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Compliance with the German Corporate Governance Code: Can the heterogeneous implementation be explained?

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Abstract

Starting with the Cadbury code in 1992, various national and international Corporate Governance (CG) codes have been issued all over the world. So far, empirical studies have revealed mixed results concerning the effects and outcomes of code implementation and thus supported the hypothesis of a ‘one system does not fit all’ approach in CG. Therefore, this paper empirically analyses influence factors on compliance with the German Corporate Governance Code for a large sample of 306 listed firms in 2015. We chose German companies because of the specific institutional settings in Germany, e.g., the strong influence of founder families on a firm’s management or the relevance of debt financing. It is assumed that the country-specific institutional setting limits the transferability of results of US and UK studies. Thus, we used the German setting to derive relevant influence factors on Code compliance. In addition, we applied a more sophisticated measure of Code implementation than previous studies. Overall, we find a significant positive effect of ownership dispersion and firm size on Code compliance, whereas the other influence factors, e.g., family influence or the supervisory board’s size, reveal the right direction of impact but not the required level of statistically significance. In contrast to institutional theory, we find a negative although statistically insignificant impact of the strength of foreign investors’ influence on Code compliance. Overall, our results indicate that the institutional setting is not decisive for Code compliance. Instead, we assume that the main rationale for Code compliance is not the reduction of agency conflicts but the alignment with peer group practices as indicated by the variable company size. Future research should investigate the peer effects on the level of Code compliance in detail.

Keywords: German Corporate Governance Code, compliance, institutional setting, influence factors, multiple theory approach.

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Streszczenie
Zgodność z niemieckim Kodeksem ładu korporacyjnego:
czy można wyjaśnić zróżnicowane podejście przedsiębiorstw do jego wdrożenia?

Począwszy od Kodeksu Cadbury'ego z 1992 roku na świecie opracowano różne krajowe i międzynarodowe kodeksy ładu korporacyjnego (Corporate Governance – CG). Jak dotąd, badania empiryczne nie dostarczyły jednoznacznych rezultatów w zakresie efektów i wyników ich implementacji, popierając tym samym hipotezę, że „jeden system nie pasuje dla każdego" w odniesieniu do CG. W niniejszym artykule poddano analizie czynniki wpływające na wdrożenie zasad niemieckiego Kodeksu ładu korporacyjnego w 306 spółkach publicznych w 2015 roku. Badaniami objęto niemieckie spółki z uwagi na specyficzne uwarunkowania instytucjonalne charakterystyczne dla Niemiec, m.in. silny wpływ rodzin będących założycielami firm na procesy zarządcze czy istotne znaczenie finansowania przez zadłużenie. Przyjmuje się, że specyficzne dla danego kraju instytucjonalne uwarunkowania ograniczają możliwość bezpośredniego odniesienia uzyskanych wyników do dotyczących Stanów Zjednoczonych czy Wielkiej Brytanii. W artykule skoncentrowano uwagę na specyfice Niemiec, co pozwoliło zidentyfikować istotne czynniki wpływające na zgodność praktyki działających w tym kraju spółek z kodeksem CG. W badaniach zastosowano także bardziej wyrafinowaną metodę pomiaru stopnia wdrożenia zasad CG niż w przeprowadzonych do tej pory. Wyniki badań pozwalają stwierdzić znaczący pozytywny wpływ rozproszenia własności i wielkości firmy na zgodność z zasadami CG. Analiza większości innych czynników, takich jak m.in. zaangażowanie rodziny czy rozmiar rady nadzorczej pozwoliła stwierdzić, że mają one zakładany wpływ, ale nie mają wymaganego poziomu statystycznej istotności. W przeciwieństwie do założeń teorii instytucjonalnej w pracy wykazano negatywny, choć nieistotny statystycznie wpływ inwestorów zagranicznych na wdrożenie zasad CG. Wyniki badań wskazują więc, że instytucjonalne uwarunkowania nie mają kluczowego znaczenia dla tego procesu. Pozwalają jednak stwierdzić, że główną przesłanką stosowania zasad CG nie jest zmniejszenie konfliktu agencji, ale dostosowanie się do praktyk stosowanych przez podobne podmioty, na co wskazuje zmienna rozmiar spółki. Dalsze badania powinny w być ukierunkowane na dokładniejsze zbadanie wpływu porównywalnej grupy przedsiębiorstw na wdrożenie zasad CG.

Słowa kluczowe: niemiecki kodeks ładu korporacyjnego, zgodność, wpływające czynniki, podejście wielu teorii.

Introduction

In general, agency theory argues that the separation of ownership and control in firms leads to agency conflicts, offering a potential for opportunistic behaviour and management discretion (Jensen and Meckling, 1976). According to firm characteristics like ownership structure, there are various agency conflicts, e.g., between investors and managers or between investors with different equity shares (Ahrens et al., 2011; Raelin and Bondy, 2013). These agency conflicts result in the necessity to implement corporate governance (CG) mechanisms, reducing management's possibilities for opportunistic behaviour (Berle and Means, 1932; Shleifer and Vishny, 1997). Differences in capital markets, corporate ownership patterns, legal requirements and other influence factors lead to different types of agency problems relevant for firms operating under such a setting (Seidl et al., 2009).

In addition, individual firm characteristics (e.g., family influence) determine the nature and size of a firm's agency conflicts. Thus, different CG mechanisms and approaches seem adequate for different firms according to their specific situation (Zattoni

and Cuomo, 2008; Aguilera and Cuervo-Cazurra, 2009; Carcello et al., 2011). Overall, there is no 'one system fits all' approach in CG. Consequently, it is necessary to analyse the main influence factors on the level of CG implementation and thus on CG code compliance.

Empirical studies on CG mostly focus on US and UK firms (Durisin and Puzone, 2009). Because of the specific characteristics of this institutional setting, such as a highly developed financial market and a high level of investor protection, the generalizability of their results is doubted (Aguilera and Jackson, 2003; for a review see Schiehll and Castro Martins, 2016). Thus, there is a call for more studies outside the US and the UK (Durisin and Puzone, 2009). In particular, the specific institutional context in Germany, e.g., the regulatory nature of the CG code, the relevance of equity blockholders, the strong influence of founding families on their firms and the lower usage of incentive remuneration (Seidl et al., 2009), require an investigation of German companies.

Therefore, it is the aim of our study to empirically analyse the level of compliance of German listed firms with the German CG code and its diverse sections. In addition, we derive potential influence factors on the level of Code compliance from the specific German institutional setting. In order to avoid some of the methodological problems of prior studies, we also use alternative theories, such as stewardship theory or signalling theory, for a broader theoretical underpinning of our research model. Moreover, we do not focus on single CG mechanisms or variables but analyse influence factors on firm compliance with the complete German CG code and its different sections and requirements. Compared to other studies, like T. Tagesson and S.-O.Y. Collin (2016), we not only measure if a company complies completely with the code but use thorough content analysis to evaluate a firm's level of code compliance in detail.

We find a high average compliance rate with the Code of more than 90%, with a considerable variance between the analysed companies and the different sections of the Code. The lowest compliance (39.87%) concerns the recommendation for a regular limit on the length of membership in the supervisory board. We derive seven potential influence factors on Code compliance under the German institutional setting. The analysis of these influence factors on Code compliance shows that only ownership dispersion has a significant positive impact, whereas family influence, foreign investors, size of the supervisory board, females in the supervisory board, size of the auditing firm and leverage cannot explain the different levels of Code compliance. Our empirical results show that the theoretically assumed link between the institutional setting in a country, the firm-specific situation and Code compliance cannot be demonstrated. In fact, there might be other influence factors besides those of the institutional setting, such as peer group orientation, which explain the different levels in Code compliance.

We contribute to the CG literature because (1) we develop and use a more sophisticated measure for code compliance, (2) we provide an updated view concerning the level of firm compliance with the German CG code and its different sections, (3) we analyse the main influence factors on code compliance derived from the unique institutional setting of Germany, and (4) we empirically check for the case of Germany whether the institutional setting really has an influence on Code compliance.

The paper is structured as follows. The first section briefly reviews the results of previous studies concerning influence factors on code compliance and discusses their shortcomings. In the second section, the research model is developed and hypotheses are derived. The third section describes the methodology, the variables and the data. The results are presented and discussed in the fourth section; in the last section we draw some implications for further research and corporate practice and discuss the limitations of our approach.

1. Review of prior studies

There is no generally accepted definition of corporate governance (L'Huillier, 2014). We define CG as a system of laws, rules and mechanisms that control management operations. They can be divided into external CG mechanisms resulting from legal regulations and requirements of financial institutions and markets, and internal mechanisms dealing with the implementation of control structures and processes in companies (Gillan, 2006 for an overview). By the end of 2014, 14 transnational institutions had issued 21 different corporate governance codes, and 91 countries had issued and revised national CG codes, mostly in Europe. Due to differences in the institutional setting, the different CG codes vary considerably in their scope, coverage, and enforcement (Cuomo et al., 2016).

There are already studies analysing the compliance with CG codes (e.g., Tuschke and Sanders, 2003; Holm and Scholer, 2010; Kang et al., 2007; Sakawa et al., 2012). These studies mostly focus on firms' overall level of compliance or compliance with different code sections. On the one hand, most of the studies find a relatively high average rate of code compliance of 90% and more. On the other hand, there is considerable variance between companies and concerning different sections of the code (Akkermans et al., 2007 for Dutch firms; Luo and Salterio, 2014 for Canadian firms; Nerantzidis et al., 2014 for Greek firms; Seidl et al., 2009 for UK firms; Seidl et al., 2013 for UK and German firms; Bassen et al., 2006; Jahn et al., 2011; von Werder and Turkali, 2015; Eisenschmidt and Bilgenroth, 2016 for German companies; for an overview see Stiglbauer and Velte, 2012). The variance of the compliance rate can partly be explained by the compliance with the so-called neuralgic recommendations which are fulfilled by less than 90% of the companies (Jahn et al., 2011).

As the Cadbury code is one of the first implemented CG codes worldwide, code compliance is expected to be higher for UK firms. D. Seidl et al. (2009) showed that in 2006, 52% of all analysed British companies fully complied with the code. In addition, 41.67% of the code's recommendations were fulfilled by all companies. Compared to German listed companies, the average rate of compliance is higher. The difference is mainly explained by the different experience of board members concerning the use of regulatory codes and self-regulation and differences in the institutional setting. For example, in the UK, large outsider financial institutions exercise a strong influence on

board members and thus on code compliance (Seidl et al., 2009). For the Greek institutional setting, Nerantzidis (2015) even finds a far lower average compliance rate of 35% (see also Nerantzidis et al., 2014).

Some studies investigate deviations from the relevant code in more detail. Tagesson and Collin (2016) showed that about half of the analysed Swedish companies deviate on at least one recommendation from the Swedish code. For Greek companies, the average rate of non-compliance was even higher. In addition, almost two third of all deviating firms did not provide any explanations for the deviations (Nerantzidis, 2015). Concerning the German CG code, 24 recommendations were applied by less than 80% of the companies (Talaulicar and von Werder, 2008). In addition, only 7% of 650 listed Canadian firms fully complied with all code recommendations and 44% could be characterised as nearly complete adopters (Luo and Salterio, 2014).

An above-average percentage of non-compliance is primarily found for requirements related to the remuneration of board members, the independence of supervisory board members and internal control systems (e.g., Akkermans et al., 2007), and concerning the cooperation between the management board and the supervisory board (Bassen et al., 2006). In Germany, less information is disclosed concerning the compliance with the more voluntary 'should or can' suggestions, which is interpreted as a lower relevance of these suggestions for companies. Depending on the methodology of the study and the analysed year, the average compliance rates concerning the suggestions amount to 60% (e.g., Bassen et al., 2006; von Werder and Talaulicar, 2006; Eisenschmidt and Bilgenroth, 2016).

In addition, Seidl et al. (2013) analysed the stated deviations and explanations of 257 UK and German listed firms. They found that 85.9% of the German companies and 48.0% of the UK companies deviated from their codes. 55.7% of the German firms and 41.3% gave no explanation for their deviations, 23.8% and 52.2%, respectively, justified deviations with reference to their firm-specific situation, and 19.7% and 6.5%, respectively, named principle problems with the specific code provision. Overall, deviations from the code are better explained and more reasonably justified in UK firms. The difference is mainly explained by the different experience of board members concerning the use of regulatory codes and self-regulation and differences in the institutional setting. For example, German firms are more likely to be controlled by insider blockholders with networks of cross-shareholders. Thus, it is assumed that there is less pressure to explain deviations from code compliance. In addition, family-owned firms may prefer privacy over transparency and disclosure of governance information (Seidl et al., 2009).

Compared to the numerous empirical studies analysing the level of code compliance, there are only a few studies concerning possible influence factors on the compliance with CG codes. Overall, there is quite a heterogeneous picture concerning possible influence factors on firms' compliance with CG codes. Nearly all studies have found a positive correlation between code compliance and firm size (e.g., Talaulicar and von Werder, 2008 for Germany; Hooghiemstra and van Ees, 2011 for the Netherlands). It is

argued that as the number and size of potential agency conflicts grow in relation to firm size, larger companies need more sophisticated governance practices and an elaborated CG approach. In addition, ownership concentration (Jahn et al., 2011; Hooghiemstra, 2012; Kohl et al., 2013; Tagesson and Collin, 2016), the size of the supervisory board (Talaulicar and von Werder, 2008; Hooghiemstra, 2012; Tagesson and Collin, 2016) and leverage (Jahn et al., 2011; Eisenschmidt, 2016) seem to be related to code compliance. Nevertheless, the selection of the investigated influence factors is not discussed from the perspective of the institutional setting of the analysed companies, and thus it is unclear if all relevant influence factors are included.

Overall, it can be taken as empirical evidence that listed companies, in particular, comply with their relevant CG code to a high degree, although there are also major deviations for specific recommendations. As the main argument for code compliance, it is said that companies want to increase their legitimacy among investors and to improve the effectiveness of their governance practices (Zattoni and Cuomo, 2008). Additionally, a high rate of compliance can be explained by strong institutional pressure (Tagesson and Collin, 2016). Nevertheless, there are considerable differences in code compliance between different countries and thus different institutional settings. In addition, the level of code compliance seems to be influenced by at least some factors related to the nature of a firm's agency conflicts, but there is no common understanding concerning their number, their relation to CG code implementation or their relevance in a specific institutional setting. In addition, the studies often focus on a single or limited number of influence factors, mostly firm size or ownership concentration. Thus, important explanatory variables might be missing, leading to a significant bias in model estimation (Börsch-Supan and Köke, 2002).

Finally, the studies suffer from several theoretical and methodological weaknesses, which might serve as a starting point for future studies:

- Further studies should be grounded in theory-based models concerning a system of influence factors on code compliance. That means that the level of code compliance could be determined by the type and size of a firm's agency conflicts which result from the institutional setting (see as an example Dey, 2008).
- Although there are several theories from a variety of disciplines, including finance, economics, law, politics and organizational theory, which could be used to explain code compliance, studies suffer from a lack of theoretical underpinning (e.g., Akkermans et al., 2007; Kohl et al., 2013) or are mainly based on agency theory (e.g., Bassen et al., 2006). Future research should consider alternative theories to derive and empirically test factors influencing the level of code compliance.
- There are severe differences between the studies concerning the measurement of code compliance. Some studies measure code compliance only as a dichotomous variable, with 1 point for complete compliance and 0 for incomplete code compliance (Tagesson and Collin, 2016); others develop metrically scaled variables calculating the percentage of all recommendations which are complied with for the whole code or for different sections (Wahab et al., 2007; Eisenschmidt, 2016). The use of

a dichotomous measurement for code compliance leads to a loss of information for the dependent variable, which can weaken or bias the statistical results[1]. However, even these studies are not directly comparable because there are differences between the studies concerning the integration of the 'should or can' suggestions (for a discussion see Stiglbauer and Velte, 2012). Future studies should be based on a more sophisticated measurement approach that enables a large information content.

2. Research model and hypotheses

Firms operate in specific institutional settings determined by factors such as the national CG legislation, market capitalisation, the relevance of foreign institutional investors or national culture influencing the potential for agency conflicts (Sahin, 2015). In addition, there are firm-specific factors determining the scope and size of a firm's agency conflicts and thus the level of Code compliance necessary to limit these conflicts (Börsch-Supan and Köke, 2002; Huse, 2005; Schiehll and Castro Martins, 2016), such as firm size or ownership structure (dispersion and type) (Jensen and Meckling, 1976), capital structure (Jensen, 1986), supervisory board size and structure (Jensen, 1993), management compensation (Jensen and Murphy, 1990), CEO tenure, attributes and background, product market competition, and life-cycle variations of the products. The list is not exhaustive, and there are discussions about which factors should be regarded as contextual variables (Huse, 2005).

Traditional agency theory emphasises the role of CG in ensuring that the firm operates in the interests of owners (Fama and Jensen, 1983), but it assumes an institutional context similar to Anglo-American governance systems. Nevertheless, the institutional setting in Germany is quite different, and thus it is unclear if the results of studies from a specific institutional context can be transferred to another context. The ownership of German listed firms can be characterised by the presence of blockholders and strong family influence (Seidl et al., 2009). In addition, foreign investments increased dramatically during the last two decades (Dill and Jirjahn, 2017) and banks play a central role in corporate finance (Jackson and Moerke, 2005). Therefore, we discuss the potential impact of these factors on compliance with the code. We also consider influence factors on code compliance which have been empirically supported by other studies, such as size and composition of the supervisory board and size of the auditing firm (Tagesson and Collin, 2016).

[1] In a dichotomous measurement, a company which only deviates in one out of 100 recommendations is treated equally to a company which more strongly or totally deviates. For the interpretation and further statistical analysis, a more precise measurement with broader information content should be applied, which can gain further and less biased insights.

We use agency theory as a starting point for the development of our hypotheses. Additionally, we use contingency theory, stewardship theory, signalling theory and institutional theory to derive research hypotheses concerning influence factors on CG compliance. The necessity of using a variety of theories for the underpinning of empirical studies concerning compliance with CG codes is also stressed by Cuomo et al. (2016) and Young and Thyil (2008).

- *Ownership dispersion*
  We have chosen ownership dispersion as a relevant influence factor on code compliance because the ownership structure of large German companies is characterised by the presence of blockholders. Considering the influence of the ownership structure on Code implementation, two opposite hypotheses are discussed. The substitutive hypothesis assumes that the level of ownership concentration determines the possibilities for ownership control. If ownership is highly dispersed, and thus single shareholders have very limited possibilities to control a firm's management, the size of the agency conflict between the management and the shareholders is large. Thus, a firm's management has to be restricted by a more thorough CG implementation. In contrast, the complementary hypothesis argues that a minimum level of ownership power is necessary to force a firm's management to comply with more demanding CG mechanisms. Thus, blockholders have the power to establish more efficient information structures and benefit more from management's information supply (Shleifer and Vishny, 1997). On the other hand, agency conflicts between blockholders and non-blockholders might develop. The substitutive hypothesis is also supported by signalling theory because a high level of code compliance is a strong positive signal to the capital market. Overall, we follow the substitutive hypothesis:

Hypothesis 1: There is a positive relationship between ownership dispersion and Code compliance.

- *Family influence*
  Even large German firms are often under the control of a family. Family-controlled companies are at least partly owned by one or more family members. On the one hand, it is argued that in family firms agency conflicts might arise between the owner family and minority investors. On the other hand, agency theory is not able to explain management behaviour in family-controlled firms because in these firms, managers seem to act as stewards. Their satisfaction results from their work ethic, their personal recognition and their contribution to the achievement of the corporate objectives (Davis et al., 1997; Miller and LeBreton-Miller, 2006). Stewardship theory states that there is no conflict of interest between family owners and managers, and managers act in line with the owners' objectives (Young and Thyil, 2008; L'Huillier, 2014). If managers act as stewards, the implementation of thorough CG mechanisms is counterproductive and destroys the trust between the firm's owners and its management.

Hypothesis 2: There is a negative relationship between family influence and Code compliance.

- *Foreign investors*
  Foreign investors form an important group of shareholders of German companies. In comparison to domestic shareholders, they face higher information asymmetries and thus stronger agency problems because they usually have less knowledge about the national legal and political setting. Besides, they could have less access to the management or the supervisory board, especially if their stake is low. This can lead to selection effects where foreign investors could avoid or terminate an investment. In order to reduce these agency conflicts and to establish trust among foreign investors, firms may signal strong Code compliance. In addition, institutional theory also suggests that a higher stake of foreign investors, especially from an Anglo-American CG setting (Yoshikawa and Rasheed, 2009), might lead to higher Code compliance because these investors expect a strong corporate governance implementation comparable to their national setting (Aguilera and Jackson, 2003; Zattoni and Cuomo, 2008).

Hypothesis 3: There is a positive relationship between foreign investors' influence and Code compliance.

- *Leverage*
  There are theoretical arguments for the link between governance and the amount of debt present in the capital structure (Jensen and Meckling, 1976). The influence of large creditors on a firm's management depends on their legal rights. In Germany and Japan, banks execute significant power over their debtors, because they often vote for significant blocks of shares, are members of the board of directors, play a dominant role in lending and operate in a legal environment favourable for banks (Shleifer and Vishny, 1997; for a detailed description see Jackson and Moerke, 2005). Agency costs related to debt are thus likely to be higher in firms with greater leverage. Owner-managers have an incentive to accept high-risk projects to transfer wealth from creditors to shareholders. Furthermore, firms with higher leverage ratios have greater incentives to manage earnings in order to avoid covenant violations and/or to prevent adverse effects on their debt ratings (Dey, 2008). Thus, higher leverage is associated with a higher level of Code compliance.

Hypothesis 4: There is a positive relationship between leverage and Code compliance.

In addition to the influence factors on Code compliance derived from the specific institutional setting in Germany, we consider influence factors which have been demonstrated to be relevant in other empirical studies.

- *Size and composition of the supervisory board*
  The supervisory board is often regarded as the core internal CG mechanism (Jensen, 1993; Carver, 2010). Listed German companies normally have a two-tier board structure with a supervisory board monitoring a firm's executive management. The

minimum and maximum size of the supervisory board in relation to firm size is dictated by law (Jackson and Moerke, 2005). Firms can vary the size of their supervisory board within these limits. On the one hand, a negative relationship between the size of the supervisory board and the implementation of CG mechanisms is assumed, because the coordination between the board members becomes more difficult and thus decision-making more inefficient. On the other hand, monitoring a firm's executive management is the most important function of a supervisory board. Thus, it can be assumed that a larger supervisory board has more diverse competencies, more resources and more power to force a firm's management to implement thorough CG (Jensen, 1993; for empirical evidence see Madhani, 2015).

Hypothesis 5: There is a positive relationship between the size of the supervisory board and Code compliance.

There is empirical evidence that female decision-makers are more risk-averse and have a higher propensity to follow the rules (e.g., Powel and Ansic, 1997). In addition, boards with a higher share of female directors are more likely to issue conflict of interest guidelines and codes of conduct (Terjesen et al., 2009). This implies that a supervisory board with a larger share of female directors leads to greater compliance with a CG code.

Hypothesis 6: There is a positive relationship between the share of female directors and Code compliance.

- *Size of the auditing firm*

  On the one hand, smaller auditing firms have more to prove and are also less confident about their brand, thus making them 'act safe' and enforce more compliance. Instead, we follow the argument that larger auditing companies have more knowledge and experience concerning the implementation of CG mechanisms and offer additional advisory services. According to the political sciences, audit companies contribute to the development of CG codes. Thus, they may advise their clients to realise a more thorough implementation of a CG code (Ahrens et al., 2011). Also, auditors might be concerned about minimising their legal liability and lobby for standards that reduce their own risks. Larger auditing companies have more power to convince their clients to more thoroughly comply with the code (Healy and Palepu, 2001). In addition, they are interested in signalling their competence in CG to the capital market.

Hypothesis 7: There is a positive relationship between the size of the auditing firm and Code compliance.

In addition to our analysis of the above factors' influence on total Code compliance, we analyse possible effects on compliance with different sections of the Code. Typically, deviations from Code compliance vary according to the section (e.g., Eisenschmidt,

2016). We are interested in identifying factors influencing compliance with different code sections. For example, according to stewardship theory, we assume that managers of family firms are self-motivated and act in the interests of the company. Thus, regulating management's financial incentives is not of great importance to family firms. We suppose that Code compliance with the *management board* section is lower for family firms because this section mainly deals with aspects of management remuneration (L'Huillier, 2014). In addition, larger and thus more powerful audit firms might be especially interested in high compliance with the Code section *reporting and audit* of the annual financial statement, because this section directly affects their auditing business, and thus they might be willing to signal their own professional quality to other potential clients and investors (for an intense discussion of the auditor's role in code compliance see Tagesson and Collin, 2016). Due to the length of our paper, we abstain from deriving various hypotheses for each section of the Code, but the assumed direction of impact of our influence factors in the analysis of the sections follows the above derived main hypotheses and is displayed in Table 6.

3. Data collection and methodology

3.1. German Corporate Governance Code

The German Corporate Governance Code (GCGC) was developed by a governmental commission of scientists, executives, board members, auditors, investors, etc. (Baums, 2001) and adopted in 2002. The Code should improve the quality of corporate governance by enforcing international standards of CG and increase transparency by describing the German corporate governance system and inform international investors, in particular, about the realisation of corporate governance at the firm level (Stiglbauer and Velte, 2012). It is structured into six sections (*shareholders and general meeting*, *cooperation between management and supervisory board*, *management board*, *supervisory board*, *transparency*, *reporting and audit*) which reflect the main aspects of CG. For each section, a number of recommendations ('shall recommendations') and suggestions ('should or can suggestions') are formulated (Talaulicar and von Werder, 2008). The question about who decides to comply with the recommendations depends on the specific recommendation in the Code. In most cases, the management makes the decision about whether to comply or not, but for some recommendations (especially in the section *supervisory board*) the supervisory board decides on the compliance (e.g., to form committees like an audit committee). However, the supervisory board can always criticise the deviations of the Code's recommendations and try to change the management's decisions in a dialogue with the management board.

The Code follows the 'comply or explain' principle. It is expected that listed companies usually comply with the Code. Deviations are allowed but have to be named,

explained and disclosed – especially for deviations from Code recommendations (Article 161 of the Stock Corporation Act). The declaration of conformity or non-compliance with the Code's recommendations has to be disclosed on the firm's website. In addition, both the publication of the declaration and its location have to be disclosed in the notes of the annual financial report. Each year, the Code is further developed with respect to its formal aspects and content (Stiglbauer and Velte, 2012).

3.2. Selection of data

We focus our research on a large sample of German corporations (1) because of the specific institutional setting in Germany, e.g., a large proportion of family firms, (2) to get a better understanding of the current implementation of the Code, and (3) to have a broad industry and size independent sample for our empirical research. The starting point of our analysis were the listed companies of the three German stock segments (Prime Standard, General Standard and Entry Standard) of the Frankfurt stock exchange at the end of 2015[2]. We had to adjust our sample for several issues. First, there were double listings in the segments. Second, foreign companies had to be eliminated because they were not obliged to disclose information regarding the implementation of the Code. Third, companies without the relevant data for our research, e.g., companies which only disclosed financial statements according to local GAAP (Handelsgesetzbuch) or companies in bankruptcy or liquidation, had to be excluded, too.

Therefore, 779 securities from the sum of 1,268 securities had to be eliminated. Additionally, we had to adjust our sample size because of obsolete data. One hundred seventy-seven companies did not disclose a current declaration of conformity referring to the Code version of 5th May 2015[3]. Six companies declared that they did not apply the Code. Overall, we still have a broad and varied sample, regarding size and capital market exposure. In total, our sample amounts to 306 German companies, of which 241 companies stem from the Prime Standard, 63 companies from the General Standard and two companies from the Entry Standard. Table 1 shows the sample size and reductions.

[2] In Germany, listed companies have to fulfill different legal requirements concerning their transparency according to the market segment of the Frankfurt stock exchange in which they are listed. The entry standard has the lowest requirements and is thus suitable especially for small and medium-sized companies. Companies listed in the general standard have to fulfill additional transparency requirements. Firms listed at the prime standard have to fulfill the strongest requirements.

[3] The Code can be adjusted every year and was changed in the past (Eisenschmidt and Bilgenroth, 2016). To assure a consistent content analysis, we only analyse the declaration of conformity when it refers to the Code's version of 5th May 2015. Especially, in the Entry Standard you are not obliged to apply the Code. Therefore, we have this huge amount of obsolete declarations.

Table 1. Sample size and reductions

Number of securities in the Prime, General and Entry Standard	**1,268**
Double listings (performance index and preferred stocks)	651
Foreign companies in the indices	58
Companies without relevant data	44
Companies in bankruptcy or liquidation	20
Companies with parent's declaration of conformity	6
Basic sample	**489**
Companies without a current declaration of conformity	177
Companies which do not apply the Code	6
Final sample	**306**

Source: author's own elaboration.

3.3. Dependent variable

We used content analysis (Krippendorff, 2012) to evaluate the companies' compliance with the Code. Major requirements for good scientific research are validity and reliability (e.g., Golafshani, 2003 with further references; Lakshmi and Mohideen, 2013). To assure validity, we tried to reduce subjectivity in the coding of the data and used an accepted and standardised catalogue of criteria for the content analysis which is displayed in one of the major commentaries for the application of the Code[4]. Each recommendation of the Code is displayed there with a certain number[5]. So, all coders used the same catalogue for their coding. The deviations from the Code's recommendations were evaluated dichotomously. If a deviation regarding a recommendation occurred, 1 point was assigned in the coding, otherwise 0. This dichotomous coding avoided that subjective elements entered into the evaluation process which could bias the coding as well as the empirical analysis. Finally, Code compliance is the percentage of recommendations complied with in relation to all recommendations of the Code. The following formula represents the calculation of Code compliance:

$$Code\ compliance = \left(1 - \frac{Sum\ of\ deviations\ from\ recommendations}{Total\ number\ of\ recommendations}\right) \times 100 \qquad (1)$$

[4] See for the catalogue Kremer et al. (2016), recital 2001.

[5] In the Code two or more recommendations can be displayed in one paragraph, e.g., several recommendations for the compensation of the board are included in paragraph 4.2.3 of the Code. Kremer et al. (2016) convert the data and display each individual recommendation with a certain number in an alphanumerical order. In the end, 102 recommendations are disclosed for the Code's version as of 5th May 2015 and are used for the coding.

Explanations of the deviations were not part of our analysis. Only in some circumstances were they considered. If there were cases where a company deviated but the behaviour was linked to a decision in the past, e.g., a five-year compensation contract for the CEO which had been made in 2013 and contained a deviation from the Code, the deviation was not evaluated as a deviation, because the company had no possibility to change this contract in 2015 and was tied to the former arrangement[6]. There were also dependencies between the recommendations in the Code. One example was the CEO's compensation. This compensation should have fixed and variable components (paragraph 4.2.3 of the Code). If a company only had a fixed payment for the CEO, it could not follow the other recommendations dealing with the requirements of variable compensation, e.g., the long term perspective of the variable component (paragraph 4.2.3 of the Code). In such cases, we assigned a deviation for the first recommendation with which the firm did not comply. The further dependent recommendations were not evaluated as deviations[7]. Such a procedure avoided that the impossibility of compliance with the dependent recommendations led to biased results. Prior studies (e.g., von Werder and Bartz, 2014) also made such adjustments which are thus regarded as a kind of scientific consensus.

To assure reliability, we implemented controls in the coding process. Every fourth data point of each coder had to be checked by one of the other five coders[8]. In total, 26.14% of the manual compiled data were checked in terms of correct coding. We did not find substantial differences between the coding of the different coders. Additionally, randomly selected observations were checked by the authors. Overall, we were able to ensure intercoder reliability (Lombard et al., 2002) for our content analysis.

3.4. Independent variables

Our empirical analysis requires the operationalisation of our hypotheses. The size of the supervisory board and the number of women included stemmed from the 2015 annual reports and were manually collected by the coders. While the size of the supervisory board was used as an absolute number, we used a relative variable for the share of female supervisory board members. The ratio was calculated by the number of females in the supervisory board divided by the total number of supervisory board members.

The operationalisation of family influence was difficult. There is no common method for or scientific consensus about measuring and operationalising family influence. Databases like Thomson Reuters provide data regarding the strategic holdings of

[6] Previous studies deal with such issues in the same way, e.g., Eisenschmidt and Bilgenroth (2016).

[7] Another example is the formation of committees by the supervisory board (paragraph 5.3.1 of the Code). If there are no committees, e.g., due to the size of supervisory board, the company cannot follow the subsequent requirements regarding the audit committee or the nomination committee (paragraph 5.3.2 and 5.3.3 of the Code).

[8] Six coders did the analysis between April and May 2016.

individuals (NOSHEM), but this information does not necessarily identify families. It could also be the case that you identify entrepreneurial actors, but not families. Thus, information from such databases is inappropriate. We used data from the Institute for SME Research (IFM) from the University of Mannheim. The IFM assumes family control if at least 50% of the shares are in the hands of a maximum of three individuals or families (see IFM, 2017, p. 48). If there are more than three individuals, they were counted as a family if at least two surnames were identical. If the major equity share was in the hands of a legal entity, it was also analysed whether it was under family control. The data was hand-collected for the year 2015[9]. The data from the IFM was mapped to our sample, and for those companies which were identified as under family control, we assigned 1 point, otherwise 0.

Besides the manual coding of the aforementioned data and the compliance with the Code, we mainly used the Datastream and Worldscope databases to obtain the necessary data for our statistical analysis, which is common in previous empirical studies in this area (e.g., Renders et al., 2010; van Essen et al., 2013; Eisenschmidt, 2016). Ownership dispersion was measured as the free float (NOSHFF) of the company at the end of 2015. Foreign investors was measured as the percentage of strategic shareholdings of 5% or more held in a country outside that of the issuer (NOSHFR). The size of the auditor was operationalised over belonging to one of the Big Four audit firms and entered as a dummy variable into the regression[10]. Leverage was operationalised as the leverage ratio (WC08231) at the fiscal year end 2015.

3.5. Control variables

The level of compliance with CG codes is also influenced by several corporate characteristics, such as firm size, profitability or industry type, etc., which should be used as control variables (e.g., von Alberti-Alhtaybat et al., 2012). The extent of agency conflicts is influenced by firm size. Large companies have a greater scale of operations which provides greater incentive and opportunities for managers to shirk (Dey, 2008). Company size was measured by a firm's market value (MV) at the end of 2015 and entered into the regression as the natural logarithm of this variable. Additionally, we used the natural logarithm of total assets in the sensitivity analysis to control for any market effects which could bias the results.

According to signalling theory, firms with high profitability might comply with their relevant CG code to a higher degree in order to send positive signals to the capital market and to protect their competitive position (e.g., Inchausti, 1997; Holland, 2005).

[9] The IFM only analysed companies with a revenue of more than 50 million Euros. For those companies in the sample which had a revenue of less than 50 million Euros in 2015 the authors analysed whether those companies have to be considered as families due the terms of the IFM.

[10] The Big Four audit firms are Ernst & Young, Deloitte Touche Tohmatsu, KPMG, and PricewaterhouseCoopers. The audit firm variable stems from Datastream (WC07800) and represents the auditor of the fiscal year 2015. Missing data was hand collected from the annual reports 2015.

Profitability was operationalised as the return on equity (WC08301) at the fiscal year end 2015.

Industry is a measure for a firm's market competition and market risk. Thus, companies belonging to a certain industry should show a comparable level of CG implementation. If they deviate concerning CG compliance from their industry standard, this could be interpreted as a negative signal and thus lead to higher costs of capital and lower firm value (e.g., Eisenschmidt, 2016). The dummy variables for the industries were derived from the general industry classification in the Worldscope database (WC06010). In comparison to prior studies, we did not choose a firm's stock index as a control variable (e.g., von Werder and Turkali, 2015), because in Germany the listing is determined by a firm's market capitalisation, which we already used to measure the firm's size. In addition, the metrically scaled variable firm size has a higher information content compared to the nominally scaled variable listing. In the Appendix, the variables, as well as their operationalisation and sources, are summarised.

4. Analysis and findings

4.1. Descriptive results

Regarding the complete sample, average compliance with the Code is high and amounts to 91.21%. Thus, there is a high acceptance of the recommendations of the Code. If we assume that formal compliance with the Code's recommendations is an adequate proxy for material CG implementation[11], we can conclude that the corporate governance of German listed companies is well-established. Table 2 presents the descriptive results for our dependent variable compliance with the Code.

Table 2. Descriptive statistics concerning Code compliance

Statistical mean/index	Prime Standard	General Standard	Entry Standard	Total sample
Min	71.57%	66.67%	83.33%	66.67%
Max	100.00%	100.00%	94.12%	100.00%
Median	94.12%	84.31%	88.73%	93.14%
Mean	92.75%	85.40%	88.73%	91.21%
Standard deviation	6.35%	7.28%	7.63%	7.18%
No. of observations	241	63	2	306

Source: author's own elaboration.

[11] A limitation of our study is that we only analysed formal Code compliance. Actually, we cannot be sure whether the declared compliance represents the real behaviour within the companies (Theisen, 2014, p. 2064).

The differentiation of the results regarding the affiliation to one of the three analysed segments shows that the average compliance in the Prime Standard is higher than in the General Standard[12]. We also see that the minimum compliance is higher in the Prime Standard than in the General Standard. Both results can be explained by the higher transparency requirements of the Prime Standard. Companies in the Prime Standard have to fulfil certain requirements to be listed in that standard[13] and are also more in the focus of investors. Therefore, they are more interested in signalling good corporate governance to capital market participants in order to profit from a better valuation and lower costs of capital. Besides, institutional theory suggests that companies face pressure to comply with the Code if their specific reference group is also doing so. Higher levels of compliance in the Prime Standard can be the result of the expected reference group's behaviour if most of the companies assume that Code compliance is higher in this segment. The comparison of our results with prior studies – which focused on surveys and only had a small number of observations – shows that these results could be biased due to the limited sample size and the research design. For example, A. von Werder and J. Turkali (2015) present lower average compliance scores for the Code's compliance in the version of 24th June 2014 for the total sample (83.60%) and for the General Standard (68.40%). Our average and median compliance with the Code are substantially higher for the whole sample as well as for the Prime and General Standard[14]. We extend previous results concerning the German market and provide a more representative picture of the compliance with the Code in Germany.

The distribution of the firms' average compliance scores is heterogeneous. Only 27 companies (8.82%) completely comply with the Code. Most of the analysed companies (54.58%) achieve a compliance score in the interval of 90% to less than 100%. There are no extreme outliers. Figure 1 shows the distribution of the compliance scores.

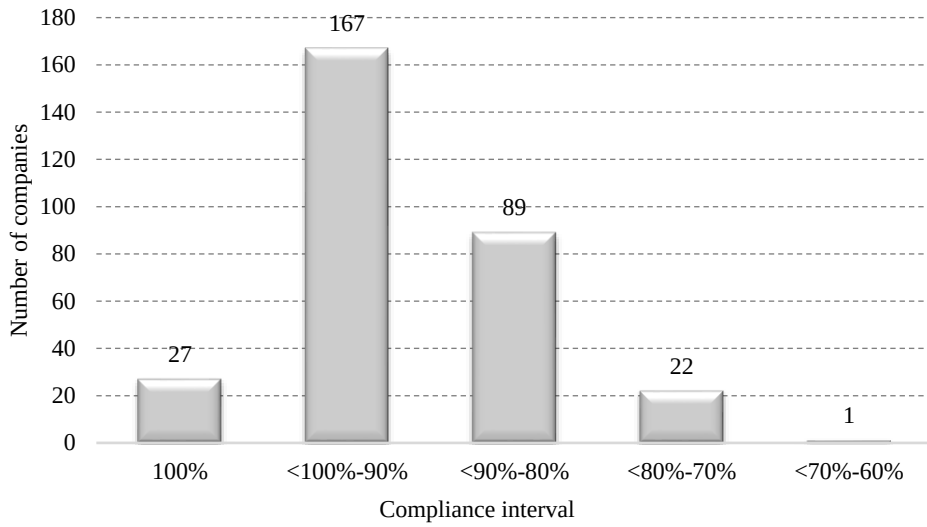
Finally, we analyse the compliance rate with the particular recommendations of the Code and differentiate the findings regarding the Code's sections. The results show strong compliance with the recommendations in some sections, e.g., 60% of the *reporting and audit* section's recommendations are followed completely. In other sections, like *transparency*, we have deviations, but the particular average compliance rate with each recommendation is always in the interval from 90% to less than 100%. Besides this strong compliance in some sections, we can also demonstrate weaker compliance with the recommendations in other sections. In particular, in the *management board* and *supervisory board* sections, a higher number of recommendations show average compliance of less than 90%. For example, 12 out of the 34 recommendations (35.29%) in the *management board* section reveal low compliance. Figure 2 presents the compliance with the recommendations in the respective Code sections.

[12] The interpretation of the results for the Entry Standard is limited due to the very small number of observations.

[13] For the requirements in the transparency standards see http://www.deutsche-boerse-cash-market.com/dbcm-de/primary-market/marktstruktur/transparenzstandards (download 04th November 2016).

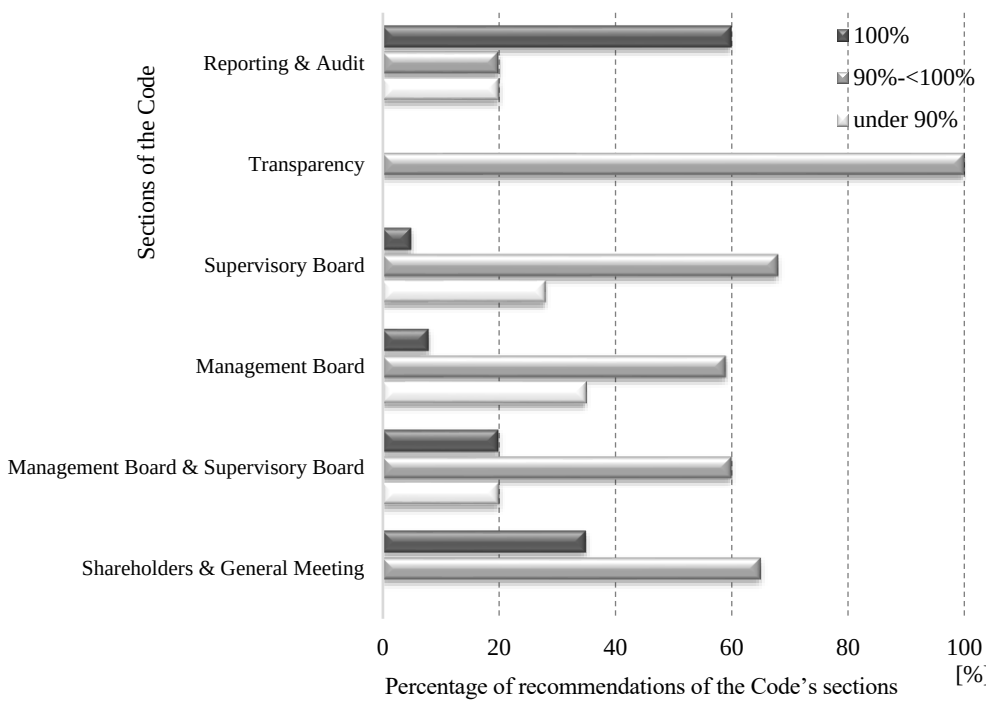
[14] As there were no major changes of the Code from 2014 to 2015 concerning its content, this could not explain the differences between the studies. See for the particular changes von Werder and Bartz (2015).

Figure 1. Distribution of the compliance scores



Source: author's own elaboration.

Figure 2. Compliance with the recommendations in the Code's sections



Source: author's own elaboration.

Critical recommendations with an average compliance rate of less than 80% exist only for a few topics of the Code. In the *cooperation between management board and supervisory board* section, 47.39% of companies deviate from the recommendation that the D&O policy for the supervisory board should have a deductible (paragraph 3.8 of the Code). Besides, some companies do not provide the compulsory information required by the Code regarding the compensation system for the management board which should be disclosed in the management report or the notes (paragraph 4.2.5 of the Code). In the section *supervisory board*, there are some stronger deviations as well. For example, the supervisory board of some companies does not specify an age limit for the members of the management board (paragraph 5.1.2 of the Code) or form committees with sufficient expertise (paragraph 5.3.1 of the Code), and it deviates in terms of an adequate structure of the supervisory board (paragraph 5.4.1 of the Code). In this section, there is also the recommendation with the lowest compliance (39.87%). The majority of companies have no regular limit on the length of membership in the supervisory board (paragraph 5.4.1 of the Code). Finally, there are also stronger deviations regarding the time frame of 90 days for the publication of the consolidated financial statements and 45 days for the publication of the interim reports (paragraph 7.1.2 of the Code). Both recommendations are part of the *reporting and audit* section of the Code.

We also analysed our independent variables. The summary of the descriptive statistics is given in Table 3. The average free float of the companies amounts to 58.34% in the sample. The huge standard deviation (28.42%) shows that we have a broad variance in this variable. We often find totally dispersed ownership, but also concentrated ownership in some cases. 12.70% of the analysed companies are classified as being under family control. The low percentage can be explained by the substantial requirement that at least 50% of the shareholding has to be owned by families. The average share held by foreign investors amounts to 10.92%. The average supervisory board size is quite high. The legal minimum size is three members (Article 95 of the Stock Corporation Act), which is substantially exceeded in our analysis. In our sample, females are underrepresented in the supervisory board. The arithmetic mean amounts to only 14.81% and the standard deviation is low. Moreover, 38.56% of the companies have no females in the supervisory board. Finally, the Big Four audit firms dominate our sample, auditing 71.24% of our companies. In sum, we conclude that we have enough variance in the data for statistical analysis regarding potential influence factors on Code compliance.

Table 3. Descriptive statistics[15]

Descriptive statistics (N = 306)	**Mean**	**Standard deviation**	**Relative share** (%)
Dependent variable			
Compliance Score	91.21%	7.18%	–
Independent variables			
Ownership dispersion	58.34%	28.42%	–

[15] The missing industry share (6.21%) represents companies from the sector other financials.

Table 3. Descriptive statistics *(cont.)*

Descriptive statistics (N = 306) / **Dependent variable**	**Mean**	**Standard deviation**	**Relative share** (%)
Family influence	–	–	12.70
Foreign investors	10.92%	20.96%	–
Supervisory board's size	7.95	5.27	–
Females in the supervisory board	14.81%	14.44%	–
Size of the auditing firm (Big Four auditor)	–	–	71.24
Leverage	27.02%	939.21%	–
Control variables			
Size of the company	19.92	2.30	–
Profitability	3.90%	42.91%	–
Industry			
Industrial	–	–	83.99
Utility	–	–	4.25
Transport	–	–	1.96
Bank	–	–	1.96
Insurance	–	–	1.63

Source: author's own elaboration.

4.2. Influence factors on Code compliance

The correlation matrix (see Table 4) shows that there is a significant positive correlation between the dependent variable (Code compliance) and the dispersion of owners, the supervisory board size, the ratio of females in the supervisory board and the size of the auditor. All coefficients are significant at the 1% level. For leverage, we only find aweak positive influence (10% level) on Code compliance. In contrast, we find a negative correlation between Code compliance and family influence and between Code compliance and foreign investors, but both coefficients are not significant. That means that only five of our seven potential influence factors seem to have a significant impact on Code compliance. We can also show that, regarding the dispersion of ownership, the substitutive perspective (formulated in H1) can be confirmed for our sample. Thus, a more dispersed ownership structure seems to lead to a higher compliance with the Code. The correlation matrix also shows significant correlations between the influence factors which could lead to collinearity problems in the statistical analysis. We, therefore, test for multicollinearity and calculate the variance inflation factors (VIF). The VIF values for all variables are below the critical value of 2.5, which indicates that there are no multicollinearity problems (Tagesson and Collin, 2016). The VIF values are shown in Table 5.

Table 4. Correlation coefficients for the dependent and independent variables (n = 306)

		1	2	3	4	5	6	7	8	9	10	11a	11b	11c	11d	11e
1.	Compliance with the Code	–	–	–		–	–	–	–	–	–	–	–	–	–	–
2.	Dispersion of owners	0.234***	–	–	–	–	–	–	–	–	–	–	–	–	–	–
3.	Family influence	–0.090	–0.089	–	–	–	–	–	–	–	–	–	–	–	–	–
4.	Foreign investors	–0.057	–0.134**	–0.126**	–	–	–	–	–	–	–	–	–	–	–	–
5.	Supervisory board's size	0.343***	0.056	–0.021	0.017	–	–	–	–	–	–	–	–	–	–	–
6.	Females in the supervisory board	0.259***	0.083	–0.014	0.029	0.478***	–	–	–	–	–	–	–	–	–	–
7.	Size of the auditing firm	0.169***	0.037	0.070	–0.004	0.404***	0.153***	–	–	–	–	–	–	–	–	–
8.	Size of the company	0.417***	0.171***	0.080	–0.172***	0.670***	0.355***	0.420***	–	–	–	–	–	–	–	–
9.	Leverage	0.103*	0.029	–0.018	–0.032	0.154***	0.038	0.002	0.209***	–	–	–	–	–	–	–
10.	Profitability	–0.002	0.008	0.118**	–0.106*	0.074	0.062	0.057	0.345***	0.061	–	–	–	–	–	–
11a.	Industrial sector	–0.212***	–0.038	0.087	0.053	–0.106*	–0.076	–0.100*	–0.194***	–0.287***	0.042	–	–	–	–	–
11b.	Utility sector	0.106*	0.026	–0.032	–0.093	0.062	0.040	0.026	0.032	0.082	–0.116**	–0.482***	–	–	–	–
11c.	Transport sector	0.050	–0.016	0.017	0.041	0.044	0.045	0.038	0.084	0.097*	0.014	–0.324***	–0.030	–	–	–
11d.	Banking sector	0.087	0.025	–0.054	–0.114**	0.133**	0.146**	0.090	0.129**	0.168***	–0.061	–0.324***	–0.030	–0.020	–	–
11e.	Insurance sector	0.140**	0.058	–0.049	–0.064	0.163***	0.122**	0.082	0.174***	0.021	0.050	–0.295***	–0.027	–0.018	–0.018	–

*/**/*** significance at the 10%, 5% and 1% level. Spearman's ρ is presented in the correlation matrix.

Source: author's own elaboration.

We use linear regression to test our hypotheses[16]. Our results reveal a significant model (1% level) with a moderate explanatory power. The adjusted R^2 amounts to 17.8%. We can demonstrate for most of our exogenous variables the assumed direction of impact on Code compliance, but only a few of them are statistically significant. Only one of our seven hypotheses can be statistically confirmed. A low ownership concentration (high free float) has a significant positive impact on Code compliance. Therefore, we support the substitutive perspective that the degree of ownership dispersion limits the possibilities for ownership control, which is compensated by a more thorough CG. Companies with a higher dispersion of ownership seem to signal good and trustworthy corporate governance to the capital market and therefore comply better with the Code. Our empirical results confirm previous empirical studies (Dey, 2008; Jahn et al., 2011; Kohl et al., 2013; Eisenschmidt, 2016) and weaken the complementary perspective.

We also show the model with only the control variables and without the possible influence factors (Table 5). The results indicate that our theoretically derived influence factors out of the institutional setting in Germany have additional explanatory power. The adjusted R^2 only amounts to 15.8% in the model only with controls and to 17.8% in the complete model.

We cannot demonstrate a significant impact of our other six theoretically derived influence factors. The regression coefficients for family influence, size and composition of the supervisory board, size of the audit firm, and leverage indeed have the assumed direction, but none of these variables achieves the required significance level. The theoretically assumed positive influence of foreign investors on the compliance with the Code cannot be shown. In fact, a lower concentration of foreign investors seems to lead to higher compliance with the Code, but the result is not statistically significant. One possible explanation for the different direction could be that foreign investors with a higher stake use other (information) channels to reduce their uncertainty and managers, therefore, have no strong incentive to comply with the Code.

Based on the statistical results, we have to reject hypotheses 2 to 7, but the missing level of significance does not necessarily mean that our influence factors have no effect. Cumming (2014) argues that p-values often make our conclusion in dichotomous terms (statistically significant or not – an effect exists or not), but this leads to an illusory certainty. He further argues that even taking a different sample can lead to different p-values (Cumming, 2014, p. 13). In the end, further studies in different settings have to be conducted in order to conclude that our theoretically derived influence factors actually have no effect on Code compliance.

In theory, it has been argued that the institutional setting strongly influences the CG mechanism and companies' decisions to comply with a code or not (e.g., Aguilera and Jackson, 2003). Following that, we derived influence factors which are typical for the German institutional setting and tested them. Our empirical results do not support that

[16] We used a linear model to test our hypotheses because this is common in empirical accounting studies.

theoretical line of argumentation. It seems that there are other influence factors besides those of the institutional setting which explain the different levels in Code compliance.

The analysis shows that firm size is a significant positive influence factor on Code compliance (1% level). Firm size can be interpreted as an indicator for the size of potential agency conflicts in a company (e.g., Holland 2005). This result is also in line with the findings of previous studies in different CG settings (e.g., Akkermans et al., 2007 for Dutch firms; Kohl et al., 2013 for German firms; or Dey, 2008 for US companies). The computation of the standardised regression coefficients gives further insights regarding the intensity of the particular variables. We can demonstrate that firm size has the highest standardised regression coefficient and is, therefore, the main influence factor in our sample. We interpret this result as a stronger institutional pressure for larger companies to comply with the Code (Tagesson and Collin, 2016). Large companies often compete on global capital markets and, according to signalling theory, they want to be more attractive for national and international investors (Holland, 2005). In addition, they might be willing to align their level of Code compliance with their peer group firms which often have a similar size. The strong influence of a firm-specific variable also implies that the institutional setting and the subsequent derived corresponding influence factors could be less relevant in explaining the different levels of Code compliance. However, at least one derived influence factor (ownership dispersion) has a significant impact. Additionally, one of our influence factors (family firm) captures a very large stake or influence of family firms. Another operationalisation of this variable could lead to differing results.

Table 5. Results of the regression model

Independent variables	**Hypothesis**	**Assumed impact**	**Model only with controls**		**Complete model**	
			Regression coefficients	VIF	Regression coefficients	VIF
Incept		?	0.698***		0.748***	
Dispersion of owners	H1	+			0.029**	1.201
Family influence	H2	–			–0.011	1.044
Foreign investors	H3	+			–0.023	1.217
Supervisory board's size	H4	+			0.001	2.078
Females in the supervisory board	H5	+			0.040	1.238
Size of the auditing firm	H6	+			0.002	1.267
Leverage	H7	+			0.000	1.044
Size of the company	control	+	0.012***	1.128	0.008***	2.278

Table 5. Results of the regression model *(cont.)*

Independent variables	Hypothesis	Assumed impact	Model only with controls		Complete model	
			Regression coefficients	VIF	Regression coefficients	VIF
Profitability	control	+	–0.024***	1.059	–0.019**	1.098
Industry						
Industrial	control	?	–0.025	2.331	–0.031*	2.425
Utility	control	?	0.009	1.617	–0.002	1.682
Transport	control	?	–0.018	1.295	–0.021	1.319
Bank	control	?	–0.005	1.305	–0.019	1.375
Insurance	control	?	0.009	1.277	–0.006	1.311
R^2			17.7%		21.5%	
Adjusted R^2			15.8%		17.8%	
F-value			9.162***		5.704***	
Observations			306		306	

*/**/*** significance at the 10%, 5% and 1% level. VIF represents the variance inflation factors.

Source: author's own elaboration.

Two other significant control variables are profitability (5% level) and the dummy variable industrial sector (10% level). In comparison with firm size, the assumed positive direction of impact for profitability cannot be confirmed. Less profitable companies comply more with the Code than highly profitable firms. This is contrary to the assumptions of signalling theory regarding information disclosure (Holland, 2005). One possible explanation is that highly profitable firms face no competitive pressure for good CG, because due to their high profitability they are already considered a good investment by the capital market (Eisenschmidt, 2016). On the other hand, unprofitable companies might try to increase their attractiveness to investors by signalling high Code compliance.

We also analyse the impact of the previous exogenous variables on compliance in certain sections of the Code. Therefore, we compute a compliance score for each Code section for every analysed company and use this data as a dependent variable in the different regressions. Models 1 to 4 in Table 6 show the results of our additional analysis.

Table 6. Regression models for the Code sections

Independent variables	Basic information		Analysis of compliance in the Code's sections			
			Model 1	**Model 2**	**Model 3**	**Model 4**
	Hypothesis	Assumed impact	Management & supervisory board	Management board	Supervisory board	Reporting & audit
Incept		?	0.719***	0.841***	0.645***	0.700***
Dispersion of owners	H1	+	0.019	0.035	0.035**	0.016
Family influence	H2	–	0.008	–0.007	–0.012	–0.031**
Foreign investors	H3	+	–0.026	–0.059*	–0.004	–0.001
Supervisory board's size	H4	+	0.004**	0.002	0.001	0.002
Females in the supervisory board	H5	+	0.075	0.012	0.057*	0.033
Size of the auditing firm	H6	+	–0.022	0.008	–0.004	0.027**
Leverage	H7	+	–0.001	0.000	–0.001	0.000
Size of the company	control	+	0.009**	0.003	0.013***	0.010***
Profitability	control	+	–0.030**	–0.019	–0.022**	–0.019*
Industry						
Industrial	control	?	–0.047*	–0.035	–0.034*	0.000
Utility	control	?	–0.081**	0.015	–0.011	0.026
Transport	control	?	–0.028	–0.039	–0.001	–0.041
Bank	control	?	0.015	–0.044	–0.009	–0.001
Insurance	control	?	–0.046	0.002	–0.010	0.001
R^2			16.6%	7.8%	22.8%	20.1%
Adjusted R^2			12.6%	3.4%	19.1%	16.3%
F–value			4.141***	1.767**	6.176***	5.241***
Observations			306	306	306	306

*/**/*** significance at the 10%, 5% and 1% level. The table contains the regression coefficients for the independent variables.

Source: author's own elaboration.

The models for the Code sections of *transparency* and *shareholder and general meeting* are not significant, and therefore the results are not shown. Compliance in the section *cooperation between management and supervisory board* is significantly determined by the supervisory board's size, the company's size and two industry variables (model 1 in Table 6). In comparison with the previous results for the main analysis (Table 5), we cannot demonstrate a significant impact of the ownership's dispersion.

By contrast, larger supervisory boards seem to lead to stronger compliance in this section. Probably, large supervisory boards have more power and more competence to force the management to comply in this area.

Compliance with the Code section *management board* offers no further insights (model 2 in Table 6). We can only show a weak model (5% level) with a low explanatory power (adjusted R^2 of 3.4%). Moreover, only foreign investors have a weak negative influence on compliance with the Code (10% level). The compliance with this section seems to be determined by other factors which are not part of our analysis. The analysis for the Code section *supervisory board* (model 3 in Table 6) provides stronger results, as we have a highly significant model (1% level) with a higher explanatory power (adjusted R^2 of 19.1%). Besides the same influence factors as in the main analysis (table 5), females in the supervisory board seem to lead to better compliance with the section *supervisory board*, but the level of significance is weak (10% level).

The analysis of the last Code section *reporting and audit* (model 4 in Table 6) reveals that the size of the auditor has a significant impact on Code compliance in this section (5% level). The high standards of large audit companies seem to generate a certain pressure for the management to follow these standards and to comply with the Code in this section. In contrast, it could also be that the relationship is reversed, i.e., that corporations complying with the Code choose a large audit firm. Family-controlled companies have lower compliance with the Code section *reporting and audit* (5% level). The strong relationship and the trust between the managers (stewards) and the family owners seem to reduce the pressure to comply in this section. Managers of family-owned firms might develop a stronger relationship with the auditor and thus can more easily deviate from the requirements of this specific section. Moreover, they probably do not have to fear penalties or negative signals towards the family owners resulting from the deviation. Our results are in line with Seidl et al. (2009), who argued that family-owned firms may prefer privacy over transparency and disclosure of governance information.

The findings of an empirical analysis can always result from the research design. Therefore, we do a robustness check and use the natural logarithm of total assets as another variable for the company's size, with debt ratio as a further variable for leverage and ROIC as another variable for profitability. The change of one single variable and the simultaneous change of all three variables do not change the results of our main regression (Table 5) substantially. The p-values of the regression coefficients change slightly, and the explanatory power (adjusted R^2) decreases a little bit. Overall, our empirical results are robust against changes in the research design. Finally, we also check whether the model assumptions for the linear regression are fulfilled. We cannot find any indications for their violation.

5. Discussion and conclusion

This study empirically analyses the compliance with the German CG Code and tries to explain which influence factors determine better compliance with the Code. Based on extensive literature research and the institutional setting in Germany, we define seven potential influence factors on Code compliance – dispersion of owners, family influence, foreign investors, size of the supervisory board, females in the supervisory board, size of the auditing firm and leverage of the company – and test our hypotheses for a large sample of German companies.

We find a heterogeneous level of Code compliance, but the average compliance rate is quite high and amounts to 91.21%. We further present an analysis for the deviations from the Code's sections. Above all, recommendations in the sections *management board* and *supervisory board* are often not implemented by the companies. A closer look at the compliance with particular recommendations reveals that compliance rates of less than 80% exist for the following Code recommendations: deductibles for the D&O policy of the supervisory board, the compensation system for the management board, the specification of an age limit for the members of the management board, the formation of committees with sufficient expertise of the supervisory board, structure of the supervisory board and the publication of consolidated financial statements and interim reports. The lowest compliance (39.87%) concerns the recommendation for a regular limit on the length of membership in the supervisory board.

We extend the findings of previous studies for current results regarding the implementation of the Code in the version from 5th May 2015 and in terms of a significantly broader and more differentiated sample. While prior studies mainly focus on larger companies in the German capital market (Seibt, 2003; Kohl et al., 2013; Eisenschmidt and Bilgenroth 2016) we present insights for companies which are smaller, use a minor stock segment (transparency level) and are less in the focus of investors. The comparison with prior studies does not show substantial differences. Thus, we conclude that the affiliation to a certain segment of the Frankfurt stock exchange (transparency level) does not change the results substantially. We also find heterogeneous distributed compliance scores for the firms and do not see major outliers. The average compliance rate is still high. We also demonstrate weaker compliance with the recommendations in some sections of the Code (compare to Eisenschmidt and Bilgenroth 2016, p. 555).

The analysis of our seven potential influence factors on Code compliance reveals that only the dispersion of the ownership structure has a significant positive impact on Code compliance. The other six influence factors – family influence, foreign investors, size of the supervisory board, females in the supervisory board, size of the auditing firm and leverage – cannot explain the different levels of the compliance with the Code in our sample. Additionally, we identify firm size as a significant positive influence factor for Code compliance. A significant negative influence on compliance can be demonstrated for the factor profitability and for companies of the industrial sector. Further

differentiation of our statistical analysis regarding the Code's sections shows that different influence factors can explain the diverse levels of compliance with the sections. We demonstrate the impact of the supervisory board's size on compliance in the section *cooperation between management board and supervisory board* as well as the impact of the size of the auditing firm on compliance in the section *reporting and audit.*

In sum, our derived influence factors offer the opportunity to explain the different levels of compliance with the Code and give further insights about firm characteristics leading to a thorough CG. At the very least, the size of a firm's agency conflicts, as indicated by the variables ownership dispersion and firm size, seems to determine the rate of compliance. The observed negative relationship between Code compliance and a firm's profitability offers possibilities for an alternative interpretation of signalling theory in the direction that firms try to compensate for the negative signal of a weak performance with a well-implemented CG system.

In theory, it has been argued that the institutional setting strongly influences the CG mechanism and companies' decisions to comply with a code or not (e.g., Aguilera and Jackson, 2003). Our empirical results do not support that theoretical line of argumentation, because we cannot show this for the German institutional setting. In contrast, it seems that there are other influence factors besides those of the institutional setting (e.g., firm-specific factors) which explain the different levels of Code compliance. If further empirical analyses for other institutional settings reveal the same results, the theoretical influence of the institutional setting can be questioned. We suppose that the institutional setting influences the scope and the coverage of the various CG codes and thus the average code compliance within a national institutional setting. As firms probably align their code compliance with the average rate of compliance of their peer group, other influence factors besides firm size do not account for variances in code compliance. In that case, this theoretical approach has to be reconsidered, and researchers are challenged to find better explanations for the different levels of code compliance.

Our research is limited to a large and unique sample of German corporations in 2015. Despite the fact that we provide updated empirical evidence for the implementation of the Code in Germany and potential influence factors which have not been analysed so far, empirical analysis for other periods and other companies may lead to different results. In particular, the results for our factors of no significant influence have to be reviewed in further statistical analyses (Cumming, 2014). We also focused our research only on one country due to the fact that there is no common corporate governance code in Europe or in the world. Additional research projects could try to find a measurable way to compare compliance with the code in different legal settings to get further insights into whether country or legal issues influence code compliance (e.g., Schiehll and Castro Martins, 2016). The explanatory power of our models also shows that there should be other additional factors which may influence compliance with the Code. One interesting research aspect in this regard is, for example, the attitude and

characteristics of the management and supervisory board (for a discussion of behavioural aspects of CG see Huse, 2005). Other research methods, such as extensive surveys or individual interviews, might gain further insights regarding other potential influence factors on the compliance with the Code. In addition, the effects of different types of agency conflicts within a firm on Code compliance should be investigated (Ahrens et al., 2011). For example, multiple agency theory (e.g., Bruton et al., 2009) suggests that agency conflicts may vary within a firm according to different governance roles played by different CG participants, e.g., between investors with different equity shares, investors and society (Raelin and Bondy, 2013) or equity investors and creditors (Yoshikawa and Rasheed, 2009).

Appendix

Variables and data source

Dependent and independent variables	Operationalisation	Data source
Compliance with the Code	Percentage of complied recommendations to all recommendations in the Code for one company	hand-collected; declaration of the company
Ownership dispersion	Free float of the company as of 31st December 2015	Datastream/Worldscope
Family influence	Percentage of strategic shareholdings of 5% or more held by individual investors as of 31st December 2015	Datastream/Worldscope
Supervisory board's size	Number of board members in the supervisory board at the end of the fiscal year 2015	hand-collected; annual report 2015
Females in the supervisory board	Percentage of women in the supervisory board at the end of the fiscal year 2015	hand-collected; annual report 2015
Size of the auditing firm	Company's auditor for the fiscal year 2015 belongs to one of the Big Four accounting firms	Datastream/Worldscope
Size of the company	Natural logarithm of market value as of 31st December 2015	Datastream/Worldscope
Leverage	Leverage ratio at the end of the fiscal year 2015	Datastream/Worldscope
Profitability	Return on equity at the end of the fiscal year 2015	Datastream/Worldscope
Industry	General industry classification	Datastream/Worldscope

Source: author's own elaboration.

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