduce their room for discretionary decisions. With respect to valuation implications of compliance, this translates into a compliance-valuation relation that predicts (a) a positive general impact of compliance and (b) a higher reward if there are powerful external shareholders. This view is summarized in the following complementary hypothesis of compliance rewards:

Complementary hypothesis of compliance rewards (CHCR): *Code compliance of firms is rewarded by the stock market, especially for firms with high ownership concentration.*

However, while code compliance may be beneficial for shareholders, from an agent's perspective, the adoption of codes of good governance comes for the cost of reduced information asymmetries and less room for discretionary decisions, which is detrimental for the agent, since both constitute the prerequisite for any type of self-serving behaviour. Hence, we argue that managers are generally reluctant to comply with codes of good governance and interpret code compliance as the outcome of a negotiation process between shareholders and managers. This view is summarised in the following hypothesis:

Complementary hypothesis of compliance behaviour (CHCB): *Only firms with strong external shareholders have high degrees of compliance with codes of good governance.*

Arguing that managers are reluctant to increase transparency, the CHCB claims that they will only adopt rules proposed by codes of good governance if they face strong external shareholders. Accordingly, the CHCB claims that code compliance is higher in firms with strong external shareholders.

Essentially, the CHCB corresponds to a *managerial power view* as known from Bebchuk et al. (2002) and Bebchuk and Fried (2003) in the context of executive compensation: Managers will take advantage of their position as long as they face weak external shareholders.[7]

One might, however, argue that there is also a second perspective on code compliance: the substitution perspective, which argues that code compliance is used as a substitute for other governance instruments. Under this

[7] Fahlenbrach (2009) distinguishes three hypotheses in the executive compensation literature: the substitution hypothesis, the complementary hypothesis and the managerial power hypothesis. While the managerial power perspective claims that managers use their power to extract additional rents, the complementary view argues that it needs strong shareholders to enforce efficient incentive schemes (for example Hartzell and Starks, 2003).

perspective, code compliance is not the outcome of, but a substitute for good governance (for example for monitoring by outside blockholders). Managers use compliance with codes of good governance to mitigate agency conflicts in order to gain reputation in the eyes of (minority) shareholders as well as all types of potential investors. As argued by LaPorta et al. (2000), firms have to rely on external capital providers, for example equity investors or banks, for firm funding from time to time. However, only a high investor reputation enables them to raise money at attractive conditions.

This view is summarised in the following *substitution perspective of code compliance*:

Substitution perspective of code compliance: ***Compliance with codes of good governance serves as substitute for other governance instruments.***

However, the adoption of codes of good governance also comes at a cost. First, there are direct *adoption costs*. For instance, ensuring that (consolidated) financial statements, financial reports and interim reports are publicly accessible within a specified time period may raise internal processing costs as well as external auditing fees. Similarly, broadcasting the annual meeting, facilitating personal voting or assisting shareholders in the use of proxies may result in higher costs for the organisation of the annual general meeting. Second, indirect adoption costs may also emerge. For instance, the recommendations referring to the structure of executive incentives or the composition of the supervisory board may impose indirect costs due to restricted entrepreneurial freedom. Other rules may simply impose barriers to the fast and efficient processing of decisions. Both types of costs may hinder the management of well-governed firm from running the firm smoothly and thus jeopardise firm performance in these firms.

Assuming that compliance per se is costly, high compliance is only a valuable signal in cases of high agency costs, namely low ownership concentration. On the other hand, the benefits of high compliance might be smaller than the costs in firms with strong external blockholders or high levels of managerial ownership, leading to neutral or even negative stock market reactions if these firms choose high compliance levels. This view is summarised in the following compliance rewards hypothesis:

Substitution hypothesis of compliance rewards (SHCR): *Code compliance of firms is rewarded by the stock market only if ownership concentration is low within the firm.*

Concerning the questions of which firms voluntarily comply with codes of good governance, we expect managers in firms with weak corporate governance structures to choose higher levels of code compliance under this perspective. The reason for this is that their benefits in terms of reputational gains are relatively larger. Consequently, the characteristics of the specific firm have to be taken into consideration when determining the level of code compliance that balances costs and benefits. This directly translates into to the following code compliance hypothesis:

Substitution hypothesis of compliance behaviour (SHCB): *Governance structures that mitigate agency conflicts like external blockholders or managerial ownership serve as substitutes for (costly) code compliance, whereas the opposite is true for firm-specific factors fostering agency costs.*

From the perspective of the SHCB, code compliance serves as a mechanism to mitigate agency costs and thus provides a substitute for other governance mechanisms such as, for example, interest rate payments (see Jensen, 1986), managerial ownership or large external blockholders with monitoring incentives (Grossman and Hart, 1980; Shleifer and Vishny, 1986). Hence, under this perspective, we expect that (a) managerial ownership and (b) large external blockholders decrease the firm's level of compliance, while (c) firm characteristics that increase agency costs have the opposite effect. For example, Dey (2008) argues that agency costs are a function in firm complexity, while Holderness (2003) discusses incentives from ownership stakes and Jensen (1993), Yermack (1996) and Core et al. (1999) argue that large boards are inefficient in executing their monitoring role. Several measures for firm-specific agency costs are described in section 4.3. To sum up, we expect compliance to be lower in firms with external blockholders and managerial ownership but higher in firms with high firm-specific agency costs under this perspective.

Note that our hypotheses predict contrary results with respect to determinants as well as performance implications of compliance. The competing hypotheses are summarised in table 1 and are tested in the empirical analysis below.

[– Table 1 goes about here –]

Furthermore, it should be mentioned that voluntary compliance with codes of good governance might be inefficient under the complementary perspective. If only firms with strong external shareholders comply with these codes, regulations that enable minority shareholders to force the management to comply should be taken

into consideration. However, if firms with high agency costs are more likely to comply, the comply-or-explain principle is superior to a strict regulation, since it allows firms with low agency costs - and hence low need for a device to mitigate agency costs - to choose lower (and less expensive) compliance levels. Hence, which of these hypotheses holds true is important for policymakers if they have to balance the advantages and disadvantages of voluntary governance codes.

4. Data and Descriptive Statistics

This section describes our sample selection procedure and the dataset. Moreover, it provides descriptive statistics.

4.1. Sample Construction

Our initial sample consists of all stocks listed in the German Prime Standard[8]. From 2002 until 2007, there are 533 stocks listed at least once, which sums up to a total of 2,376 stock-year observations. Since some firms issue preferred and common stock, we remove 118 stock-year observations to avoid double counting. We eliminate another 219 firm-year observations from Non-German firms, 234 firm-year observations from financial firms and 68 observations belonging to firms in special situations such as insolvency, squeeze-outs or bankruptcy procedures. For the remaining 1,734 firm-year observations, we collect statements of conformity. With 115 missing statements, we end up with a final sample of 1,619 firm-year observations. Table 2 gives a detailed overview of our sample construction.

[– Table 2 goes about here –]

Since there is no database offering access to detailed corporate governance information for German firms, we set up a unique database containing hand-collected data on (1) code compliance, (2) firm characteristics, (3) board structure, (4) ownership structure and (5) (industry) competition. While firm characteristics, like accounting and capital market data, are extracted from Thomson databases, information on board and ownership structures is manually collected from Hoppenstedt Aktienführer, annual reports, Lexis-Nexis database, press search and requests to investor relation departments.

[8] See appendix A.1 for a detailed description of the German Prime Standard.

4.2. *Data on Compliance*

The compliance data is hand-collected from the firms' compliance statements (DoC). For each year and each firm, we carefully read the corresponding DoC and collect the version of the relevant code as well as all deviations from each of the relevant recommendations.[9]

We then define two proxies of compliance behaviour. First, COMPLIANCE measures the level of compliance by summing all deviations and normalising them by the sum of all recommendations of the applicable version of the code. One hundred minus this value in percentage of deviations leads to the COMPLIANCE variable. Second, NEURALGIC measures the level of compliance with *critical* recommendations defined as the sum of deviations from critical recommendations normalised by the sum of all critical recommendations. Thereby, a recommendation is defined as critical if more than 10% of firms do not comply in any year over the period of our sample (see v. Werder et al., 2005 for a similar concept). Again, 100 minus this value in percentage defines NEURALGIC. It is important to note that the NEURALGIC proxy relies on a fixed set of code recommendations in any year. Hence, we can use time variation in this index in the empirical section.[10]

Table 3 reports compliance behaviour over time. While we generally observe relatively high (and stable) compliance levels, recall that the code is dynamic in the sense that depending on the particular year, firms have to consider different versions of the code. Figure 1 plots the distribution of average compliance behaviour, compliance in 2002 and in 2007, as well as average neuralgic compliance.

[– Table 3 goes about here –]

[– Figure 1 goes about here –]

4.3. *Firm Characteristics and Governance Variables*

Now, the variables to control for firm characteristics as well as governance variables are explained. Detailed definitions of the variables can be found in table 13.

Valuation and performance measures: We use two measures for the market valuation of a firm. First, we consider the market-to-book (MtB) multiple. Second, we examine TOBIN'S Q defined as market capitalisation of equity plus total liabilities divided by total assets. Furthermore, return on assets (ROA) defined as earnings before

[9] We argue that the accuracy of these compliance reports can be deemed to be high given the size and analyst coverage associated with Prime Standard firms.

[10] For the COMPLIANCE proxy, this would lead to biased outcomes, since the recommendations can change from year to year. Hence, time-variation of the COMPLIANCE variable includes changes in firm behaviour and the code.

interest and taxes divided by total assets is used to control for firm performance. To avoid problems with outliers, we winsorise all performance variables at the 1% level.

Firm characteristics: We measure firm size (SIZE) by the log of 1 + total sales. Taking into account that code compliance has high fixed costs, we expect larger firms to exhibit higher compliance levels. The asset structure of the firm is proxied by CASH, defined as total cash and short-term investments to total assets, and INTANGIBILITY, defined as intangible assets to fixed assets. The capital structure is proxied by EQUITY defined as total shareholder's equity to total liabilities. Finally, we control for firm payouts by DIVIDEND, which is a dummy variable indicating whether or not a firm pays a dividend in a given year.

These different firm characteristics can also be interpreted as proxies for firm-specific agency costs. Thereby, we argue that larger firms are more prone to suffer from agency conflicts, as firm complexity is higher in these firms (Dey, 2008). Furthermore, agency costs are expected to increase in intangibility (due to higher complexity) and cash (due to higher possibilities for rent extraction). Higher equity ratios are again associated with more agency costs, as interest payments can discipline the management (Jensen, 1986). Although dividends can mitigate agency costs, the effect is weaker as for interest payments, since the management can decide to cut or omit them.

Ownership structure: In the empirical analysis, we consider various measures of the firm's ownership structure. The ownership data is hand-collected from Hoppenstedt Aktienführer. Thereby, we focus on the three largest external shareholders and on managerial ownership. Large external blockholders are supposed to represent an efficient mechanism to monitor the management and thus to reduce agency costs resulting from the separation of ownership and control (for example Attig et al., 2008; Holderness, 2003; Park et al., 2008; Shleifer and Vishny, 1986). Substantial inside ownership is supposed to ensure the alignment of interests of executives and external shareholders (for example Kaserer and Moldenhauer, 2008; McConnell and Servaes, 1990; Morck et al., 1988, for German evidence).

Accordingly, we define EXTERN_OWN as the fraction of voting rights held by the three largest shareholders and INSIDE_OWN as the fraction of voting rights held by the management board (Vorstand). Aggregating these figures gives our measure of ownership concentration, and we define FREE_FLOAT as 1 less EXTERN_OWN and INSIDE_OWN. Moreover, we define a dummy variable DOMINATED (WIDELY HELD) indicating whether (or not) the firm has a blockholder owning more than 10% of voting rights in a given year.

Board structure: Furthermore, we consider several measures of (supervisory) board characteristics.[11] Data for

[11] In the following, we will use *supervisory board* and *board* interchangeably.

these variables are hand-collected from annual reports and further research activities. In Germany, board size is not an endogenous firm decision but substantially regulated (see appendix A.2). Accordingly, supervisory board size is highly correlated with firm size. In order to circumvent multicollinearity problems, we apply a measure of excess board size:

First, we define BOARD SIZE as the residual of an annual regression explaining the number of supervisory board members (without employee representatives) by a constant and the number of employees. Larger boards are commonly associated with higher agency costs (Yermack, 1996).

Second, CODET is a dummy variable indicating whether or not the firm acts under codetermination, namely whether or not there are employee representatives on the supervisory board (see appendix A.2 for details on codetermination in Germany). We argue that codetermination increases agency costs, since a third party, namely labour, can exercise control over the firm (Gorton and Schmid, 2004 show that firms with equal representation of employees and shareholders trade at significant discounts on the stock market).

Third, BUSY BOARD is another dummy variable indicating whether the supervisory board is dominated by busy directors. This measure is constructed as a dummy variable taking the value of 1 in cases in which at least 50% of supervisory board members have three or more additional directorships.

Fourth, OUTSIDE CEO is the fraction of supervisory board members (excl. employee representatives) that serve as CEOs in another company. Both BUSY BOARDS and OUTSIDE CEOs are expected to worsen the agency conflict, since their incentives and/or possibilities to effectively control the management might be limited (Fich and Shivdasani, 2006 show that busy boards hinder firm performance, indicating that monitors serving on several boards are not effective in monitoring the management).

Founder involvement: Recent research argues that founders are particularly dominant players within a firm (for example Anderson and Reeb, 2003a,b; Villalonga and Amit, 2006)). We measure founder involvement by examining whether the current CEO of a firm is related to the founding family. Therefore, we construct a dummy variable CEO_FOUNDER, which takes the value of 1 in cases in which the current CEO is related to the founding members of the firm and 0 otherwise. However, question of whether founder CEOs increase or decrease agency costs is not straightforward. On the one hand, founder CEOs might align interests between (family) owners and the management. On the other hand, founders who act as CEOs or their families often own substantial amounts of the firm's voting rights. This might increase conflicts between large founder-related shareholders and other blockholders or small minority shareholders (for example Villalonga and Amit, 2006).

Product market competition: Recent research also stresses the fact that product market competition might serve as a substitute for internal governance (for exampleGiroud and Mueller, 2010; Giroud and Mueller, 2011; Januszewski et al., 2002).

To measure product market competition, proceed in three steps. First, we calculate annual firm-specific rents (for example Januszewski et al., 2002):

$$F\_RENT_{it} = \frac{EBIT_{it} - (EURIBOR_t * TOTAL\_ASSETS_{it})}{SALES_{it}},$$

where EURIBOR represents the annual average of EURIBOR rates for maturities of one week. Second, we calculate average industry rents by taking the mean of F_RENT over all firms in a particular industry class, where again we use the seventeen-industry classification taxonomy of Fama and French (1997).[12] Finally, we calculate IND_COMP as the inverse of the average industry rent, arguing that high rents are the outcome of uncompetitive environments. Consequently, we hypothesise that high product market competition mitigates firm-specific agency costs.

Media coverage and opaqueness: The media might exert substantial pressure on firms. We argue that this is a matter of firm size and whether or not the firm belongs to one of the largest stock market indices. Unfortunately, the two are highly correlated. Thus again, we calculate an excess measure, namely, *excess media coverage.* Therefore, we define two dummy variables, DAX and MDAX, indicating whether a firm is listed in the DAX or MDAX in the respective year.[13] We then define INDEX as 2 if the firm is listed in the DAX and 1 for MDAX companies. MEDIA is the residual of an annual regression explaining INDEX by a constant and the firm's market capitalisation. Of course, media coverage is expected to increase firm transparency and decrease firm-specific agency costs.

As a proxy for firm opaqueness, we use the residuals of a market model explaining 36 monthly stock market returns of the firm. Contrary to media coverage, we argue that high levels of opaqueness increase the agency costs of a firm. For example, Anderson et al. (2009) show that corporate opacity can be exploited to extract private benefits of control.

[12] We consider industry perspective to be a more accurate proxy for the competitive situation than firm-level rents. Firm-level measures suffer from two facts: a) bad firms in uncompetitive environments cannot be separated from good firms in competitive environments and b) the measure is strongly correlated with performance.

[13] The DAX (Deutscher Aktienindex) is the most important German stock index. It is calculated by Deutsche Börse AG and covers the thirty largest firms listed at the Frankfurt stock exchange. The MDAX (Mid-Cap-DAX) covers fifty firms, mainly from the manufacturing industry.

Fixed-effects dummy variables: In most of our analyses, we will use time and industry fixed effects. Our industry dummy variables are constructed according to Fama and French (1997). Given our sample size, we use the seventeen-industries classification scheme.

4.4. Descriptive Statistics

Table 4 provides summary statistics. While Panel A reports mean and median values, Panel B reports univariate correlations between the variables and firms' compliance behaviour.

[– Table 4 goes about here –]

The average compliance level is about 93% for overall compliance and 74% for neuralgic. The median firm has sales slightly above 200 million EUR, 12% liquidity in its balance sheet and a ratio of intangible assets to fixed assets of 65%. Operating performance of the median firm is 6.3% (measured in ROA), which is rewarded by a MtB multiple of 1.7, a Tobin's Q of 1.3 and an annual stock market performance of about 12%. It is interesting to observe that in the univariate analysis, all four performance measures are negatively correlated to our compliance levels (note, however, that these correlations are only statistically significant in the case of ROA, MTB and Tobin's Q).

With respect to the ownership structure, we find that 15% of voting rights are in the hands of the management and 33% in the hands of the three largest external blockholders. Moreover, we find compliance level to be negatively correlated to free float.

5. Empirical Analysis

This section empirically examines the relationship between firm valuation levels, firm characteristics, governance mechanisms and compliance behaviour. Section 5.1 discusses our empirical strategy. Section 5.2 analyses the relationship between compliance behaviour and valuation levels, and Section 5.3 discusses the robustness of the results. Finally, Section 5.4 examines the determinants of compliance behaviour.

5.1. Empirical Strategy

First, we analyse how the stock market values a firm's level of compliance. However, endogeneity is a major problem in all valuation analyses. First of all, reverse causality might bias the results. The question here is if causality runs from ownership structures and compliance to market valuation or vice versa. One could argue that

well-performing firms are more likely to have high compliance levels. However, since we are interested in the effect of compliance (in combination with the ownership structure) on valuation levels, we have to ensure that the results are not subject to reverse causality. Moreover, unobserved firm heterogeneity is known to affect firm performance (for example Himmelberg et al., 1999). We address these problems in several ways.

First, we lag all our explanatory variables by one year to reduce the problem of contemporaneous effects. Second, we account for unobserved heterogeneity. Therefore, we include fixed industry and time effects filtering out unobserved (but constant) time and industry effects. Moreover, we include the lagged dependent variable as an additional explanatory variable on the right-hand side of our valuation equations. Specifically, the corresponding *valuation model* reads as follows:

$$V_{i,t} = \widetilde{\alpha}_a + \widetilde{\lambda}_a \cdot V_{i,t-1} + \widetilde{\kappa}_a \cdot CB_{i,t-1} + \widetilde{\psi}_a \cdot C^*_{i,t-1} + \widetilde{\mu}_{i,t-1} \tag{1.a}$$

$$V_{i,t} = \widetilde{\alpha}_b + \widetilde{\lambda}_b \cdot V_{i,t-1} + \widetilde{\kappa}_{b,0} \cdot CB_{i,t-1} + \widetilde{\kappa}_{b,1} \cdot CB_{i,t-1} \cdot O_{i,t-1} + \widetilde{\kappa}_{b,2} \cdot O_{i,t-1} + \widetilde{\psi}_b \cdot C^*_{i,t-1} + \widetilde{\eta}_{i,t-1}. \tag{1.b}$$

Thereby, V stands for the valuation level, CB for compliance behaviour, O for ownership variables and C for controls. The models (1.a) and (1.b) follow Thomsen et al. (2006), Dey (2008), Dittmann et al. (2009) and others.[14] The fundamental idea of this approach relies on the argument that unobserved heterogeneity should affect current and lagged performance the same way. Accordingly, the lagged dependent variable is supposed to filter out most of the unobserved heterogeneity.

Models (1.a) and (1.b) enable us to alleviate concerns of reverse causality and unobserved heterogeneity. However, as Dittmann et al. (2009) note, this is only true if the models are correctly specified. To ensure that our models are correctly specified, we conduct several robustness tests, which are explained in the robustness section (Section 5.3).

Second, the question of which firms voluntarily choose high levels of compliance arises. In order to reduce endogeneity problems, we lag all right-hand side variables by one period (namely by one year). In sum, this gives us the following *compliance model*:

$$CB^*_{i,t} = \widetilde{\alpha} + \widetilde{\beta} \cdot X_{i,t-1} + \widetilde{\gamma} \cdot O_{i,t-1} + \widetilde{\delta} \cdot C_{i,t-1} + \widetilde{\varepsilon}_{i,t-1}, \tag{2}$$

[14] Dittmann et al. (2009) note that using the lagged dependent variable as an additional right-hand side variable represents a variant of the approach introduced by Granger (1969). Furthermore, the authors argue that the approach is rather conservative, since the lagged performance variable is supposed to filter out much of the cross-sectional variation whenever the dependent variable changes only slowly over time.

where the level of compliance CB is explained by firm-specific factors that are related to agency costs (X), the firm's ownership structure (O) and other control variables (C).

Estimating model (2), we have to keep in mind that our first measure of compliance behaviour (COMPLIANCE) is affected by the dynamic structure of the code and thus reflects firm-specific **and** code-specific changes over time. Moreover, governance variables generally rarely change. Accordingly, arguments put forward by Zhou (2001), Plümper and Tröger (2007), Fahlenbrach (2009) and others prevent us from using a firm-fixed effects design.[15] Thus, we estimate a two-way fixed effects model using fixed time and industry effects.

It is well known that using standard ordinary least square (OLS) linear regression analysis for model (2) may produce inconsistent estimates. Accordingly, we estimate a variant of the Tobit regression model allowing two-sided censored variables, which applies maximum likelihood methods (for example Sigelman and Zeng, 1999). However, since coefficients of a Tobit analysis are difficult to interpret (specifically with respect to economic significance) and since we wanted to challenge the results, we also estimate model (2) using standard OLS techniques.

5.2. Empirical Analysis of Compliance behaviour and Valuation Levels

In a first step, we examine if the stock market rewards firms for high compliance levels. Table 5 reports results from OLS-regression analyses explaining valuation levels. Panel A explains log-valuation levels, while Panel B uses standard valuation levels. Both panels examine two performance measures: the MtB ratio and Tobin's Q.

For each of the dependent variables, we estimate two specifications: First a specification using (among others) COMPLIANCE and FREE FLOAT as explanatory variables and a second specification using (among others) COMPLIANCE, FREE FLOAT and an interaction term COMPLIANCE x FREE FLOAT as explanatory variables. To account for the problem of endogeneity, all explanatory variables are lagged one period, and the lagged endogenous variable is included.

Besides the explanatory variables reported in the table and the lagged dependent variable, each specification contains several additional explanatory variables: a constant, SIZE, CASH, RND RATIO, INTANGIBILITY, OPER PERFORMANCE, EQUITY, DIVIDEND and OPAQUENESS. Moreover, we control for fixed industry and year effects.[16]

[15] With respect to determinants of compliance behaviour, this can also be rationalised from a conceptual perspective. In fact, we are mainly interested in cross-sectional effects, since we expect compliance to be driven by governance mechanisms and our governance variables display only limited time-series heterogeneity (see Zhou (2001) and Hermalin and Weisbach (1991) for similar arguments).

[16] Coefficients and t-values of these variables are not reported.

[– Table 5 goes about here –]

The results in both panels clearly indicate that compliance per se has no effect on firm valuation (models P.C.1, 3, 5, 7). Free float, on the other hand, has a weak, negative impact in most models. Interestingly, the results change if an interaction term COMPLIANCE x FREE FLOAT is included (models 2, 4, 6, 8). Now, compliance leads to lower stock market valuation in all models. This is consistent with the fact that compliance leads to direct and indirect costs for a firm. Hence, on average, the costs of compliance outweigh its benefits. However, compliance in firms with high free float has the opposite effect. In these firms, the stock market rewards high levels of compliance with higher market valuations, namely the benefits of compliance are higher than its costs in this case.

Hence, compliance leads to lower stock market valuations if free float is low, namely if managerial ownership and voting rights in the hands of external blockholders are high. However, without managerial ownership or external blockholders, high levels of compliance are beneficial for the firm. In this vein, investors seem to trade-off benefits and costs of compliance with codes of good governance. To sum up, this result is in line with the substitution hypothesis and against the complementary hypothesis of compliance rewards.

5.3. Robustness of Valuation Results

The robustness of these results is investigated along four dimensions. *First*, different measures for compliance behaviour and ownership concentration are used. Therefore, we replace COMPLIANCE by NEURALGIC and then use a widely held dummy in lieu of free float. Results for the neuralgic compliance level are presented in Panel A of Table 6. They are in line with the results of the standard model discussed above. On average, we find no effect of compliance on valuation. However, differentiating with respect to the level of free float, we find that compliance is detrimental to firm valuation in case of low levels of free float. In contrast, for high levels of free float, the effect of compliance is positive. Panel B re-estimates the models with a widely held dummy instead of free float. Again, the interaction of compliance and ownership concentration is positive and highly significant, confirming the prior results. However, the significance of the negative valuation effect of high compliance given low ownership concentration disappears. While the coefficient is still negative, the effect is no longer significant, which might be due to the fact that there are several firms with shareholders reporting blocks just below the 10% treshold.

[– Table 6 goes about here –]

Second, we account for the problem of measurement errors in our valuation measures (see Gompers et al. (2010) for a discussion). Our standard regression specifications P.C.1 - P.C.4 from Table 5 use a log-transformation of the valuation measures. While the log-specification already reduces the problem of outliers, it also allows an appealing economic interpretation of the coefficients. To further reduce the probability that the results are biased by measurement errors, we follow Gompers et al. (2010) and estimate (i) a median regression explaining log valuation levels and an (ii) ordinary OLS regression explaining negative inverse valuation levels, namely $-1/valuation$. The results are reported in Table 7. Again, both tests confirm our findings discussed above.

[– Table 7 goes about here –]

Third, we examine whether our empirical models (1.a) and (1.b) are correctly specified in three steps. In particular, we (i) use different numbers of lags, (ii) estimate a dynamic panel model and (iii) use firm-fixed effects. Hence, we re-run all estimations using two and three lags $V_{i,t-1}, \ldots, V_{i,t-3}$. The results are reported in Table 8 and support the prior results. Then, we use our compliance measure NEURALGIC, which is calculated on a fixed set of recommendations in each year, and use dynamic panel methods, more specifically an Arellano-Bond 2-step estimator in first differences, and estimate a version of model (1.a) and (1.b). Again, results reported in Panel A of Table 9 show that the results are robust under this alternative estimation method. As a last step, we re-estimate the models with firm-fixed effects. Therefore, we have to rely on neuralgic compliance levels, since standard compliance is also affected by changes in the code itself. In the empirical model, we do not include the lagged endogenous variable as a right-hand side variable, since this would produce biased estimates (for exampleBond, 2004). Results can be found in Panel B of Table 9. As can be seen, the results remain largely unchanged for this estimation methodologies. Consequently, we argue that the results are robust to different model specifications and estimation methodologies.

[– Table 8 goes about here –]

[– Table 9 goes about here –]

Fourth, as a final robustness test, we cross-check our results using an instrument variable approach. Borrowing from the capital structure literature, for example Faulkender and Petersen (2006) and John and Litov (2010), we instrument a firm's compliance behaviour by the average compliance level of comparable firms. Given our compliance behaviour regressions, we define firms as qualifying as comparable firm if the firms have a similar size. Specifically, for each year, we sort our firms along our firm size variable SIZE and assign them to five (ten)

groups of equal size (quintile and decile groups). With this annual classification, we calculate the instrument Z_{it} for firm i in year t as the average compliance level of all firms in the firm's size quintile (decile) group in year t where we do not consider the firm i itself. The results are reported in Table 10. Again, they are similar to the ones reported in the results section. Hence, this test helps to alleviate concerns that unobserved and time-varying firm heterogeneity biases the results.

[– Table 10 goes about here –]

5.4. Empirical Analysis of Determinants of Compliance behaviour

Now we focus on the question of which firms actually comply with codes of good governance. As seen in the valuation analysis, only firms with high firm-specific agency costs are rewarded for high compliance levels. However, to answer the question of whether hard regulation dominates soft regulation or vice versa, it is important to understand which firms voluntarily choose high compliance levels.

Results for the empirical selection equation (2) using COMPLIANCE as the dependent variable are shown in table 11. As COMPLIANCE is measured in per cent, it is by definition restricted to values between 0 and 100. Thus, we use zero as the lower and 100 as the upper bound in the Tobit model. As robustness test, we additionally report OLS results.

While specification B.C.1 considers only firm characteristics, specification B.C.2 also considers ownership and board structure variables. Specifications B.C.3 and B.C.4 further extend the analysis to founder involvement, industry competition, media coverage and a proxy for firm opaqueness. Specification B.C.5 re-estimates model B.C.4 by using OLS methods, which we use to evaluate economic significance. Specification B.C.6 restricts the sample to the 2003 to 2007 period, allowing firms to learn in the first year of the code. Again, specification B.C.7 re-estimates specification B.C.6 using OLS methods. All models use fixed time and industry effects, the latter based on a Fama-French industry classification with seventeen industry groups.

[– Table 11 goes about here –]

All specifications provide consistent evidence in favour of the substitution hypothesis. In particular, firms with high agency costs show higher compliance levels. Insider ownership and voting rights of external blockholders are significantly and negatively correlated with a firm's compliance level in all different models. Hence, firms with low agency conflicts between owners and managers are less likely to have high levels of compliance. Furthermore, SIZE, CASH, INTANGIBILITY and EQUITY show a positive and significant correlation with the compliance

level, as predicted by the substitution hypotheses. High values of these variables are associated with high agency costs.

Furthermore, board characteristics that foster agency costs lead to higher levels of compliance as well. BOARD SIZE is positive and highly statistically significant in all specifications. Similarly, the coefficients of the supervisory board variables CODET and OUTSIDE CEOs are positive and statistically significant. The coefficient of the fourth board variable, BUSY BOARD, is positive but not statistically significant.

Founder involvement leads to higher levels of compliance, but the statistical significance is rather weak. Moreover, firm performance is negatively correlated with compliance levels. This suggests that poorly performing firms are more likely to comply with the code. Product market competition, media coverage and opaqueness are insignificant in most specifications.

The impact of firm-specific agency costs on the level of compliance is not only statistically significant, but also important from an economic perspective. According to specification B.C.5, for instance, a one-standard deviation increase in FIRM SIZE (2.240) leads to a 0.8 percentage point increase in compliance.[17] Given the average compliance level of 93.4% with a *compliance gap* of 6.6%, this effect is clearly substantial. In contrast, a one-standard deviation increase in INSIDE OWN (0.226) leads to a 1 percentage point decrease in compliance. Similarly, a one-standard deviation increase in EXTERN OWN (0.261) leads to a 0.3 percentage point decrease in compliance.

We challenge the results for COMPLIANCE in table 11 by re-estimating all specifications using NEURALGIC as the dependent variable. The results are reported in table 12. However, the main findings remain unchanged for this alternative compliance measure.

[– Table 12 goes about here –]

Overall, these specifications provide consistent evidence for the substitution hypothesis claiming that firms facing high firm-specific agency costs voluntarily choose high compliance levels. These findings are in line with substitution effects between agency costs and firm-specific governance structures as found by Bushman et al. (2004), Dey (2008), Fahlenbrach (2009) and others. In contrast, the evidence does not support the complementary hypothesis. Specifically, voting rights accumulated by external blockholders are significantly and negatively correlated with a firm's compliance level. To sum up, we find that firms with high agency costs, namely those firms

[17] Please note that we use the OLS model to calculate economic effects, since coefficients estimated by Tobit models cannot be interpreted in a direct manner.

that are rewarded by the capital market for their compliance with codes of good governance, voluntarily choose higher compliance levels.

6. Discussion and Conclusion

The question of if and how the governance structure of a firm should be regulated is subject to controversial public discussion - at least since the corporate scandals in the 1990s of the last century. While some advocate for strict regulations, others argue that this would be obstructive for firms and the whole economy. As a middle course between no and strict regulation, some countries have introduced codes of good governance that adopt the comply-or-explain principle during the last decade. These codes allow firms to choose individual governance structures and simultaneously provide a framework to make these individual governance structures transparent to investors. However, it is a priori not clear if this soft regulation dominates hard regulation of corporate governance or vice versa. In particular, two important sub-questions in this context remain unanswered: (i) How does the stock market reward code compliance, and (ii) which firms actually comply with codes of good governance?

It is the aim of this paper to shed light on these two questions. This helps to understand if codes of good governance are superior or inferior to hard regulations, a question of high relevance for capital market regulators. For this purpose, we use compliance of firms with the GCGC as a test. A hand-collected panel dataset including data on code compliance, ownership and board structures, which covers 1,619 firm-year observations, allows us to discriminate between two competing perspectives on code compliance: the complementary and the substitution perspective. Under the complementary perspective, code compliance is always beneficial for shareholders, but it needs strong external blockholders to force managers to comply with codes of good governance. Under the substitution perspective, compliance is only beneficial if firm-specific agency costs are high. Furthermore, managers in firms with high agency costs voluntarily choose high levels of code compliance to mitigate agency conflicts.

Our results are clearly in favour of the substitution perspective. Concerning the capital market rewards for code compliance, we find that firms with low agency costs, namely high ownership concentration, are traded at a discount if they choose high compliance levels. However, the opposite is true for firms with low ownership concentration and high levels of compliance. These findings demonstrate that the benefits of code compliance are higher in firms that have higher levels of firm-specific agency costs. In contrast, well-governed firms suffer from high compliance, because this burdens them with direct (for example auditing fees) and indirect costs (for example limited managerial freedom). These results are robust under a variety of specifications, including an instrumental

variable approach, firm-fixed effects and dynamic-panel methods. The analysis of which firms voluntarily comply reveals that both external blockholders and managerial ownership decrease firms' compliance level, whereas the opposite is true for firm-specific factors that foster agency costs, such as, for example, ineffective board structures.

The main finding of this paper is that soft regulation of corporate governance works well. Even without powerful external monitors, firms suffering from high agency costs voluntarily choose higher compliance levels and are rewarded by the capital market for their compliance. However, the capital market negatively reacts to high compliance in well-governed firms. This suggests that mandatory governance regulations are inferior to flexible approaches like codes of good governance adopting the comply-or-explain principle. Concerning policy implications, our results make a strong case for soft regulation of corporate governance.

Of course, several avenues for future research emerge. First, it would be interesting to see if these results hold true for other governance environments. Second, cross-country studies on this subject could improve the understanding of interdependencies between code compliance and the legal environment. Third, an interesting avenue for future research would be to analyse hard versus soft regulation for aspects other than corporate governance, for example corporate social responsibility.

A. German Peculiarities

A.1. German Prime Standard

In EU countries, firms generally can choose between two different points of access to equity capital markets. Besides the *EU-regulated market*, most exchanges offer a market regulated by themselves. The two markets differ with respect to legal basis and status but also with respect to transparency requirements. Within the EU-regulated market, the Frankfurt Stock Exchange (FWB - Frankfurter Wertpapierboerse), which is the most relevant German stock exchange, allows firms to list in one of two different market segments. While firms willing to fulfill the EU-regulated minimum transparency level only have to list in the General Standard, firms opting for a listing in the Prime Standard have to fulfill additional transparency requirements. Accordingly, the Prime Standard is the market segment with the highest reporting and disclosure level at the most important German stock exchange. Since our analysis requires detailed analysis of firm and board characteristics, we restrict our sample to firms opting for Prime Standard. All companies of the German stock exchange segments DAX, MDAX, SDAX and TecDAX are included herein.

A.2. The German Board System

General structure: It is well known that the German corporate governance system is characterised by a two-tier system with two boards: the supervisory board (Aufsichtsrat) and the management board (Vorstand). According to the German Stock Corporation Act (Aktiengesetz – AktG), the supervisory board supervises (§111 AktG) and appoints (§84 AktG) members of the management board.

Besides the pure fact of the two-tier system, there are two more peculiarities of the German board system to be kept in mind. First, the size of the supervisory board is largely regulated. Second, the Codetermination Act also regulates the possibility of employee representatives within the supervisory board.

Size of the supervisory board: The German Stock Corporation Act regulates the minimum and the maximum number of supervisory board members. Specifically, §95 AktG says that in general, the supervisory board has to consist of at least three members. The supervisory board may consist of more directors, but the number of directors is restricted by a) being a multiple of three and b) a maximum of 21 board members depending on firm size (measured in terms of subscribed capital). Moreover, the Codetermination Act of 1976 (Mitbestimmungsgesetz – MitbestG) also regulates the size of the supervisory board (12, 16 or 20 directors) depending on the number of regularly engaged employees (in Germany). The German Stock Corporation Act also regulates minimum

qualification conditions for supervisory board members (§100 AktG) and how they can be recalled. For instance, supervisory board members representing the interests of shareholders (Aufsichtsratsmitglieder der Aktionäre) can be recalled by the general meeting with 75% of valid votes (§103 AktG).

Moreover, according to §107 AktG, the supervisory board has to elect a chairman (as well as a deputy) and a may organise its work in committees. Except for the conciliation committee (*Vermittlungsausschuss* in accordance with §27 of the Codetermination Act for disputes between shareholder and employee representatives), the size and structure of these committees are not regulated. However, it is commonly assumed that each committee has to consist of at least two directors and even three directors to be a quorum.

Regulatory rules on codetermination: The Codetermination Act regulates the possibility of mandatory employee representatives within the supervisory board depending on firm size and the sector in which the firm is operating. The Act generally requires for firms with regularly more than 2,000 German employees (more than 500 employees) that half (one-third) of supervisory board members are employee representatives. Firms with regularly more than 2,000 employees are thus said to act under equal codetermination, and firms with regularly more than 500 but less than 2,000 under one-third codetermination.

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B. Tables

Table 1: Summary of hypotheses

Stock market rewards firms for high compliance, if ownership concentration is ...	**H1**	**H2**	Empirical specification: Measured in terms of...
... low	o/+	+	free float and widely held dummy
... high	+	-/o	free float and widely held dummy
Predicted sign of correlation between (the level of) compliance and...			
... external blockholders	+	-	... voting rights held by three largest outside shareholders
... managerial ownership	o	-	... voting rights held by members of the management board
... firm-specific agency costs	o	+	... e.g. firm complexity and board structures

Notes:

This table summarises our hypotheses for firms' compliance behaviour. H1 refers to the complementary hypothesis. H2 refers to the substitution hypothesis. + indicates a positive, - a negative and o no predicted effect.

Table 2: Sample description

Description	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**Total**
Stocks in Prime Standard	409	392	370	378	404	423	2,376
Firms with double listing	21	21	20	18	19	19	118
Firms in Prime Standard	**388**	**371**	**350**	**360**	**385**	**404**	**2,258**
Firms with a foreign ISIN	41	35	33	34	40	36	219
Financial services firms	27	34	37	42	44	50	234
Firms in special situations	13	17	13	3	12	13	68
Initial Sample	**307**	**285**	**267**	**281**	**289**	**305**	**1,734**
Firms without compliance statement	50	30	15	10	5	5	115
Final Sample	**257**	**255**	**252**	**271**	**284**	**300**	**1,619**

Notes: The table documents our sample selection process. Starting from all stocks listed in the German Prime Standard, we arrive at all firms listed in the Prime Standard by excluding all preferred shares in case of double listing. Next, we exclude all Non-German firms, since only German firms have to comply with the German Corporate Governance Code. As standard, we exclude all financial firms, because their firm characteristics differ significantly from other firms. Moreover, we exclude firms in special situations (e.g. bankruptcy, insolvency or temporary delisting), since we are unable to get compliance statements for these firms. This leaves us with an initial sample that covers 1,734 firm-year observations. Since we were not able to find compliance statements for 115 firm-years, our final sample consists of 1,619 firm-year observations. These observations originate from 364 different firms.

Table 3: Compliance behaviour over time

Year	2002	2003	2004	2005	2006	2007	Total
PANEL A: COMPLIANCE [in %]							
Mean	95.6	94.2	92.6	92.6	93.0	92.6	93.4
Median	96.9	93.8	93.1	92.4	92.5	92.6	93.8
Max	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Min.	72.3	76.9	75.4	75.8	77.6	66.2	66.2
Std. Dev.	4.8	4.7	4.1	4.4	4.5	5.2	4.8
Obs.	257	255	252	271	284	300	1,619
PANEL A: NEURALGIC [in %]							
Mean	83.5	78.1	71.5	70.9	71.6	69.6	74.0
Median	85.7	78.6	71.4	71.4	71.4	71.4	71.4
Max	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Min.	42.9	35.7	21.4	21.4	28.6	21.4	21.4
Std. Dev.	16.5	17.2	14.8	16.3	17.2	19.8	17.8
Obs.	257	255	252	271	284	300	1,619

Notes: The table reports firms' compliance behaviour over time. Panel A reports the compliance behaviour as measured by COMPLIANCE. Panel B reports the compliance behaviour as measured by NEURALGIC.

Table 4: Descriptive statistics

	PANEL A:			**PANEL B:** Correlation to	
	Mean	Median	Observations	...COMPLIANCE	...NEURALGIC
COMPLIANCE	93.384	93.846	1,619	1.00	
NEURALGIC	74.001	71.429	1,619	0.94***	1.00
SIZE	5.641	5.310	1,605	0.29***	0.30***
CASH	0.190	0.118	1,603	-0.03	-0.06**
INTANGIBILITY	6.102	0.648	1,601	0.03	0.03
ROA	0.029	0.063	1,575	-0.08***	-0.10***
MTB	2.271	1.733	1,602	-0.08***	-0.09***
TOBIN'S Q	1.523	1.273	1,602	-0.09***	-0.11***
EQUITY	1.795	0.763	1,603	0.00	-0.01
DIVIDEND	0.410	0.000	1,619	0.11***	0.09***
INSIDE OWN	0.151	0.000	1,615	0.08***	0.08***
EXTERN OWN	0.328	0.275	1,615	0.11***	0.10***
FREE FLOAT	0.521	0.500	1,615	-0.21***	-0.20***
DOMINATED	0.857	1.000	1,615	-0.05*	-0.05*
BOARD SIZE	-0.024	-0.308	1,586	0.21***	0.23***
CODET	0.367	0.000	1,599	0.29***	0.30***
OUTSIDE CEOS	0.157	0.000	1571	0.18***	0.17***
BUSY BOARD	0.312	0.000	1.610	0.14***	0.15***
FOUNDER	0.382	0.000	1.604	-0.14***	-0.17***
COMPETITION	24.762	24.646	1,619	0.11***	0.13***
MEDIA	0.056	0.014	1,602	0.20***	0.22***
OPAQUENESS	0.124	0.106	1,401	-0.08***	-0.05***

Notes: The table reports descriptive statics. Panel A reports means, medians and the number of observations for each variable. Panel B reports correlations between the variable and our two measures of compliance behaviour. All variables are described in table 13. Statistical significance at the 1%, 5%, and 10% levels is indicated by *** , ** , and * , respectively.

Table 5: Performance implications

Panel A: OLS-Analysis explaining log valuation levels using COMPLIANCE and FREE FLOAT				
Model	**P.C.1**	**P.C.2**	**P.C.3**	**P.C.4**
Dep. variable	ln(MTB)	ln(MTB)	ln(TOBIN Q)	ln(TOBIN Q)
Method	OLS	OLS	OLS	OLS
COMPLIANCE	0.149	-1.301 **	0.016	-0.957 ***
	(0.53)	(-2.21)	(0.10)	(-2.75)
COMPLIANCE*FREE_FLOAT		2.925 ***		1.963 ***
		(2.78)		(3.32)
FREE_FLOAT	-0.075	-2.805 ***	-0.057 **	-1.889 ***
	(-1.56)	(-2.84)	(-1.99)	(-3.39)
Lagged performance	yes	yes	yes	yes
Firm controls	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes
Year effects	yes	yes	yes	yes
Obser.	1,331	1,331	1,330	1,330
Adj. R-Square	0.652	0.654	0.700	0.702
Panel B: OLS-Analysis explaining valuation levels using COMPLIANCE and FREE FLOAT				
Model	**P.C.5**	**P.C.6**	**P.C.7**	**P.C.8**
Dep. variable	MTB	MTB	TOBIN Q	TOBIN Q
Method	OLS	OLS	OLS	OLS
COMPLIANCE	-0.591	-4.707 ***	-0.110	-1.855 ***
	(-0.63)	(-2.79)	(-0.36)	(-2.76)
COMPLIANCE x FREE FLOAT		8.280 ***		3.513 ***
		(3.12)		(3.21)
FREE FLOAT	-0.334 **	-8.063 ***	-0.116 *	-3.395 ***
	(-2.00)	(-3.23)	(-1.90)	(-3.27)
Lagged performance	yes	yes	yes	yes
Firm controls	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes
Year effects	yes	yes	yes	yes
Obser.	1,331	1,331	1,330	1,330
Adj. R-Square	0.430	0.432	0.636	0.638

Notes: The table reports results from OLS-regression analyses explaining performance implications of compliance aviour. Panel A explains log-valuation levels, while Panel B explains standard valuation levels. Both panels examine two performance measures: MtB ratio of equity and Tobin's Q. For each of the endogenous variables, we estimate two specifications: a specification using (among others) COMPLIANCE and FREE FLOAT as explanatory variables and a second specification using (among others) COMPLIANCE , FREE FLOAT and COMPLIANCE x FREE FLOAT as explanatory variables. To account for the problem of endogeneity, all explanatory variables are lagged one period, and we included the lagged endogenous variable. Essentially, our specifications are a variant of the adjusted version of Granger (1969)'s causality model. Besides the explanatory variables reported in the table, each specification contains several additional explanatory variables: the lagged endogenous variable, a constant, SIZE, CASH, RND RATIO, INTANGIBILITY, ROA, EQUITY, DIVIDEND, and OPAQUENESS. Coefficients and t-values of these variables are not reported here. Moreover, we control for fixed industry and year effects, where the former follow the 17-industries classification scheme of Fama and French (1997). All variables are described in table 13. Values in parentheses are heteroscedasticity robust t-statistics. Statistical significance at the 1%, 5%, and 10% levels is indicated by *** , ** , and * , respectively.

Table 6: ROBUSTNESS TEST – Revisiting performance implications

PANEL A: OLS-Analysis explaining log valuation levels using NEURALGIC and FREE FLOAT

Model	**P.N.1**	**P.N.2**	**P.N.3**	**P.N.4**
Dep. variable	ln(MTB)	ln(MTB)	ln(TOBIN Q)	ln(TOBIN Q)
Method	OLS	OLS	OLS	OLS
NEURALGIC	0.045	-0.475***	-0.021	-0.365***
	(0.59)	(-2.93)	(-0.50)	(-3.76)
NEURALGIC*FREE_FLOAT		1.008***		0.666***
		(3.53)		(4.04)
FREE_FLOAT	-0.075	-0.824***	-0.056*	-0.551***
	(-1.56)	(-3.74)	(-1.94)	(-4.23)
Lagged performance	yes	yes	yes	yes
Firm controls	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes
Year effects	yes	yes	yes	yes
Obser.	1,317	1,317	1,317	1,317
Adj. R-Square	0.652	0.655	0.700	0.703

PANEL B: OLS-Analysis explaining log valuation levels using COMPLIANCE and WIDELY HELD

Model	**P.C.9**	**P.C.10**	**P.C.11**	**P.C.12**
Dep. variable	ln(MTB)	ln(MTB)	ln(TOBIN Q)	ln(TOBIN Q)
Method	OLS	OLS	OLS	OLS
COMPLIANCE	0.122	-0.106	-0.004	-0.144
	(0.43)	(-0.36)	(-0.02)	(-0.89)
COMPLIANCE x WIDELY HELD		1.853**		1.134***
		(2.57)		(2.94)
WIDELY HELD	-0.013	-1.750***	-0.025	-1.088***
	(-0.38)	(-2.58)	(-1.32)	(-3.00)
Lagged performance	yes	yes	yes	yes
Firm controls	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes
Year effects	yes	yes	yes	yes
Obser.	1,317	1,317	1,317	1,317
Adj. R-Square	0.651	0.653	0.699	0.701

Notes: The table reports results from OLS-regression analyses explaining performance implications of compliance behaviour. Panel A reports performance implications in an OLS-setting where compliance behaviour is measured by NEURALGIC. Panel B reports performance implications in an OLS-setting where compliance behaviour again is measured by COMPLIANCE but against another ownership concentration variable. In both panels, we examine log-valuation levels using two performance measures: MtB ratio of equity and Tobin's Q. For each of the endogenous variables, we estimate two specifications: a specification using (among others) COMPLIANCE and FREE FLOAT as explanatory variables and a second specification using (among others) COMPLIANCE (COMPLIANCE_IV), FREE FLOAT and COMPLIANCE x FREE FLOAT as explanatory variables. To account for the problem of endogeneity, all explanatory variables are lagged one period, and we included the lagged endogenous variable. Essentially, our specifications are a variant of the adjusted version of Granger (1969)'s causality model. Besides the explanatory variables reported in the table, each specification contains several additional explanatory variables: the lagged endogenous variable, a constant, SIZE, CASH, RND RATIO, INTANGIBILITY, ROA, EQUITY, DIVIDEND and OPAQUENESS. Coefficients and t-values of these variables are not reported here. Moreover, we control for fixed industry and year effects, where the former follow the 17-industries classification scheme of Fama and French (1997). All variables are described in table 13. Values in parentheses are heteroscedasticity robust t-statistics. Statistical significance at the 1%, 5%, and 10% levels is indicated by *** , ** , and * , respectively.

Table 7: ROBUSTNESS TEST – Performance implications with alternative specifications

Panel A: Median regression explaining log valuation levels				
Model	**P.C.1**	**P.C.2**	**P.C.3**	**P.C.4**
Dep. variable	ln(MTB)	ln(MTB)	ln(TOBIN Q)	ln(TOBIN Q)
Method	MEDIAN	MEDIAN	MEDIAN	MEDIAN
COMPLIANCE	0.204	-1.197 *	0.123	-0.455
	(0.72)	(-1.76)	(0.88)	(-1.41)
COMPLIANCE*FREE_FLOAT		2.948 ***		1.194 **
		(2.66)		(1.97)
FREE_FLOAT	-0.058	-2.807 ***	-0.018	-1.136 **
	(-1.21)	(-2.68)	(-0.67)	(-1.98)
Lagged performance	yes	yes	yes	yes
Firm controls	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes
Year effects	yes	yes	yes	yes
Obser.	1,331	1,331	1,330	1,330
Adj. R-Square	0.425	0.428	0.648	0.650
Panel B: OLS-Analysis explaining negative inverse valuation levels				
Model	**P.C.5**	**P.C.6**	**P.C.7**	**P.C.8**
Dep. variable	-1/MTB	-1/MTB	-1/TOBIN Q	-1/TOBIN Q
Method	OLS	OLS	OLS	OLS
COMPLIANCE	0.286	-1.070	0.097	-0.562 *
	(0.89)	(-1.45)	(0.79)	(-1.91)
COMPLIANCE*FREE_FLOAT		2.729 *		1.328 ***
		(1.84)		(2.61)
FREE_FLOAT	0.028	-2.520 *	-0.024	-1.263 ***
	(0.46)	(-1.83)	(-1.12)	(-2.64)
Lagged performance	yes	yes	yes	yes
Firm controls	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes
Year effects	yes	yes	yes	yes
Obser.	1,331	1,331	1,330	1,330
Adj. R-Square	0.454	0.456	0.474	0.475

Notes: The table reports results from median and OLS-regression analyses explaining performance implications of compliance behaviour. Panel A explains log-valuation levels using a median regression approach, while Panel B explains negative inverse valuation levels. Both panels examine two performance measures: MtB ratio of equity and Tobin's Q. For each of the endogenous variables, we estimate two specifications: a specification using (among others) COMPLIANCE and FREE FLOAT as explanatory variables and a second specification using (among others) COMPLIANCE , FREE FLOAT and COMPLIANCE x FREE FLOAT as explanatory variables. To account for the problem of endogeneity, all explanatory variables are lagged one period, and we included the lagged endogenous variable. Essentially, our specifications are a variant of the adjusted version of Granger (1969)'s causality model. Besides the explanatory variables reported in the table, each specification contains several additional explanatory variables: the lagged endogenous variable, a constant, SIZE, CASH, RND RATIO, INTANGIBILITY, ROA, EQUITY, DIVIDEND and OPAQUENESS. Coefficients and t-values of these variables are not reported here. Moreover, we control for fixed industry and year effects, where the former follow the 17-industries classification scheme of Fama and French (1997). All variables are described in table 13. Values in parentheses are heteroscedasticity robust t-statistics. Statistical significance at the 1%, 5%, and 10% levels is indicated by *** , ** , and * , respectively.

Table 8: ROBUSTNESS TEST – Performance implications with two and three lags

PANEL A: OLS-regression analysis with two lags

Model	**P.R.1**	**P.R.2**	**P.R.3**	**P.R.4**
Dep. variable	ln(MTB)	ln(MTB)	ln(TOBIN Q)	ln(TOBIN Q)
Method	OLS	OLS	OLS	OLS
COMPLIANCE	0.149	-1.301 **	0.016	-0.957 ***
	(0.53)	(-2.21)	(0.10)	(-2.75)
COMPLIANCE x FREE_FLOAT		2.925 ***		1.963 ***
		(2.78)		(3.32)
FREE_FLOAT	-0.075	-2.805 ***	-0.057 **	-1.889 ***
	(-1.56)	(-2.84)	(-1.99)	(-3.39)
Lagged performance	2 lags	2 lags	2 lags	2 lags
Firm controls	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes
Year effects	yes	yes	yes	yes
Obser.	1,317	1,317	1,317	1,317
Adj. R-Square	0.652	0.654	0.700	0.702

PANEL B: OLS-regression analysis with three lags

Model	**P.R.1**	**P.R.2**	**P.R.3**	**P.R.4**
Dep. variable	ln(MTB)	ln(MTB)	ln(TOBIN Q)	ln(TOBIN Q)
Method	OLS	OLS	OLS	OLS
COMPLIANCE	0.153	-1.293 **	0.026	-0.959 ***
	(0.53)	(-2.19)	(0.16)	(-2.78)
COMPLIANCE x FREE_FLOAT		2.922 ***		1.990 ***
		(2.74)		(3.36)
FREE_FLOAT	-0.070	-2.797 ***	-0.060 **	-1.918 ***
	(-1.44)	(-2.79)	(-2.07)	(-3.43)
Lagged performance	3 lags	3 lags	3 lags	3 lags
Firm controls	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes
Year effects	yes	yes	yes	yes
Obser.	1,298	1,298	1,298	1,298
Adj. R-Square	0.660	0.662	0.704	0.706

Notes: The table reports results from OLS-regression analyses explaining performance implications of compliance behaviour. The specifications reported in Panel A (Panel B) consider two (three) lags of the endogenous variable on the right-hand side. We examine two performance measures: MtB ratio of equity and Tobin's Q. For each of the performance measures, we estimate two specifications: a specification using (among others) COMPLIANCE and FREE FLOAT as explanatory variables and a second specification using (among others) COMPLIANCE , FREE FLOAT and COMPLIANCE x FREE FLOAT as explanatory variables. To account for the problem of endogeneity, all explanatory variables are lagged one period. Besides the explanatory variables reported in the table, each specification contains several additional explanatory variables: a constant, SIZE, CASH, RND RATIO, INTANGIBILITY, ROA, EQUITY, DIVIDEND and OPAQUENESS All variables are described in table 13. Values in parentheses are heteroscedasticity robust t-statistics. Statistical significance at the 1%, 5%, and 10% levels is indicated by *** , ** , and * , respectively.

Table 9: ROBUSTNESS TEST – Endogeneity of performance implications

PANEL A: Dynamic Panel Analysis explaining log valuation levels using NEURALGIC and FREE FLOAT

Model	**P.DP.1**	**P.DP.2**	**P.DP.3**	**P.DP.4**
Dep. variable	ln(MTB)	ln(MTB)	ln(TOBIN Q)	ln(TOBIN Q)
Method	DPA	DPA	DPA	DPA
NEURALGIC	-0.256	-2.290***	-0.142	-1.315***
	(-0.65)	(-3.42)	(-1.02)	(-3.44)
NEURALGIC x FREE FLOAT		4.160***		2.511***
		(2.69)		(2.95)
FREE FLOAT	-0.898**	-3.884***	-0.329	-2.151***
	(-2.14)	(-3.44)	(-1.28)	(-2.99)
Lagged performance	1st lag	1st lag	1st lag	1st lag
Firm controls	yes	yes	yes	yes
Firm effects	1st diff.	1st diff.	1st diff.	1st diff.
Year effects	yes	yes	yes	yes
Obser.	1,188	1,188	1,187	1,187

PANEL B: Firm-fixed effects analysis explaining log valuation levels using NEURALGIC and FREE FLOAT

Model	**P.FE.1**	**P.FE.2**	**P.FE.3**	**P.FE.4**
Dep. variable	ln(MTB)	ln(MTB)	ln(TOBIN Q)	ln(TOBIN Q)
Method	FFE	FFE	FFE	FFE
NEURALGIC	0.087	-0.340	-0.029	-0.324**
	-0.650	(-1.15)	(-0.40)	(-2.09)
NEURALGIC x FREE FLOAT		0.909*		0.630**
		(1.700)		(2.290)
FREE_FLOAT	-0.447***	-1.115***	-0.243***	-0.707***
	(-3.64)	(-2.68)	(-3.75)	(-3.27)
Lagged performance	no	no	no	no
Firm controls	yes	yes	yes	yes
Firm effects	yes	yes	yes	yes
Year effects	yes	yes	yes	yes
Obser.	1,515	1,515	1,515	1,515
Adj. R-Square	0.678	0.679	0.719	0.720

Notes: The table reports results from regression analyses explaining performance implications of compliance behaviour that allow for unobserved firm-specific heterogeneity. Panel A reports performance implications in a dynamic panel regression setting using an Arellano-Bond 2-step estimator where compliance behaviour is also measured by NEURALGIC. Panel B reports performance implications in an regression setting with fixed-firm effects where compliance behaviour is measured by NEURALGIC. In each panel, we examine two performance measures: MtB ratio of equity and Tobin's Q. For each of the performance measures, we estimate two specifications: a specification using (among others) COMPLIANCE and FREE FLOAT as explanatory variables, and a second specification using (among others) COMPLIANCE , FREE FLOAT and COMPLIANCE x FREE FLOAT as explanatory variables. To account for the problem of endogeneity, all explanatory variables are lagged one period. Besides the explanatory variables reported in the table, each specification contains several additional explanatory variables: a constant, SIZE, CASH, RND RATIO, INTANGIBILITY, ROA, EQUITY, DIVIDEND and OPAQUENESS. All variables are described in table 13. Values in parentheses are heteroscedasticity robust t-statistics. In Panel B, we report Arellano-Bond t-statistics that are robust to firm-specific autocorrelation. Statistical significance at the 1%, 5%, and 10% levels is indicated by *** , ** , and * , respectively.

Table 10: ROBUSTNESS TEST – Causality of performance implications

PANEL A: Instrument variable approach explaining log valuation levels - 1st instrument

Model	**P.IV.1**	**P.IV.2**	**P.IV.3**	**P.IV.4**
Dep. variable	ln(MTB)	ln(MTB)	ln(TOBIN Q)	ln(TOBIN Q)
Method	IVA	IVA	IVA	IVA
COMPLIANCE	2.195	-2.627	2.378**	-1.165
	(1.19)	(-0.87)	(2.17)	(-0.58)
COMPLIANCE x FREE_FLOAT		9.055**		6.671**
		(2.31)		(2.49)
FREE_FLOAT	-0.090	-8.537**	-0.086**	-6.309**
	(-1.68)	(-2.33)	(-2.54)	(-2.52)
Instrument	COMPL_5	COMPL_5	COMPL_5	COMPL_5
Lagged performance	yes	yes	yes	yes
Firm controls	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes
Year effects	yes	yes	yes	yes
Obser.	1,298	1,298	1,298	1,298
Adj. R-Square	0.642	0.648	0.644	0.642

PANEL B: Instrument variable approach explaining log valuation levels - 2nd instrument

Model	**P.IV.5**	**P.IV.6**	**P.IV.7**	**P.IV.8**
Dep. variable	ln(MTB)	ln(MTB)	ln(TOBIN Q)	ln(TOBIN Q)
Method	IVA	IVA	IVA	IVA
COMPLIANCE	1.962	-3.371	2.080*	-1.538
	(1.05)	(-1.28)	(1.80)	(-0.93)
COMPLIANCE x FREE_FLOAT		10.504***		7.154***
		(2.66)		(2.79)
FREE_FLOAT	-0.087	-9.889***	-0.082**	-6.757***
	(-1.58)	(-2.67)	(-2.38)	(-2.81)
Instrument	COMPL_10	COMPL_10	COMPL_10	COMPL_10
Lagged performance	yes	yes	yes	yes
Firm controls	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes
Year effects	yes	yes	yes	yes
Obser.	1,298	1,298	1,298	1,298
Adj. R-Square	0.646	0.635	0.657	0.644

Notes: The table reports results from instrument variable regression analyses explaining performance implications of compliance behaviour. In Panel A (B), we use COMPL_5 (COMPL_10) as our instrument for COMPLIANCE. COMPL_5 (COMPL_10) is calculated as follows: for each year, we sort all firms along SIZE and group them into five (ten) groups of equal size (quintile and decile groups). With this annual classification, we calculate the instrument Z_{it} for firm i in year t as the average compliance level of all firms in the firm's size quintile (decile) group in year t where we do not consider the firm i itself. In each panel, we examine two performance measures: MtB ratio of equity and Tobin's Q. For each of the performance measures, we estimate two specifications: a specification using (among others) COMPLIANCE and FREE FLOAT as explanatory variables and a second specification using (among others) COMPLIANCE , FREE FLOAT and COMPLIANCE x FREE FLOAT as explanatory variables. To account for the problem of endogeneity, all explanatory variables are lagged one period. Besides the explanatory variables reported in the table, each specification contains several additional explanatory variables: a constant, SIZE, CASH, RND RATIO, INTANGIBILITY, ROA, EQUITY, DIVIDEND and OPAQUENESS. All variables are described in table 13. Values in parentheses are heteroscedasticity robust t-statistics. Statistical significance at the 1%, 5%, and 10% levels is indicated by *** , ** , and * , respectively.

Table 11: Explaining compliance

Model	**B.C.1**	**B.C.2**	**B.C.3**	**B.C.4**	**B.C.5**	**B.C.6**	**B.C.7**
Dep. variable	COMPLIANCE	COMPLIANCE	COMPLIANCE	COMPLIANCE	COMPLIANCE	COMPLIANCE	COMPLIANCE
Method	TOBIT	TOBIT	TOBIT	TOBIT	OLS	TOBIT	OLS
Constant	93.412***	95.889***	94.356***	93.528***	93.115***	90.692***	90.955***
	(104.)	(91.1)	(73.1)	(68.6)	(64.2)	(64.3)	(70.5)
SIZE	0.778***	0.354***	0.365***	0.346***	0.349***	0.444***	0.423***
	(9.98)	(3.35)	(3.44)	(3.10)	(3.21)	(3.90)	(4.02)
CASH	3.709***	2.432***	2.305***	2.749***	2.743***	2.788***	2.755***
	(4.93)	(3.20)	(3.02)	(3.26)	(3.36)	(3.33)	(3.48)
INTANGIBILITY	0.009***	0.007***	0.008***	0.007***	0.007**	0.007***	0.007***
	(3.04)	(2.84)	(2.97)	(3.14)	(2.35)	(3.20)	(3.32)
ROA	-4.170***	-3.176***	-3.041***	-2.283**	-2.053**	-1.968*	-1.774*
	(-4.75)	(-3.55)	(-3.40)	(-2.10)	(-2.36)	(-1.81)	(-1.77)
MTB	-0.159**	-0.203***	-0.221***	-0.177***	-0.172***	-0.176***	-0.168**
	(-2.48)	(-2.95)	(-3.25)	(-2.68)	(-2.68)	(-2.60)	(-2.53)
EQUITY	0.017***	0.020***	0.019***	0.018***	0.018	0.018***	0.017***
	(3.50)	(4.58)	(4.30)	(4.84)	(1.40)	(4.88)	(4.87)
DIVIDEND	0.189	0.361	0.392	0.708**	0.634*	0.758**	0.668**
	(0.57)	(1.07)	(1.16)	(2.01)	(1.95)	(2.10)	(1.99)
INSIDE OWN		-3.556***	-3.862***	-4.437***	-4.219***	-4.657***	-4.382***
		(-4.55)	(-4.88)	(-5.33)	(-6.00)	(-5.61)	(-5.54)
EXTERN OWN		-1.242**	-1.230**	-1.130*	-1.096*	-1.932***	-1.742***
		(-2.02)	(-2.00)	(-1.70)	(-1.81)	(-2.83)	(-2.75)
BOARD SIZE		0.361***	0.360***	0.309***	0.298***	0.367***	0.350***
		(3.51)	(3.53)	(2.87)	(3.24)	(3.38)	(3.43)
CODET		1.330***	1.448***	1.977***	1.910***	2.064***	2.014***
		(2.90)	(3.12)	(4.18)	(4.25)	(4.24)	(4.33)
OUTSIDE CEOS		2.810***	2.909***	1.333*	1.350*	1.494**	1.469**
		(3.83)	(3.94)	(1.77)	(1.89)	(1.99)	(2.14)
BUSY BOARD		0.050	0.105	0.496	0.381	0.513	0.398
		(0.16)	(0.35)	(1.59)	(1.32)	(1.64)	(1.38)
FOUNDER			0.568*	0.574*	0.554*	0.642*	0.612*
			(1.70)	(1.67)	(1.77)	(1.86)	(1.85)
COMPETITION			0.031*	-0.001	-0.006	0.019	0.011
			(1.69)	(-0.05)	(-0.30)	(0.97)	(0.61)
MEDIA				0.426	0.148	0.014	-0.168
				(1.09)	(0.38)	(0.03)	(-0.44)
OPAQUENESS				3.611	3.209	3.954	3.547
				(1.23)	(1.20)	(1.36)	(1.28)
Industry effects	yes	yes	yes	yes	yes	yes	yes
Year effects	yes	yes	yes	yes	yes	yes	yes
Cross sections	346	332	331	272	272	265	265
First year	2002	2002	2002	2002	2002	2003	2003
Last year	2007	2007	2007	2007	2007	2007	2007
Total obs.	1,523	1,445	1,444	1,185	1,185	1,068	1,068
Censored obs.	228	215	215	127	n.a.	101	n.a.
Uncensored obs.	1,295	1,230	1,229	1,058	n.a.	967	n.a.
Chi-Statistic // F-Statistic	321.56***	374.15***	379.82***	345.40***	11.18***	335.00***	10.86***

Notes: The table reports Tobit and OLS-estimates using COMPLIANCE as the endogenous variable. Note that as COMPLIANCE is measured in per cent, it is by definition restricted to be between 0 and 100. Thus, we generally use Tobit regression methods. While specification B.C.1 considers only firm characteristics, specification B.C.2 also considers ownership and board structure variables. Specifications B.C.3 and B.C.4 further extend the analysis by considering founder involvement, industry competition, media coverage and a proxy for information asymmetries. Specification B.C.5 re-estimates model B.C.4 by using OLS methods, which we use to evaluate economic significance. Specification B.C.6 restricts the sample to 2003 to 2007 allowing firms to learn in the first year of the code. Again, specification B.C.7 re-estimates specification B.C.6 using OLS methods. All models use fixed time and industry effects, the latter based on a Fama-French industry classification with 17 industry groups. All variables are described in table 13. Values in parentheses are heteroscedasticity robust z-statistics (t-statistics). Statistical significance at the 1%, 5%, and 10% levels is indicated by *** , ** , and * , respectively.

Table 12: Explaining neuralgic compliance

Model	**B.N.1**	**B.N.2**	**B.N.3**	**B.N.4**	**B.N.5**	**B.N.6**	**B.N.7**
Dep. variable	NEURALGIC	NEURALGIC	NEURALGIC	NEURALGIC	NEURALGIC	NEURALGIC	NEURALGIC
Method	TOBIT	TOBIT	TOBIT	TOBIT	OLS	TOBIT	OLS
Constant	75.517***	84.262***	78.285***	73.906***	72.272***	63.578***	64.428***
	(21.3)	(20.4)	(15.7)	(14.3)	(16.1)	(11.7)	(13.0)
SIZE	2.950***	1.363***	1.364***	1.294***	1.331***	1.669***	1.621***
	(10.1)	(3.44)	(3.44)	(3.06)	(3.50)	(3.80)	(4.02)
CASH	10.113***	5.169*	4.960*	5.892*	5.788*	6.287*	6.078*
	(3.44)	(1.75)	(1.67)	(1.75)	(1.84)	(1.85)	(1.89)
INTANGIBILITY	0.034***	0.028***	0.029***	0.027***	0.028***	0.026***	0.027***
	(2.92)	(2.67)	(2.72)	(2.87)	(3.00)	(2.91)	(3.02)
ROA	-16.548***	-12.519***	-11.997***	-8.358**	-7.486**	-7.461*	-6.717*
	(-4.86)	(-3.68)	(-3.54)	(-2.12)	(-2.11)	(-1.89)	(-1.86)
MTB	-0.445*	-0.583**	-0.612**	-0.497*	-0.469*	-0.505*	-0.467*
	(-1.77)	(-2.10)	(-2.23)	(-1.79)	(-1.74)	(-1.76)	(-1.66)
EQUITY	0.065***	0.073***	0.072***	0.063***	0.062***	0.063***	0.061***
	(2.96)	(3.56)	(3.31)	(4.54)	(4.61)	(4.50)	(4.55)
DIVIDEND	0.106	0.847	0.882	2.223*	1.987*	2.431*	2.130*
	(0.08)	(0.68)	(0.71)	(1.72)	(1.69)	(1.80)	(1.71)
INSIDE OWN		-12.138***	-12.675***	-14.547***	-13.692***	-16.217***	-15.125***
		(-4.57)	(-4.75)	(-5.21)	(-5.28)	(-5.52)	(-5.46)
EXTERN OWN		-5.469**	-5.557**	-5.176**	-5.019**	-8.280***	-7.537***
		(-2.47)	(-2.51)	(-2.12)	(-2.28)	(-3.28)	(-3.24)
BOARD SIZE		1.810***	1.810***	1.694***	1.638***	1.853***	1.776***
		(4.91)	(4.94)	(4.30)	(4.51)	(4.61)	(4.73)
CODET		5.168***	5.294***	7.799***	7.427***	8.136***	7.811***
		(3.15)	(3.18)	(4.60)	(4.68)	(4.58)	(4.63)
OUTSIDE CEOS		9.970***	10.025***	3.514	3.523	4.126	3.982
		(3.59)	(3.60)	(1.20)	(1.32)	(1.37)	(1.43)
BUSY BOARD		0.084	0.157	1.922*	1.452	1.839	1.358
		(0.07)	(0.14)	(1.65)	(1.39)	(1.53)	(1.24)
FOUNDER			0.570	1.150	1.061	1.681	1.558
			(0.47)	(0.92)	(0.90)	(1.33)	(1.29)
COMPETITION			0.136**	0.030	0.013	0.104	0.074
			(1.98)	(0.41)	(0.20)	(1.40)	(1.09)
MEDIA				1.866	0.754	0.319	-0.467
				(1.25)	(0.57)	(0.20)	(-0.33)
OPAQUENESS				20.851*	19.540*	21.225*	19.906*
				(1.90)	(1.90)	(1.92)	(1.90)
Industry effects	yes	yes	yes	yes	yes	yes	yes
Year effects	yes	yes	yes	yes	yes	yes	yes
Cross sections	346	332	331	272	272	265	265
First year	2002	2002	2002	2002	2002	2003	2003
Last year	2007	2007	2007	2007	2007	2007	2007
Total obs.	1,523	1,445	1,444	1,185	1,185	1,068	1,068
Censored obs.	234	221	221	132	n.a.	106	n.a.
Uncensored obs.	1,289	1,224	1,223	1,053	n.a.	962	n.a.
Chi-Statistic // F-Statistic	358.03***	418.65***	422.68***	376.08***	12.50***	350.60***	11.59***

Notes: The table reports Tobit and OLS-estimates using NEURALGIC as the endogenous variable. Note that as NEURALGIC is measured in per cent, it is by definition restricted to be between 0 and 100. Thus, we generally use Tobit regression methods. While specification B.C.1 considers only firm characteristics, specification B.C.2 also considers ownership and board structure variables. Specifications B.C.3 and B.C.4 further extend the analysis by considering founder involvement, industry competition, media coverage and a proxy for information asymmetries. Specification B.C.5 re-estimates model B.C.4 by using OLS methods, which we use to evaluate economic significance. Specification B.C.6 restricts the sample to 2003 to 2007 allowing firms to learn in the first year of the code. Again, specification B.C.7 re-estimates specification B.C.6 using OLS methods. All models use fixed time and industry effects, the latter based on a Fama-French industry classification with 17 industry groups. All variables are described in table 13. Values in parentheses are heteroscedasticity robust z-statistics (t-statistics). Statistical significance at the 1%, 5%, and 10% levels is indicated by *** , ** , and * , respectively.

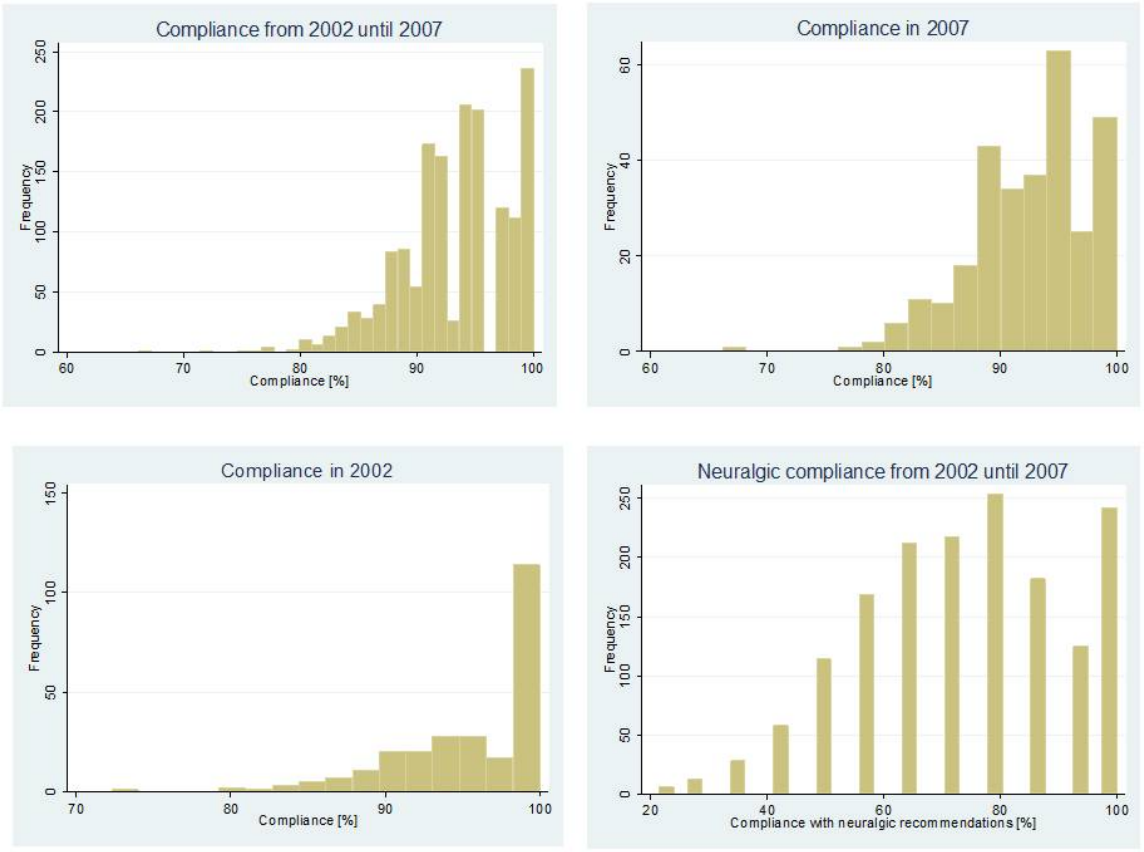
Table 13: Definition of variables

Dimension	Variable	Description
Compliance behaviour	COMPLIANCE	Degree of compliance with the code *Calculation:* 100 minus sum of deviations from the code's recommendations divided by the total number of recommendations times 100 *Source:* hand-collected from firms' statements of compliance (as reported in the annual report)
	NEURALGIC	Degree of compliance with *neuralgic* recommendations *Calculation:* 100 minus sum of deviations from neuralgic recommendations divided by the total number of neuralgic recommendations times 100. Recommendations are considered neuralgic in case they are deviated from more than 10% in any year of our sample *Source:* hand-collected from firms' statements of compliance (as reported in the annual report)
Firm character-istics	SIZE	Size of the firm measured in sales *Calculation:* log of (1+sales or revenues)
	CASH	Fraction of cash and short-term investments to total assets *Calculation:* cash and short term investments to total assets
	INTANGIBILITY	Intangibility of assets *Calculation:* intangible assets to net property plants and equipment
	EQUITY	Leverage variable *Calculation:* total shareholder equity to total liabilities
	DIVIDEND	Dividend dummy *Calculation:* dummy variable taking the value of 1 in case that the firm pays dividends
Firm performance	MTB	Market to book ratio *Calculation:* market to book value of equity (winsorised at 1%)
	TOBIN Q	Tobin's Q *Calculation:* 1+(market capitalization of equity -book value of equity)/(total assets) (winsorised at 1%)
	ROA	Return on assets *Calculation:* EBIT to total assets (winsorized at 1%)
Ownership structure	INSIDE OWN	Inside ownership *Calculation:* fraction of voting rights held by members of the management board *Source:* hand-collected from Hoppenstedt Aktienführer
	EXTERN OWN	External blockholders *Calculation:* fraction of voting rights held by the three largest external blockholders *Source:* hand-collected from Hoppenstedt Aktienführer
	FREE FLOAT	Fraction of voting rights held by small investors *Calculation:* 1 - INSIDE OWN - EXTERN OWN
	DOMINATED	Dummy variable indicating a dominated firm *Calculation:* dummy variable taking the value of 1 in case that the largest shareholder holds more than 10% of voting rights *Source:* hand-collected from Hoppenstedt Aktienführer
	WIDELY HELD	Dummy variable indicating a widely held firm *Calculation:* dummy variable calculated as 1 - DOMINATED
Board structure	BOARD SIZE	Excess size of the supervisory board *Calculation:* residuals of a regression explaining board size by a constant and the (log of the) number of employees *Source:* hand-collected from annual reports
	CODET	Codetermination of the supervisory board *Calculation:* variable taking the value of 1 (0.5) in case of parity (one third) codetermination *Source:* hand-collected from annual reports
	OUTSIDE CEOS	Fraction of supervisory board members that serve as CEO in another company *Calculation:* fraction of supervisory board members that serve as CEOs of other companies (only capital representatives) *Source:* hand-collected from annual reports and further research activities
	BUSY BOARD	Dummy variable indicating supervisory boards with a large number of busy members *Calculation:* dummy variable taking the value of 1 in the case that at least 50% of supervisory board members have 3 (or more) additional directorships *Source:* hand-collected from annual reports and further research activities
Other variables	FOUNDER	Founder involvement *Calculation:* dummy variable taking the value of 1 in case that (one of the) founder(s) is still involved in the management or supervisory board of the firm *Source:* hand-collected from annual reports and further research activities
	COMPETITION	Proxy for industry competition *Calculation:* inverse of the median industry rent
	MEDIA	Proxy for (excess) media coverage *Calculation:* residuals of a regression explaining media coverage (proxied by DAX and MDAX listing) by a constant and the (log of 1 plus the) market capitalisation *Source:* Deutsche Börse
	OPAQUENESS	Measure of information asymmetry *Calculation:* residuals of a market model explaining (36) monthly stock market returns of the firm *Source:* Own calculation based on monthly TSRs

Notes: The table shows all relevant variables and their calculation. Firm characteristics are from Worldscope and Datastream.

C. Figures

Figure 1: Compliance from 2002 until 2007



Notes: The figure illustrates absolute frequencies of compliance with the code in 2002, 2007 and general. Furthermore, it depicts compliance with neuralgic recommendations over the period from 2002 until 2007.