REAL EFFECTS OF THE GERMAN CORPORATE GOVERNANCE CODE:
Evidence from Gender Diversity and the Comply-or-Explain Principle

Dissertation

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List of Abbreviations

AktG	German Stock Corporation Act
CAT	Category
CDAX	Composite German stock index
CG	Corporate Governance
CGC	Spanish Corporate Governance Code
CGN	Corporate Governance Notification
CGR	Corporate Governance Ratings
CSQ	Commitment to Status Quo
CSR	Corporate Social Responsibility
DAX	German stock index
DFM	Dubai Financial Market
DIW	Deutsches Institut für Wirtschaftsforschung (German Institute for Economic Research)
DUM	Dummy
EB	Executive Board
ESG	Environmental, social, and governance
EU	European Union
EUR	Euros
FE	Fixed Effects
FEM	Female Executive board member
FRC	Financial Reporting Council
FTSE	The Financial Times Stock Exchange
GCGC	German Corporate Governance Code
GCGI	Good Corporate Governance Index
ICC	Implied Cost of Capital
IND	Industry
INDIV	Individual Attributes
IPO	Initial Public Offering
IR	Integrated Reporting
LSE	Lima Stock Exchange
MCCG	Malaysian Code on Corporate Governance

MDAX	Midcaps German stock index
NDTAX	Non-debt Tax Shield
NS	Not significant
OLS	Ordinary Least Square
PAKCGI	Corporate Governance Index Pakistan
RND	Research and Development
ROA	Return on Assets
ROE	Return on Equity
SDAX	Small-Cap German stock index
SEC	Security and Exchange Commission
SIC	The Standard Industrial Classification
SOX	Sarbanes-Oxley Act
TMT	Top Management Teams
TSX	Toronto Stock Exchange
VHB	The German Academic Association for Business Research
VIF	Variance Inflation Factor

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Dedication: **امان ءٍ بابا**

1. Introduction

The significance of robust corporate governance has become increasingly prominent in the wake of major corporate scandals such as Enron and WorldCom as well as the 2008-09 financial crisis. These events underscore the need for effective governance mechanisms to guide and regulate corporate behavior. Corporate governance codes typically provide a set of principles and recommendations to guide firms in adopting best practices. These codes often include material legal provisions and suggestions, and are generally applied uniformly to all listed firms, regardless of size - a concept known as "one-size-fits-all." However, critics argue that this approach may not be suitable for all firms because companies differ materially in terms of structure, size, and organization and may face different challenges and circumstances, even within the same industry (MacNeil and Li, 2006).

In response to these concerns, many governance frameworks now offer flexibility through the "comply or explain" approach, also referred to as "apply or explain." This approach, which is the cornerstone of many governance codes, including Germany, requires listed firms to either comply with code provisions or provide explanations in their annual statements for any deviations from best practices (e.g., the German Corporate Governance Code, 2022, p. 2; Norwegian Code of Practice for Corporate Governance, 2021, p. 12). This flexibility allows firms to adopt code provisions that best suit their needs, while justifying alternative practices when necessary. Despite the intended benefits of the 'comply or explain' approach, the existing literature (e.g., Shrives and Brennan, 2015) suggests that firms may exploit this flexibility by providing generic or substandard explanations for deviations from the code. This practice potentially undermines the effectiveness of the governance frameworks. The lack of auditing for the annual declaration of conformity statements (which include explanations for deviations from the code), despite being part of audited annual reports, may contribute to the use of boilerplate language in these annual governance disclosures. This aligns with observations by Shrives and Brennan (2015), who noted that auditors often do not question compliance or explanation adequacy, despite poor disclosure quality. This undermines the effectiveness of the corporate governance code and may expose the firm to various fronts, from business reputation to other firm risks. Corporate governance includes various aspects of how firms manage their day-to-day affairs, including board composition, diversity on boards, shareholder rights, publications of reports, and others. For instance, the German Corporate Governance Code (2022) explicitly states that diversity should be considered in the appointment of management and supervisory board members, reflecting both legal requirements and broader social

objectives. The push for diversity, particularly gender diversity, on corporate boards is driven by both business and social perspectives. From a business standpoint, theories suggest that gender diversity may influence risk perception, decision-making processes, and the overall firm strategy. Socially, the introduction of legal quotas aims to improve women's participation in corporate leadership, while aligning with sustainable development goals. This trend is evident across the European Union, with countries such as Germany and Norway implementing quotas, and the EU passing legislation to improve the gender balance on corporate boards of listed firms. However, the effectiveness of the 'comply or explain' approach in achieving these governance goals, including diversity targets, remains a subject of debate. While the primary motive of corporate governance codes is to improve the governance quality of individual firms, weak governance may add to the magnitude of crises (Kirkpatrick, 2009).

Based on these arguments, it is pertinent to first examine the existing literature on the empirical evidence regarding the application and effectiveness of the 'comply or explain' approach. Therefore, in the first paper titled 'Comply or Explain Disclosures: A Review of Economic Consequences', we systematically review the literature on the economic consequences of the 'comply or explain' approach in corporate governance, focusing on firm-level evidence. Our review examines the effectiveness of compliance statements in the key areas of firm-specific economic consequences. These compliance statements include justifications provided by firms for departure from the code's recommendations, and these explanations are generally left for investors to interpret (Shrives and Brennan, 2015). Firms use different theories to justify these explanations such as agency, stakeholders, and legitimacy theory. The literature (e.g., Seidl, Sanderson, & Roberts, 2013; Galle, 2014) suggests that firms exploit the explain aspect of comply-explain approach and provide generic or standard explanations for deviations from the code. Therefore, we investigate whether the comply or explain approach induces firm-level economic consequences and whether the market (investors) reacts to these explanations for deviations. Our review consists of 24 studies examining seven key areas of firm-specific economic consequences: firm performance, firm value, investment efficiency, accounting choices, financial distress, cost of capital, and corporate social responsibility (CSR). We find that the comply-or-explain approach can induce economic consequences, with varying impacts across countries and market reactions to compliance statements. We find that the direction of the impact also varies depending on the firm-level economic outcome, sampling period, and associated endogeneity challenges. This study contributes to the ongoing debate on the suitability and effectiveness of this approach in corporate governance. We identify future research avenues that emphasize the need for

comprehensive studies on the quality of explanations and their impact on firm-level outcomes. We conclude that understanding the economic consequences of the comply-or-explain approach is crucial for policymakers, regulators, and stakeholders to ensure effective governance practices and the transparent disclosure of deviations.

Building on the review paper, our second paper titled 'Unpacking the Explain in Comply-or-Explain and Its Impact on Firm Performance: Evidence from German Listed Firms' investigates the impact of the quality of explanations provided for deviations from the code on firm performance in the context of the German Corporate Governance Code (GCGC). We use content analysis to develop a typology based on Hooghiemstra (2012) and Ullah et al. (2021) and categorize the explanations for deviation into different categories ranging from standard or generic (low-quality), partial, and future compliance, to firm-specific (high-quality) explanations. Using an index (comply or explain index) and a comprehensive analysis of explanations provided by German public firms, we examine how quality and compliance with GCGC affect firm performance and whether this impact differs between large and small firms. Contrary to previous studies, our findings, using a recent sample of German prime listed firms from 2015 to 2018, reveal that quality and compliance with GCGC do not result in a positive impact of comply or explain index on firm performance across firm sizes. However, we find significant differences in how the quality of the explanations affects firms of varying scales when we analyze large and small firms separately. For large firms, both high-quality, firm-specific explanations and generic explanations are associated with negative performance, potentially signaling underlying issues to the market. In contrast, small firms experience negative performance impacts when partially complying with or choosing alternative practices against the code. This may appear unfavorable for small firms, as they should benefit more from the "comply or explain" approach, provided they have valid justification for their departures from the code. Our analysis of different GCGC chapters shows varying levels of importance, with transparency and financial reporting chapters crucial for firm performance, especially for large firms, while the impact of quality of explanations in other GCGC chapters differs across firm sizes. We also find that the negative impact of explanations on firm performance is driven primarily by deviations from specific chapters related to management and supervisory boards. This study contributes to the literature by providing a more detailed understanding of the comply-or-explain mechanism, highlighting the complex interplay between explanation quality, code compliance across different chapters of GCGC, and firm performance. Our study shows that the market mechanism of disclosure in the 'comply-or-explain' approach does not consistently lead to better firm performance. Both high-quality and

generic explanations do not result in positive outcomes across different firm sizes, indicating that the expected market pressure may not be working as intended. Overall, this may also suggest that the market may prefer compliance over explanations. These findings highlight the need for further scrutiny of GCGC. While the 'explain' aspect emphasizes the importance for firms to prioritize high-quality disclosures in critical governance areas, our results call for a reassessment of the effectiveness of the 'comply-or-explain' approach in achieving its intended governance goals. One such goal of the German Corporate Governance Code (GCGC) is to improve diversity on corporate boards. The code recommends that firms prioritize and set diversity targets for the future if not already achieved.

This leads us to explore a specific aspect of board diversity in our final paper, titled ‘Female Board Members and Corporate Risk: The Role of Executives' Commitment to Firm Status Quo in German Public Firms’. In this study, we investigate whether gender diversity affects the risk-taking behavior of German public firms in terms of leverage and research and development expenditures. Existing evidence on the association between gender diversity and risk taking is inconclusive (negative: Faccio et al., 2016; Huang & Kisgen, 2013; no effect: Matsa & Miller, 2013; not significant: Sila et al., 2016). Therefore, this study examines this relationship in the unique context of German public firms with a dual board system, while incorporating the management concept of Executives Commitment to Status Quo (CSQ) as an additional aspect. We use CSQ to examine its moderating effect on the association between female executive board members and corporate risk. According to Hambrick et al. (1993), Geletkanycz (1997), and Geletkanycz and Black (2001), several factors affect executives' CSQ and influence their decision-making behavior, which varies based on individual, firm, and industry characteristics. The individual characteristics of an executive may include tenure at the firm, age, and education. Similarly, firm-specific factors, such as the availability of resources (slack), past performance, and size of the firm may also impact the decision making of executives. The third dimension is the industry in which firms operate; for example, the high discretionary industry, which includes technology firms, is dynamic and executive needs to adapt and evolve in order to compete. On the other hand, firms in the low-discretionary industry, such as furniture and cement, require a different approach. Our results show that female representation on executive boards decreases debt capital and increases R&D (innovation). However, we find limited evidence for CSQ's moderating role, entropy balancing results suggest that lower CSQ may amplify the negative relationship between gender diversity and leverage. Our study contributes to upper echelons theory by demonstrating how executives' beliefs and expectations influence strategic decisions, expanding insights from CEO-level to

board-level dynamics within Germany's unique corporate governance structure. These findings offer likely moderating effects of CSQ on the implications of board diversity for corporate policy, contributing to the current debate on its effectiveness. While board diversity is one aspect among many governance provisions, our research provides valuable insights into how the overall corporate governance code has fared in terms of firm-level economic outcomes following the flexibility offered by the 'comply or explain' approach.

This thesis examines corporate governance from two critical perspectives: corporate governance disclosures and firm-level governance characteristics. First, we take a broader approach by exploring how the 'comply or explain' principle of corporate governance codes influences firm-level economic consequences through a comprehensive systematic literature review, providing insights across different contexts and jurisdictions (Chapter 2). We then bridge the gap between the broader 'comply or explain' principle and its practical implementation by investigating how the transparency and quality of explanations for non-compliance affect firm performance in the German context (Chapter 3). These two chapters focus on corporate governance disclosure. Finally, we examine how board diversity, as a crucial firm-level characteristic, is associated with risk-taking behavior in German listed firms (Chapter 4). This chapter captures an important aspect of firm-level governance characteristics specifically focusing on the executive board within the unique context of Germany's dual board system. By addressing both governance disclosures and firm-level characteristics, this study contributes to the ongoing dialogue in the corporate governance literature, offering valuable insights for academics, policymakers, and practitioners. In conclusion, this research underscores the complexity of governance issues and highlights the need for comprehensive approaches to understanding and implementing effective corporate governance practices in today's dynamic business environment.

References

Board, N. C. G. (2021). The Norwegian Code of Practice for Corporate Governance. 14 de Octubre. Oslo, Noruega.

Code, G. C. G. (2022). German Corporate Governance Code.

Faccio, M., Marchica, M. T., & Mura, R. (2016). CEO gender, corporate risk-taking, and the efficiency of capital allocation. *Journal of Corporate Finance*, *39*, 193-209.

Galle, A. (2014). 'Comply or explain' in Belgium, Germany, Italy, the Netherlands, and the UK: Insufficient explanations and an empirical analysis. *Corporate Ownership and Control* 12 (1): 862–873.

Geletkanycz, M. A. (1997). The salience of 'culture's consequences': The effects of cultural values on top executive commitment to the status quo. *Strategic Management Journal*, *18*(8), 615-634.

Geletkanycz, M. A., & Black, S. S. (2001). Bound by the past? Experience-based effects on commitment to the strategic status quo. *Journal of Management*, *27*(1), 3-21.

Hambrick, D. C., Geletkanycz, M. A., & Fredrickson, J. W. (1993). Top executive commitment to the status quo: Some tests of its determinants. *Strategic Management Journal*, *14*(6), 401-418.

Hooghiemstra, R. (2012). What determines the informativeness of firms' explanations for deviations from the Dutch corporate governance code? *Accounting and Business Research*, 42(1), 1-27.

Huang, J., & Kisgen, D. J. (2013). Gender and corporate finance: Are male executives overconfident relative to female executives?. *Journal of Financial Economics*, *108*(3), 822-839.

Kirkpatrick, G. (2009). The corporate governance lessons from the financial crisis. *OECD Journal: Financial Market Trends*, *2009*(1), 61-87.

MacNeil, I., & Li, X. (2006). "Comply or Explain": market discipline and non-compliance with the Combined Code. *Corporate Governance: An International Review*, *14*(5), 486-496.

Matsa, D. A., & Miller, A. R. (2013). A female style in corporate leadership? Evidence from quotas. *American Economic Journal: Applied Economics*, *5*(3), 136-69.

Seidl, D., Sanderson, P., & Roberts, J. (2013). Applying the 'comply-or-explain'principle: discursive legitimacy tactics with regard to codes of corporate governance. *Journal of Management & Governance*, *17*(3), 791-826.

Shrives, P. J., & Brennan, N. M. (2015). A typology for exploring the quality of explanations for non-compliance with UK corporate governance regulations. *The British Accounting Review*, *47*(1), 85-99.

Sila, V., Gonzalez, A., & Hagendorff, J. (2016). Women on board: Does boardroom gender diversity affect firm risk?. *Journal of Corporate Finance*, *36*, 26-53.

Ullah, S., Ahmad, S., Akbar, S., Kodwani, D., & Frecknall-Hughes, J. (2021). Governance disclosure quality and market valuation of firms in UK and Germany. *International Journal of Finance & Economics*, 26(4), 5031-5055.

2. "Comply or explain" Disclosures: A Review of Economic Consequences

2.1. Introduction

The 'comply or explain' approach is fundamental to the effectiveness of corporate governance codes. Often referred to as soft law, this approach provides recommendations and suggestions that are not binding on companies, allowing firms to deviate from best practices as long as they justify their departure from the code. Today, compliance disclosure regimes, as a form of soft regulation, are prevalent in many jurisdictions, including the EU, UK, and Australia. Companies are required to comply with a governance code, report compliance, or provide explanations for deviations. The flexibility and cost-effectiveness of this soft regulation have been identified as key advantages that significantly enhance firm-specific corporate governance quality. However, the soft regulation of corporate governance presents challenges related to monitoring, enforcement, and potential difficulties in its application (Fasterling, 2012; MacNeil and Li, 2006). An important aspect of the comply or explain approach is that the interpretation of these corporate governance disclosures is left to investors (Shrives and Brennan, 2015). This raises critical questions regarding the effectiveness of the approach and its impact on firm-level outcomes. In line with these arguments, we systematically review the literature to answer the following research questions:

1. Does the comply or explain approach induce firm-level economic consequences?
2. Are markets (investors) able to correctly assess these explanations for deviation from the code?
3. Do the economic consequences of the comply and-explain approach vary among countries?

Our initial observation of findings suggests that the comply or explain approach induces various firm-level economic consequences, including effects on firm performance, the cost of capital, investment efficiency, and other factors. However, the results are mixed because of several factors, such as the measure of corporate governance quality, sampling periods, and endogeneity challenges. Additionally, firms employ various theories to justify their deviation from the best corporate governance practices. While there are studies on corporate governance and the evolution of corporate governance codes over time and across countries (e.g., Cuomo et al., 2016), a comprehensive review of the firm-specific economic consequences of the comply or explain approach is lacking.

This study aims to fill this gap by being the first to systematically review the quality and compliance of corporate governance codes and their firm-level economic consequences.

We focus on seven key areas of firm-specific economic consequences: firm performance, firm value, investment efficiency, accounting choices, financial distress, cost of capital, and corporate social responsibility (CSR). Our review encompasses 24 papers that provide a broad perspective on this subject.

Our observations suggest that while much of the existing literature has focused on specific corporate governance attributes and their impact on firm-specific outcomes, our study brings attention to the overall effectiveness of corporate governance code quality and compliance within the comply or explain framework. This study makes several important contributions. This is the first study to systematically review governance disclosure quality, focusing on the explanations provided by firms for deviations. It also identifies future avenues for research related to the comply or explain approach of the code. Our findings have substantial policy implications for a diverse range of stakeholders including investors, firms, policymakers, and researchers. This study provides these groups with current evidence on the potential effectiveness of governance codes and offers insights into their further development and implementation.

The remainder of this paper is organized as follows. Section 2.2 reviews the 'comply or explain' approach, including its theoretical framework and motives for compliance. Section 2.3 outlines the data collection and the methodology used in this study. Section 2.4 presents and discusses the empirical findings in detail. Finally, Section 2.5 highlights the key findings and suggests avenues for future research.

2.2. Comply or Explain Approach

The comply or explain approach is a form of soft regulation of corporate governance. Under the comply or explain approach, a regulatory authority (i.e., securities regulatory and legislative authority) or body of self-governance selects the provisions and best practices of corporate governance in the form of a corporate governance code (MacNeil and Li, 2006; Cuomo et al., 2016; Ho, 2017). The comply or explain approach is linked to a disclosure obligation on corporate governance practices. Hence, companies can either comply with the provisions of the selected code or opt to deviate from the provisions and explain these deviations to inform investors and stakeholders. Investors and stakeholders need to correctly understand and interpret a company's governance disclosures to ensure the efficient application of a corporate governance code (MacNeil and Li 2006).

Specifically, markets need to assess whether an explanation is a justifiable deviation from the code, or whether it should be treated as unjustifiable non-compliance. Generally, a

firm is reported to have complied with the code if it has not reported any deviations; that is, compliance is always implied, and deviations are mandated to be explicitly mentioned. Based on the GCGC Code 2022 (p. 2), "well-justified departures from the Code's recommendations may be in the best interests of good corporate governance." Therefore, when a company provides detailed firm-specific justified explanations, it should be considered equivalent to compliance. Conversely, lack of explanation is typically seen as non-compliance.

When assessing the impact of the comply or explain approach, it is important to consider the exact design of the regulation, the institutional, legal, and cultural environment of a jurisdiction adopting the code, and potential incentives created by the regulation (Ho, 2017; Cuomo et al., 2016). At first glance, a comply or explain approach is a seemingly adequate method to regulate corporate governance allowing especially for flexibility in the application and ensuring cost efficiency by selecting effective best practices (Ho, 2017; Ullah et al., 2021). However, a significant disadvantage may limit its positive impact (Jackson et al., 2020; Fasterling, 2012). First, it is important to consider code design. Many provisions of the codes only reflect the requirements of corporate law, as is the case for the UK code (MacNeil and Esser, 2020) and the German code (e.g., provisions related to board composition and remuneration), which in turn limits the actual degree of flexibility and explains the high compliance rates. Second, the application behavior of firms depends not only on market discipline, but also on the general acceptance of the proposed best practices, as well as the existence of monitoring and enforcement institutions. Efficient enforcement and monitoring of governance disclosures are often limited to a review of compliance statements within the scope of statutory audits (Fasterling, 2012).

2.2.1. Theoretical Background

Prior literature mostly examined the compliance aspect of a 'comply or explain' approach, neglecting the underlying principle of explaining the reasons for adopting alternative corporate governance mechanisms. The 'explain' principle is inherently linked to the non-binding and voluntary nature of the code, with the aim of allowing firms to adopt their optimal corporate governance structure while enhancing monitoring by the board and increasing transparency in the market (Cuomo et al., 2016). In line with the statement of the Financial Reporting Council (FRC) of UK, "(e)xplanations are a positive opportunity to communicate, not an onerous obligation" (FRC, 2018, p. 2). Major corporate scandals have led to the adoption of corporate governance codes worldwide. The core component of the corporate governance code is the use of a comply or-explain approach. Firms adapt this principle to build trust with

their stakeholders and disclose additional information regarding deviations from the code. The literature employs various theoretical frameworks to substantiate the explanations offered in firms' compliance statements. Among these, four theories are widely utilized: 1) agency theory, 2) stakeholder theory, 3) legitimacy theory, and 4) market failure theory. Agency theory postulates that through detailed explanations, managers demonstrate that a firm's current corporate governance practices are appropriate. Consequently, quality corporate governance reporting is signaled through these disclosures, which are influenced by managers' reporting incentives (Shrives & Brennan, 2015). Similarly, information asymmetry explains why firms disclose voluntary or mandatory information to mitigate market failures. According to this notion, investors need more information to clarify uncertainty before investing in a firm. Corporate governance disclosure, through a comply-or-explain approach, provides firms with the opportunity to disclose additional information, whether voluntary or mandatory. This helps justify firms' actions and policies, thereby reducing information asymmetry regarding departure from the code. The reduction in information asymmetry ultimately leads to lower agency costs, which is a result of strong governance mechanisms, and this, in turn, can lead to a lower cost of capital for firms (Drobetz et al., 2004).

In contrast to agency theory, stakeholder theory emphasizes firms' responsibilities toward a broad array of stakeholders, including customers, employees, and the community (Freeman, 2010; Freeman, Wicks, & Parmar, 2004; Ullah et al., 2021). According to Deegan (2002), managers are likely to comply with governance measures or provide information when requested by influential stakeholders, which may explain firms' deviations from governance codes to address these concerns.

The legitimacy theory argues that business continuity is based on a firm's reputation in society. Reputation defines the legitimate right to existence. Therefore, firms use "explain" component to justify their actions and deviations from the single provisions of the code. For example, Seidl, Sanderson, & Roberts (2013) identify various legitimizing tactics used by firms to justify deviations, such as moral legitimacy[1], pragmatic legitimacy[2], and future compliance with codes. They show that 55% of German and 40% of UK firms' explanations fall into the deficient category (when firms provide no reason for deviation). Similarly, Galle (2014) uses

[1] Moral legitimacy refers to the perception that an organization's actions are the "right thing to do" based on societal norms and values. Companies justify deviations from governance codes by appealing to higher principles, such as laws or social norms, that would be violated by strict compliance.

[2] In Pragmatic legitimacy companies argue that certain code provisions conflict with the interests of their stakeholders, thus justifying their deviations as more effective or efficient in serving those interests (see Seidl et al., 2013).

legitimacy theory in addition to market failure theory to explain deviations. The author uses a similar approach to argue that legitimacy theory can be applied to clarify the information provided in annual reports on corporate governance, as the information itself signals companies' actions. In a cross-country study, the author showed that Germany had the highest percentage (57%) of insufficient explanations, while the Netherlands had the lowest (19%). However, genuine explanations for Germany and the Netherlands account for approximately 15% and 19%, respectively. They further conclude that firm size and time can predict the level and quality of compliance.

2.2.2. Motives for Compliance

A wide range of studies has analyzed the overall level of compliance with corporate governance codes in the last decade (e.g., Tuschke and Sanders, 2003; Holm and Scholer, 2010; Kang et al., 2007; Sakawa et al., 2012). Most studies report compliance rates of more than 90%, demonstrating the likely advantages of governance regulations (for an overview, see Stiglbauer and Velte, 2012). A closer look at the deviations reveals that non-compliance relates to certain provisions, such as the remuneration of board members, independence of supervisory board members and internal control systems (e.g., Akkermans et al., 2007), and cooperation between the management board and supervisory board (Bassen, Mayer, and Schalange, 2006).

Prior studies indicate that several factors influence the level of corporate governance compliance. Firm size is an important determinant because larger companies have a dispersed ownership structure and face more capital market pressure to enhance their internal monitoring mechanisms (e.g., for the UK, Conyon and Mallin, 1997; for Germany, von Werder et al., 2005; and for the Netherlands, Akkermans et al., 2007). Further, studies show that the level of compliance and the level of detail disclosed explanations increase over time, which may be associated with increased market scrutiny (Akkermans et al., 2007; MacNeil & Li, 2006; O'Shea, 2005; Price, Román, & Rountree, 2011). Eisenschmidt and Vanini (2019) argue that firms' prevalent motivation to comply with the code may be aligned with peer group practices rather than a reduction in agency costs.

In addition to compliance with the code, another stream of the literature investigates the contents of compliance statements to evaluate the quality of explanations. Shrives and Brennan (2015) investigate UK FTSE 100 firms in two different periods (due to significant modifications in the two versions of the code) of 2002/03 and 2010/11 regarding the quality of explanations for noncompliance with the code. They found three main rhetorical strategies: minimization of negative feelings, use of weasel words, and transcendence used in the explanations. The results

also indicate that strategies are more inclined towards misleading rather than meaningful explanations. The authors observed that while valid explanations are critical, misleading explanations may damage the comply explain system itself. Arcot et al., (2010) also find that the overall compliance trend is high for UK FTSE non-financial firms for the period 1998-2004 but there has been frequent use of standardized explanations in the compliance statements. This is also true for Dutch listed firms. According to Van de Poel and Vanstraelen (2011), Dutch firms listed on the Amsterdam Stock Exchange provided generic explanations for noncompliance during the sample period of 2004-05. In a European setting, Nerantzidis (2015) measures the quality of explanations of Greek firms listed on the Athens Stock Exchange. The results indicate that compliance with the code is low, and approximately 41% of the firms provide no explanation for non-compliance. The question arising here is whether the principle of "comply or explain" fulfills the actual objective of increasing firm-specific corporate governance quality or whether it is undermined by boilerplate language. Based on the aforementioned insights, we first review the literature on the influence of corporate governance on the economic consequences. We differentiate between (non-) compliance, and the quality of explanations given for non-compliance with corporate governance codes.

2.3. Data and Methodology

Table 2.1 presents an overview of the steps taken to systematically select articles based on the specific criteria. First, we meticulously screened all articles in the Web of Science, EBSCOhost Business Source Premier, and Google Scholar databases. This screening uses a list of keywords, such as comply-explain, quality of explanations, and the corporate governance code to access the relevant articles.

We strategically combined different keywords using Boolean operators (AND, OR) with previously defined keywords to broaden the research results. Only articles written in English were selected and further filtering of the results was performed based on the VHB Publication Media Rating 2024 rankings. The German Academic Association for Business Research (VHB) ranking, first introduced in 2003, evaluates the national and international journals relevant to German-speaking business researchers. We identified a total number of 24 papers (cumulative without self-citations of 1552) relevant for our study. Table 2.2 provides a breakdown of these papers, including the publication year and relevant journals.

Table 2.1 **Methodology**

Step	Description
Step 1: Database Selection	Scopus, Web of Science, Google Scholar, and EBSCOhost Business Source Premier
Step 2: Search Keywords	Comply or explain, Quality of explanations, corporate governance index, non-compliance, governance code, Greenbury report, compliance statements, corporate governance compliance, explanations, compliance, corporate
Step 3: Search Strategy	Used Boolean operators (e.g., OR , AND) to combine keywords (e.g., "comply or explain " AND "firm performance" OR "cost of capital" OR "quality of explanations").
Step 4: Search Period	The earliest study is from 2004 and the latest from 2022.
Step 5: Language Restriction	We only included articles written in English language
Step 6: Quality Filtering	We then filtered the articles based on the VHB Publication Media Rating 2024. It evaluates the quality of publication outlets in business studies, replacing the 2015 VHB-JOURQUAL3. It includes 18 area ratings based on member surveys, focusing on scientific quality to guide researchers and promote quality assurance in publishing.
Step 7: Screening Process	Conducted an initial screening of the retrieved articles based on title and abstract to exclude irrelevant studies.
Step 8: Full-Text Assessment	Reviewed the full text of selected articles against inclusion criteria to ensure they align with the research objectives and questions

Note. This table outlines the steps followed in the systematic literature review process.

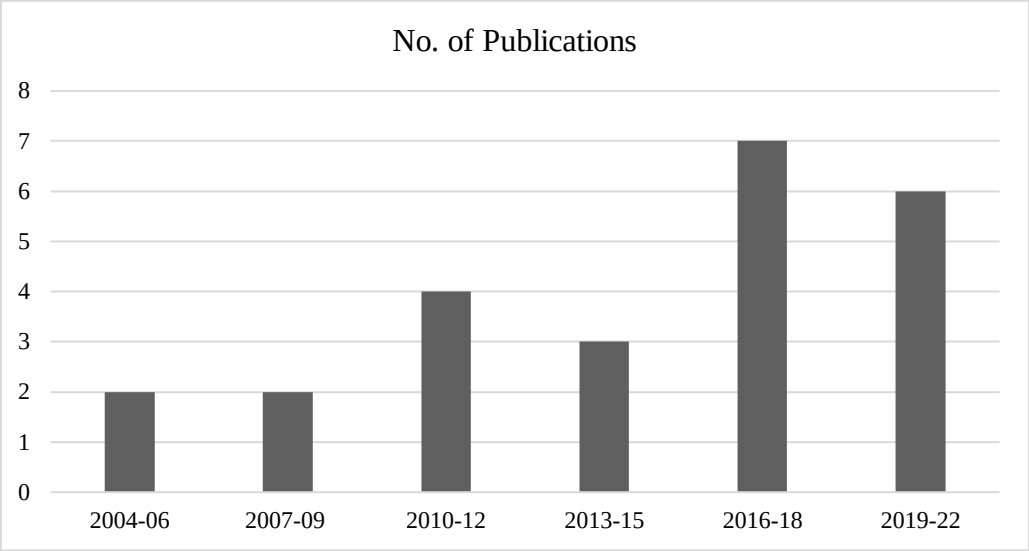
Table 2.2 **Overview of Studies**

Author(s)	Journal	Year
Drobetz et al.	European Financial Management	2004
Goncharov et al.	Corporate Governance: An International Review	2006
Brown et al.	The Journal of Finance	2008
Bassen et al.	Corporate Ownership & Control	2009
Chang and Sun	Review of Accounting and Finance	2010
Renders et al	Corporate Governance: An International Review	2010
Stiglbauer	Problems and Perspectives in Management	2010
Jo et al	Journal of Business Ethics	2012
Chan et al	Journal of Business Ethics	2014
Luo et al	Corporate Governance: An International Review	2014
Kaspereit et al	The Journal of Risk Finance	2015
Hawas and Tse	Journal of Accounting, Auditing & Finance	2016
Mahr et al	Journal of Institutional and Theoretical Economics (JITE)	2016
Rose	European Management Journal	2016
Al-Gamrh et al	Applied Economics	2018
Ali et al	International Review of Economics & Finance	2018
Ghouma et al	The Quarterly Review of Economics and Finance	2018
Rashid	Social Responsibility Journal	2018
Honigsberg	Journal of Accounting Research	2019
Melgarejo	Journal of Accounting in Emerging Economies	2019
Koirala et al	Journal of Corporate Finance	2020
Bravo-Urquiza and Moreno-Ureba	Research in International Business and Finance	2021
Younas et al	Corporate Governance: The International Journal of Business in Society	2021
Hamad et al	Sustainable Development	2022

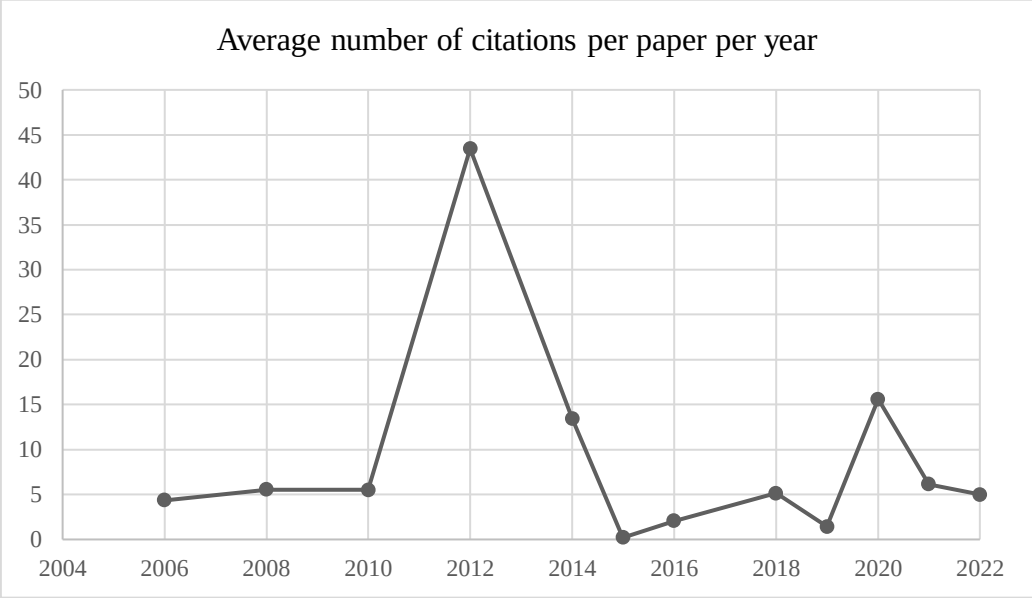
Note. This table provides an overview of key studies included in the systematic literature review, listing author names, journal names, and years of publication.

Figure 2.1 presents two panels illustrating the publication and citation of the 24 selected papers, focusing on firm-level economic consequences. Panel A shows the number of published studies over time. The earliest study in our literature review on the comply and explain principle dates back to 2004, and the latest to 2022. The data show an increase in research after 2009, which may be due to the increased focus on corporate governance following the 2008-09 financial crisis. Panel B shows the corresponding citations per paper per year during the observation period.

Figure 2.1 **Sample Papers and Citations Over the Period**



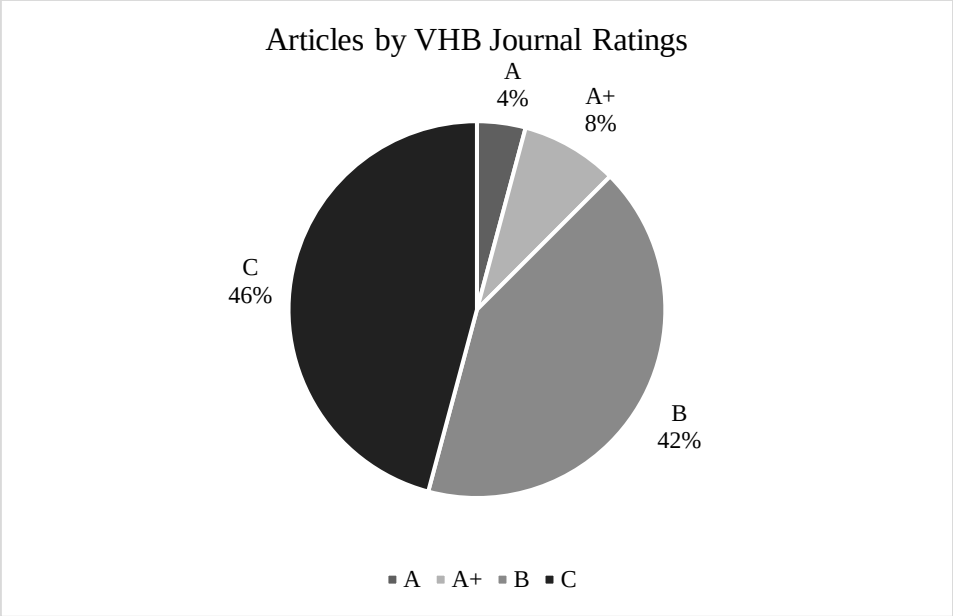
Note. Panel A: Publication over the years



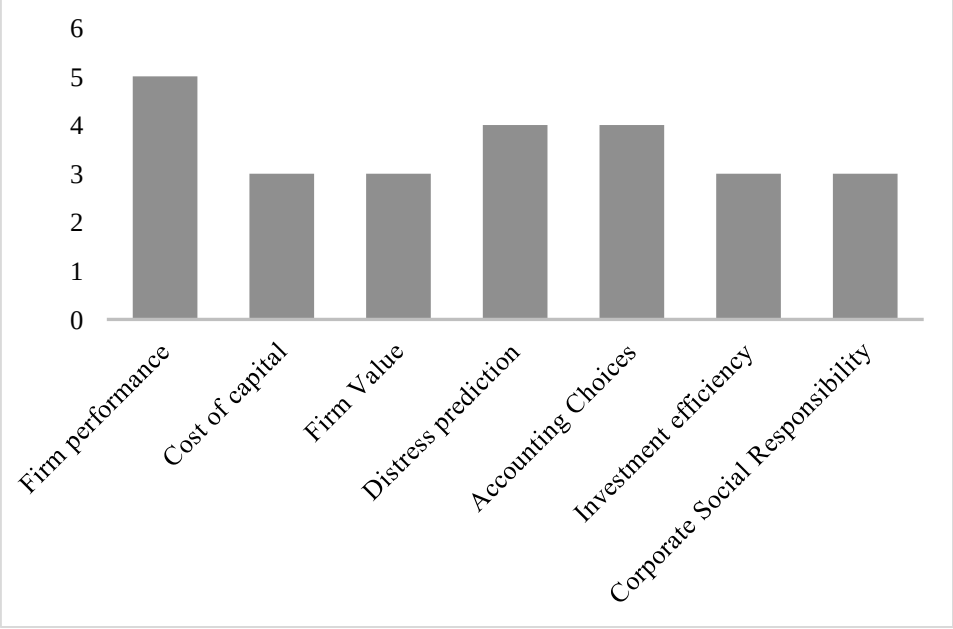
Note. Panel B: Average number of citations per paper per year obtained from Web of Science

While the average number of citations per paper per year remains relatively consistent, there is an apparent peak around 2012, complementing previous argument. Similarly, in Figure 2.2 Panel A, we present a breakdown of these papers according to the 2024 VHB Publication Media Journal Rating categories and in Panel B number of papers by firm-level economic outcome.

Figure 2.2 **Breakdown of Papers by VHB Journal Rankings and Economic Consequences**



Note. Panel A: Breakdown of Papers by VHB Journal Rankings



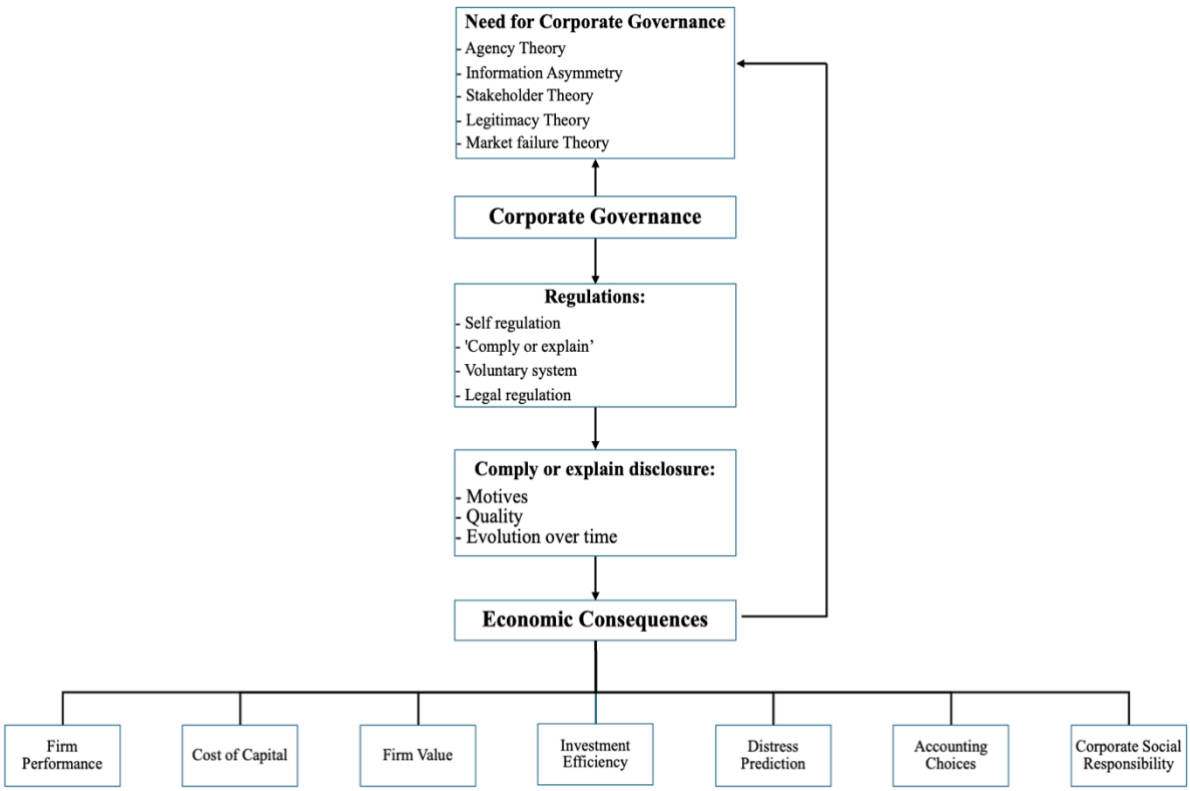
Note. Panel B : Papers by Economic Consequences

2.4. Economic Consequences of Application of Comply or Explain Approach

This literature review explores how the quality of "comply or explain" disclosures impacts firm-level economic consequences. Research on the economic effects of corporate governance employs various measures to assess governance quality, including (a) corporate governance characteristics, such as board and ownership structure; (b) corporate governance indices, which indicate whether specific provisions are met; and (c) governance disclosure quality proxies, which analyze the content of compliance or non-compliance with codes. Given our focus on the "comply or explain" principle, this review primarily examines studies that assess compliance with code provisions using corporate governance indices (b) and those that analyze the content of corporate governance disclosures (c). Specifically, we concentrate on the following firm-specific economic consequences: 1) firm performance, 2) firm value, 3) investment efficiency, 4) accounting choices, 5) financial distress, 6) cost of capital, and 7) corporate social responsibility (CSR).

Figure 2.3 illustrates the conceptual framework of our study, providing a structured overview of the key corporate governance components, their interrelationships, and associated firm-level economic consequences.

Figure 2.3 **Conceptual Framework**



Note. This figure illustrates the conceptual framework: corporate governance and outcomes.

2.4.1. Firm Performance

There is a broad stream of literature on the association between corporate governance and firm performance. The assumption is that strong governance leads to better monitoring and reduced agency costs, and hence, better firm performance. There are few studies that evaluates how comply or explain approach or governance ratings affects firm performance. Starting with a broader study on European firms related to corporate governance ratings and firm performance. Renders et al. (2010) use five performance measures: ROA, ROE, Tobin's Q, market-to-book, and market-to-sales ratio, and capture governance ratings with Deminor ratings. They use the probit regression 2sls model and control for endogeneity. They argue that the prior negative association between corporate governance and performance may be because studies have failed to control for endogeneity. They used lagged variables for corporate governance ratings and governance score as instruments. They show that market performance measures are significantly positively associated with corporate governance ratings, while operational firm performance is insignificant in the FTSE Eurofirst 300 during the period 1999-2003. They further find that an improvement in corporate governance ratings over time reduces marginal benefits in terms of performance in a cross-European study. They further conclude that the marginal benefit of corporate governance on firm performance is more for firms operating in countries with weaker shareholder protection than for firms operating in countries with strong governance regulations and laws.

Firms typically offer explanations if they deviate from certain code provisions. Whether this explanation justifies a firm's actions and is acceptable to the stock market requires further investigation. Rose (2016) investigates such an association of Danish listed firms for a single year, 2010. The author evaluates compliance with the Danish Corporate Governance Code and its subsequent impact on firm performance. The author constructs comply or explain governance disclosure score in four different categories: total governance score, board composition score, remuneration score, and audit score. Binary values were assigned according to compliance with the recommendations (total 71) of the code. Their results show that corporate governance, measured as the remuneration score, has a significantly positive relationship with firm performance (measured as ROE). The same is true for board composition and total governance, when performance is measured in terms of ROA. Overall, their results show a positive relationship between the governance disclosure score and firm performance.

A Canadian cross-sectional study by Luo and Salitero (2014) investigated the impact of corporate governance quality and firm performance. They used three different measures of governance based on the different parameters of the 47 Canadian Code items. For example, the

initial simple measure assumes that firms have the option to comply with, explain, or choose a legitimate alternative. A score of 1 was assigned for compliance, whereas a score of 0 was assigned for non-compliance. In the first simple measure, they assume that both comply or explain are legitimate options for firms and score 1 or 0 for compliance or non-compliance, respectively. The second measure uses a three-point scale with scores of 1(compliance), 2(explanation of alternative best practices), and 0 for non-compliance and no explanations. They find the relationship to be positive and weak between corporate governance and better operational performance (measured as ROE) and significantly positive for firm value as measured by Tobin's Q for listed Canadian firms (650 firms); for the single cross-sectional data year 2006. Neither of these cross-sectional studies controlled for endogeneity. The use of single-year data is mainly because of limitations in the manual collection of governance data. Literature shows that firm performance has a weak or positive association with governance disclosure.

For Germany, however, Bassen et al. (2009) find a negative association between corporate governance aggregate and Tobin's Q (a measure of firm performance) in 100 large German publicly listed firms for the year 2005. They measured three aggregate measures of corporate governance, based on the code's recommendations, suggestions, and both. Similarly, both accounting and book performance measures were used in the regression. They found that all the performance measures (ROA and ROE) are insignificant for code compliance.

Stiglbauer (2010), in a recent German study, also finds similar results in a cross-sectional study of 100 prime standard German public firms for 2007. The author developed a corporate governance score (maximum score of 94) and used content analysis to analyze the data available from various sources, such as webpages, compensation reports, codes of conduct, and annual reports. Simultaneous equation modelling and 3SLS statistical model were used to investigate the impact of declared compliance on firm performance. The author did not find support for the theoretical assumption of a positive association between declared compliance and firm performance, even after controlling for endogeneity, using instruments similar to those mentioned earlier.

Overall, the results are mixed, with some studies showing positive associations and others reporting weak or negative correlations. This inconsistency arises from factors such as methodological differences, variations in legal frameworks, and challenges in controlling for endogeneity. While the 'comply or explain' approach has potential, its effectiveness in improving firm performance is context-dependent, highlighting the need for continued research in this area.

2.4.2. Cost of Capital

The literature on corporate governance quality and cost of capital is multifaceted. Jensen and Meckling (1976) argue that ownership concentration reduces agency costs. According to agency theory, separation of ownership and control leads to diverging interests between capital providers and management, resulting in agency costs that can increase the cost of capital and decrease firm value. Kaspereit, Lopatta, and Zimmermann (2015) conducted a comprehensive study to investigate whether the recommendations of corporate governance codes affect the implied cost of equity capital. Their study, spanning 2003 to 2012, employed various methods to address endogeneity and multiple measures of the German Corporate Governance Code (GCGC). They used two compliance measures: the percentage of compliance (calculated as one minus the number of deviations per firm divided by the total recommendations of the code) and a weighted percentage of compliance based on the version of the code. To capture the implied cost of capital (ICC), they followed Hou et al. (2012) and used their earnings forecast model. They found that compliance with one additional recommendation of the GCGC (out of 80) resulted in a drop of approximately 0.17 percentage points in the ICC. The authors concluded that higher levels of compliance with the code reduce the cost of capital, as improvements in corporate governance quality have taken over the monitoring role traditionally held by commercial banks. Thus, good corporate governance can help shareholders reduce monitoring and auditing costs, thereby lowering the cost of equity.

Conversely, Ghouma, Ben-Nasr, and Yan (2017) investigated a similar question for Canadian listed firms and found the opposite results. They used the Globe and Mail corporate governance index derived from the annual management proxy circulars filed by Canadian listed firms on the Toronto Stock Exchange (TSX) and used bond spreads as a measure of the cost of debt. Analyzing a sample of 169 firms from 1986 to 2014 using OLS regression, they find a negative association between the governance index and the cost of debt.

Following the inception of the German Corporate Governance Code in February 2002, Drobetz, Schillhofer, and Zimmermann (2004) were the first to investigate the association between compliance with the German Corporate Governance Code and its impact on expected stock returns for German public firms. Their cross-sectional event study included 91 German public firms, both financial and non-financial. They developed a corporate governance rating with a maximum score of 30 based on five categories: management and supervisory board matters, auditing, shareholder rights, corporate governance commitment, and transparency. The survey questionnaire was sent to 253 firms, with 91 responses (approximately 36%). The

collected information was cross-verified with available data from web pages, quarterly reports, company charters, and other sources. Using dividend yield as a proxy for the cost of capital, they find negative correlations between expected stock returns and firm-level corporate governance.

Overall, the results consistently indicate an association between corporate governance and cost of capital. However, the outcomes vary depending on the measure of the cost of capital, sample period, and country's institutional setting.

2.4.3. Firm Value

Research shows that higher levels of corporate compliance can increase a company's market value (Kaspereit, Lopatta, and Onnen, 2017) and lower its cost of capital (Kaspereit, Lopatta, and Zimmermann, 2015). Building on this, Drobetz et al. (2004) explores the association between compliance with the German governance code and firm valuation. Their results showed a positive association between corporate governance ratings and firm valuation, measured as Tobin's Q and market-to-book ratio. They further divided the sample into two portfolios based on CG ratings, an agent portfolio (CGR score < 18) and a principal portfolio (CGR score >18), to study the price-varying effect on stock returns. They find that the principal portfolio outperformed the agent portfolio over a 50-month period (January 1998 to March 2002). This finding supports the notion that good corporate governance is associated with more efficient capital allocation and better firm performance.

Existing evidence in the German setting does not evaluate explanations for measuring corporate governance. If the information provided in the explanations is deemed credible and useful for investors, it should be reflected in the stock prices. Mahr et al., (2016) test this argument to study the short and long run effects of compliance disclosure on firm value. They used a survey questionnaire to conduct an event study. To capture compliance, they used the number of absolute deviations and categorized them as low for six or more deviations and high for two or fewer deviations. They performed analyses over a three-year period (starting the code's first inception in 2002), making a time-varying simple compliance measure. They find that code compliance is value-irrelevant for prime standard German public firms. Foreign institutional investors were also asked using a survey questionnaire to input the explanations provided by firms on deviation from the code in the annual declaration of conformity statements. Their task was to categorize explanations into three categories of explanations given by firms: 1) personal matters, 2) industry or firm-specific requirements, and 3) reasonably explained decisions. Only a fraction of all explanations was considered reasonably explained

and unavoidable due to firm- or industry-specific reasons, and no weight was given to personal matters. They conclude that even in the long run, a change in compliance level does not have an impact on stock price performance. They argue that monitoring and legal enforcement are prerequisites for corporate governance reform. Although the authors used a comprehensive approach to measure both corporate governance compliance and firm valuations, they failed to address the issue of endogeneity, possibly because there was no time-varying measure of corporate governance.

Goncharov et al., (2006) address both endogeneity and the role of ownership structure in a sample of 61 German public firms (DAX30 and MDAX excluding financial firms) around the similar period i.e., 2002-2003. The authors use the absolute number of deviations to capture governance compliance, as a comply-explain was not embedded in the German corporate governance code at that time. They use two valuation models based on Kothari and Zimmerman (1995) and Easton and Sommers (2003). Both models were tested with and without the inclusion of corporate governance variables. Both models find an incremental effect of higher compliance with the code after incorporating the corporate governance variable. To address the endogeneity issue, they follow Koeke (2002) and use various proxies as instruments such as board structure (board size), ownership structure (free float, block holders, etc.), takeover activity (dummy for legal announcement of takeover), financial structure (leverage), and competition situation (firm size and transnationality). The results post-endogeneity stands positive and significant at 5% level of significance. They concluded that compliance with the code was value relevant.

2.4.4. Investment Efficiency

The efficient allocation of investment (capital) affects productivity and growth in the economy. The decisions managers make regarding investments are critical, and the quality of information available to investors significantly influences these choices. Corporate governance practices and their disclosures play a vital role in this context, as explanations for deviations from established governance codes provide valuable insights to investors and stakeholders. For instance, understanding how remuneration policies align with overall firm performance can be crucial for investor decision-making. Stricter compliance with relevant code sections or provision of firm-specific information regarding departures from the code can enhance investors' decision-making processes. However, the relationship between corporate governance and investment efficiency is complex. Stricter regulations may enhance transparency but can also impose compliance burdens that deter insiders from pursuing value-enhancing, risky

investments. Conversely, dominant insiders might opt for underinvestment to maximize their private benefits.

Several empirical studies have explored these dynamics. Hawas & Tse (2016) examined the preferences of major shareholders regarding corporate governance compliance before and during the financial crisis in the UK. Using a sample of 139 UK FTSE 350 companies, they developed a Corporate Governance (CG) index based on the UK combined code and annual report disclosures. Their findings suggest that corporate governance does influence investment decisions, with compliance patterns differing during financial crisis. They further find that UK firms are motivated to comply with the code's recommendations to secure funds at lower costs and regain shareholder trust. Additionally, the specific provisions of the code, particularly those related to board composition and independence, significantly impact investment decisions.

In the context of an emerging market economy, Koirala et al. (2020) find a positive association between stricter corporate governance reforms and corporate risk-taking, measured as earnings volatility, in India. Utilizing Clause 49, which is equivalent to the US Sarbanes-Oxley Act (SOX), as a measure of corporate governance reform, they analyzed 3,839 firms listed on the National Stock Exchange or the Bombay Stock Exchange from 2000 to 2007. Their study suggests that, in institutional settings with weak investor protection and dominant insiders, strict corporate governance can limit the exploitation of private benefits and maximize value through risk-taking. This supports the argument that stricter corporate governance can yield positive investment outcomes. These findings are consistent with those of Al-Gamrh et al. (2018), who studied UAE-listed firms (including financial firms) on the Dubai Financial Market (DFM) and the Abu Dhabi Stock Exchange post-financial crisis, covering the period from 2008 to 2012, one year after the UAE Code was introduced. However, their research design used corporate governance disclosure quality as a moderator for the influence of investment opportunities. They also developed a corporate governance disclosure index, which covered 11 out of 14 articles of the UAE corporate governance code. They also find that in a weak institutional setup, corporate governance can mitigate the negative impact of investment opportunities on firm performance.

Despite these insights, there remains limited evidence on the economic consequences of the "comply or explain" approach on investment efficiency. The initial findings suggest that stricter compliance with corporate governance codes may mitigate risk, lower the cost of capital, and positively impact value-enhancing risky investment outcomes. Further research is needed to understand how investors react to additional information regarding departures from governance codes, and how this information impacts investment efficiency.

2.4.5. Distress Prediction

Bankruptcy or financial distress prediction is one of the driving factors for strong corporate governance mechanisms. Corporate scandals have pushed for laws and codes that monitor public firms. Recent literature has analyzed the impact of corporate governance in improving bankruptcy prediction models (Bredart, 2014; Platt and Platt, 2012; Lu, Tsai, and Shih, 2016). The existing literature has used corporate governance mechanisms in predicting financial distress and also as an additional variable to improve the power of a predictability model. While most studies have used various corporate governance mechanisms, very few have examined the impact of corporate governance disclosure quality on financial distress. The measure of financial distress also varies, ranging from the Altman Score to self-coded binary variables that satisfy certain conditions.

Bravo-Urquiza and Moreno-Ureba (2021) conducted a recent study examining the impact of compliance with 64 items of the Spanish corporate governance code (CGC) on financial distress. For the period 2013-2016, their small sample consisted of 35 firms from the IBEX35 index. They did not find any evidence of overall compliance with the recommendations of the corporate governance code for predicting financial distress. However, they did find support only for high compliance with CGC recommendations related to the board of directors (a sub-index consisting of 25 items of the code). The study controlled for endogeneity and used corporate reputation and corporate social responsibility (CSR) as two instrumental variables.

In contrast, the results for an emerging market, Pakistan, show different findings. Younas et al. (2021) developed a corporate governance index (PAKCGI) based on 64 provisions of the corporate governance code to test whether compliance with the governance code mitigates financial distress for firms, measured using the Altman Z-score. For the period from 2003-2017, using a sample of 152 non-financial firms, they found evidence that corporate governance (PAKCGI) can help reduce financial distress. However, they only mentioned fixed effects models and pooled data to account for endogeneity.

Ali et al. (2018) used a broader sample of 1,086 firms to investigate a similar question but with different measures, i.e., default risk, for a developed country, Australia. Their sample period covered 2001-2013 and included 1,086 non-financial firms. They measure default risk using two proxies: credit default swap and distance to default. To measure corporate governance quality, they developed a corporate governance index that covers 17 provisions of the Australian corporate governance code. After controlling for endogeneity using lagged

variables, they found contrasting results, that is, governance disclosure quality has a negative association with default risk. However, they found support only for firms with high growth opportunities. Specifically, they find that corporate governance quality can reduce the default risk of firms with more growth opportunities.

For US firms, Brown et al. (2008) conducted a cost-benefit analysis of regulatory disclosure requirements regarding operational risk and conflicts of interest in the hedge fund industry. They used the SEC mandatory disclosure Form ADV, a regulatory filing for investment advisors and hedge fund managers, to analyze disclosure information. They find that these disclosures have no effect, indicating either that investors do not regard this information as material or that they lack this information. However, a recent study in a similar setting by Honisberg (2019) shows that mandatory SEC disclosures (Form ADV) reduce misreporting at hedge funds and induce changes in firms' auditors.

Overall, the results highlight the importance of comprehensive corporate governance disclosure quality measures in predicting financial distress. However, there are not enough studies that evaluate the materiality of the information provided in compliance statements to predict financial distress. The initial results are mixed and vary between emerging and developed economies.

2.4.6. Accounting Choices

The vast theoretical and empirical literature suggests that effective corporate governance helps mitigate agency costs and provides better financial and accounting information. Empirical studies have extensively used various corporate governance mechanisms as proxies to measure overall corporate governance and investigate their impact on earnings quality. For example, internal governance mechanisms can play an important role in restraining earnings management. The monitoring role of the board of directors aims to protect shareholder rights (Fama and Jensen, 1983) and decrease the exploitation of accounting choices.

In an emerging economy, Hamad et al. (2022) investigate the impact of the Malaysian Code on Corporate Governance (MCCG) on the disclosure quality of integrated reporting for a small sample of 37 firms over the period of 2016-2020. They find that MCCG has a positive and significant impact on disclosure quality. Similar to the comply-or-explain approach, where firms are either asked to comply with recommendations or explain deviations from the code, the Lima Stock Exchange has developed a Good Corporate Governance Index (GCGI) based on 26 principles. Listed companies are required to voluntarily submit declarations regarding

these 26 principles annually, and these self-assessments must be audited by external auditors (unlike in the UK and Germany). Based on these assessments, the LSE declares which firms can be part of the GCGI for that particular year. Melgarejo (2019) uses this information to investigate whether the GCGI has any impact on the earnings quality of listed firms for the period 2009-2015. The author's findings indicate that firms included in the annual GCGI provide high-quality accounting information–that is, more persistent and conservative accounting information–using different measures of earnings quality and controlling for endogeneity using a 2SLS regression model. However, it is important to mention that more than 50% of the observations in the sample consist of only two industries: mining, oil and gas, and manufacturing.

In the US, the Corporate Oversight Bill, also known as the Sarbanes-Oxley Act (SOX), was introduced following major accounting scandals (e.g., Enron and WorldCom) to impose a number of corporate governance rules on public companies. Chang and Sun (2010) investigated whether corporate governance disclosure requirements mandated by SOX affect a firm's earnings quality. Their study covers the periods before (2001-02) and after (2002-03) the implementation of SOX. They find that an independent board and independent audit committee increase earnings informativeness while earnings management is reduced post-SOX. They also show that post-SOX, having a financial expert on independent audit committees mitigates earnings management and improves the integrity of financial information. Overall, the results show that the market perceives mandated disclosure as value-relevant.

Honisberg (2019), on the other hand, studies the impact of mandatory SEC disclosure on hedge funds' misreporting in US firms. As the regulations also work on the comply-or-explain principle, the author evaluates its effectiveness in the specific setting of hedge funds. The author shows that these mandatory SEC disclosures moderate misreporting in hedge funds. The results also show that the disclosure requirement induces changes in the internal governance of the firm, such as a change in the auditor, which subsequently leads to a more accurate reporting of financial performance.

Overall, research shows that robust corporate governance enhances financial reporting quality and reduces earnings management. Compliance with governance codes and regulatory frameworks improves disclosure quality in both emerging and developed markets. These findings indicate that corporate governance enhances transparency and accountability, leading to more reliable financial information.

2.4.7. Corporate Social Responsibility

According to the literature review by Jamali (2008), there is a notable overlap between corporate governance and corporate social responsibility (CSR). Bhimani and Soonawalla (2005) argue that corporate disclosure, governance, and CSR are part of a corporate responsibility continuum. Similarly, Jensen (2002) and Aguilera et al. (2007) emphasize that companies bear moral responsibility toward their stakeholders and, therefore, need to increase corporate governance and CSR quality. Rashid (2018) examines such an impact of corporate governance on the quality of CSR disclosure within an emerging country context. The study investigates whether compliance with corporate governance codes improve CSR disclosure. The author uses a corporate governance index based on 37 items identified as best practices in the Corporate Governance Notification (CGN), which is equivalent to the 'comply or explain' code in the international context. This code requires Bangladeshi listed firms to comply with or explain any deviation from the CGN. The sample period spans seven years, from 2007 (a year after the CGN was issued) to 2012, and includes 101 firms listed on the Dhaka Stock Exchange. The findings provide no evidence of improved CSR disclosure following compliance with the CGN. Moreover, the study reveals a significant negative impact of both partial and full compliance with the CGN on CSR disclosures. By controlling for endogeneity using cross-lagged analysis, the author concludes that firms are reluctant to do more than the minimum legally required.

Chan, Watson, and Woodliff (2014) offer a different perspective, suggesting that better corporate governance enhances corporate citizenship and is positively associated with voluntary CSR information disclosure. They use an independent ranking based on Horwath's (2005) corporate governance report for Australian listed firms adhering to best practices to assess corporate governance quality. Analyzing a sample of 222 Australian listed companies for the year 2004, they find a positive association between CSR disclosure and governance quality. Additionally, they observe that leverage, industry, and firm size are positively correlated with CSR disclosures. However, a key limitation of their study is that the results are only applicable to a single country for a single year, limiting generalizability. Jo and Harjoto (2012) confirm similar results in an extended and large sample from the Russell 2000, Domini 400, and S&P 500 indices during the period 1993-2004. They find that corporate governance characteristics, such as analyst following, board independence, and institutional ownership, are positively associated with CSR choices. Despite extensive research on the relationship between CSR and numerous corporate governance mechanisms, there remains a lack of studies

specifically addressing the impact of corporate governance disclosure quality on CSR disclosure, whether in terms of compliance with ESG or social investments. Further research is needed to gain a more comprehensive understanding of the causal relationship between these two variables.

Table 2.3 provides an overview of all studies and the key findings discussed in this section.

Table 2.3 **Overview of Empirical Results**

Year	Author(s) Name	Independent Variable	Dependent Variable	Sample Period	Results	Endogeneity
2004	Drobetz et al.	Corporate governance rating (CGR)	Tobin's Q, market-to-book ratio, Expected stock returns	1998-2002	+ve (firm valuation) -ve (expected stock returns)	No
2006	Goncharov et al.	Compliance with the GCGC	Market valuation (stock prices)	2002-2003	+ve	Yes
2008	Brown et al.	Mandatory disclosure (Form ADV)	Operational risk	2006	NS	No
2009	Bassen et al.	Compliance with GCGC	Tobin's Q	2005	-ve	No
2010	Stiglbauer	CG Score	Market-to-book value of equity Total shareholder return	2007	NS	Yes
2010	Renders et al.	Corporate governance ratings	Tobin's Q, ROA, ROE	1999-2003	+ve	Yes
2010	Chang & Sun	Corporate governance disclosure (SOX)	Earnings quality	2001-2003	+ve (earnings informativeness) -ve (earnings management)	No
2012	Jo & Harjoto	Corporate governance (CG) quality	CSR Choices	1993-2004	+ve	Yes
2014	Luo & Salterio	Corporate governance (CG) quality	Tobin's Q, ROE	2006	+ve (firm value), weakly +ve (operational performance)	Yes
2014	Chan et al.	Corporate governance quality	CSR disclosure	2004	+ve	No
2015	Kaspereit et al.	Compliance with GCGC	Implied cost of capital (ICC)	2003-2013	+ve (higher compliance reduces ICC)	Yes
2016	Hawas & Tse	Corporate governance (CG) index	Major shareholdings	2005-2009	+ve	Yes
2016	Caspar Rose	Comply or explain disclosure score	ROE, ROA	2010	+ve ROE/ROA	No
2018	Rashid	Corporate governance index	CSR reporting	2007-2012	NS	Yes

Year	Author(s) Name	Independent Variable	Dependent Variable	Sample Period	Results	Endogeneity
2017	Ghouma et al.	Corporate governance index	Bond spreads (cost of debt)	1986-2014	-ve	No
2018	Ali et al.	Corporate governance quality	Default risk	2001-2013	+ve	Yes
2019	Melgarejo	Corporate governance (CG) index	Earnings quality	2009-2015	+ve	Yes
2019	Honigsberg	Mandatory disclosure rules	No. of Misreporting flags	1986-2014	+ve	No
2018	Al-Gamrh et al.	Investment opportunities Corporate governance quality	Firm performance	2008-2012	-ve (investment opportunities) +ve (corporate governance quality)	No
2020	Koirala et al.	Corporate governance (SOX)	Corporate risk-taking	2000-2007	+ve	No
2021	Younas et al.	Corporate governance index	Financial distress (Altman Z-Score)	2003-2017	+ve (reduces financial distress)	No
2021	Bravo-Urquiza & Moreno-Ureba	Compliance with code	Financial distress	2013-2016	NS (overall compliance, board subcommittees) +ve (board of directors)	Yes
2022	Hamad et al.	Compliance with code	Integrated Reporting (IR) disclosure quality	2016-2020	+ve	No

Note. This table summarizes empirical results from selected studies, categorizing outcomes as +ve (Positive), -ve (Negative), or NS (Not Significant)

2.5. Discussion and Future Research Avenues

The empirical results of most studies suggest that the comply or explain approach induces several firm-level economic consequences as discussed earlier. While the overall results are mixed, the impact of corporate governance disclosure quality is positive and consistent for accounting choices across different countries. This indicates that better governance and information quality can help reduce the exploitation of accounting choices. Similarly, the limited available studies on investment efficiency suggest a positive impact of governance disclosure quality across countries. Interestingly, we also find that markets react differently across countries and even within the same country to certain economic consequences.

The relationship between institutional environment and corporate governance codes may exhibit substitutive effects. For example, Renders et al. (2010) find that improvements in governance over time benefit countries with weak shareholder protection and have a reduced impact in countries with strong protection. Kaspereit et al. (2015) also argue that enhanced governance quality has taken over the role of commercial banks, thereby reducing the cost of capital and other monitoring costs for firms. Koirala et al. (2020) and Al-Gamrh et al. (2018) share similar sentiments, noting that in countries with weak investor protections, such as emerging markets like India and the UAE, corporate governance can limit the exploitation of private benefits and mitigate the negative impact of investment opportunities. Similarly, the impact of corporate governance on financial distress also differs between emerging and developed countries too. For example, Younas et al. (2021) conclude that in Pakistan, corporate governance can mitigate financial distress, whereas Bravo-Urquiza and Moreno-Ureba (2021) find no impact for Spanish firms. Overall, the relationship between institutional environment and corporate governance codes may exhibit substitutive effects. In countries with weaker institutional frameworks, such as emerging markets, strong corporate governance can substitute for weaker legal protections. Conversely, in countries with stronger institutional environments, the role of corporate governance codes may be less pronounced, as existing legal and regulatory structures provide robust shareholder protection. However, the results remain mixed both within and across countries, irrespective of whether the economy is emerging or developed, depending on the firm-level economic consequences.

The contrasting results obtained in similar institutional settings indicate that other factors are at play, driving the results in particular ways. These factors include endogeneity, use of a time-invariant approach (single studies), differences in methodology, measurement of variables, and sample periods.

Measurement

Empirical studies clearly indicate that the comply explain approach (measured with different dimensions) induces economic consequences, but the results are mixed. The inconclusive results on the economic consequences of corporate governance disclosure are due to differences in methodology, sample firms, and study period. For example, existing German studies only consider the declared compliance of the code (i.e., the number of deviations) as a measure of corporate governance and corporate governance quality. This is because comply-explain principle was not embedded in the German corporate governance code till 8th version of the code was published in May 2012. The simplest definition may not gauge the actual compliance or quality of a firm's governance. Prior to the implementation of comply-explain principle and to avoid the oversimplification of firm compliance governance few studies used survey questionnaires and built corporate governance ratings or scorecards based on numerous aspects of the code. It was then studies focused on using content analysis techniques to evaluate the justification when firms were required to justify the deviations from the code in the annual declaration of conformity.

The existing literature shows that researchers have tilted from the simplest definition of governance compliance and use available governance indices to develop more complex corporate governance ratings. Utilizing content analysis techniques alongside the creation of a corporate governance scorecard represents a more comprehensive approach to measuring both the reported governance compliance and the actual governance quality of a firm. Most studies have focused exclusively on the quality of explanations for deviations from governance codes, and their impact on firm-level economic consequences is limited. It would be beneficial to adopt a broader perspective, examining not only the general quality of explanations but also how these explanations impact various firm-level outcomes. Additionally, investigating whether the quality of explanations varies across different sections (or chapters) of the code, and whether such variations can account for the mixed results observed in current studies, would provide valuable insights.

Endogeneity

In addition to measurement, existing studies suffer from endogeneity issues. Well-performing firms may choose to adapt the best governance rules, and not vice versa. For example, Drobetz et al., (2004), find that corporate governance compliance has a significant impact on firm value without controlling for endogeneity. Stiglbauer (2010), find the results

insignificant after controlling for endogeneity in similar sample of German public firms. Most studies report difficulty in obtaining a suitable instrument to control for endogeneity, while others include a broader range of control variables as an alternative. Endogeneity is a widely reported challenge in governance research, where reverse causality cannot be ruled out. Most studies acknowledge this problem, and few have addressed it. Those who have addressed also acknowledge that is practically difficult to find strong instruments, and that choosing a weak instrument can lead to biased results. The studies in our review have used both statistical techniques (such as lagged variables) and instruments to control for endogeneity.

Sampling

The sampling of firms (sample size, selection of firms) has been another visible difference among studies on the economic consequences of corporate governance compliance. For example, few studies broadly address financial and non-financial firms, whereas others focus only on non-financial firms. Although the adoption of the corporate governance code applies to all publicly listed firms, financial firms are obligated to comply with additional regulations as well. It would be interesting to explore whether the inclusion of a large number of financial firms affects the results, potentially driving significant or insignificant outcomes. Additionally, it would be valuable to investigate if there are notable differences in the results when financial firms are included compared to when only non-financial firms are considered.

Identification Strategy and Design

In addition, the mixed results may be due to the different study periods. Most of the studies are cross-sectional; that is, the reported results are only a single year analysis of compliance with the governance code because of the laborious work of collecting governance data from multiple sources (websites and codes of conduct). Bylaws, corporate governance reports, annual reports, etc.). The argument in favor of a cross-sectional study is that a firm's governance tends to be sticky, that is, it does not change significantly over time (Stiglbauer, 2010). However, it is also pertinent to mention that the versions of the governance code also change over time; that is, even the best practices tend to evolve, and firms should be assumed to evolve as well. In addition to that, the contents of the explanations provided by companies to justify the deviations are rarely used. Interestingly, despite compliance statements being published in annual audited reports, the content of these compliance statements is not audited. Yet, annual reports are a more credible source of information for investors and other

stakeholders than any other source. It would be interesting to see whether investors and other stakeholders let these explanations go un-scrutinized. This complexity suggests that the relationship between corporate governance and firm-level outcomes requires further exploration.

2.6. Conclusion

This paper provides a critical review of the literature on the economic consequences of the comply or explain approach in corporate governance. Our objective was to examine whether this approach induces economic consequences, investigate market reactions to compliance statements, and explore variations in economic consequences across countries. Our findings reveal that the comply-or-explain approach can induce economic consequences. Although it offers flexibility and cost-effectiveness, challenges in implementation, monitoring, and enforcement persist. The quality of explanations for deviations from the code varies from generic to firm-specific, reflecting the flexibility offered by this approach. This highlights the need to evaluate how markets assess this information, as compliance statements are crucial for efficient application of the code.

We find that market reactions differ, but the effectiveness of market discipline is contingent upon the general acceptance of best practices and the existence of monitoring and enforcement institutions. These factors may impact firm behavior and the quality of explanations for deviations from the code. Firms use various theories to justify their deviations, such as the legitimacy theory and market failure. These explanations serve to enhance transparency, justify deviations, and reduce information asymmetry. Our findings suggest that the quality of explanations and resulting economic consequences vary across countries. While overall compliance with codes has increased over the years, deviations are mostly reported for board remuneration, composition, independence, internal control systems, and cooperation between management and supervisory boards. Further investigation is required to evaluate the quality of the explanations provided for these important and recurring provisions.

Despite numerous studies on the economic consequences of corporate governance, a more systematic review is required to fully comprehend the effects of the comply-or-explain approach. As noted by Cuomo et al., (2016), firm-level research on reporting behavior under this approach provides a fruitful path for future research. Further evidence will help to assess the effectiveness of the comply or-explain approach. A better understanding of market and stakeholder reactions to compliance disclosures not only adds to the discussion of the proper

regulation of corporate governance, but also informs the overall desirability of compliance disclosure regimes. This understanding is particularly important for assessing the suitability of these approaches. Overall, the comply-or-explain approach has both advantages and limitations. Understanding its economic consequences is crucial for policymakers, regulators, and stakeholders to ensure effective governance practices and the transparent disclosure of deviations. As regulatory landscapes evolve, continued research on this approach's effectiveness and applicability across different domains of corporate reporting will be essential.

References

Aguilera, R. V., Rupp, D. E., Williams, C. A., & Ganapathi, J. (2007). Putting the S back in corporate social responsibility: A multilevel theory of social change in organizations. *Academy of Management Review*, 32(3), 836-863.

Akkermans, D., Van Ees, H., Hermes, N., Hooghiemstra, R., Van der Laan, G., Postma, T., & Van Witteloostuijn, A. (2007). Corporate governance in the Netherlands: An overview of the application of the Tabaksblat Code in 2004. *Corporate Governance: An International Review*, 15(6), 1106-1118.

Al-Gamrh, B., Ku Ismail, K. N. I., & Al-Dhamari, R. (2018). The role of corporate governance strength in crisis and non-crisis times. *Applied Economics*, 50(58), 6263-6284.

Ali, S., Liu, B., & Su, J. J. (2018). Does corporate governance quality affect default risk? The role of growth opportunities and stock liquidity. *International Review of Economics & Finance*, 58, 422-448.

Arcot, S., Bruno, V., & Faure-Grimaud, A. (2010). Corporate governance in the UK: Is the comply or explain approach working?. *International Review of Law and Economics*, 30(2), 193-201.

Bassen, A., Meyer, K., & Schlange, J. (2006). The influence of corporate responsibility on the cost of capital. *SSRN Working Paper Series 984406.*

Bassen, A., Prigge, S., & Zöllner, C. (2009). Behind broad corporate governance aggregates: a first look at single provisions of the German Corporate Governance Code. *Corporate Ownership & Control*, 6(3), 388-406.

Bhimani, A., & Soonawalla, K. (2005). From conformance to performance: The corporate responsibilities continuum. *Journal of Accounting and Public Policy*, 24(3), 165-174.

Bravo-Urquiza, F., & Moreno-Ureba, E. (2021). Does compliance with corporate governance codes help to mitigate financial distress? *Research in International Business and Finance*, 55, 101344.

Brédart, X. (2014). Financial distress and corporate governance: The impact of board configuration. *International Business Research*, *7*(3), 72.

Brown, S., Goetzmann, W., Liang, B., & Schwarz, C. (2008). Mandatory disclosure and operational risk: Evidence from hedge fund registration. *The Journal of Finance*, 63(6), 2785-2815.

Chan, M. C., Watson, J., & Woodliff, D. (2014). Corporate governance quality and CSR disclosures. *Journal of Business Ethics*, 125, 59-73.

Chang, J. C., & Sun, H. L. (2010). Does the disclosure of corporate governance structures affect firms' earnings quality? *Review of Accounting and Finance*, 9(3), 212-243.

Conyon, M. J., & Mallin, C. (1997). Women in the boardroom: Evidence from large UK companies. *Corporate Governance: An International Review*, 5(3), 112-117.

Cuomo, F., Mallin, C., & Zattoni, A. (2016). Corporate governance codes: A review and research agenda. *Corporate Governance: An International Review*, 24(3), 222-241.

Deegan, C. (2002). Introduction: The legitimising effect of social and environmental disclosures–a theoretical foundation. *Accounting, Auditing & Accountability Journal*, 15(3), 282-311.

Drobetz, W., Schillhofer, A., & Zimmermann, H. (2004). Corporate governance and expected stock returns: Evidence from Germany. *European Financial Management*, 10(2), 267-293.

Easton, P. D., & Sommers, G. A. (2003). Scale and the scale effect in market-based accounting research. *Journal of Business Finance & Accounting*, *30*(1-2), 25-56.

Eisenschmidt, K., & Vanini, U. (2019). Compliance with the German Corporate Governance Code: Can the heterogeneous implementation be explained?. *The Theoretical Journal of Accounting*, *101*(157), 167-200.

Fama, E. F., & Jensen, M. C. (1983). Separation of ownership and control. *The Journal of Law and Economics*, 26(2), 301-325.

Fasterling, B. (2012). Development of norms through compliance disclosure. *Journal of Business Ethics*, 106(1), 73-87.

Freeman, R. E., Wicks, A. C., & Parmar, B. (2004). Stakeholder theory and "the corporate objective revisited". *Organization Science*, 15(3), 364-369.

Freeman, R. E. (2010). *Strategic management: A stakeholder approach*. Cambridge university press.

Galle, A. (2014). 'Comply or explain' in Belgium, Germany, Italy, the Netherlands, and the UK: Insufficient explanations and an empirical analysis. *Corporate Ownership and Control* 12 (1): 862–873.

Ghouma, H., Ben-Nasr, H., & Yan, R. (2018). Corporate governance and cost of debt financing: Empirical evidence from Canada. *The Quarterly Review of Economics and Finance*, 67, 138-148.

Goncharov, I., Werner, J. R., & Zimmermann, J. (2006). Does compliance with the German corporate governance code have an impact on stock valuation? An empirical analysis. *Corporate Governance: An International Review*, 14(5), 432-445.

Hamad, S., Lai, F. W., Shad, M. K., Konečná, Z., Goni, F. A., Chofreh, A. G., & Klemeš, J. J. (2022). Corporate governance code and voluntary disclosure of integrated reporting: Evidence from an emerging economy. *Sustainable Development*, 30(6), 1497-1510.

Hawas, A., & Tse, C.-B. (2016). How corporate governance affects investment decisions of major shareholders in UK listed companies: has the recent credit crunch changed the game? *Journal of Accounting, Auditing & Finance*, 31(1), 100-133.

Ho, V. H. (2017). Comply or explain and the future of nonfinancial reporting. *Lewis & Clark L. Rev.*, 21, 317.

Holm, C., & Schøler, F. (2010). Reduction of asymmetric information through corporate governance mechanisms–the importance of ownership dispersion and exposure toward the international capital market. *Corporate Governance: An International Review*, 18(1), 32-47.

Honigsberg, C. (2019). Hedge fund regulation and fund governance: Evidence on the effects of mandatory disclosure rules. *Journal of Accounting Research*, 57(4), 845-888. Ireland, 37(6), 33-37.

Horwath, W. H. K. (2005). Corporate governance report. *Sydney: Horwath (NSW) Pty Limited*.

Jackson, G., Bartosch, J., Avetisyan, E., Kinderman, D., & Knudsen, J. S. (2020). Mandatory non-financial disclosure and its influence on CSR: An international comparison. *Journal of Business Ethics*, 162(2), 323-342.

Jamali, D. (2008). A stakeholder approach to corporate social responsibility: A fresh perspective into theory and practice. *Journal of Business Ethics*, 82(1), 213-231.

Jensen, M. C. (2002). Value maximization, stakeholder theory, and the corporate objective function. *Business Ethics Quarterly*, 235-256.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305-360.

Jo, H., & Harjoto, M. A. (2012). The causal effect of corporate governance on corporate social responsibility. *Journal of Business Ethics*, 106, 53-72.

Kang, H., Cheng, M., & Gray, S. J. (2007). Corporate governance and board composition: Diversity and independence of Australian boards. *Corporate Governance: An International Review*, 15(2), 194-207.

Kaspereit, T., Lopatta, K., & Onnen, D. (2017). Shareholder value implications of compliance with the German corporate governance code. *Managerial and Decision Economics*, *38*(2), 166-177.

Kaspereit, T., Lopatta, K., & Zimmermann, J. (2015). Does compliance with the German Corporate Governance Code pay off? An investigation of the implied cost of capital. *The Journal of Risk Finance*, 16(3), 344-376.

Köke, J. (2002) *Corporate Governance in Germany: An Empirical Investigation*. Heidelberg:Physica, 2002.

Koirala, S., Marshall, A., Neupane, S., & Thapa, C. (2020). Corporate governance reform and risk-taking: Evidence from a quasi-natural experiment in an emerging market. *Journal of Corporate Finance*, 61, 101396.

Kothari, S. P., & Zimmerman, J. L. (1995). Price and return models. *Journal of Accounting and Economics*, *20*(2), 155-192.

Liang, D., Lu, C. C., Tsai, C. F., & Shih, G. A. (2016). Financial ratios and corporate governance indicators in bankruptcy prediction: A comprehensive study. *European Journal of Operational Research*, *252*(2), 561-572.

Luo, Y., & Salterio, S. E. (2014). Governance quality in a "comply or explain" governance disclosure regime. *Corporate Governance: An International Review*, 22(6), 460-481.

Platt, H., & Platt, M. (2012). Corporate board attributes and bankruptcy. *Journal of Business Research*, *65*(8), 1139-1143.

MacNeil, I., & Esser, I. M. (2020). The Pandemic Response in the UK in the Context of Corporate and Financial Law–within and without Law. *Available at SSRN:* https://ssrn.com/abstract=3636292.

MacNeil, I., & Li, X. (2006). "Comply or Explain": market discipline and non-compliance with the Combined Code. *Corporate Governance: An International Review*, 14(5), 486-496.

Mahr, T. G., Nowak, E., & Rott, R. (2016). The (Ir) relevance of disclosure of compliance with corporate governance codes: Empirical evidence from the German stock market. *Journal of Institutional and Theoretical Economics (JITE)/Zeitschrift für die gesamte Staatswissenschaft*, 475-520.

Melgarejo, M. (2019). The impact of corporate governance on earnings quality: evidence from Peru. *Journal of Accounting in Emerging Economies*, 9(4), 527-541.

Nerantzidis, M. (2015). Measuring the quality of the "comply or explain" approach: Evidence from the implementation of the Greek corporate governance code. *Managerial Auditing Journal*, 30(4/5), 373-412.

O'Shea, N. (2005). Governance how we've got where we are and what's next. *Accountancy Ireland*, *37*(6), 33-37.

Price, R., Román, F. J., & Rountree, B. (2011). The impact of governance reform on performance and transparency. *Journal of Financial Economics*, 99(1), 76-96.

Rashid, A. (2018). The influence of corporate governance practices on corporate social responsibility reporting. *Social Responsibility Journal*, 14(1), 20-39.

Renders, A., Gaeremynck, A., & Sercu, P. (2010). Corporate-Governance Ratings and Company Performance: A Cross-European Study. *Corporate Governance: An International Review*, 18(2).

Rose, C. (2016). Firm performance and comply or explain disclosure in corporate governance. *European Management Journal*, 34(3), 202-222.

Sakawa, H., Moriyama, K., & Watanabel, N. (2012). Relation between Top Executive Compensation Structure and Corporate Governance: Evidence from Japanese Public Disclosed Data. *Corporate Governance: An International Review*, 20(6), 593-608.

Seidl, D., Sanderson, P., & Roberts, J. (2013). Applying the 'comply-or-explain'principle: discursive legitimacy tactics with regard to codes of corporate governance. *Journal of Management & Governance*, 17(3), 791-826.

Shrives, P. J., & Brennan, N. M. (2015). A typology for exploring the quality of explanations for non-compliance with UK corporate governance regulations. *The British Accounting Review*, 47(1), 85-99.

Stiglbauer, M. (2010). Transparency & disclosure on corporate governance as a key factor of companies' success: a simultaneous equations analysis for Germany. *Problems and Perspectives in Management*, 8(1), 161-173.

Stiglbauer, M., & Velte, P. (2012). Compliance with the German Corporate Governance Code and firm performance: a ten-year experience. *International Journal of Behavioural Accounting and Finance*, 3(1-2), 5-23.

Tuschke, A., & Gerard Sanders, W. (2003). Antecedents and consequences of corporate governance reform: The case of Germany. *Strategic Management Journal*, 24(7), 631-649.

Ullah, S., Ahmad, S., Akbar, S., Kodwani, D., & Frecknall-Hughes, J. (2021). Governance disclosure quality and market valuation of firms in UK and Germany. *International Journal of Finance & Economics*, 26(4), 5031-5055.

v. Werder, A., Talaulicar, T., & Kolat, G. L. (2005). Compliance with the German corporate governance code: An empirical analysis of the compliance statements by German listed companies. *Corporate Governance: An International Review*, 13(2), 178-187.

Van de Poel, K., & Vanstraelen, A. (2011). Management reporting on internal control and accruals quality: insights from a “comply-or-explain” internal control regime. *Auditing: A Journal of Practice & Theory*, 30(3), 181-209.

Younas, N., UdDin, S., Awan, T., & Khan, M. Y. (2021). Corporate governance and financial distress: Asian emerging market perspective. *Corporate Governance: The International Journal of Business in Society*, 21(4), 702-715

3. Unpacking the 'Explain' in Comply-or-Explain and Its Impact on Firm Performance: Evidence from German Listed Firms

3.1. Introduction

The German Corporate Governance Code (GCGC), enacted in 2002, established a "comply-or-explain" principle for listed companies. This framework grants firms the flexibility to deviate from specific recommendations enshrined in the Code but necessitates transparent and comprehensive explanations justifying such departures in the annual declaration of conformity statement (Comply or Explain). While numerous studies have examined the influence of diverse corporate governance mechanisms on firm performance, the impact of the "explain" aspect within the "comply-or-explain" principle remains relatively unexplored, primarily because of the reported high compliance rates. It is pertinent to mention that the declaration of conformity statement is part of the annual audited reports, but the statements themselves are not audited, leaving room for tick-the-box exercise and providing generic and sub-standard explanations. For example, Seidl et al. (2013) report that 55% of the explanations provided by German firms for non-compliance fall into the deficient category. Galle (2014) also noted that a significant portion (57%) of the explanations in Germany were deemed insufficient in terms of quality. Similarly, Mahr et al. (2016) observe that only a fraction of all explanations were considered reasonably explained and unavoidable for firm or industry-specific reasons when using a survey instrument to assess investor reactions to explanations for the most frequent deviations. Their study of Prime Standard firms in Germany, conducted in the initial year following GCGC adoption, examined various aspects of code compliance and explanation quality. There is a lack of literature on how market participants perceive these deviations from corporate governance codes. However, limited research has explored whether the quality of the explanations provided for such deviations mitigates or amplifies negative perceptions. Ullah et al. (2021) offer a study on this relationship, encompassing firms in both the UK and Germany. While their findings suggest no significant impact on German companies, their analysis did not differentiate between varying disclosure quality levels.

Existing studies have examined the relationship between corporate governance and firm performance (measured as Tobin's Q), the findings are mixed for several reasons. According to Bauer et al. (2004), who examined firms across multiple European countries using the FTSE Eurotop 300 index, there is a negative association between corporate governance compliance and firm performance. Luo and Salterio (2014) report no significant impact of corporate governance compliance on firm performance for Canadian listed firms in a single-year cross-

sectional study for the year 2006. In contrast, Rose (2016) and Beiner et al. (2006) find a positive impact of compliance on firm performance in Danish and Swiss firms, respectively. These inconclusive or mixed results may be due to number of reasons. According to von Werder et al. (2005), firm size is an important determinant for German listed firms, because larger companies have a dispersed ownership structure and face more capital market pressure to enhance their internal monitoring mechanisms. Similarly, Ullah et al. (2021) find a positive association between firm size and compliance or disclosure quality, suggesting that larger firms tend to be more compliant or provide higher quality disclosures. Existing studies on the impact of corporate governance on firm performance often overlook the distinct contexts of large and small firms, warranting a more nuanced examination.

Previous research (e.g., Sanderson et al., 2010; Stiglbauer, 2010; Talaulicar & von Werder, 2008) has examined various characteristics of corporate governance mechanisms. However, these studies have largely overlooked the potential nuances within corporate governance codes themselves, particularly the German Corporate Governance Code (GCGC). Specifically, they have not thoroughly investigated how deviations from specific chapters or sections of GCGC may impact firm performance. This gap in the literature presents an opportunity for a more comprehensive analysis of the association between quality of compliance with different aspects of governance codes and firm performance. Therefore, this study makes several key contributions to the literature on the comply-or-explain approach in corporate governance. First, this study provides a comprehensive analysis of the compliance and quality of explanations for deviations from the GCGC (using CoE index) and their impact on firm performance across different firm sizes, extending our understanding of how firms utilize the 'explain' aspect of the 'comply or explain' principle and how this varies between large and small firms.

Second, it offers novel insights into the differential effects of specific explanation quality (such as generic, firm-specific, and alternative practice categories) on firm performance and investigates how this relationship is moderated by firm size, emphasizing the importance of considering firm size when evaluating corporate governance practices. Third, this study examines the varying impacts of the CoE index for different chapters of the GCGC on firm performance, highlighting how these effects differ for large and small firms. This approach highlights that not all sections of the code can have equal influence, contributing to a more detailed understanding of which governance areas may be more critical for firm performance.

In line with the above arguments, we attempt to thoroughly examine the ‘explain’ aspect of the comply-or-explain approach within the German corporate governance code and attempt

to answer the following questions:

1. How does the compliance and quality of firms' explanations for deviations from the German Corporate Governance Code (GCGC) affect firm performance, and does this effect vary by firm size?
2. How does varying quality of firms' explanations for deviations from GCGC affect firm performance, and does this relationship differ by firm size?
3. How does the interaction between the type of explanation and the specific GCGC chapter influence firm performance, and does this vary between large and small firms?

Using a more recent sample of German listed firms for the years 2015-2018, we find a negative association between compliance and quality of explanations for GCGC (measured as CoE index) and firm performance (Tobin's Q and ROE). This contradicts the findings of Ullah et al. (2021) for German and UK firms, highlighting the potential context-specific factors. However, when examining specific explanation categories, we find varying effects for large and small firms. For large firms, both high-quality (firm-specific explanations) and generic explanations show negative impact on performance, while for small firms, partial compliance and alternative practice explanations show a significant negative impact on certain performance measures. Interestingly, our analysis shows that certain chapters of the GCGC have a more pronounced influence on firm performance than others. In particular, CoE index related to transparency and financial reporting chapters appear to be especially important, with their impact being more evident in larger firms. These findings highlight the intricate nature of the comply-or-explain principle and suggest that a one-size-fits-all approach to corporate governance may not be optimal.

Our study emphasizes the importance of considering both firm size and specific governance areas when evaluating the effectiveness of explanations for code deviations. This research underscores the complexity of the comply-or-explain mechanism, suggesting the need for further scrutiny and potential revisions to the GCGC to ensure it effectively drives improvements in corporate governance practices, especially those related to management and supervisory boards.

The next section covers corporate governance regulation in Germany, followed by literature review and hypothesis development (Section 3.3), research methodology, development of the index and data (Section 3.4), empirical & multivariate analysis (Section 3.5 & 3.6), and implications and conclusion (Section 3.7).

3.2. Corporate Governance Regulation in Germany

In July 2001, the recommendation for the introduction of a voluntary corporate governance code, alongside a declaration of conformity (also called compliance statement) for all publicly traded companies, was put forth (Bundestag Drucksache 14/7515). Furthermore, suggestions were made to amend the legal framework to augment the liability of management and supervisory boards and strengthen the rights of minority shareholders. Following extensive deliberations, the GCGC was incorporated into the German Stock Corporation Act (Aktiengesetz, AktG) in July 2002.

Section 161 of the AktG mandates the annual disclosure of the declaration of conformity statement with GCGC for publicly traded companies. The GCGC comprises a consolidation of existing legal requirements, recommendations, and suggestions pertaining to a firm's corporate governance practices. Companies are expected to delineate their compliance with code recommendations using a 'comply or explain' approach. The GCGC undergoes periodic revisions. These revisions primarily focused on the composition and compensation of management and supervisory boards as well as addressing potential conflicts of interest. Some revisions aimed to enhance the quality of corporate governance, such as the introduction of corporate governance and remuneration reports. Others reflected an increasing emphasis on equality, with recommendations added to promote diversity within the supervisory board and increase female representation. Remuneration policies garnered attention after the financial crisis, with recommendations advocating capped fixed and variable payments and alignment of remuneration packages with long-term goals. Most changes from 2015 to 2017 were editorial in nature, except for the introduction of the supervisory board competency profile. Although composition goals for the supervisory board were recommended in 2010, it was not until 2017 that a suggestion to publish these goals in a competency profile was made.

3.3. Literature Review and Hypotheses Development

3.3.1. Theoretical Framework

The core component of the corporate governance code is the use of a comply-or-explain approach. This approach is essential for fostering trust among stakeholders by providing transparent explanations for deviations from established governance standards. Academic discourse often delves into various theories to explain why firms offer the explanations they do in their compliance statements. These theories encompass, agency theory, legitimacy theory, stakeholder theory, and signaling theory, all of which aim to understand how corporate

governance practices affect a company's performance. Within the agency theory framework, managers exercise control over free cash flows in publicly traded companies, while ownership is dispersed, creating a separation between ownership and control. Jensen and Meckling (1976) initially addressed this dynamic, emphasizing the inherent agency problem that arises as a result. Thus, effective corporate governance becomes crucial in addressing agency problems and hence reducing agency costs by overseeing managerial activities and ultimately aligning managers' interests with those of shareholders. This increased monitoring through effective corporate governance mechanisms can reduce agency cost and result in lower cost of capital (Drobetz et al., 2004). In addition, the quality of explanations provided by firms for deviation from the code helps mitigate information asymmetry, reduces investor monitoring costs, and signals transparency, potentially improving corporate investment decisions and impacting firm performance. Similarly, high-quality explanations signal a commitment to reducing managerial opportunism and enhancing trust, potentially leading to better corporate investment decisions that can improve firm performance.

Voluntary disclosure plays a critical role in signaling theory, particularly in the context of noncompliance. Hooghiemstra (2012) notes that unclear guidelines in codes on how firms should explain deviations allow managers significant freedom in deciding how and to what extent information about these deviations is provided. This information can be generic or detailed. In theory, there is a cost-benefit trade-off in providing voluntary information. High-quality information can indicate positive aspects to investors, but it may also reveal underlying problems within the firm. Signaling theory suggests that firms willingly incur additional costs associated with implementing robust corporate governance practices to signal their commitment to transparency and accountability. By providing high-quality explanations for deviations from governance codes, firms send a positive signal to the market regarding their commitment to transparency and accountability, thereby reducing the need for extensive managerial monitoring. This, in turn, leads to lower capital costs and enhanced overall performance (Beiner et al., 2006; Drobetz et al., 2004). Consequently, the quality of explanations provided for deviations from governance codes may serve as a credible signal of a firm's dedication to sound governance practices and its future potential, ultimately enhancing performance. Conversely, poor or inadequate explanations may send negative signals, potentially reflecting poorly on the firm's governance standards and future prospects. This underscores the importance of investors' ability to interpret the quality of explanations, particularly firm-specific ones, and their subsequent reactions to them, as signals of a company's commitment to tailored governance practices, which can positively impact firm performance.

While governance disclosure related to remuneration, leadership structure, and resource allocation may positively signal transparency, it may also highlight problems within the organization (Bhat et al., 2006). Goldstein and Yang (2019) highlight an important consideration regarding these unintended consequences of information disclosure. They argue that mandated disclosures might inadvertently crowd out other types of valuable information, potentially leading to a less comprehensive understanding of the firm's situation.

On the other hand, Stakeholder theory emphasizes firms' responsibility not only to shareholders but also to a wide range of stakeholders, including customers, employees, and the broader community (Freeman, 2010; Freeman, Wicks, & Parmar, 2004). Unlike agency theory, which focuses on shareholders, stakeholder theory advocates governance mechanisms that serve diverse stakeholder interests (Ullah et al., 2021). According to Deegan (2002), managers are likely to comply if influential stakeholders request specific governance measures or information. In this context, firms' explanations for deviations from governance codes may address stakeholders' concerns and enhance trust and legitimacy, ultimately improving performance. This is also in line with legitimacy theory, in which firms use explanations to satisfy stakeholder concerns, especially from investors and regulators, to bolster legitimacy and performance (Seidl et al., 2013).

In summary, the voluntary disclosure of non-compliance, through high-quality, firm-specific explanations serves as a credible signal under signaling theory, allowing firms to communicate their commitment to good governance practices. This can positively influence stakeholder perceptions and reduce information asymmetry costs, potentially improving firm performance.

3.3.2. Corporate Governance Compliance: Firm Performance and Other Financial Implications

The relationship between corporate governance and firm performance is a widely explored area; however, the findings remain inconclusive, particularly within the German context. Several factors contribute to this ambiguity, including variations in research methodologies, sample compositions, and timeframes. Mahr et al. (2016) conducted a notable study examining the initial compliance of German listed firms with the corporate governance code. Specifically, they investigated 315 companies in 2003, a year after the introduction of the code in 2002. They did not find any impact of compliance with the code and firm performance and concluded that even a change in compliance level does not impact stock price performance

in the long run. Wintoki et al. (2012) and Schultz et al. (2010) reached similar conclusions in their study of Australian firms. An earlier study by Renders et al. (2010) also observed diminishing returns as firms improved compliance over time within the FTSE Eurofirst 300 sample.

The 'explain' aspect of the comply-or-explain approach counters the one-size-fits-all, providing companies the flexibility to deviate from the code as long as they offer justified explanations. Luo and Salitero (2014) incorporated the presence of explanations for code deviations in their single-year (2006) cross-sectional study for the 655 Canadian listed firms. However, their index focused on whether an explanation was provided rather than its quality. Essentially, any explanation for the deviation was counted equally regardless of its content. Their study indicates a positive relationship between the simple presence of explanations and firm performance. Similar to Luo and Salitero (2014), Stiglbauer (2010) also focused on a binary compliance measure in their single-year cross-sectional study of 100 Prime standard German firms. Explanations for deviations from the GCGC were not incorporated into their analysis. Therefore, a notable gap in the existing literature centers on the quality of explanations companies provide when deviating from corporate governance codes. The focus has predominantly been on simple compliance metrics, neglecting the subtle ways in which firms justify non-compliance. Studies incorporating the "explain" aspect offer limited insight into how varying levels of explanation quality impact firm performance. This study contributes to the literature by explicitly examining whether compliance and quality of explanations affect firm performance. According to Talaulicar and von Weder (2008), compliance can vary with firm size. Chhaochharia and Grinstein (2007), also find that the effects of governance are inconsistent and vary across large and small firms. Their study of US firms reveals that large firms earn positive abnormal returns compared to small firms, even though both types of firms are less compliant with governance provisions. They further conclude that certain provisions of Sarbanes-Oxley Act (SOX) are detrimental to small firms.

Similarly, Christensen et al. (2015) investigate the impact of corporate governance on earnings quality in small and large Australian firms before and after the adoption of a governance code. They find that compliance might positively signal quality for small firms, but does not significantly affect earnings quality, although the presence of an audit committee has a positive impact on such firms. Kent et al. (2015) echo these findings, suggesting that large firms benefit more from governance best practices than smaller firms. They recommend voluntary adoption of recommendations for small firms, whereas mandatory governance recommendations are more beneficial for large firms. This underscores the fact that the

relevance and impact of code provisions can vary depending on firm size. In line with these arguments, we also explore whether the impact of compliance and quality of explanations for deviations from GCGC on firm performance varies between large and small firms, without distinguishing the isolated effects of individual chapters of GCGC.

H1a: There is a significant association between the compliance and quality of firms' explanations for deviations from the GCGC and their financial performance.

H1b: The association between compliance and explanation quality with financial performance varies by firm size.

In contrast, Shrives and Brennan (2015) developed a typology to assess the quality of corporate governance explanations of FTSE 350 firms, focusing on the various characteristics of these explanations. Their findings highlight that companies may exploit the "explain" provision of governance codes, suggesting that they can justify non-compliance through ambiguous explanations. This suggests that the results matter more than strict rule adherence. Ullah et al. (2021) also investigated the quality of corporate governance explanations, creating a "comply-or-explain index" based on Hooghiemstra (2012). Their index scores explanations for deviations from German and UK governance codes, assigning higher scores to firm-specific justifications (5) and lower scores to generic explanations (2). While a positive association was found between explanation quality and firm performance in the UK, no such association was evident for German firms. The study, however, had some limitations. They do not consider how varying the quality of explanations (high-quality, ambiguous, or generic) affects firm performance. Building on this, we examine whether different types of explanations (varying quality), such as firm-specific or generic ones, affect firm performance.

Theoretically, small firms may face higher costs associated with providing explanations compared to larger firms, primarily due to their limited resources. As a result, these firms must navigate a trade-off between ensuring compliance and delivering high-quality, justified explanations. This observation aligns with the findings of Gordon et al. (2012), who examined the voluntary adoption of governance codes by small publicly listed firms in Canada. Their research highlights that larger firms are more likely to comply consistently, driven by greater incentives and resource availability. Their study, focusing on the period before 2005, suggests that while adopting best practices can enhance the performance of small firms, resource limitations may restrict their ability to fully implement these recommendations, potentially making the costs outweigh the benefits. Singh and Pillai (2022) also emphasize the need for different governance mechanisms for SMEs, given their unique structure and nature, to improve performance. In line with these arguments, we explore whether the impact of the quality of

explanations for deviations from GCGC on firm performance varies between large and small firms.

H2a: The quality of explanations for deviations from the GCGC has a significant impact on firm performance.

H2b: The effect of explanation quality on firm performance is moderated by firm size.

Existing empirical studies have examined the impact of overall corporate governance codes on firm performance. However, the measurement of compliance is often overly aggregated, focusing solely on the number of deviations from the code without considering the quality of the explanations provided (Talaulicar and Weder, 2008). For instance, Bassen et al. (2009) find a negative association between compliance with the overall corporate governance code and Tobin's Q in 100 large publicly listed German firms for the year 2005. While they consider compliance rates with individual GCGC items, they also do not address the aspect of explanations for deviations.

On the other hand, Rose (2016) demonstrates a positive correlation between the remuneration score (a subcategory of the Danish governance code) and firm performance, underscoring the potential significance of specific governance elements while ignoring the explanations for deviation from the code. It is worth noting that Mahr et al. (2016) and Goncharov et al. (2006) use similar compliance measures (absolute deviations) yet reach opposing conclusions on the value-relevance of code compliance for German firms. Similarly, Ciampi (2015) explores the role of governance mechanisms in improving the predictability of default prediction models for Italian SMEs. They find that small firms with concentrated ownership and personally involved directors may experience more effective decision making.

This suggests that the previous research did not examine whether different types of explanations across various chapters of the code have distinct impacts on performance. Building on this and earlier cost-benefit arguments for small and large firms regarding compliance, as well as the potential impact of certain provisions of the code on small firms, we seek to investigate whether differences within the governance code—specifically, the interactions between different chapters and the types of explanations provided for each chapter—affect firm performance.

H3a: Firm performance is influenced by the interaction between the type of explanation provided and the specific GCGC chapter it relates to.

H3b: The influence of the interaction between explanation type and GCGC chapter on firm performance differs for large and small firms.

3.4. Research Methodology and Data

3.4.1. Development of Comply or Explain Index

Building upon the work of Ullah et al. (2021) and Hooghiemstra (2012), our index focuses not only on the overall quality of explanations but also on the impact of varying quality of explanations across different chapters of the code on firm performance. Only one firm did not provide any explanation for the deviation from the code. The index includes a scale of 1(no explanation for deviation), 2 (generic or future compliance assurance), 3(alternative practice), 4(partial compliance with part of the code), and 5 (demonstrating firm-specific considerations for compliance). Since the comply or explain principle emphasizes firm-specific governance quality and gives equal importance to justified explanations and compliance, we assign a score of five to firms that fully comply with the code. We applied content analysis to thoroughly examine 2857 explanations provided between 2015 and 2018 by German public firms listed on the Frankfurt stock exchange. A notable finding is the tendency of firms to reuse similar explanations year after year, rarely demonstrating an effort to achieve compliance after an initial deviation. Our categorization scheme allowed for a systematic analysis of the explanations and categorized each explanation into one of the five categories: category A (no explanation), B(generic or standard explanation), C(future compliance assurance), D (alternative practice), E(partial compliance), and F (firm-specific explanation).

$$\text{Index} = [1A+2(B + C) + 3D + 4E + 5F] / N$$

Where N is the total number of explanations reported in a particular year by a firm. Table 3.1 reports the coding scheme of various explanation categories. To illustrate the index calculation, consider a scenario in which a company reports five explanations classified across all categories of our scale, except category A (no explanation). The calculation is as follows:

$$[1(0)+ 2(1+1) + 3(1) + 4(1) + 5(1)] / 5 = 3.2.$$

Each explanation is meticulously reviewed and coded according to the proposed scheme. A higher score on the compliance index indicates a better quality of explanation for deviations and greater adherence to code. Detailed examples of this coding process are provided in Appendix 3A.

Table 3.1: **Coding Scheme for Quality of Explanations**

Category of Explanation	**Description**	**Score**
A. No explanations for non-compliance	no explanations for deviation from the code	1
B. Generic or Substandard	When a firm uses stock phrases like "in our opinion" , "in the best interest of the company" or "we believe…" to justify the deviation from the code	2
C. Future compliance	When a firm suggests that it will implement a Code provision in a vague timeframe like "the near future" or "by year…"	2
D. Description of alternative practice	When a firm deviates from the code but ensure implementation alternative practice	3
E. Partial compliance/non-compliance	When a firm is partially complied with a particular provision of the code	4
F. Firm-specific explanation	When a firm issue detailed explanations justifying departure from the particular provision of the code based on 1) board size 2) company size 3)company structure 4)industry or market related departure and 5) implementation issues.	5

Note: This taxonomy builds upon the work of Hooghiemstra (2012) and Ullah et al. (2021).

In line with Ullah et al. (2021), we employ Ordinary Least Squares (OLS) regression models with robust firm-clustered standard errors. This approach accounts for potential heteroscedasticity and autocorrelation within firms over time. Additionally, we include fixed effects for both industry and year to control for unobserved heterogeneity, which could influence Tobin's Q. We develop the following regression equation(s):

$$TOBINSq = \beta_0 + \beta_1 CoE\_index + \beta_2 SIZE + \beta_3 R\&D + \beta_4 LEVERAGE + \beta_5 Beta + \beta_6 Foreign\_listing + Industry\ Dummies + Year\ Dummies + \varepsilon \quad (1)$$

$$TOBINSq = \beta_0 + \beta_1 CAT\_Quality + \beta_2 SIZE + \beta_3 R\&D + \beta_4 LEVERAGE + \beta_5 Beta + \beta_6 Foreign\_listing + Industry\ Dummies + Year\ Dummies + \varepsilon \quad (2)$$

$$TOBINSq = \beta_0 + \beta_1 CoE\_Chapter\_GCGC + \beta_2 SIZE + \beta_3 R\&D + \beta_4 LEVERAGE + \beta_5 Beta + \beta_6 Foreign\_listing + Industry\ Dummies + Year\ Dummies + \varepsilon \quad (3)$$

Our primary dependent variable is Tobin's Q, as established in previous research (Aggarwal et al., 2019; Luo & Salterio, 2014; Ullah et al., 2021). We control for firm size (natural log of assets), expecting a negative association (Drobetz et al., 2004), and leverage (total debt/assets), anticipating a positive relationship due to agency costs (Christensen et al., 2019). Research and development (R&D) expenditure serves as a proxy for growth opportunities, potentially boosting firm performance, though a comprehensive measure would also include increases in non-current internally generated intangibles. Consistent with Ullah et al. (2021) and Beiner et al. (2006), we include foreign listings alongside the beta for systematic risk. Table 3.2 provides a full list of variable definitions and measurements.

Table 3.2: **Definition of Variables**

Variables	Definition
Tobin's Q	Total assets + market value of equity - Total common equity - deferred taxes / Total assets
SIZE	Natural log of total assets
R&D	Research & development expenses over sales
LEVERAGE	total debt scaled by total assets
Beta	Firm risk values taken from Refinitiv Eikon
Foreign listing	Dummy equals one if firm is cross listed and zero otherwise.
CoE_Index	Comply or explain index based on the no. of explanations in each category: = 1(No explanation) + 2 (Generic or standard + future assurance) +3 (alternative practice) + 4(partial non-compliance) + 5(firm-specific explanations). CoE_index =1(A) +2(B+C) +3(D) + 4(E) + 5(F)
Chapter_CoE Index	Index based on all the explanation of a particular chapter of the code
Category_total	Frequency of explanations under each category (e.g. Total in CAT_D)

Note. This table defines the variables used in the analyses. All variables are winsorized at the 1st and 99th percentiles to mitigate the impact of outliers.

3.4.2. Sample and Data

The sample consists of all Prime Standard[3] firms listed on the Frankfurt Stock Exchange from 2015 to 2018. After excluding German language reports and firms within the energy and financial sectors (which face unique regulatory requirements), the final sample comprised 106 firms (see Table 3.3). The explanation data was hand-collected from annual corporate governance reports and company websites. Financial data are sourced from Compustat, whereas market capitalization and firm risk data are obtained from Refinitiv Eikon. To ensure an accurate data analysis, all variables were winsorized at the 1st and 99th percentiles, and firms were grouped according to their two-digit SIC industry classification. To examine how compliance with various chapters of the German Corporate Governance Code (GCGC) affects firm performance across different organizational sizes, we divide our sample into large and small firms. This classification is based on the median value of the firm size. We create a dummy variable equal to 1 for firms larger than the median firm size (classified as large firms) and 0 otherwise (classified as small firms). This approach allows us to investigate the differential impact of the comply or explain index on firm performance, providing insights into how corporate governance practices influence organizations of varying scales.

[3] The sample includes all the main indices (DAX, MDAX, TecDAX, SDAX) and rest of the prime standard firms as part of CDAX.

Table 3.3 **Sample Selection**

Panel A: Data selection

	Number of firms
Prime Standard firms from 2015 to 2018	180
Less: Financial, Insurance, and Utilities	29
Initial sample	151
Firms with Reported Deviations	137
Less: Firms with Compliance Statement in German	4
Less: Firms with Missing Financial Data	27
Final Sample	106

Panel B: Distribution by Sector & Index

Sector	Frequency in %
Automobile	9.63%
Basic Resources	0.53%
Chemicals	9.09%
Construction	3.21%
Consumer	5.61%
Industrial	31.82%
Media	3.21%
Pharma & Healthcare	11.50%
Retail	1.34%
Software	8.56%
Technology	9.63%
Telecommunication	2.14%
Transportation & Logistics	3.74%
Total	100%

Index	Frequency in %
DAX	18.72%
MDAX	23.53%
SDAX	21.12%
TecDAX	11.50%
CDAX	25.13%
Total	100%

Note. Panel A details the data selection process for Prime Standard firms from 2015 to 2018. Panel B shows the distribution by sector and index.

3.5. Empirical Analysis

3.5.1. Distribution of Quality of Explanations

Table 3.4 presents the distribution of explanations provided by firms in the sample that deviate from the code but offer justifications (explain) for their departure from the code. The data, collected from the annual declaration of conformity statements from 2015 to 2018, is categorized into five categories of explanations quality: CAT B (Generic or Standard), CAT C (Future Compliance), CAT D (Alternative Practice), CAT E (Partial Compliance), and CAT F (Firm-Specific). The total number of average deviations reported during the sample period is almost 714 deviations each year. Most (81 %) of the explanations fall into generic, standard, and firm-specific categories. For example, CAT B consistently has the highest representation, ranging from 39% to 41% annually, totaling 1,143 explanations (40%). This indicates a preference for basic explanations without a strong commitment to address or resolve areas of non-compliance.

Table 3.4 **Frequency of Explanations**

	2015		2016		2017		2018		Total	
CAT B (Generic or Standard)	301	40%	302	41%	274	39%	266	40%	1143	40%
CAT C (Future Compliance)	28	4%	23	3%	41	6%	20	3%	112	4%
CAT D (Alternative Practice)	111	15%	103	14%	101	14%	96	15%	411	14%
CAT E (Partial Compliance)	89	12%	91	12%	79	11%	81	12%	340	12%
CAT F (Firm-Specific)	231	30%	216	29%	210	30%	194	30%	851	30%
Total	760		735		705		657		2857	100%

Note. This table presents the distribution of explanations provided by firms that deviate from the code but offer justifications (explanations). Data is categorized into five quality categories: CAT B (Generic or Standard), CAT C (Future Compliance), CAT D (Alternative Practice), CAT E (Partial Compliance), and CAT F (Firm-Specific), based on declarations from 2015 to 2018. Categories are defined according to the taxonomy in Table 3.1

CAT F follows with stable percentages of 29% to 30%, totaling 851 explanations (30%). CAT D remains consistent at 14% to 15% each year, totaling 411 explanations (14%). CAT E shows slight fluctuations, ranging from 11% to 12%, with a total of 340 explanations (12%). CAT C has the lowest representation, ranging from 3% to 6%, totaling 112 explanations (4%).

Overall, the table includes 2,857 explanations across all categories and years, reflecting consistent reporting practices, with a notable predominance of generic or standard and firm-specific explanations. The consistent percentages for each year suggest that firms that do not comply initially are likely to maintain non-compliance in subsequent years for the same items of the code. Table 3.5 provides a chapter-wise breakdown of these explanations, further highlighting the areas where firms most frequently deviate (i.e., explain) from the code. Chapter 5 (Supervisory Board), which mostly deals with the structure, composition, and working of the supervisory board, and Chapter 4 (Management Board) have the highest number of explanations, with 1,439 and 885, respectively. This indicates that firms find it most difficult to comply with governance issues related to board structure.

We examine further the quality of the explanations in each chapter. In our sample, for example, in Chapter 5, CAT B (Generic or Standard) explanations dominate at 44%, followed by CAT F (Firm-Specific) at 30%. Similarly, in Chapter 4, CAT F explanations are the most common, at 35%, indicating that firms often cite firm-specific reasons for deviations in board-related governance practices. The high proportion of CAT B and CAT F explanations in these chapters suggests that firms rely on either standard justifications or specific contextual factors to explain their departure from the code.

In Table 3.5, Chapters 2 (Shareholders and the General Meeting) and 3 (Cooperation between Boards) also show significant reliance on CAT B explanations at 40% and 83%, respectively. This reliance on generic justifications in these chapters may indicate a lack of tailored and substantive reasons for deviation, potentially undermining the transparency and accountability that the code aims to promote. Chapters 6 (Transparency) and 7 (Financial Reporting & Auditing), however, have relatively fewer explanations , potentially suggesting stronger compliance or clearer guidelines. However, these chapters still show the notable presence of CAT B and CAT F explanations. The dominance of these categories across different chapters underscores a broader trend in which firms provide either standard or firm-specific reasons for non-compliance, raising questions about the depth and quality of these justifications.

The analysis in both tables indicates a significant reliance on generic or standard (CAT B) and firm-specific (CAT F) explanations for deviations from the German Corporate Governance Code. This consistency over the years and across different chapters suggests that firms tend to maintain their non-compliance with the same items of the code, reflecting stable reporting practices and potentially highlighting areas where the code's requirements may not align well with firm-specific circumstances.

Table 3.5 **Chapterwise Distribution of Explanation Categories**

	Chapter 2	Chapter 3	Chapter 4	Chapter 5	Chapter 6	Chapter 7	Total	
	Shareholders and the General Meeting	**Cooperation between Boards**	**Management Board**	**Supervisory Board**	**Transparency**	**Financial Reporting & Auditing**		
CAT B	14	268	159	631	14	57	1143	40%
(Generic or Standard)	40%	83%	18%	44%	52%	38%		
CAT C	0	2	57	43	1	9	112	4%
Future Compliance	0%	1%	6%	3%	4%	6%		
CAT D	7	20	214	161	1	8	411	14%
(Alternative Practice)	20%	6%	24%	11%	4%	5%		
CAT E	2	22	141	173	0	2	340	12%
(Partial Compliance)	6%	7%	16%	12%	0%	1%		
CAT F	12	9	314	431	11	74	851	30%
(Firm-Specific)	34%	3%	35%	30%	41%	49%		
Total	35	321	885	1439	27	150	2857	

Note. This table shows the distribution of explanation categories across chapters of the German Corporate Governance Code, including Shareholders and the General Meeting, Cooperation between Boards, Management Board, Supervisory Board, Transparency, and Financial Reporting & Auditing.

3.5.2. Descriptive Statistics

Table 3.6 presents the summary statistics for the overall sample (N=374). For the full sample, the mean Tobin's Q is 1.901, with a standard deviation of 1.3543, similar to Stiglbauer (2010) for German firms. This indicates moderate variability in firm performance, as measured by market valuation. The CoE index averages 3.544, indicating relatively high compliance compared to the 2.811 reported by Ullah et al. (2021) for German firms in earlier years (i.e., 2007–2011). This suggests that the quality of explanations and compliance has improved on average, over the years. The mean firm size is 7.5369 with significant variation, as indicated by a standard deviation of 2.2399, similar to the 7.706 reported by Stiglbauer (2010) for German firms. Firm size averages 16,591 million Euros, with high dispersion (standard deviation of 44,084 million Euros), reflecting significant differences in firm sizes. The average R&D expenditure is 0.0786 and the leverage ratio is 0.2132, which is close to the leverage value of 0.254 reported by Ullah et al. (2021) for German firms. This reflects moderate investment in R&D and the steady use of debt financing. The beta value averages 0.7558, consistent with Bassen et al. (2009), indicating that the firms have slightly higher volatility compared to the market. Only a small fraction (0.0642) of firms are listed on foreign exchange.

Notable differences emerged when comparing large and small firms. Interestingly, large firms (N=213) exhibit a lower mean Tobin's Q (1.5977) than do small firms (2.3022), suggesting that smaller firms might have higher market valuations relative to their assets. The mean Tobin’s Q value for large firms is consistent with that of Bassen et al. (2009) for the largest 100 German firms listed on the Frankfurt Stock Exchange. The CoE index is higher for large firms (3.8034) than for small firms (3.2008), indicating better compliance with the governance codes among larger firms. Large firms also have a significantly larger average size (9.0721) than small firms (5.5058).

In terms of R&D expenditure, small firms invest more (0.1384) than large firms (0.0333), which might reflect a focus on innovation and growth, translating into a higher Tobin's Q for small firms. The average R&D value for large firms is similar to the 0.022 found by Stiglbauer (2010) for German firms. Leverage is slightly higher for large firms (0.2375) than for small firms (0.1809). The beta value is higher for large firms (0.8744) and is consistent with Mahr et al. (2016) than for small firms (0.5988), indicating greater market risk for larger firms. The proportion of firms with foreign listings is slightly higher among large firms (0.0751) than small firms (0.0497). The univariate analysis underscores the significant differences between large and small firms in terms of sample characteristics, justifying further investigation into

how quality and compliance with corporate governance vary across different firm sizes.

Table 3.6 **Descriptive Statistics**

Panel A: Summary Statistics					
Variables	Mean	Standard Deviation	25% Quartile	Median	75% Quartile
Full sample N=374					
TOBINSq	1.901	1.3543	1.1357	1.4765	2.0363
CoE_index	3.544	0.9806	2.8182	3.5	4
SIZE	7.5369	2.2399	5.9834	7.5032	8.9242
SIZE(in million Euros)	16591	44084	397	1814	7512
R&D	0.0786	0.2154	0.0165	0.0314	0.0593
LEVERAGE	0.2132	0.1448	0.1044	0.1994	0.3264
Beta	0.7558	0.3449	0.5483	0.7367	0.9731
Foreign Listing	0.0642	0.2454	0	0	0
Large firms N=213					
TOBINSq	1.5977	0.7048	1.0819	1.3921	1.865
CoE_index	3.8034	1.0241	3	4	5
SIZE	9.0721	1.4639	7.8098	8.73	10.3878
SIZE (in million Euros)	28800	55419	2465	6186	32462
R&D	0.0333	0.0341	0.0088	0.025	0.0429
LEVERAGE	0.2375	0.1333	0.1413	0.2229	0.3381
Beta	0.8744	0.3188	0.6574	0.8424	1.077
Foreign Listing	0.0751	0.2642	0	0	0
Small firms N=161					
TOBINSq	2.3022	1.8257	1.2192	1.5463	2.5017
CoE_index	3.2008	0.8025	2.75	3.25	3.625
SIZE	5.5058	1.2522	4.7179	5.7265	6.5166
SIZE (in million Euros)	440	406	112	307	676
R&D	0.1384	0.3167	0.0216	0.049	0.1224
LEVERAGE	0.1809	0.1533	0.0447	0.1439	0.3054
Beta	0.5988	0.3147	0.394	0.6063	0.7734
Foreign Listing	0.0497	0.218	0	0	0

Note. This table includes descriptive statistics for three samples: Full sample (N=374), Large firms (N=213), and Small firms (N=161). All variables are winsorized at the 1% and 99% percentiles. For a definition of variables, see Table 3.2

3.5.3. Spearman Correlation

Table 3.7 presents the Pearson and Spearman correlation coefficients for the variables, including TOBINsq, the CoE index, LEVERAGE, SIZE, R&D, Beta, and Foreign listing. The Pearson correlation coefficients reveal that TOBINsq is significantly negatively correlated with the CoE index (-0.161), LEVERAGE (-0.230), SIZE (-0.315), and Beta (-0.328), whereas it is positively correlated with R&D (0.268) and Foreign listing (0.247). Similarly, the Spearman correlation coefficients indicate significant negative correlations between TOBINsq and LEVERAGE (-0.244), SIZE (-0.354), and Beta (-0.341), and positive correlations with R&D (0.201) and Foreign listing (0.186). The positive correlation between Tobin's Q and Foreign Listing may suggest that firms listed on foreign exchanges tend to have higher Tobin's Q ratios, which is consistent with the idea that foreign listings can give firms access to a wider pool of investors and reduce their exposure to home country risk.

Additionally, Foreign listing shows a notable positive correlation with R&D (0.384 for Pearson and 0.220 for Spearman), indicating that firms listed on foreign markets tend to have higher R&D investments. The significance levels, denoted by asterisks, highlight the strength of these relationships, with many correlations significant at the 1% level. The correlation coefficients did not indicate severe multicollinearity.

Table 3.7 **Pearson and Spearman Correlation Coefficients**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) TOBINSq	1	-0.048	-0.354***	-0.244***	0.201***	-0.341***	0.186***
	0	0.3539	0	0	0.0001	0	0.0003
(2) CoE index	-0.161***	1	0.087*	0.367***	-0.141***	0.086*	0.03
	0.0018	0	0.0919	0	0.0064	0.0971	0.5653
(3) LEVERAGE	-0.230***	0.07	1	0.198***	-0.102**	0.094*	-0.019
	0	0.1743	0	0.0001	0.0498	0.07	0.7084
(4) SIZE	-0.315***	0.358***	0.191***	1	-0.254***	0.480***	0.085*
	0	0	0.0002	0	0	0	0.1
(5) R&D	0.268***	-0.079	-0.129**	-0.211***	1	0.004	0.220***
	0	0.1261	0.0126	0	0	0.9395	0
(6) Beta	-0.328***	0.088*	0.074	0.505***	0.036	1	0.002
	0	0.0889	0.1545	0	0.4881	0	0.9658
(7) Foreign listing	0.247***	0.039	-0.004	0.079	0.384***	-0.001	1
	0	0.4517	0.9381	0.1281	0	0.9816	0

Note. Pearson correlations are reported below the diagonal; Spearman correlations are above the diagonal. All variables are winsorized at the 1% and 99% percentiles. For a definition of variables, see Table 3.2 * p < .10, ** p < .05, *** p < .01

3.6. Multivariate Analysis

3.6.1. Effect of Comply or Explain Index

The regression results show that the quality of firms' explanations for GCGC deviations, as measured by the CoE_index, does not significantly affect Tobin's Q (H1a) across any firm size category (H1b). For the full sample (Table 3.8, column 1), the CoE_Index (comply or explain index) has a negative but statistically insignificant coefficient (-0.1239, p=0.2815), suggesting no strong relationship between the comply or explain index and firm performance. For large firms (see Table 3.8, column II), the CoE_Index shows a positive but insignificant coefficient (0.0332, p=0.5730), similar to that of Ullah et al. (2021). For small firms, it is negative and insignificant (-0.3862, p=0.2150).

Leverage shows negative association with Tobin's Q across the full sample and small firms with coefficients of -1.5069 (p=0.1096) and -1.4675 (p=0.2446), respectively. While negative and significant impact for large firms with coefficients of -1.5246 (p=0.0121). This indicates that higher leverage is associated with lower firm performance. R&D expenditure positively and significantly affects Tobin's Q in the full sample (1.0900, p=0.0092) and in large firms (4.000, p=0.0204), indicating that investment in R&D is beneficial for firm performance. These findings are partially consistent with those of Stiglbauer (2010) for German firms. Beta, representing firm-specific risk, has a negative and significant impact on Tobin's Q, consistent with Bassen et al. (2009) in the full sample (-0.9934, p=0.0366) and in large firms (-0.9377, p=0.0005), suggesting that higher risk is associated with lower firm performance. Foreign listing positively impacts Tobin's Q in the full sample (1.0491, p=0.0710) and in small firms (3.3959, p=0.0059), indicating that firms listed on foreign exchanges tend to have higher market valuations. Size has a negative but insignificant impact across all samples.

This analysis also reveals interesting differences between large and small firms. For large firms, LEVERAGE (negative) and R&D (positive) show significant effects on performance. This positive impact of R&D expenditure indicates that investment in R&D is beneficial for firm performance. In contrast, for small firms, these factors are not statistically significant. Foreign listings appear to have a positive impact on performance, especially for small firms (3.3959, $p < 0.01$).

Table 3.8 Panel A - **Impact of Comply or Explain Index(COE_Index) on Firm Performance**

	(I) Coeff (p-value)	(II) Coeff (p-value)	(III) Coeff (p-value)	(IV) Coeff (p-value)	(V) Coeff (p-value)	(VI) Coeff (p-value)
VARIABLES	Full Sample	Large Firms	Small Firms	Full Sample	Large Firms	Small Firms
	TOBINSq			**ROE**		
CoE_index	-0.1239	0.0332	-0.3862	-0.0215**	-0.0163	-0.0414*
	(0.2815)	(0.5730)	(0.2150)	(0.0439)	(0.1903)	(0.0719)
LEVERAGE	-1.5069	-1.5246**	-1.4675	-0.2718***	-0.1988**	-0.2154
	(0.1096)	(0.0121)	(0.2446)	(0.0002)	(0.0455)	(0.2136)
SIZE	-0.0578	-0.0337	-0.0183	0.0203***	0.0158*	0.0216
	(0.4036)	(0.4498)	(0.9496)	(0.0012)	(0.0774)	(0.3809)
R&D	1.0090**	4.0200**	-0.0685	-0.1101	0.1121	-0.0626
	(0.0218)	(0.0342)	(0.9253)	(0.1123)	(0.6414)	(0.6712)
Beta	-0.9934**	-0.9377***	-0.8309	0.0072	-0.0408	0.0552
	(0.0366)	(0.0005)	(0.4954)	(0.8518)	(0.2673)	(0.4486)
foreign_listing	1.0491*	0.3132	3.3959***	-0.0928*	-0.0332	-0.2115
	(0.0710)	(0.1779)	(0.0059)	(0.0941)	(0.1093)	(0.2586)
Constant	3.5399***	2.8538***	3.8028***	0.0697	0.0960	0.1117
	(0.0000)	(0.0000)	(0.0048)	(0.2157)	(0.1017)	(0.3897)
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
F-Value	8.72	8.32	2.09	16.08	5.24	1.85
Prob(F-statistic)	(0.0000)	(0.0000)	(0.0443)	(0.0000)	(0.0000)	(0.0767)
Mean VIF	1.35	1.32	1.55	1.35	1.32	1.55
Observations	374	213	161	374	213	161
Adjusted R-squared	27%	43%	25%	19%	9%	22%

Note. The table presents the results of OLS regressions examining the impact of the "Comply or Explain" index on firm performance across three samples: Full sample (N=374), Large firms (N=213), and Small firms (N=161). The dependent variables are Tobin's Q and ROE, representing different measures of firm performance. All variables are winsorized at the 1% and 99% percentiles to mitigate the influence of outliers. Industry fixed effects are included at the 2-digit SIC level, along with year fixed effects. Standard errors are robust to heteroskedasticity and clustered at the firm level. Variance inflation factors (VIF) are reported to assess multicollinearity, with all values below the threshold of concern. Significance levels are indicated as follows: * p < .10, ** p < .05, *** p < .01. For a definition of variables, see Table 3.2

Following the methodologies of Rose (2016), Render et al. (2010), and Bauer et al. (2004), we employ alternative measures of performance, Return on Equity (ROE), as a proxy for Tobin's Q (firm performance). We use ROE to assess shareholder value creation. This is widely used measures of performance in the finance literature. The results (Table 3.8, columns IV to VI) reveal ROE exhibits a significant negative relationship with the CoE_index for the full sample (coefficient = -0.0215, $p < 0.05$) and a weakly significant negative relationship for small firms (coefficient = -0.0414, $p < 0.1$). These findings suggest that while the comply or explain index (CoE_Index) does not impact market-based firm value, it may negatively influence accounting-based performance measures, particularly for smaller firms.

For robustness of results, we also employ additional index. Prior studies such as Ullah et al. (2021) have used commercially available ratings as proxies for governance. However, we follow Hooghiemstra (2012) and develop an alternative index that meets the criteria for explanation quality. We retained the original name for the index, ISCORE, as used by the original author. Unlike our index, ISCORE has fewer categories, providing a simpler assessment of explanation quality. The ISCORE ranges from a minimum of 1 for no explanations to a maximum of 4 for firm-specific explanations, with generic explanations scoring 2. Here is how ISCORE is calculated as (4 × firm-specific explanations + 2 × generic explanations + 1 × no explanations) / total number of explanations.

Consistent with the main results, the ISCORE shows no significant relationship with Tobin's Q across all firm sizes (Table 3.8, Panel B). Unlike the CoE_index results, ISCORE does not exhibit any significant relationship with ROE across any firm size category. These findings reinforce the overall conclusion that the compliance and quality of explanations has no significant impact on market-based firm value but may negatively influence accounting-based performance measures, particularly for smaller firms. Consistency across different proxy and measures strengthens the robustness of these results.

Overall while the comply or explain does not show a significant direct impact on firm performance, the analysis reveals that other factors affect large and small firms differently. This suggests that the relationship between corporate governance compliance and quality and firm performance is complex and requires thorough investigation. This is where we argue that overall index may not gauge the discrete and intricate impact of different types of explanations or mere compliance with the code and the importance of different provisions of corporate governance which might be important for stakeholders.

Table 3.8 Panel B- **Impact of ISCORE Index on Firm Performance**

	(I) Coeff (p-value)	(II) Coeff (p-value)	(III) Coeff (p-value)	(IV) Coeff (p-value)	(V) Coeff (p-value)	(VI) Coeff (p-value)
VARIABLES	Full Sample	Large Firms	Small Firms	Full Sample	Large Firms	Small Firms
	TOBINSq			**ROE**		
ISCORE	-0.0153	0.0043	0.0191	-0.0144	-0.0151	-0.0302
	(0.8514)	(0.9464)	(0.9344)	(0.1727)	(0.1911)	(0.1416)
LEVERAGE	-1.4991	-1.5621***	-2.0287	-0.2701***	-0.1809*	-0.2603
	(0.1148)	(0.0080)	(0.1622)	(0.0002)	(0.0509)	(0.1173)
SIZE	-0.0789	-0.0284	-0.1135	0.0178***	0.0146*	0.0135
	(0.2218)	(0.5270)	(0.6416)	(0.0022)	(0.0869)	(0.5430)
R&D	0.9924**	3.9808**	-0.2939	-0.1178*	0.0747	-0.0851
	(0.0296)	(0.0442)	(0.6406)	(0.0975)	(0.7571)	(0.5496)
Beta	-0.9553**	-0.9524***	-0.6960	0.0098	-0.0392	0.0560
	(0.0375)	(0.0006)	(0.5703)	(0.7997)	(0.2945)	(0.4526)
foreign_listing	1.0485*	0.3181	3.7088***	-0.0925*	-0.0311	-0.2025
	(0.0766)	(0.1694)	(0.0017)	(0.0850)	(0.1509)	(0.2453)
Constant	3.2742***	2.9393***	3.0750**	0.0484	0.0830	0.1050
	(0.0000)	(0.0000)	(0.0123)	(0.4072)	(0.1613)	(0.4937)
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
F-Value	8.18	8.36	1.85	16.86	5.31	1.71
Prob(F-statistic)	(0.0000)	(0.0000)	(0.0762)	(0.0000)	(0.0000)	(0.1058)
Mean VIF	1.33	1.31	1.53	1.33	1.31	1.53
Observations	374	213	161	374	213	161
Adjusted R-squared	26%	43%	22%	18%	8%	20%

Note: The table reports the results of OLS regressions examining the impact of the ISCORE index on firm performance across three samples: Full sample, Large firms, and Small firms. The dependent variables are Tobin's Q and ROE. All variables are winsorized at the 1% and 99% percentiles. Industry fixed effects are included at the 2-digit SIC level, along with year fixed effects. Standard errors are robust to heteroskedasticity and clustered at the firm level. For details on how ISCORE is calculated, see Footnote 4. Significance levels are indicated as follows: * p < .10, ** p < .05, *** p < .01. For a definition of variables, see Table 3.2

3.6.2. The Impact of Varying Quality of Explanations

To the impact of different categories of explanation quality on firm performance (H2a) and the moderating effect of firm size (H2b), Table 3.9 Panel A presents regression results. For the overall sample, generic and standard explanations (CAT B) show a positive but insignificant association with Tobin's Q. Future compliance (CAT C) shows no significant associations. Regarding alternative practices (CAT D), when firms deviate from the code and adopt an alternative approach, the results demonstrate a negative but insignificant association for the overall sample. Partial compliance explanations (CAT E) have a weakly significant negative

association with Tobin's Q for the full sample ($p < 0.1$). Firm-specific explanations (CAT F) show a weakly significant negative association with Tobin's Q for the full sample ($p < 0.1$). These findings provide partial support for H2a, indicating that the quality of explanations for deviations from the GCGC does have an impact on firm performance, although the effects vary across categories and are not consistently positive for higher-quality explanations.

Regarding H2b, which posits that the effect of explanation quality on firm performance is moderated by firm size, we observe distinct patterns for large and small firms. For large firms, generic and standard explanations (CAT B) show a significant negative impact on Tobin's Q ($p < 0.05$), suggesting that stakeholders view such explanations unfavorably for larger companies. Firm-specific explanations (CAT F) also show a significant negative association with Tobin's Q for large firms ($p < 0.05$), implying that more detailed explanations may also send negative signals to the market for these companies. This may also indicate that large firms providing detailed explanations could be experiencing underlying issues. For small firms, CAT F also shows a weak but insignificant impact hinting at potential benefits of context-specific explanations for smaller entities, with the effect being most pronounced and significant for larger firms. In contrast, for small firms, alternative practices (CAT D) have a more pronounced negative effect on Tobin's Q, although not statistically significant. Partial compliance explanations (CAT E) have a weakly significant negative association with Tobin's Q for small firms ($p < 0.1$), indicating that partial compliance may be particularly unfavorable for smaller companies.

The proxy, ROE, provides no support for H2a, which aligns with earlier findings where only weak support was observed in the initial results. The results further highlight the moderating effect of firm size (H2b). Small firms show a significant negative impact from alternative practice explanations (CAT D, $p < 0.05$) and a weakly significant negative impact from firm-specific explanations (CAT F, $p < 0.1$). This may be seen as critical because small firms should benefit more from the comply or explain approach provided that these firms have valid justification for departure from the code. These results suggest that for smaller firms, both alternative practices and highly detailed explanations may be associated with lower return on equity. Large firms, however, do not exhibit significant associations between explanation categories and ROE.

Table 3.9 Panel A **Categories Classification Based on CoE_Index**

Dependent variable:	(I) Coeff (p-value)	(II) Coeff (p-value)	(III) Coeff (p-value)	(IV) Coeff (p-value)	(V) Coeff (p-value)	(VI) Coeff (p-value)
VARIABLES	**Full Sample**	**Large Firms**	**Small Firms**	**Full Sample**	**Large Firms**	**Small Firms**
		TOBINSq			**ROE**	
CAT B*	0.1071	-0.0887**	0.2082	0.0094	0.0025	0.0046
(Generic or Standard)	(0.3778)	(0.0373)	(0.4215)	(0.2493)	(0.7970)	(0.7439)
CAT C	-0.0871	0.0781	0.0107	-0.0103	-0.0018	-0.0199
Future Compliance	(0.4584)	(0.2611)	(0.9718)	(0.5745)	(0.8828)	(0.5843)
CAT D	-0.0961	0.0999	-0.1860	-0.0209	0.0024	-0.0435**
(Alternative Practice)	(0.2535)	(0.2653)	(0.1311)	(0.1149)	(0.8733)	(0.0487)
CAT E	-0.1600*	-0.0595	-0.4541*	-0.0018	-0.0083	0.0048
(Partial Compliance)	(0.0550)	(0.4696)	(0.0680)	(0.8536)	(0.4377)	(0.8330)
CAT F	-0.1265*	-0.1037**	-0.0064	-0.0107	-0.0035	-0.0232*
(Firm-Specific)	(0.0882)	(0.0280)	(0.9653)	(0.1975)	(0.6646)	(0.0708)
Control variables	Included	Included	Included	Included	Included	Included
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
F-Value	7.43	7.40	1.82	11.67	6.32	1.66
Prob(F-statistic)	(0.0000)	(0.0000)	(0.0621)	(0.0000)	(0.0000)	(0.0976)
Mean VIF	1.38	1.51	1.72	1.38	1.51	1.72
Observations	374	213	161	374	213	161
Adjusted R-squared	29%	49%	27%	20%	5%	25%

Note. The table presents OLS regression results examining the impact of different categories of explanation quality on firm performance across three samples: Full sample, Large firms, and Small firms. The dependent variables are Tobin's Q and ROE. Categories include Generic or Standard (CAT B), Future Compliance (CAT C), Alternative Practice (CAT D), Partial Compliance (CAT E), and Firm-Specific (CAT F). Control variables, industry effects at the 2-digit SIC level, and year effects are included in all models. Standard errors are robust to heteroskedasticity and clustered at the firm level. For detailed methodology and category definitions, see Table 3.1, and for a definition of variables, see Table 3.2 Significance levels are indicated as follows: * p < .10, ** p < .05, *** p < .01.

As a robustness test, the ISCORE index results largely confirm the findings from the main analysis (see Table 3.9, Panel B), with some variations. The results regarding H2a are consistent using the alternative proxy, ISCORE. The results for H2b show a weakly significant negative association ($p < 0.1$) between Tobin's Q and “No Explanations” for small firms, suggesting that the absence of explanations may be particularly detrimental for smaller companies. Large firms demonstrate a weakly significant negative association with "Generic Explanations" ($p < 0.1$) and a significant negative association with "Firm-specific Explanations" ($p < 0.05$), consistent with the main findings that detailed explanations may signal underlying issues for larger firms. For ROE, small firms show a weakly significant negative impact for both "No Explanations" and "Firm-specific Explanations" ($p < 0.1$). This

partially corroborates the main findings; while highlighting that for smaller firms, both the absence of explanations and highly detailed explanations may be associated with lower return on equity.

Table 3.9 Panel B **Alternative Classification (ISCORE)**

Dependent variable: TOBINS Q	(I) Coeff (p-value)	(II) Coeff (p-value)	(III) Coeff (p-value)	(IV) Coeff (p-value)	(V) Coeff (p-value)	(VI) Coeff (p-value)
VARIABLES	**Full Sample**	**Large Firms**	**Small Firms**	**Full Sample**	**Large Firms**	**Small Firms**
	TOBINSq			**ROE**		
No Explanations	-0.1306	0.0838	-0.2418*	-0.0204	0.0046	-0.0392*
	(0.1493)	(0.3003)	(0.0587)	(0.1057)	(0.6904)	(0.0751)
Generic Explanations	0.0375	-0.0751*	0.0391	0.0065	-0.0017	0.0053
	(0.6888)	(0.0657)	(0.8057)	(0.3721)	(0.8188)	(0.5745)
Firm-specific Explanations	-0.0938	-0.1071**	0.0726	-0.0093	-0.0024	-0.0232*
	(0.1840)	(0.0289)	(0.5536)	(0.2582)	(0.7594)	(0.0501)
Control variables	Included	Included	Included	Included	Included	Included
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
F-Value	8.44	7.79	1.71	13.58	3.9	1.92
Prob(F-statistic)	(0.0000)	(0.0000)	(0.0944)	(0.0000)	(0.0001)	(0.0556)
Mean VIF	1.39	1.48	1.62	1.39	1.48	1.62
Observations	374	213	161	374	213	161
Adjusted R-squared	27%	50%	23%	20%	5%	26%

Note. The table presents OLS regression results examining the impact of different categories of explanation quality on firm performance across three samples: Full sample, Large firms, and Small firms. The dependent variables are Tobin's Q and ROE. Categories include No Explanations, Generic Explanations, and Firm-specific Explanations. For detailed methodology and category definitions, see Hooghiemstra (2012). Control variables, industry effects at the 2-digit SIC level, and year effects are included in all models. Standard errors are robust to heteroskedasticity and clustered at the firm level. Significance levels are indicated as follows: * p < .10, ** p < .05, *** p < .01

These findings provide support for H2b, demonstrating that the effect of explanation quality on firm performance is indeed moderated by firm size. The impact of different explanation categories varies between large and small firms, with some categories having more pronounced effects on one group than the other. For instance, generic explanations and firm-specific explanations have a more negative impact on large firms' Tobin's Q, while alternative practices and partial compliance explanations have a more negative effect on small firms' performance measures.

Overall, the results show that large firms providing generic or standard explanations (CAT B) have a negative impact on performance, suggesting that stakeholders might view these explanations as inadequate or indicative of deeper issues. Interestingly, high-quality firm-

specific explanations (CAT F) are also negatively associated with negative performance, potentially signaling to the market that the firm may have underlying issues. The negative impact of alternative practices (CAT D) suggests that deviations from the code are generally viewed unfavorably unless well justified.

To further understand why high-quality explanations (CAT F) and low-quality explanations (CAT B or C) have a similar impact on firm performance, we need to examine which chapters of the GCGC these explanations pertain to and whether the observed patterns remain consistent across these different chapters.

3.6.3. Effect of Different Chapters of German Corporate Governance Code

To test hypotheses H3a and H3b, we examine how the interaction between the type of explanation provided and the specific GCGC chapter it relates to influences firm performance, and how this influence differs for large and small firms. We run separate regressions for each chapter from chapters 2 to 7 (see Table 3.10 for chapter details). The initial descriptive analysis of explanations revealed that most explanations originated from Chapters 4 and 5 of the GCGC, which address the Management Board and the Supervisory Board, respectively. However, there were sufficient explanations for other chapters, with the exception of Chapter 2, which deals with Shareholders and the General Meeting.

Our analysis reveals (Table 3.10 Columns, I to III) varying impacts across different chapters (H3a) and firm sizes (H3b). For Chapter 2 (Shareholders and General Meeting), we find a weakly significant positive association with Tobin's Q for the full sample (coefficient = 0.2801, $p < 0.1$) weakly supporting H3a. This finding suggest that explanations related to shareholders and general meetings may positively influence overall firm value. Due to insufficient observations, the impact on small firms could not be assessed for this chapter.

Chapter 3 shows no significant associations across any firm size category. For Chapter 4, which pertains to management board matters, we observe no statistically significant relationships with Tobin's Q across all firm sizes, although the coefficients are negative. Chapter 5(which deals with supervisory board matters), exhibits a weakly significant positive association for large firms (coefficient = 0.0831, $p < 0.1$), indicating that high-quality explanations for deviations in supervisory board practices may enhance firm value for larger companies. Notably, Chapter 6, which pertains to transparency, demonstrates a strong positive association with firm performance for both large firms (coefficient = 0.2052, $p < 0.01$) and small firms (coefficient = 0.5040, $p < 0.05$). This underscores the importance of transparency

in corporate governance across different firm sizes. Chapter 7, focusing on financial reporting and auditing, shows a significant positive association with firm performance, primarily driven by large firms (coefficient = 0.1454, $p < 0.05$). While the association is also positive for small firms, it is not statistically significant.

Table 3.10 Panel A - **Impact of Different Chapters of the GCGC Code on TOBINSq**

Dependent variable: TOBINSq	(I) Coeff (p-value)	(II) Coeff (p-value)	(III) Coeff (p-value)	(IV) Coeff (p-value)	(V) Coeff (p-value)	(VI) Coeff (p-value)	(VII) Coeff (p-value)	(VIII) Coeff (p-value)
	Full Sample	Large Firms	Full Sample	Large Firms	Small Firms	Full Sample	Large Firms	Small Firms
	TOBINSq		**TOBINSq**			**TOBINSq**		
CoE_chapter2 **Shareholders and the General Meeting**	0.2801* (0.0777)	-0.0169 (0.9097)						
CoE_chapter3 **Cooperation between Boards**			0.1121 (0.2406)	0.0431 (0.5470)	0.0587 (0.6879)			
CoE_chapter4 **Management Board**						-0.0857 (0.3284)	-0.0350 (0.6193)	-0.2229 (0.2552)
Control variables	Included	Included	Included	Included	Included	Included	Included	Included
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	61	53	212	105	107	269	161	108
Adjusted R-squared	51%	73%	34%	54%	46%	25%	50%	19%

*Note.*The table presents OLS regression results examining the impact of compliance and the quality of explanations for each chapter of the German Corporate Governance Code (GCGC) using the Comply or Explain Index (CoE_Index) on firm performance, as measured by Tobin's Q. The analysis assesses how different types of explanations within each chapter affect performance. Due to insufficient observations (fewer reported deviation) Chapter 2 could not be analyzed for small firms. Control variables, industry effects at the 2-digit SIC level, and year effects are included in all models. Standard errors are robust to heteroskedasticity and clustered at the firm level. For a definition of variables, see Table 3.2. Significance levels are indicated as follows: * p < .10, ** p < .05, *** p < .01

Table 3.10 Panel B - **Impact of Different Chapters of the GCGC Code on TOBINSq**

Dependent variable: TOBINSq	(IX) Coeff (p-value)	(X) Coeff (p-value)	(XI) Coeff (p-value)	(XII) Coeff (p-value)	(XIII) Coeff (p-value)	(XIV) Coeff (p-value)	(XV) Coeff (p-value)	(XVI) Coeff (p-value)	(XVII) Coeff (p-value)
	Full Sample	Large Firms	Small Firms	Full Sample	Large Firms	Small Firms	Full Sample	Large Firms	Small Firms
	TOBINSq			**TOBINSq**			**TOBINSq**		
CoE_chapter5 **Supervisory Board**	-0.0982 (0.4224)	0.0831* (0.0966)	-0.3004 (0.3016)						
CoE_chapter6 **Transparency**				0.0566 (0.4706)	0.2052*** (0.0007)	0.5040** (0.0209)			
CoE_chapter7 **Financial Reporting and Auditing**							0.2570** (0.0453)	0.1454** (0.0153)	0.1543 (0.4754)
Control variables	Included	Included	Included	Included	Included	Included	Included	Included	Included
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	322	167	155	70	56	14	115	67	48
Adjusted R-squared	24%	46%	24%	43%	74%	80%	44%	63%	63%

*Note.*The table presents OLS regression results examining the impact of compliance and the quality of explanations for each chapter of the German Corporate Governance Code (GCGC) using the Comply or Explain Index (CoE_Index) on firm performance, as measured by Tobin's Q. The analysis assesses how different types of explanations within each chapter affect performance. Control variables, industry effects at the 2-digit SIC level, and year effects are included in all models. Standard errors are robust to heteroskedasticity and clustered at the firm level. For a definition of variables, see Table 3.2. Significance levels are indicated as follows: * p < .10, ** p < .05, *** p < .01

As a robustness measure (Table 3.10 Panels C and D), the ISCORE index for different chapters of GCGC largely confirms our main findings and provides additional insights. For Chapter 2 , we observe a highly significant positive association with Tobin's Q for small firms (coefficient = 0.8620, $p < 0.01$). This finding shows that, for smaller companies, explanations related to shareholders and general meetings may be particularly valuable. Chapters 3, 4, and 5 show no significant associations across firm sizes, consistent with the main findings. Notably, the results for Chapter 6 (transparency) remain robust, with a strong positive association for large firms (coefficient = 0.3078, $p < 0.01$), although the effect for small firms is no longer significant. Chapter 7 (financial reporting and auditing) shows significant positive associations for both the full sample (coefficient = 0.3422, $p < 0.05$) and large firms (coefficient = 0.2007, $p < 0.05$), reinforcing the importance of high-quality explanations in this area. These robustness tests using the ISCORE index generally support our main findings, emphasizing the varying impacts of different GCGC chapters across firm sizes and highlighting the importance of transparency and financial reporting practices, especially for larger firms. The strong positive effect of Chapter 2 explanations for small firms emerges as a new insight from this alternative analysis. We also examine the effects on ROE as untabulated results. These findings are generally consistent with our Tobin's Q results, except for Chapter 7, where the results are not robust across these alternative performance measure.

In conclusion, these findings generally support hypotheses H3a and H3b, demonstrating that firm performance is indeed influenced by the interaction between the type of explanation provided and the specific GCGC chapter it relates to, and that this influence differs for large and small firms. However, the limitations in sample size for certain subgroups, particularly for small firms in Chapters 2 and 6, necessitate a cautious interpretation of these results. Despite these limitations, the results consistently highlight the importance of transparency and financial reporting practices across different firm sizes, although the magnitude and reliability of these effects may vary.

Overall, the results highlight that not all parts of the code may be equally important for firms, and the significance of explanations can differ based on the specific governance area and firm size. Particularly, transparency and financial reporting practices appear to have the most consistent positive impact on firm value across different firm sizes. This detailed analysis provides valuable insights into the complex relationship between corporate governance explanations and firm performance, emphasizing the need for a differentiated approach when interpreting the impact of compliance and explanation quality on firm value.

Table 3.10 Panel C - **Impact of (ISCORE) Different Chapters of the GCGC Code on TOBINSq**

Dependent variable: TOBINSq	(I) Coeff (p-value)	(II) Coeff (p-value)	(III) Coeff (p-value)	(IV) Coeff (p-value)	(V) Coeff (p-value)	(VI) Coeff (p-value)	(VII) Coeff (p-value)	(VIII) Coeff (p-value)	(IX) Coeff (p-value)
	Full Sample	**Large Firms**	**Small Firms**	**Full Sample**	**Large Firms**	**Small Firms**	**Full Sample**	**Large Firms**	**Small Firms**
	TOBINSq			**TOBINSq**			**TOBINSq**		
ISCORE_chap2 **Shareholders and the General Meeting**	0.1101 (0.3298)	-0.0113 (0.9097)	0.8620*** (0.0000)						
ISCORE_chap3 **Cooperation between Boards**				0.1833 (0.1626)	0.0274 (0.7659)	0.0808 (0.7489)			
ISCORE_chap4 **Management Board**							-0.0251 (0.7858)	-0.0356 (0.5381)	-0.0829 (0.6898)
Control variables	Included	Included	Included	Included	Included	Included	Included	Included	Included
IndustryFE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	65	53	12	212	105	107	269	161	108
Adjusted R-squared	51%	73%	89%	34%	53%	46%	25%	50%	17%

*Note.*The table presents OLS regression results examining the impact of compliance and the quality of explanations for each chapter of the German Corporate Governance Code (GCGC) using the ISCORE index on firm performance, as measured by Tobin's Q. The analysis assesses how different types of explanations within each chapter affect performance. Control variables, industry effects at the 2-digit SIC level, and year effects are included in all models. Standard errors are robust to heteroskedasticity and clustered at the firm level. For details on how ISCORE is calculated, see Footnote 4. For detailed methodology, refer to Hooghiemstra (2012). For a definition of variables, see Table 3.2. Significance levels are indicated as follows: * p < .10, ** p < .05, *** p < .01

Table 3.10 Panel D - **Impact of (ISCORE) Different Chapters of the GCGC Code on TOBINSq**

Dependent variable: TOBINSq	(X) Coeff (p-value)	(XI) Coeff (p-value)	(XII) Coeff (p-value)	(XIII) Coeff (p-value)	(XIV) Coeff (p-value)	(XV) Coeff (p-value)	(XVI) Coeff (p-value)	(XVII) Coeff (p-value)	(XVIII) Coeff (p-value)
	Full Sample	**Large Firms**	**Small Firms**	**Full Sample**	**Large Firms**	**Small Firms**	**Full Sample**	**Large Firms**	**Small Firms**
	TOBINSq			**TOBINSq**			**TOBINSq**		
ISCORE_chap5 **Supervisory Board**	-0.0190 (0.8461)	0.0396 (0.5876)	-0.0696 (0.7813)						
ISCORE_chap6 **Transparency**				0.0485 (0.6726)	0.3078*** (0.0007)	0.4486 (0.2211)			
ISCORE_chap7 **Financial Reporting and Auditing**							0.3422** (0.0297)	0.2007** (0.0119)	0.2240 (0.4468)
Control variables	Included	Included	Included	Included	Included	Included	Included	Included	Included
IndustryFE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	322	167	155	70	56	14	115	67	48
Adjusted R-squared	23%	45%	21%	43%	74%	61%	44%	63%	63%

*Note.*The table presents OLS regression results examining the impact of compliance and the quality of explanations for each chapter of the German Corporate Governance Code (GCGC) using the ISCORE index on firm performance, as measured by Tobin's Q. The analysis assesses how different types of explanations within each chapter affect performance. Control variables, industry effects at the 2-digit SIC level, and year effects are included in all models. Standard errors are robust to heteroskedasticity and clustered at the firm level. For details on how ISCORE is calculated, see Footnote 4. For detailed methodology, refer to Hooghiemstra (2012). For a definition of variables, see Table 3.2. Significance levels are indicated as follows: * p < .10, ** p < .05, *** p < .01

3.6.4. Addressing Potential Endogeneity

Endogeneity is a significant challenge in governance-related studies, primarily because of the issues of reverse causality. The question is whether well-performing firms choose to adopt good governance practices or if good governance itself leads to better performance. We identify three instruments to address endogeneity: free float, firm age, and the industry average comply-or-explain index. Free float, as used by Goncharov et al. (2006), serves as a proxy for market pressure to comply with governance codes, indicating a positive correlation with compliance. Kaspereit et al. (2015) also suggest that dispersed ownership exerts positive pressure on firms' disclosures. We define free float as a dummy equal to 1 if a firm's free-float percentage exceeds 75%, and 0 otherwise. The second instrument, industry-average compliance, is based on the studies by Ali et al. (2018) and Jiraporn et al. (2015). This is based on the argument that industry peer pressure might compel firms to adhere to governance codes or avoid specific provisions, such as committee formation or executive remuneration disclosure. Although industry-average compliance may correlate with a firm's compliance, it should not directly affect its performance. We calculate industry average index as the industry's comply or explain index minus that of the firm. Lastly, we use firm age as the third instrument, following Jo and Harjoto (2012). Firm age may suggest that older firms have more established governance practices than newer firms, potentially making them more responsible, as noted by Rashid (2018). Firm age is defined as the natural log of the number of years since the firm's Initial Public Offering (IPO).

In the first stage of the 2SLS method, we regress the comply-or-explain index (CoE_index) on the selected instruments and other control variables to capture the variation explained by these instruments.

$$\text{CoE\_index}=\alpha 0+\alpha_1\text{Free Float}+\alpha_2\text{Firm Age}+\alpha_3\text{Industry\_Avg Index} + \text{Control Variables}+ \text{Industry Dummies} + \text{Year Dummies} + \varepsilon \quad (1)$$

In the second stage, we use the fitted values of the CoE_index obtained from the first stage in our main model to address potential endogeneity issues.

$$\text{TOBINSq}= \beta_0 + \beta_1(\text{CoE\_index})\hat{} + \text{Control Variables} + \text{Industry Dummies} + \text{Year Dummies} +\varepsilon \quad (2)$$

The results, in Table 3.11, indicate that our instruments; free float, industry average index, and firm age are both strong and relevant. In the first-stage results, firm age is the only instrument that is not statistically significant, although it has a positive coefficient. Overall, the F-test for excluded instruments yields a statistic of 23.54 with a p-value below 1%, allowing us to reject the null hypothesis that the instruments do not explain any variation in the endogenous regressor (CoE_index). The Kleibergen-Paap rk LM statistic of 42.13 with a p-value of 0.0000, also rejects the null hypothesis of underidentification, indicating that the model is properly identified. Furthermore, the Cragg-Donald Wald F statistic of 21.91 exceeds the Stock-Yogo critical value at a 5%, rejecting the null hypothesis of weak identification and confirming the strength of the instruments.

In the second-stage regression, the model explains approximately 27% of the variability in TOBINSq, with significant effects observed for LEVERAGE, R&D, Beta, and foreign_listing. The overall model is statistically significant, as indicated by an F-statistic of 9.16 (p-value = 0.0000). The Hansen J-statistic, with a p-value of 0.1045, supports the null hypothesis that the instruments are valid and uncorrelated with the error term. These results validate the instrumental variable approach in addressing endogeneity concerns that influence TOBINSq. After controlling for addressing potential endogeneity concerns, the second stage results confirm the robustness of our main findings. The results consistently show no significant relationship between the CoE_index and firm performance across all sample categories, reinforcing our initial conclusions.

Table 3.11 **Endogeneity Analyses**

	2SLS					
	First Stage Regression			Second Stage Regression		
	(I) Coeff (p-value)	(II) Coeff (p-value)	(III) Coeff (p-value)	(IV) Coeff (p-value)	(V) Coeff (p-value)	(VI) Coeff (p-value)
	Full sample	Large Firms	Small Firms	Full sample	Large Firms	Small Firms
CoE_index				0.0053	0.1150	0.2179
				(0.9745)	(0.2636)	(0.5449)
Free Float	0.2806*	0.1191	0.5011***			
	(0.0771)	(0.6123)	(0.0064)			
Industry Avg CoE_Index	-7.9399***	-8.3548***	-6.6212***			
	(0.0000)	(0.0000)	(0.0005)			
Firm AGE	0.0249	0.1022	-0.2217**			
	(0.8145)	(0.4548)	(0.0351)			
LEVERAGE	0.0853	-0.7768	1.2167**	-1.7250*	-1.5525***	-2.4148*
	(0.8691)	(0.4032)	(0.0310)	(0.0577)	(0.0064)	(0.0926)
SIZE	0.1309***	0.0987	0.2102*	-0.0833	-0.0521	-0.1496
	(0.0027)	(0.3002)	(0.0843)	(0.2638)	(0.2800)	(0.6005)
R&D	0.0704	-0.9386	0.4435	0.7917*	3.4182**	-0.4219
	(0.7827)	(0.7764)	(0.1013)	(0.0519)	(0.0424)	(0.5443)
Beta	-0.2946	-0.4153	-0.4332	-0.9397**	-0.9236***	-0.6698
	(0.2582)	(0.2818)	(0.1804)	(0.0489)	(0.0002)	(0.5818)
foreign_listing	-0.1942	0.0805	-0.7956***	1.3906**	0.5550***	3.8610***
	(0.3439)	(0.7554)	(0.0076)	(0.0261)	(0.0009)	(0.0007)
Constant	30.5093***	32.4210***	25.8713***	3.3049***	2.7460***	2.6804**
	(0.0000)	(0.0000)	(0.0001)	(0.0000)	(0.0000)	(0.0231)
Model Fit:						
F test of excluded instruments:	26.25 (0.0000)	15.95 (0.0000)	10.86 (0.0000)			
Underidentification test: Kleibergen-Paap rk LM statistic (Chi-sq)	40.77 (0.0000)	22.91 (0.0000)	21.37 (0.0000)			
Weak identification test: (Cragg-Donald Wald F statistic)	21.91	11.77	14.09			
Overidentification test: Hansen J-statistic				4.517 (0.1045)	2.401 (0.3010)	5.261 (0.0720)
Observations	363	205	158	363	205	158
Adjusted R-squared	25%	17%	28%	27%	44%	18%

Note. The table presents Two-Stage Least Squares (2SLS) regression results addressing potential endogeneity in the analysis of the impact of compliance and explanation quality on firm performance, as measured by Tobin's Q. In the first stage, the Comply or Explain Index (CoE_Index) is regressed on selected instruments: Free Float, Industry Average CoE_Index, and Firm Age. Free Float is a dummy variable equal to 1 if a firm's free-float percentage exceeds 75%, and 0 otherwise. Industry Average CoE_Index is calculated as the industry's index minus that of the firm. Firm Age is defined as the natural log of the number of years since the firm's IPO. The second stage evaluates the effect on firm performance across three samples: Full sample, Large firms, and Small firms. Standard errors are robust to heteroskedasticity and clustered at the firm level. Model diagnostics include F-tests for excluded instruments, Kleibergen-Paap rk LM statistics for underidentification, Cragg-Donald Wald F

statistics for weak identification, and Hansen J-statistics for overidentification. Significance levels are indicated as follows: * p < .10, ** p < .05, *** p < .01

3.7. Implications and Conclusion

Our study investigates how firms utilize the 'explain' aspect of the comply-or-explain approach and its subsequent impact on their performance. Previous research has largely concentrated on the effects of various corporate governance mechanisms on firm performance, while other streams have explored compliance patterns with governance codes, particularly focusing on the major deviations and quality of explanations provided. Our comprehensive review not only examines these explanations in terms of quality and their impact on firm performance but also considers how different chapters of the governance code affect firm performance and whether this association is consistent across large and small firms.

While the overall comply or explain index does not show a significant direct impact on firm performance, our analysis uncovers subtle effects when considering different types of explanations and firm sizes. Large firms experience negative performance impacts for both generic (CAT B) and high-quality firm-specific explanations (CAT F), suggesting that stakeholders may view these explanations as indicative of underlying issues. The prevalence of generic and firm-specific explanations suggests that, while firms provide reasons for deviations, these reasons may not always be sufficiently detailed or tailored to promote meaningful compliance. Conversely, small firms are more negatively affected by alternative practices (CAT D) and partial compliance explanations. This could be considered critical, as small firms are expected to benefit more from the "comply or explain" approach, provided they have valid justifications for deviating from the code.

The interaction between explanation type and specific GCGC chapters significantly influences firm performance, with effects differing between large and small firms. Notably, transparency (Chapter 6) and financial reporting practices (Chapter 7) consistently show positive impacts on firm performance across different firm sizes, although the magnitude of these effects may vary, suggesting these areas are critical for maintaining market confidence and firm performance. Our findings highlight that not all parts of the governance code are equally important for firms, and the significance of explanations can differ based on the specific governance area and firm size. This underscores the need for a differentiated approach when interpreting the impact of compliance and explanation quality on firm performance. Sensitivity analyses using alternative measures (ISCORE, ROE) generally support our main findings,

particularly regarding the importance of transparency and financial reporting practices. However, some results, such as those for small firms in certain chapters, should be interpreted cautiously due to sample size limitations.

In conclusion, the interplay between the quality of explanations and the specific chapters of the GCGC is complex, with significant implications for firm performance. Firms, particularly large ones, should prioritize high-quality transparent disclosures and pay close attention to critical areas such as transparency and financial reporting to enhance their performance. The consistency of some findings across different chapters highlights the need for further scrutiny and potential revisions to the code to ensure it effectively drives improvements in corporate governance practices.

Appendix 3A: Examples of classification of explanations (deviations) from the German Corporate Governance Code (GCGC)

This appendix presents examples of explanations reported by German public firms for derivation from the GCGC and how we classified and coded these explanations:

Generic or Substandard Explanation

WACKER CHEMIE AG- 2015

'The considerable importance that Wacker Chemie AG attaches to diversity extends to Executive Board membership. Nonetheless, expertise – including experience gained abroad – and qualifications are the key criteria here. For this reason, we do not consider it expedient to prioritize "the aim of appropriate representation of women" over expertise and qualifications.'

Generic or Substandard Explanation

AHLERS AG - 2015

'For organisational reasons, Ahlers AG does currently not make the consolidated financial statements publicly available within 90 days from the end of the fiscal year. The consolidated financial statements are published no later than 120 days after the end of the fiscal year.'

Future Compliance

K+S AG - 2017

'The compensation system for the Board of Executive Directors was not changed in 2017, so that it no longer Complied with the new recommendation in Section 4.2.3 Paragraph 2 Sentence 3 as of April 24, 2017. The recommendation will be Complied with in 2018 by an adjustment as of January 1, 2018.'

Firm-Specific explanation

First Sensor AG - 2016

'Up to June 16, 2016, the Board of Management was comprised of two persons. The term of office of the previous Chairman, Dr. Martin U. Schefter, expired on June 16, 2016. Until Dr. Dirk Roth-Weiler was appointed as his successor on January 1, 2017, the Board of Management will consist of only one person, with no Chairman or Spokesman.'

References

Aggarwal, R., Jindal, V., & Seth, R. (2019). Board diversity and firm performance: The role of business group affiliation. *International Business Review*, *28*(6), 101600.

Ali, S., Liu, B., & Su, J. J. (2018). Does corporate governance quality affect default risk? The role of growth opportunities and stock liquidity. *International Review of Economics & Finance*, 58, 422-448.

Bassen, A., Prigge, S., & Zöllner, C. (2009). Behind broad corporate governance aggregates: a first look at single provisions of the German Corporate Governance Code. *Corporate Ownership & Control*, 6(3), 388-406.

Bauer, R., Guenster, N., & Otten, R. (2004). Empirical evidence on corporate governance in Europe: The effect on stock returns, firm value and performance. *Journal of Asset Management*, 5, 91-104.

Beiner, S., Drobetz, W., Schmid, M. M., & Zimmermann, H. (2006). An integrated framework of corporate governance and firm valuation. *European Financial Management*, 12(2), 249-283.

Bhat, G., Hope, O. K., & Kang, T. (2006). Does corporate governance transparency affect the accuracy of analyst forecasts?. *Accounting & Finance*, *46*(5), 715-732.

Chhaochharia, V., & Grinstein, Y. (2007). Corporate governance and firm value: The impact of the 2002 governance rules. *The Journal of Finance*, 62(4), 1789-1825.

Christensen, H. B., Hail, L., & Leuz, C. (2019). Adoption of CSR and sustainability reporting standards: *Economic Analysis and Review* (Vol. 623). National Bureau of Economic Research Cambridge, MA, USA.

Christensen, J., Kent, P., Routledge, J., & Stewart, J. (2015). Do corporate governance recommendations improve the performance and accountability of small listed companies?. *Accounting & Finance*, *55*(1), 133-164.

Ciampi, F. (2015). Corporate governance characteristics and default prediction modeling for small enterprises. An empirical analysis of Italian firms. *Journal of Business Research*, *68*(5), 1012-1025.

Deegan, C. (2002). Introduction: The legitimising effect of social and environmental disclosures–a theoretical foundation. *Accounting, Auditing & Accountability Journal*, 15(3), 282-311.

Drobetz, W., Schillhofer, A., & Zimmermann, H. (2004). Corporate governance and expected stock returns: Evidence from Germany. *European Financial Management*, 10(2), 267-293.

Freeman, R. E., Wicks, A. C., & Parmar, B. (2004). Stakeholder theory and "the corporate objective revisited". *Organization Science*, 15(3), 364-369.

Freeman, R. E. (2010). Strategic management: A stakeholder approach. *Cambridge university press*.

Galle, A. (2014). 'Comply or explain' in Belgium, Germany, Italy, the Netherlands, and the UK: Insufficient explanations and an empirical analysis. *Corporate Ownership and Control* 12 (1): 862–873.

Goldstein, I., & Yang, L. (2019). Good disclosure, bad disclosure. *Journal of Financial Economics*, *131*(1), 118-138.

Goncharov, I., Werner, J. R., & Zimmermann, J. (2006). Does compliance with the German corporate governance code have an impact on stock valuation? An empirical analysis. *Corporate Governance: An International Review*, 14(5), 432-445.

Gordon, I. M., Hrazdil, K., & Shapiro, D. (2012). Corporate governance in publicly traded small firms: A study of Canadian venture exchange companies. *Business Horizons*, *55*(6), 583-591.

Hooghiemstra, R. (2012). What determines the informativeness of firms' explanations for deviations from the Dutch corporate governance code? *Accounting and Business Research*, 42(1), 1-27.

Jensen, M.C., & Meckling, W. H. (1976).Theory of the firm: Managerial behavior, agency costs, and ownership structure. *J. Finance. Econ*. 3, 305–360.

Jiraporn, P., Chatjuthamard, P., Tong, S., & Kim, Y. S. (2015). Does corporate governance influence corporate risk-taking? Evidence from the Institutional Shareholders Services (ISS). *Finance Research Letters*, 13, 105-112.

Kaspereit, T., Lopatta, K., & Zimmermann, J. (2015). Does compliance with the German Corporate Governance Code pay off? An investigation of the implied cost of capital. *The Journal of Risk Finance*, 16(3), 344-376.

Kent, P., Kent, R. A., Routledge, J., & Stewart, J. (2016). Choice of governance structure and earnings quality. *Accounting Research Journal*, *29*(4), 372-390.

Luo, Y., & Salterio, S. E. (2014). Governance quality in a "comply or explain" governance disclosure regime. *Corporate Governance: An International Review*, 22(6), 460-481.

Mahr, T. G., Nowak, E., & Rott, R. (2016). The (Ir) relevance of disclosure of compliance with corporate governance codes: Empirical evidence from the German stock market. *Journal of Institutional and Theoretical Economics (JITE)/Zeitschrift für die gesamte Staatswissenschaft*, 475-520.

Rashid, A. (2018). The influence of corporate governance practices on corporate social responsibility reporting. *Social Responsibility Journal*, 14(1), 20-39.

Renders, A., Gaeremynck, A., & Sercu, P. (2010). Corporate-Governance Ratings and Company Performance: A Cross-European Study. *Corporate Governance: An International Review*, 18(2).

Rose, C. (2016). Firm performance and comply or explain disclosure in corporate governance. *European Management Journal*, 34(3), 202-222.

Salterio, S. E., Conrod, J. E., & Schmidt, R. N. (2013). Canadian evidence of adherence to "comply or explain" corporate governance codes: An international comparison. *Accounting Perspectives*, 12(1), 23-51.

Seidl, D., Sanderson, P., & Roberts, J. (2013). Applying the 'comply-or-explain'principle: discursive legitimacy tactics with regard to codes of corporate governance. *Journal of Management & Governance*, 17, 791-826.

Shrives, P. J., & Brennan, N. M. (2015). A typology for exploring the quality of explanations for non-compliance with UK corporate governance regulations. *The British Accounting Review*, 47(1), 85-99.

Singh, K., & Pillai, D. (2022). Corporate governance in small and medium enterprises: a review. *Corporate Governance: The International Journal of Business in Society*, *22*(1), 23-41.

Stiglbauer, M. (2010). Transparency & disclosure on corporate governance as a key factor of companies' success: a simultaneous equations analysis for Germany. *Problems and Perspectives in Management*, 8(1), 161-173.

Talaulicar, T., & V. Werder, A. (2008). Patterns of compliance with the German corporate governance code. *Corporate Governance: An International Review*, 16(4), 255-273.

Ullah, S., Ahmad, S., Akbar, S., Kodwani, D., & Frecknall-Hughes, J. (2021). Governance disclosure quality and market valuation of firms in UK and Germany. *International Journal of Finance & Economics*, 26(4), 5031-5055.

v. Werder, A., Talaulicar, T., & Kolat, G. L. (2005). Compliance with the German corporate governance code: An empirical analysis of the compliance statements by German listed companies. *Corporate Governance: An International Review*, 13(2), 178-187.

Wintoki, M. B., Linck, J. S., & Netter, J. M. (2012). Endogeneity and the dynamics of internal corporate governance. *Journal of Financial Economics*, 105(3), 581-606.

4. Female Board Members and Corporate Risk: The Role of Executives' Commitment to Firm Status Quo in German Public Firms

4.1. Introduction

In traditional finance theory, information asymmetries and agency problems are considered to be the main drivers of the corporate decision-making process. However, individual preferences of managers may also result from personal characteristics, such as risk aversion between genders, overconfidence, differences in incentive structures, and individual unemployment risk. In addition, social norms regarding the preferable role of certain groups, such as women, may also influence decision choices (Faccio et al., 2016; Sila et al., 2016). Women are characterized as more risk-averse and less overconfident. While these arguments may describe average females in the general population, the literature documents that the aforementioned differences disappear if women enter top executive positions (Sila et al., 2016).

Prior empirical evidence regarding the association between gender diversity and risk-taking behavior is ambiguous. Faccio et al. (2016) and Huang and Kisgen (2013) find that women are less likely to issue debt, make acquisitions, and decrease earnings volatility. Matsa and Miller (2013) do not support this empirical evidence. They show that leverage is not affected after a mandatory gender quota on the board of directors is introduced in Norway. Similarly, studies that investigate the effect of board diversity on the cost of debt (Huang and Kisgen, 2013), equity risk (Sila et al., 2016), and corporate risk (Faccio et al., 2016) also exhibit mixed results. However, the empirical results on strategic decisions, such as investments in innovation, which may affect future growth, draw a clearer picture. Chen, Ni, and Tong (2016) find that gender diversity in boards ameliorates R&D-related risk management. Further, Bernile, Bhagwat, and Yonker (2018) show that U.S. firms with diverse boards tend to invest more in R&D. These results are consistent with psychological studies arguing that diverse teams are better at solving problems and are more innovative (Cao et al., 2021). In addition to differences such as the time period, country, and variable measurement, previous mixed empirical results may also be due to different commitments to the firm's status quo (CSQ) by female board members. Hambrick et al. (1993) have defined CSQ as "the strength of an executive's belief in the enduring correctness of current organizational strategies and profiles" (Hambrick et al., 1993: 402). They suggest that managers exhibit different levels of CSQ driven by individual, firm, and industry characteristics (Hambrick et al., 1993; Geletkanycz, 1997; Geletkanycz & Black, 2001). More precisely, McClelland et al. (2010) investigated the chief executive officer's (CEO) CSQ using a content analysis approach. After analyzing CEO letters

to shareholders, the authors find that multilevel attributes, such as slack resources, organization size, past firm performance, and managerial discretion, significantly affect CEO's CSQ. Executives' CSQ is assumed to be a "cognitive component of strategic rigidity" (McClelland et al, 2010: 1,252). A CEO with a strong commitment to a firm's status quo may not see any need for strategic change (Geletkanycz and Black, 2001). In this case, the CEO may actively avoid the strategic reorientation of the firm. However, a CEO with weak commitment to a firm's status quo is more likely to engage in more strategic changes to better prepare the firm for future challenges. This could explain why certain companies adapt better to environmental changes than others do (Behr & Fehre, 2019). The underlying argument refers to the upper echelons theory, which states that the strategic development of a firm reflects its executives' beliefs and experiences. It is assumed that the beliefs and experiences of top managers can be captured by demographic characteristics (Carpenter et al., 2004; Priem et al., 1999; Hambrick & Mason, 1984) and as well as organizational and environmental attributes (McClelland et al., 2010). Expanding on the above arguments that the composition of top management teams (TMT) is crucial in decision-making processes (Behr & Fehre, 2019), we investigate the CSQ of the executive board instead of focusing only on the CEO.

We address the effect of CSQ on the association between gender diversity and a firm's risk behavior by using the CSQ determinants suggested by McClelland et al. (2010). We first investigate whether gender diversity significantly affects the corporate risk-taking behavior of German public firms in terms of leverage and R&D expenditures. Second, we analyze whether commitment to firms' status quo moderates the association between gender diversity and risk-taking decisions.

We find consistent evidence of a negative association between gender diversity and leverage, although the statistical significance varies. The findings are significant at the 10% level in our main analysis and at the 5% level in the entropy-balanced sample, providing cautious support for hypothesis H1a; increase in female executives on the board is associated with decreased debt financing. But mere presence of at least one woman (which may indicate tokenism) does not allow for any inferences. Thus, the number of female board members appears essential for capturing the diversity effect. The results regarding R&D investments are highly significant and robust across all specifications, clearly confirming hypothesis H1b. The effect is more pronounced for a higher percentage of females than for at least one woman on the executive board.

Regarding the role of executives' commitment to the status quo (CSQ) in relation to gender diversity and risk-taking (Hypothesis H2), our findings require cautious interpretation.

The main analysis and Heckman procedure suggest no significant moderating effects of CSQ attributes, the entropy balancing results indicate some support for the moderating role of CSQ. Specifically, entropy balancing shows that CSQ may moderate the relationship between gender diversity and corporate risk-taking, particularly for leverage.

This study contributes to the literature in three ways: To the best of our knowledge, this is the first study to investigate the impact of gender diversity in executive board on the level of debt financing and R&D expenses for German non-financial firms. This could be due to the low percentage of female executives in the past, which significantly increased in the last decade from 1.35% in 2007 to 8.11% in 2018. Second, commitment to the status quo (CSQ) of firms has only examined in a limited number of studies (e.g., Hambrick et al., 1993; Geletkanycz, 1997; Geletkanycz & Black, 2001). We add to the existing literature on the association between gender diversity and a firm's financial characteristics by introducing an important aspect of organizational behavior: CSQ of firms. Third, we extend the CSQ argument to the entire executive board, since prior research shows that TMT and its composition are crucial in decision-making processes.

The remainder of this paper is organized as follows. Section 4.2 outlines the literature and develops the hypotheses. Section 4.3 presents the data and research design while section 4.4 describes descriptives and univariate results, and section 4.5 and 4.6 provide multivariate results, including endogeneity analyses. Finally, Section 4.7 concludes the paper.

4.2. Theoretical Background and Hypotheses Development

Traditional finance theories suggest that managers' corporate decisions maximize shareholder value in perfect capital markets. Information asymmetry and agency problems may significantly affect corporate decision-making processes. However, managers' preferences may also be driven by personal characteristics such as risk aversion between genders, overconfidence, differences in incentive structures, and individual unemployment risk. In addition, social norms regarding the preferable role of certain groups, such as women, may also influence decision choices (Faccio et al., 2016; Sila et al., 2016).

Literature in psychology, experimental economics, and behavioral finance find that women are more risk-averse than men (Croson & Gneezy, 2009; Bertrand, 2011). Byrnes et al. (1999) conducted a meta-analysis of 150 studies. They document that women are less likely to engage in risky experiments or gambling than men. Experiments on decision-making processes reveal that women make less risky choices than men do (e.g., Fehr-Duda et al., 2006; Levin et

al., 1988). Moreover, risk aversion is also reflected in more conservative investment decisions (Bernasek & Shwiff, 2001; Sunden & Surette, 1998)[4]. Females are also stated to be, on average, less overconfident than men (e.g., Lundeberg et al., 1994; Barber & Odean, 2001; Malmendier & Tate, 2005, 2008; Malmendier et al., 2011), which may explain why female executives are less likely to be involved in acquisitions and less likely to increase leverage compared to male executives (Huang & Kisgen, 2013).

However, prior literature differentiates between females in the general population and those in management positions. The differences in risk and overconfidence levels may disappear if women enter top executive positions. The empirical findings of Adams and Funk (2012) show that female directors are more risk-seeking than male directors in Sweden. Deaves et al. (2010) find no gender differences in the overconfidence level based on a sample of financial market practitioners in Germany, including professionals from commercial banks, investment firms, and other financial institutions.

Differences in incentive structures and individual unemployment risk may affect gender differences in risk-taking behavior. Women may decide to work in firms that offer more fixed-compensation contracts. Simultaneously, these firms may reveal lower corporate risk levels (Bandiera et al., 2015; Manning & Saidi, 2010). There is a self-selection argument regarding the unemployment risk. If corporate risk is negatively associated with job security, women may decide to work in firms with lower risk or to decrease firm risk once they become a CEO (Phelps & Mason, 1991).[5] Finally, social norms about the preferable role of certain groups in society may determine decision choices regarding the type of profession, industry, and firms in which females choose to engage (e.g., Altonji & Blank, 1999; Akerlof & Kranton, 2000; Guiso et al., 2008; Bertrand et al., 2010; Booth & Nolen, 2012).

4.2.1. Gender Diversity and Leverage

We focus on leverage as the first risk-taking measure because it captures the riskiness of corporate financing decisions (Faccio et al., 2016). Since high leverage ratios increase default risk, firms in financial distress due to a negative shock to their business operations may suffer higher profitability losses than firms with lower leverage ratios. The following studies provide an overview of prior empirical results on the association between gender diversity and debt

[4] See Croson and Gneezy (2009) for a literature review about gender differences in risk taking decisions.
[5] We address these confounding effects in the context of the endogeneity analyses in the empirical part of the study.

financing. Faccio et al. (2016) show that female CEOs decrease the volatility of earnings as well as the level of leverage compared to male CEOs in European private and publicly held firms. This study covers a sample of 18 European countries including the UK and demonstrates that the reduction in corporate risk-taking remains significant even after controlling for endogeneity.

Matsa and Miller (2013) analyze the introduction of a mandatory gender quota in Norway in 2006 and find no significant effect on leverage. Huang and Kisgen (2013) find that women are less likely to issue debt compared to their male counterparts in US listed firms, which is consistent with the theoretical argument that females are less overconfident in the context of financing decisions.

Most studies address whether gender-diverse boards influence the cost of debt. Fields et al. (2012) investigate the effects of bank loans on the cost and non-price terms for US S&P 500 firms. They find that firms with large, independent, experienced, and diverse boards, as well as with lower institutional ownership, face a lower cost of debt capital. Similarly, Francis et al. (2013) show that, on average, US S&P 1500 firms with female CFOs have to pay about 11% lower bank loan prices. Loan contracts have longer maturities and include less likely collaterals compared to loan agreements with firms having a male CFO. Luo et al. (2016) investigate a large sample of Chinese A-share listed firms operating from 2006 to 2012 and find that firms with women CEOs exhibit lower loan costs than their counterparts. This association is more prevalent in non-state-owned enterprises, firms without political connections, and non-crisis years. However, they did not reveal significant results for firms with female chairpersons, CFOs, or directors. In the context of small and medium enterprises in Europe, the results of Mascia and Rossi (2017) indicate that female-led firms receive worse price conditions for bank financing. In line with this finding, firms changing from female CFO to male CFO face lower interest rate levels. Tanaka (2014) examine a sample of Japanese corporate bond issues and find evidence that gender-diverse boards reduce the cost of corporate public debt, after considering corporate governance, bond and firm characteristics.

Regarding the impact of board diversity on firm risk, Wilson and Altanlar (2011) argue that gender diversity is negatively associated with insolvency risk. Empirical analyses have been conducted on more than 5.8 million firm-year observations of newly incorporated UK firms. However, Sila et al. (2016) analyze whether there is a causal link between gender diversity and equity firm risk in US firms. After using a dynamic model, they do not find evidence that female boardroom representation affects equity risk. They state that the negative association between gender diversity and firm risk may be driven by firm heterogeneity. In

summary, empirical results on the association between gender diversity and leverage, cost of debt, and firm risk are mixed.

From a theoretical and empirical perspective, the association between gender diversity in executive boards and financing decisions remains ambiguous; we assume that gender diversity significantly affects risk-taking decisions captured by leverage, without suggesting whether this association is positive or negative.

Hypothesis 1a: *Gender diversity on the executive board significantly affects corporate risk in terms of leverage*.

4.2.2. Gender Diversity and R&D

Our second risk measure are the research and development (R&D) expenses deflated by total assets. As the literature suggests, R&D investments are considered highly risky because future cash flows are uncertain (Chen et al., 2021). Kothari et al. (2002) show that the influence of R&D expenditures on future earnings volatility is three times higher than in case of capital expenditures. However, investing in innovation may foster future economic growth, thereby decreasing overall (real) risk taking (Bernile et al., 2018).

Studies on psychological and organizational behavior suggest that diversity allows multiple perspectives to improve the problem-solving ability of groups. In line with this, Hong and Page (2004) show that diverse teams are better problem-solvers, whereas Cao et al. (2021) find that diverse teams are more innovative.

Consistent with these implications, Bernile et al. (2018) find that diverse teams in the U.S. invest more in R&D. Similarly, Chen et al. (2021) indicate that female board members improve the board's effectiveness in R&D-related risk management. They find that inclusion of female executives on boards of US firms can enhance efficient risk-taking by improving R&D performance. Expanding on these findings, we assume that gender diversity in German executive boards fosters R&D expenditure to ensure future firm growth.

Hypothesis 1b: *Gender diversity on executive boards is positively associated with R&D expenditure.*

4.2.3. Moderating Effect of Executives' Commitment to Status Quo

McClelland, Liang, and Barker III (2010) pose the question of why some organizations are successfully changing their strategies whereas others resist altering established practices. One possible reason is that top executives differ in their personal incentives and values, which may affect their decision-making processes (Hambrick & Mason, 1984; Schwenk, 1995). To investigate the attitude of firms' top executives toward change, the management literature investigates several observable individual characteristics of top management, such as tenure and age (Finkelstein & Hambrick, 1990; Grimm & Smith, 1991; Henderson, Miller, & Hambrick, 2006; Miller, 1991; Wu, Levitas, & Priem, 2005). A further attribute considered by Hambrick, Geletkanycz, and Fredrickson (1993) is the cognitive construct of executive commitment to the status quo (CSQ). Based on upper echelons theory, an organization is a reflection of its top manager (Hambrick and Mason 1984; Carpenter et al. 2004). Hambrick et al. (1993) argue that commitment to a firm's status quo may affect the level of strategic change in an organization. CSQ has been defined as "the strength of an executive's belief in the enduring correctness of current organizational strategies and profiles" (Hambrick et al., 1993: 402). Prior studies find that executives exhibit different levels of CSQ, driven by individual, firm, and industry characteristics (Hambrick et al., 1993; Geletkanycz, 1997; Geletkanycz & Black, 2001). McClelland et al. (2010) investigated CEO letters to shareholders to directly measure CSQ. They find that attributes such as slack resources, organization size, past firm performance, and managerial discretion significantly determine the level of commitment to the status quo.

Slack resources are firm resources that exceed the resources required to ensure that firms operate their businesses. A firm with high slack resources provides top managers with higher flexibility to change inefficient or established practices in the current status quo at a low cost (Singh, 1986). Moreover, powerful stakeholders are less likely to disagree with the proposed changes (e.g., D'Aveni, 1989; Singh, 1986; Thompson, 1967). Organizational size can also be a determinant of CSQ. Large firms reveal elaborate structures and formal systems, which can only be difficult to change (Quinn & Cameron, 1983) and may thus result in high change management costs (Tushman & Romanelli, 1985).

The literature on the effect of past firm performance on commitment to the status quo argues that top executives have fewer reasons to change existing policies if past performance is high (Hambrick et al., 1993; Pettigrew, 1985; Starbuck & Milliken, 1988). Nevertheless, prior research finds evidence that periods of crisis may also be the reason why top executives

in low-performing firms neglect to induce change (Barker & Mone, 1998; Mone, McKinley, & Barker, 1998). We assume a higher probability of strategic change when past performance is low.

Moreover, managerial discretion may also determine the level of CSQ. Managerial discretion measures the latitude at which managers must make changes to existing organizational policies and strategies. This latitude depends to the industry environment (Hambrick & Finkelstein, 1987). In low-discretion industries, such as primary metals, textiles, and furniture, top executives have only limited opportunities to successfully implement changes regarding policies and practices of the status quo due to characteristics such as regulation constraints, low demand growth, and trading with commodities. In contrast, high-discretion industries can be more flexible regarding the (technology-intense) products and services, such as computer equipment and electronic components (e.g., Wu et al., 2005).

In summary, high and medium industry discretion, low firm performance, small firms, and more firm slack are potential determinants of less commitment to the firm's status quo (McClelland et al., 2010), thus inducing more strategic changes.

Based on the above-mentioned arguments, we expect that the CSQ of top management has a moderating impact on the association between gender diversity and corporate risk raking in terms of debt financing and R&D investments. If female executives on the board strongly commit themselves to the current status of the firm, they would not be inclined to induce changes; rather, they would prohibit any change. In contrast, if female executives are not strongly committed to the firms' current status, they will promote changes and new strategic avenues. Previous mixed empirical results may, therefore, be attributed to differences in executives' commitment to firms' status quo. Thus, Hypothesis 2 is formulated as follows:

Hypothesis 2: *The association between gender diversity in the executive board and corporate risk depends on commitment to a firm's status quo.*

4.3. Data and Research Design

4.3.1. Sample Selection

We investigate the public firms included in the DAX30, MDAX, and SDAX indices of the Frankfurt Stock Exchange in the prime standard from 2007 to 2018. We obtain financial data from Compustat Global. Data capturing gender diversity in the executive board has been

hand collected[6] from the annual reports of the companies. The initial sample consists of 136 firms and 1488 firm-year observations. We exclude firms with a single-tier board to ensure a homogenous board structure in our analyses. After excluding financial firms and firms with missing data, the total number reduces to 93 firms and 989 firm-year observations (see Table 4.1). All variables are winsorized at the 1st and 99th percentiles and with industries clustered at the two-digit SIC code level.

Table 4.1 **Sample Selection**

Data Selection		
	Firm-Year Observations	Number of firms
Initial sample include DAX30, MDAX and SDAX from 2007 to 2018	1488	136
Less Firms with single-tier board	105	11
Less Financial firms	221	20
Less Utilities	27	4
Less Firms with different currency	18	2
Less Implausible values	32	6
Less Missing data for variables	96	
Final sample for leverage model	989	93
Final sample for R&D model	794	85

Note. The distribution of the observations by year refers to the final number of firm-years used in the analyses.

4.3.2. Research design

Following Faccio et al. (2016) and Sila et al. (2016) we use an ordinary least square regression model to estimate the impact of gender diversity on firms' financial risk, captured by the leverage ratio in model (1) and by R&D-expenditures in model (2):

$$LEVERAGE_{it} = \alpha_0 + \beta_1 Gender\_Diversity_{it} + \beta_2 PROFITABILITY_{it} + \beta_3 GROWTH_{it} + \beta_4 SIZE_{it} + \beta_5 LIQUIDITY_{it} + \beta_6 TANGIBILITY_{it} + \beta_7 NDTAX_{it} + \beta_8 MARKET\_BOOK_{it} + \varepsilon_{it} \quad (1)$$

$$R\&D_{it} = \alpha_0 + \beta_1 Gender\_Diversity_{it} + \beta_2 GROWTH_{it} + \beta_3 SIZE_{it} + \beta_4 LIQUIDITY_{it} + \beta_5 TANGIBILITY_{it} + \beta_6 NDTAX_{it} + \beta_7 MARKET\_BOOK_{it} + \varepsilon_{it} \quad (2)$$

[6] The hand-collected data of gender descriptive correspond to numbers disclosed in the report to *Women executives barometer 2018: Top 200 Companies* (DIW Weekly Report, 2018).

LEVERAGE is measured as the ratio of total debt to total assets. The variable R&D is defined as research and development expenses deflated by total assets. The main variable of interest is Gender Diversity, which captures the following two proxies: FEM_EB_%, measured as the percentage of female members on the firm's executive board. The second proxy, FEM_EB_DUM, is an indicator variable that takes the value of 1 if there is at least one woman on the executive board and 0 otherwise. In this way, we not only analyze whether the existence of at least one female board member has an impact on strategic decision processes but also whether the number of female board members is important to capture the diversity effect on debt financing and R&D investment. Our sample contains a minimum of one and a maximum of two female board members per firm-year, with a total of 183 female executive board members across all companies and the sample period (see Table 4.2 for distribution).

The following control variables are defined at the end of fiscal year t (see Appendix 4A).

TANGIBILITY: Bevan and Danbolt (2002) and Titman and Wessels (1988) show that tangibility is positively associated with leverage. Thus, higher amounts of fixed assets facilitate access to debt. Tangibility is defined as tangible assets plus inventories divided by book assets (Chang et al. 2017). In addition, as companies with a higher proportion of tangible assets may have fewer resources to invest in R&D and tangible assets may be less dependent on R&D, we expect a negative association between R&D and tangibility.

PROFITABILITY and LIQUIDITY: Empirical evidence suggests that profitability and liquidity are negatively correlated with leverage (Titman & Wessels, 1988; Bevan & Danbolt, 2002). Firms with high profitability and liquidity levels have less need to increase their debt financing (Jensen 1986). Profitability is defined as the ratio of earnings before interest and taxes to the total assets. Liquidity is measured by current assets divided by current liabilities.

GROWTH: Growth opportunities measured as percentage change in total assets over the year may also affect the level of leverage (Manzur, 2007). Firms with higher growth require more funds to ensure future investments, thus increasing debt financing (Manzur, 2007; Titman & Wessels, 1988). Therefore, we predict a positive relationship between growth and leverage. Similarly, companies with higher growth may see R&D as a key driver of future growth, and may be more willing to invest in it. Hence, we expect a positive association between R&D and growth opportunities.

SIZE: Empirical studies show a positive association between debt and firm size (Bevan & Danbolt, 2002). Since large firms have better access to capital markets (Ferri & Jones, 1979) and tend to be diversified (Rajan & Zingales, 1995), they have a lower insolvency risk. Hence,

size may be an inverse proxy for insolvency risk. We therefore assume a positive association with debt. We measure size as the natural logarithm of total assets (Habib & Hasan, 2017; Gungoraydinoglu & Öztekin, 2011). We also expect a positive association between R&D and SIZE because larger companies may have more resources to invest in R&D, and may also have more R&D needs to maintain their competitive advantage.

NDTAX: Non-interest tax expenses, such as depreciation expenses, can serve as substitutes for debt tax shields (Manzur, 2007). We expect a negative association between leverage and non-debt tax shield. Non-debt tax shield is measured as depreciation divided by total assets. Regarding R&D and Non-interest tax expenses, we assume a positive association because companies with lower tax burdens may have more resources available to invest in R&D and R&D expenses can be tax-deductible.

MARKET_BOOK: The market-to-book ratio is defined as total assets minus the book value of common equity plus the market value of common equity scaled by total assets. We expect a negative association with leverage and a positive association with R&D expenditures.

In the context of commitment to status quo analyses following McClelland, Liang, and Barker III (2010) and Chiu et al. (2022), we use industry discretion, firm slack, firm past performance, and tenure and age of the executive board members to capture commitment to the status quo. We create three individual indices consisting of the variables discussed in the commitment to status quo literature. For the industry-based attributes of the CSQ, we use a dummy variable, IND_lowCSQ, to represent industry discretion. This variable is equal to 1 if firms belong to high- and medium-discretion industries (low CSQ) and 0 if they belong to low-discretion industries (high CSQ). Industry discretion is defined based on two-digit SIC codes. High to medium industry discretion captures computer equipment, electronic components, and industrial equipment industries, whereas low industry discretion includes the furniture, textiles, and primary metals industries. For firm-based CSQ attributes, we construct an index (FIRM_lowCSQ) using two variables, firm slack and past firm performance. Firm slack, measuring LIQUIDITY, is defined as current assets minus inventories, divided by current liabilities. Higher slack indicates more resources available for firms to take risks (or experiment), thus implying less commitment to the status quo. Firm past performance is calculated as a three-year moving average of return on assets. Specifically, firms with more slack are considered to have less CSQ, while the interpretation of past performance suggests that low past performance signals a need for change in current practices; therefore, low past performance is associated with less commitment to the status quo (low CSQ).

For individual-based CSQ attributes, we create an index (INDIV_lowCSQ) using the

two variables: tenure and age of female executive board members. Both measures are inversely related to commitment to the status quo, meaning that shorter tenure and younger age of female executives indicate less commitment to the status quo. Higher values of INDIV_lowCSQ represent less commitment to the status quo. Overall, we expect to find a stronger impact of gender diversity on corporate risk when there is less commitment to the status quo.

For all indices, we standardize the relevant attributes before summing them to create each index. These indices allow us to examine how different aspects of commitment to the status quo - at the industry, firm, and individual levels - may influence the relationship between gender diversity and risk-taking behavior.

4.4. Descriptive Statistics and Correlations

The average percentage of women on German boards is 12.19% (descriptive, untabulated) compared to approximately 11% in US public companies (Conyon & He, 2017) and 11.70% in Fortune 500 companies (Jurkus et al., 2011). A closer investigation of the executive and supervisory board ratios reveals that the majority of women, 15.29% are members in the supervisory board whereas only 3.34% are executive board members. This may be partly explained by the missing mandatory gender quota for executive boards in Germany.

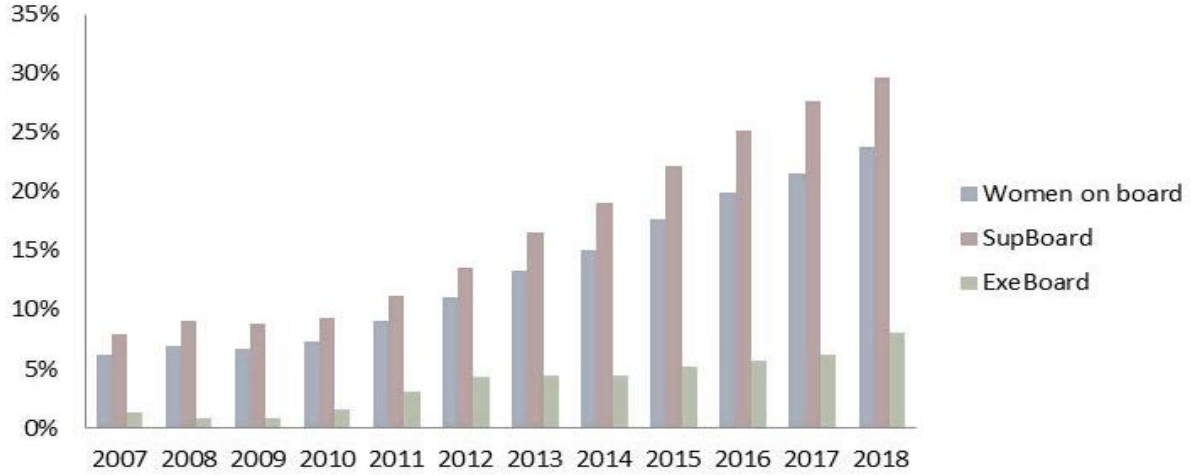
Table 4.2 presents the development of female executive board members of firms included in the DAX30[7] , MDAX[8] , and SDAX[9] indices. The time series analyses reveal that the executive boards of MDAX firms did not have any female directors until 2012. For DAX30 firms, the number of female executive board members significantly increased after 2010. In general, there is an overall positive trend of women being part of the executive board over the decade 2007 with 1.35% to 2018 with around 8%. Table 4.3 shows the descriptive statistics, the sample firms exhibit a lower leverage ratio of 21.74% compared to 32.40% of European firms run by female CEOs (Faccio et al., 2016). However, the leverage ratio is similar to that (21.9%) of US firms with at least one woman on board (Sila et al., 2016). The average profitability in our sample is 8.04% with a standard deviation of 6.79%, which is higher than 6.5% for US firms run by female CEOs (Sila et al., 2016).

[7] Frankfurt Stock Exchange Index of top 30 blue chip companies
[8] Top 50 firms listed on the Frankfurt Stock Exchange
[9] Top 70 firms listed on the Frankfurt Stock Exchange

Table 4.2 **Development of Gender Diversity in German Management Boards**

		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
DAX30	FEM_EB	1	1	1	4	8	13	10	11	13	15	18	20
	Total_EB	109	126	128	129	135	142	136	139	140	146	147	139
	FEM_EB_%	0.92%	0.79%	0.78%	3.10%	5.93%	9.15%	7.35%	7.91%	9.29%	10.27%	12.24%	14.39%
MDAX	FEM_EB	0	0	0	0	0	1	2	2	4	4	5	7
	Total_EB	83	86	89	101	116	116	115	130	120	131	135	110
	FEM_EB_%	0%	0%	0%	0%	0%	0.86%	1.74%	1.54%	3.33%	3.05%	3.70%	6.36%
SDAX	FEM_EB	3	2	2	2	4	3	5	5	4	5	5	5
	Total_EB	102	125	124	141	127	127	127	129	129	128	151	131
	FEM_EB_%	2.94%	1.60%	1.61%	1.42%	3.15%	2.36%	3.94%	3.88%	3.10%	3.91%	3.31%	3.82%

Figure 4.1 Relative Development of the Number of Women on Supervisory and Executive Boards (2007-2018)



Note. ExeBoard stands for executive board, and SupBoard stands for supervisory board. Women ratio (women on board) is defined as the percentage of female directors on both boards. SupBoard is the percentage of female members on the supervisory board, and ExeBoard is the percentage of female members on the executive board. The number of observations only refers to DAX30, MDAX, and SDAX firms included in our final sample.

The firms' growth is, on average, 6.65%, with a standard deviation of 14.05%. On an average, firms hold 62.49% more liquid assets after meeting their current liabilities. The mean firm size amounts to EUR 21,200 million. Moreover, 36.22% of the firms' assets can be held as collateral. The non-debt tax shield (NDTAX) ratio is 3.78%, and the mean market-to-book ratio is approximately 1.58

Table 4.3 **Descriptives**

Variables	Mean	Standard Deviation	25% Quartile	Median	75% Quartile
FEM_EB_%	0.0334	0.0816	0.0000	0.0000	0.0000
FEM_EB_DUM	0.1709	0.3766	0	0	0
LEVERAGE	0.2174	0.1447	0.1044	0.1994	0.3071
R&D	0.0317	0.0315	0.0071	0.0232	0.0473
PROFITABILITY	0.0804	0.0679	0.0441	0.0683	0.1019
GROWTH	0.0665	0.1405	0	0.0414	0.1049
SIZE : Ln(total assets)	8.3208	1.8216	7.0714	8.1943	9.5608
SIZE2 : total assets in million EUR	21200	44700	1340.608	4459	15800
TANGIBILITY	0.3622	0.1665	0.2468	0.3667	0.4716
NDTAX	0.0378	0.0192	0.0248	0.033	0.0474
MARKET_BOOK	1.5878	0.9803	1.0416	1.2808	1.7075
Tenure_FEM _EB	2.8333	2.7237	1	2	4
Age_FEM_EB	51.4899	8.1657	46	51	56
IND_lowCSQ	0.4317	0.4956	0	0	1
PAST_PERFORMANCE	0.0456	0.0505	0.02	0.0395	0.0616
LIQUIDITY	1.6249	0.6711	1.131	1.4812	1.9533

Note. N = 989 for the Leverage model and N = 794 for the R&D model All variables are winsorized at the 1st and 99th percentiles. For detailed variable definitions, see Appendix 4A.

Table 4.4 depicts the correlation analysis with the Pearson correlations below and Spearman correlation above the diagonal. The association between leverage and women on the executive board is negative and insignificant. Whereas the association between R&D and women on the executive board is positive and significant. A firm's leverage ratio is significantly positively associated with size (corr = .4) and non-debt tax shield (corr = .13) and significantly negatively associated with profitability (corr = -.17), market-to-book ratio (corr = -.3), and

liquidity (corr = -.37). A negative association between profitability and liquidity indicates that firms opt for more debt when they lack internal funding. In contrast, we find a significantly positive association between profitability (corr = .15), liquidity (corr = .25), and non-debt tax shields (corr .09) and R&D, suggesting that profitable firms invest more in R&D. Contrary to the expected positive association between R&D and SIZE, we find a significantly negative association (corr -.18). A possible explanation may be that firms invest more in R&D and have fewer resources available to invest in increasing their size. We also find that tangibility (corr -. -0.11) is negatively and significantly correlated with R&D. The correlation of leverage with growth and tangibility was insignificant in both Pearson correlation and Spearman correlation analyses. The correlation coefficients did not indicate severe multicollinearity.

Table 4.4 **Pearson and Spearman Correlation**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) LEVERAGE	1	-0.248***	0.026	0.046	-0.163***	0.015	-0.390***	0.391***	-0.016	0.180***	-0.274***
(2) R&D	-0.225***	1	0.077**	0.084**	0.218***	0.038	0.326***	-0.208***	-0.083**	0.070**	0.167***
(3) FEM_EB_%	-0.018	0.097***	1	0.993***	0.046	0.03	-0.142***	0.261***	-0.060*	0.017	0.098***
(4) FEM_EB_DUM	0.046	0.085**	0.911***	1	0.059*	0.037	-0.153***	0.294***	-0.069*	0.013	0.097***
(5) PROFITABILITY	-0.178***	0.157***	-0.031	0.001	1	0.295***	0.269***	-0.236***	-0.115***	0.059*	0.557***
(6) GROWTH	0.02	0.011	-0.008	0.006	0.233***	1	0.099***	-0.074**	-0.163***	-0.201***	0.230***
(7) LIQUIDITY	-0.371***	0.257***	-0.113***	-0.143***	0.348***	0.104***	1	-0.454***	0.224***	-0.074**	0.148***
(8) SIZE	0.395***	-0.185***	0.182***	0.313***	-0.243***	-0.090**	-0.460***	1	-0.092***	0.04	-0.195***
(9) TANGIBILITY	0	-0.112***	-0.021	-0.063*	-0.070**	-0.192***	0.108***	-0.055	1	0.347***	-0.288***
(10) NDTAX	0.131***	0.095***	0.026	0.006	0.028	-0.155***	-0.140***	0.021	0.329***	1	-0.036
(11) MARKET_BOOK	-0.302***	0.112***	0.037	0.036	0.661***	0.199***	0.363***	-0.277***	-0.228***	-0.112***	1

Note. For a definition of variables see Appendix 4A. All variables are winsorized at 1% and 99% percentiles. The number of firm-year observations is 989.
Pearson correlations are reported below the diagonal; Spearman correlations are above the diagonal. * p < .10, ** p < .05, *** p <

4.5. Association Between Gender Diversity and Corporate Risk

4.5.1. Main Results

First, we investigate whether gender diversity affects risk-taking behavior in terms of leverage (H1a) and R&D expenditure (H1b). Table 4.5 presents the results. We find a significantly negative association between female executives and debt ratio ($b = -0.1361$, $p < .10$). The effect size of the association is similar to the results of prior studies (Huang & Kisgen, 2013; Usman et al., 2019), indicating that an increased number of women on executive boards decreases debt financing, and thus, corporate risk for shareholders. In line with theoretical expectations, size and growth are positively associated with leverage, whereas liquidity and market-to-book ratio are negatively associated with debt capital. Using an alternative measure for gender diversity, FEM_EB_DUM (see Table 4.5, Column II), we find a negative but insignificant coefficient. In this case, the mere existence of (at least) one woman on the board does not affect a firm's strategic orientation.

For our second measure of corporate risk, the R&D expenses, we find strong evidence supporting our second hypothesis that female executives tend to invest more in R&D to avoid future risk exposure. Table 4.5 (Columns III and IV) shows a significantly positive association between the percentage of female board members (FEM_EB_% $b = 0.0748$, $p < .01$) and the indicator variable (FEM_EB_DUM $b = 0.0170$, $p < .01$) with R&D investments.

Overall, we find weak evidence for Hypothesis H1a and a negative association between gender diversity and leverage. The findings reveal that a higher number of female executives on the board significantly decreases debt funding in contrast to the mere existence of at least one woman on the board. The results regarding R&D investments are highly significant at the 1% level and robust across all specifications, strongly confirming Hypothesis H1b. The effect is more pronounced for a higher percentage of females than for at least one woman on the executive board. Thus, the number of female board members is essential for capturing the diversity effect.

Table 4.5 **Gender Diversity and Firm's Risk Taking**

Dependent variable:	(I) Coeff (t-value)	(II) Coeff (t-value)	(III) Coeff (t-value)	(IV) Coeff (t-value)
VARIABLES	**LEVERAGE**		**R&D**	
FEM_EB_ %	-0.1361*		0.0748***	
	(-1.8827)		(2.8327)	
FEM_EB_DUM		-0.0253		0.0170***
		(-1.3962)		(2.6780)
PROFITABILITY	0.2602	0.2727		
	(1.4669)	(1.5324)		
LIQUIDITY	-0.0270*	-0.0265*	0.0120***	0.0118**
	(-1.7307)	(-1.7002)	(2.6904)	(2.6337)
GROWTH	0.0711	0.0715	-0.0035	-0.0044
	(1.6327)	(1.6473)	(-0.3911)	(-0.4900)
SIZE	0.0211***	0.0217***	-0.0015	-0.0021
	(3.2300)	(3.3966)	(-0.8146)	(-1.0616)
TANGIBILITY	0.0002	-0.0026	-0.0402*	-0.0392
	(0.0023)	(-0.0321)	(-1.6862)	(-1.6489)
NDTAX	0.0068	0.0123	0.4039***	0.4041***
	(0.0103)	(0.0187)	(2.6782)	(2.6721)
MARKET_BOOK	-0.0424***	-0.0430***	-0.0011	-0.0013
	(-3.1466)	(-3.1912)	(-0.4011)	(-0.4511)
Constant	0.0978	0.0921	0.0279	0.0326
	(1.2333)	(1.1810)	(1.1305)	(1.3049)
Industry & Year FE	Yes	Yes	Yes	Yes
Mean VIF	1.83	1.84	1.85	1.86
F-statistics	4.87	4.55	6.23	5.49
Prob (F)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Observations	989	989	794	794
Adjusted R-squared	24%	24%	20%	20%

Note. This table presents the results of OLS regression models. The main dependent variables are LEVERAGE (defined as the ratio of the sum of short-term and long-term debt over book assets) and R&D (R&D expenses scaled by total assets). The sample consists of 989 firm-year observations for the LEVERAGE model and 794 for the R&D model. The coefficients are based on robust standard errors and clustered at the firm level. Industry and year fixed effects are included in all models. Industry effects are dummy variables defined at the 2-digit SIC level. All variables are winsorized at the 1st and 99th percentiles. For full variable definitions, see Appendix 4A. * p < .10, ** p < .05, *** p < .01

4.5.2. Endogeneity Analysis

Heckman Procedure

Our findings may suffer from endogeneity concerns, since either women can choose to apply in certain firms with low risk profile or firms with low risk profile prefer hiring females. Unobservable factors may influence both female executive board members and firm risk,

resulting in biased coefficient estimates. Therefore, we first perform a Heckman two-step estimation method, which is suitable to correct for selectivity bias (Lennox, Francis, and Wang, 2012). We follow Reguera-Alvarado et al. (2017) and use the variables LAW and INDEX as instruments[10] for the Heckman model. The first-stage regression predicts the probability of selection of female executive board members (see Table 4.7).

$$FEM\_EB\_DUM = \alpha_0 + \beta_1 PROFITABILITY_{it} + \beta_2 GROWTH_{it} + \beta_3 SIZE_{it} + \beta_4 LIQUIDITY_{it} + \beta_5 TANGIBILITY_{it} + \beta_6 NDTAX_{it} + \beta_7 MARKET\_BOOK_{it} + \beta_8 LAW_{it} + \beta_9 INDEX_{it} + \varepsilon_{it} \quad (3)$$

LAW captures the introduction of the mandatory gender quota for supervisory boards in year 2016. Although we are not investigating female participation in supervisory boards, but only in executive boards, we still expect that the introduction of a mandatory quota will enhance public pressure to increase female ratios at different levels in a company, implying top management positions, like the members of the executive board. LAW is an indicator variable taking the value of 1 for the years 2016 to 2018, and 0 otherwise. The second instrument, INDEX, is an indicator variable taking the value 1 if a firm is included in the DAX or MDAX index and 0 otherwise. Larger firms tend to have higher female ratios on executive boards than smaller firms do because larger firms face more social pressure to advocate for gender diversity. For example, in 2018, the percentage of female executives rose to 10.84% for large firms (DAX and MDAX) compared to 3.82% for smaller (SDAX) firms. Consistent with the results of previous studies (Faccio et al. 2016; Sila et al., 2016), we also include the firm-level variables of profitability, growth, size, liquidity, tangibility, non-debt tax shield, and market-to-book ratio. For the definitions of these variables, see Appendix 4A.

The second-stage Heckman results (Table 4.7, Panel A) indicate that the association between gender diversity and leverage loses statistical significance ($b = -0.0250$, $p > .10$) after accounting for potential selection bias. This finding suggests that the effect of gender diversity on leverage may be weaker than that initially observed for H1a. In contrast, the results strongly

[10] Prior studies used education, population, and director connectedness as suitable instruments to capture female employment choice (Sila et al., 2016; Jurkus et al., 2011). Due to missing data availability, we cannot use the variables education and director connectedness as instruments. Moreover, Jurkus et al. (2011) employed the increase in female resident population in states where firms operate. However, we cannot find a positive change in women population in states where the sample firms operate. Therefore, we cannot use this instrument in our analyses.

support Hypothesis 1b, which proposes that gender diversity on executive boards is positively associated with R&D expenditures. The positive relationship remains robust and statistically significant ($b = 0.0162$, $p < .01$) even after controlling for potential endogeneity (Table 4.7, Panel B). This reinforces our initial findings and provides stronger evidence of the positive impact of gender diversity on R&D investments.

Entropy Balancing

Additionally, we also use the entropy balancing method to control for endogeneity because it demands limited data input and produces balanced samples for the analyses. Entropy balancing is a multivariate reweighting method described by Hainmueller (2012) that allows the reweighting of the dataset such that the covariate distributions in the re-weighted data satisfy a set of specified moment conditions. We reweight the dataset such that the mean of all control variables is the same in both the treatment group and the control group. The treatment group consists of firms with at least one woman on the executive board (FEM_EB_DUM=1), whereas the control group consists only of firms with male executive board members (FEM_EB_DUM=0).

Table 4.8 presents the results of entropy balancing after weighting. The entropy balancing results show a significant negative relationship between gender diversity and leverage ($b = -0.0264$, $p < .05$) in the main model. This supports our initial findings and contrasts with the Heckman results, which showed a non-significant relationship. The entropy balancing results strengthen the evidence for H1a, suggesting that gender diversity indeed reduces corporate risk through lower leverage. Similarly, the results for R&D strongly confirm our main findings and the Heckman procedure outcome that there is a significant positive association between gender diversity and R&D investments ($b = 0.0145$, $p < .01$) in the main model. This provides robust support for H1b across different methodological approaches.

In summary, the entropy balancing results largely reinforce our main findings for H1a and H1b. Overall, the results indicate that gender diversity is associated with lower leverage and higher R&D investment, confirming its role in influencing corporate risk-taking.

4.6. The Moderating Effect of the Commitment to Status Quo

4.6.1. Main Results

We argue that the impact of gender diversity depends on commitment to the status quo within a firm. A high commitment to the status quo reflects a reluctance to allow any change. As suggested by McClelland and Barker (2010), we refer to organizational and environmental (industry) attributes such as slack resources, past firm performance, individual attributes, and managerial discretion to capture executives' commitment. In the context of our second hypothesis, we investigate how a company's commitment to the status quo (CSQ) influences the relationship between gender diversity on executive boards and corporate risk-taking. We find no significant interaction effects of any of the CSQ measures on leverage (See Table 4.6).

Our findings for R&D expenses, show that female executives significantly increase innovation investment across all specifications regardless of CSQ effect. This means that, contrary to our expectations, we find no significant moderating effects of CSQ on the relationship between gender diversity and R&D investments.

4.6.2. Endogeneity Analyses

Heckman Procedure

For robustness, Table 4.7 (Panel A and B) presents the findings of the second-stage Heckman test and confirms these findings regarding Hypothesis 2 after controlling for potential endogeneity. The interaction terms between female executive board representation and CSQ attributes at individual (INDIVI_lowCSQ) , firm (FIRM_lowCSQ), and industry (IND_lowCSQ) levels are not statistically significant. Therefore, we do not find support for moderating effects of CSQ on the relationship between gender diversity and either leverage or R&D investment. Overall, these results remain robust and consistent with our main findings.

Table 4.6 **Moderating Impact of CSQ on the Association Between Gender Diversity and Firm's Risk Taking**

Dependent variable:	(I) Coeff (t-value)	(II) Coeff (t-value)	(III) Coeff (t-value)	(IV) Coeff (t-value)	(V) Coeff (t-value)	(VI) Coeff (t-value)
VARIABLES	**Industry Discretion**		**Firm Attributes**		**Individual Attributes**	
	LEVERAGE	R&D	LEVERAGE	R&D	LEVERAGE	R&D
FEM_EB_%	-0.1135	0.0804***	-0.1196*	0.0772**	-0.1778*	0.0610***
	(-1.1745)	(2.7415)	(-1.6976)	(2.3864)	(-1.8495)	(2.6436)
IND_lowCSQ	-0.0110	-0.0034				
	(-0.3549)	(-0.4104)				
FEM_EB*IND_lowCSQ	-0.0855	-0.0214				
	(-0.4383)	(-0.5623)				
FIRM_lowCSQ			-0.0180**	0.0060***		
			(-2.4110)	(3.1410)		
FEM_EB*FIRM_lowCSQ			-0.0096	0.0022		
			(-0.2451)	(0.1058)		
INDIV_lowCSQ					0.0005	0.0001
					(0.0928)	(0.1523)
FEM_EB*INDIV_lowCSQ					-0.0154	-0.0047
					(-0.7977)	(-1.1676)
PROFITABILITY	0.2643		0.4746***		0.2689	
	(1.4851)		(2.6901)		(1.4986)	
LIQUIDITY	-0.0250	0.0128***			-0.0267*	0.0122***
	(-1.5640)	(2.6385)			(-1.7145)	(2.7026)
SIZE	0.0221***	-0.0012	0.0221***	-0.0023	0.0215***	-0.0014
	(3.0590)	(-0.6368)	(3.5412)	(-1.2805)	(3.3514)	(-0.7214)
GROWTH	0.0706	-0.0034	0.0987**	-0.0109	0.0705	-0.0037
	(1.6088)	(-0.3664)	(2.2975)	(-1.2357)	(1.6281)	(-0.4010)
TANGIBILITY	-0.0097	-0.0437*	-0.0005	-0.0303	0.0006	-0.0404*
	(-0.1166)	(-1.8017)	(-0.0058)	(-1.2272)	(0.0069)	(-1.6957)
NDTAX	0.1111	0.4359***	-0.2948	0.3710**	0.0069	0.4044***
	(0.1675)	(2.7264)	(-0.4655)	(2.3356)	(0.0106)	(2.6853)
MARKET_BOOK	-0.0424***	-0.0012	-0.0388***	-0.0052	-0.0428***	-0.0011
	(-3.2160)	(-0.4255)	(-2.9641)	(-1.4281)	(-3.1458)	(-0.3920)
Constant	0.0904	0.0256	0.0348	0.0572**	0.0933	0.0264
	(1.0857)	(1.0193)	(0.5059)	(2.5533)	(1.2077)	(1.0518)
Observations	989	794	960	771	989	794
Inudstry & Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Mean VIF	1.87	1.88	1.88	1.89	2.01	2.07
F-statistics	4.97	7.38	5.12	6.58	5.4	5.94
Prob (F)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Adjusted R-squared	24%	20%	27%	20%	24%	20%

Note. This table presents OLS regression results. The main dependent variables are LEVERAGE and R&D. Interaction terms test the moderating effects of industry discretion, firm attributes, and individual attributes on the relationship between gender diversity and risk-taking behavior. Industry discretion is a dummy variable (1 for high- and medium-discretion industries; 0 for low-discretion industries) based on two-digit SIC codes. Firm attributes combine slack and past performance; individual attributes use tenure and age of female executive board members. All three indices (attributes) are standardized before summing. Variables are winsorized at the 1st and 99th percentiles. Standard errors are robust and clustered at the firm level. Industry and year fixed effects are included. For full variable definitions, see Appendix 4A. * p < .10, ** p < .05, *** p < .01

Entropy Balancing

The entropy balancing results (Table 4.8, Columns 3 to 8) provide additional insights into this dynamic. Using the industry-based CSQ proxy, we find a marginally significant interaction effect ($b = -0.0374$, $p < .10$) which show that in industries more open to change (lower CSQ), the presence of women on the board is associated with slightly lower levels of debt. The effect of gender diversity remains, however, non-significant. The effect of female participation on R&D remains positive overall, however moderated, with a slight decrease in R&D spending ($b = -0.0097$, $p < .05$) in industries more open to change. At the firm level, our findings indicate that companies more willing to embrace change (lower CSQ) experience significantly lower debt levels when they have more female board members ($b = -0.0270$, $p < .01$), but this openness does not significantly affect R&D investments. Similarly, at the individual level, when board members show less commitment to maintaining the status quo, having more women on the board correlates with reduced debt levels ($b = -0.0212$, $p < .01$), yet this individual-level flexibility does not significantly influence R&D spending. These results suggest that a lower commitment to the status quo generally strengthens the association between gender diversity and reduced debt levels across industry, firm, and individual levels. However, the effects on R&D spending are limited.

The strong effects of FEM_EB_DUM on R&D expenditure support previous research indicating positive properties of TMT, such as enhanced problem-solving ability and higher creativity (Cao et al., 2021), which are evident regardless of the level of commitment to the status quo.

Table 4.7 Panel A **Two-Stage Heckman Regression- LEVERAGE**

Endogeneity Approach	Heckman Procedure							
	First Stage Regression				Second Stage Regression			
	Main Model	Industry Attributes	Firm Attributes	Individual Attributes	Main Model	Industry Attributes	Firm Attributes	Individual Attributes
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	FEM_EB_DUM				LEVERAGE			
FEM_EB_DUM					-0.0250	-0.0147	-0.0199	-0.0307
					(-1.3873)	(0.6056)	(0.2522)	(0.1278)
IND_lowCSQ		0.0128				-0.0087		
		(0.9643)				(0.7830)		
FIRM_lowCSQ			-0.1130				-0.0208**	
			(0.3230)				(0.0373)	
INDIV_lowCSQ				-0.3798***				-0.0003
				(0.0000)				(0.9718)
FEM_EB*IND_lowCSQ						-0.0254		
						(0.5691)		
FEM_EB* FIRM_lowCSQ							-0.0093	
							(0.4684)	
FEM_EB*INDIV_lowCSQ								-0.0114*
								(0.0922)
LAW	1.1772***	1.1783***	1.1727***	0.9178*				
	(2.7574)	(0.0050)	(0.0071)	(0.0533)				
INDEX	-0.5753*	-0.5771*	-0.6124*	-0.1046				
	(-1.8110)	(0.0620)	(0.0620)	(0.7012)				
Inverse Mills Ratio					0.0322	0.0324	0.0518	0.0365
					(0.4424)	(0.6562)	(0.4530)	(0.3510)
PROFITABILITY	0.0401	0.0451	0.8133	4.1247**	0.2600	0.2633	0.4911***	0.3782*
	(0.0184)	(0.9834)	(0.7399)	(0.0147)	(1.4596)	(0.1433)	(0.0066)	(0.0568)
LIQUIDITY	-0.2929	-0.2948		-0.1649	-0.0329	-0.0308		-0.0310*
	(-1.2923)	(0.2116)		(0.3483)	(-1.5750)	(0.1510)		(0.0693)
GROWTH	0.4660	0.4661	0.4835	0.0700	0.0806	0.0794	0.1139**	0.0724
	(0.7676)	(0.4429)	(0.4518)	(0.9196)	(1.5064)	(0.1443)	(0.0321)	(0.1039)
SIZE	0.3400***	0.3397***	0.3621***	0.2931***	0.0279*	0.0290*	0.0330**	0.0297***
	(3.1885)	(0.0015)	(0.0006)	(0.0032)	(1.8385)	(0.0619)	(0.0254)	(0.0058)
TANGIBILITY	0.5868	0.5960	0.1589	0.3921	0.0205	0.0101	0.0229	0.0172
	(0.9354)	(0.3621)	(0.8090)	(0.6143)	(0.2097)	(0.9196)	(0.7901)	(0.8476)
NDTAX	-2.0222	-2.1299	0.2198	-0.0636	-0.0969	0.0024	-0.4082	-0.0121
	(-0.3461)	(0.7511)	(0.9707)	(0.9906)	(-0.1440)	(0.9972)	(0.5058)	(0.9853)
MARKET_BOOK	0.3396***	0.3394***	0.3514***	0.0274	-0.0349*	-0.0350*	-0.0271	-0.0408***
	(2.7250)	(0.0062)	(0.0082)	(0.8121)	(-1.6641)	(0.0956)	(0.2053)	(0.0053)
Constant	-4.4887***	-4.4865***	-5.1370***	-4.3981***	-0.0370	-0.0461	-0.1958	-0.0708
	(-3.3405)	(0.0009)	(0.0000)	(0.0005)	(-0.1227)	(0.8787)	(0.5252)	(0.7090)
Observations	989	989	960	989	989	989	960	989
Pseudo R2 (R-squared)	22%	22%	21%	42%	26%	26%	29%	26%

Note. This table presents results from the Heckman two-stage regression models. The main dependent variable is LEVERAGE. The first stage includes instrument variables: LAW (dummy variable equal to 1 for 2016 and later) and INDEX (dummy variable equal to 1 for DAX30 and MDAX firms, 0 for SDAX). Interaction terms assess the moderating effects of industry, firm, and individual attributes on the relationship between gender diversity and risk-taking behavior. Standard errors are robust and clustered at the firm level. All variables are winsorized at the 1st and 99th percentiles. For full variable definitions, see Appendix 4A. * p < .10, ** p < .05, *** p < .01

Table 4.7 Panel B **Two-Stage Heckman Regression- R&D**

Endogeneity Approach	Heckman Procedure							
	First Stage Regression				Second Stage Regression			
	Main Model	Industry Attributes	Firm Attributes	Individual Attributes	Main Model	Industry Attributes	Firm Attributes	Individual Attributes
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	FEM_EB_DUM				R&D			
FEM_EB_DUM					0.0162***	0.0195**	0.0155**	0.0134**
					(2.6788)	(0.0101)	(0.0191)	(0.0116)
IND_lowCSQ		0.0107				-0.0038		
		(0.9730)				(0.6409)		
FIRM_lowCSQ			-0.0717				0.0069***	
			(0.5399)				(0.0005)	
INDIV_lowCSQ				-0.3705***				0.0039**
				(0.0000)				(0.0473)
FEM_EB*IND_lowCSQ						-0.0077		
						(0.3331)		
FEM_EB* FIRM_lowCSQ							-0.0002	
							(0.9689)	
FEM_EB*INDIV_lowCSQ								-0.0007
								(0.6295)
LAW	1.7646***	1.7660***	1.7836***	1.3821**				
	(3.2488)	(0.0008)	(0.0017)	(0.0271)				
INDEX	-0.9011**	-0.9021***	-1.0175***	-0.2078				
	(-2.5523)	(0.0087)	(0.0048)	(0.4877)				
Inverse Mills Ratio					-0.0217**	-0.0217**	-0.0218**	-0.0211**
					(-2.2471)	(0.0298)	(0.0174)	(0.0178)
PROFITABILITY								
LIQUIDITY	-0.2136	-0.2157		-0.0152	0.0145***	0.0155***		0.0121***
	(-0.8620)	(0.4046)		(0.9340)	(3.1435)	(0.0028)		(0.0078)
GROWTH	0.3772	0.3771	0.3580	-0.1138	-0.0055	-0.0056	-0.0114	-0.0004
	(0.6064)	(0.5440)	(0.5892)	(0.8851)	(-0.5771)	(0.5668)	(0.2334)	(0.9694)
SIZE	0.4399***	0.4394***	0.4743***	0.3703***	-0.0069**	-0.0065*	-0.0078**	-0.0073**
	(4.4214)	(0.0000)	(0.0000)	(0.0004)	(-2.0431)	(0.0566)	(0.0186)	(0.0271)
TANGIBILITY	0.0280	0.0377	-0.5898	-0.4431	-0.0469*	-0.0519**	-0.0308	-0.0368
	(0.0353)	(0.9620)	(0.4682)	(0.6069)	(-1.9312)	(0.0403)	(0.2105)	(0.1205)
NDTAX	1.5268	1.4334	5.0399	3.4931	0.4475***	0.4881***	0.3806**	0.3658**
	(0.2231)	(0.8575)	(0.4767)	(0.5940)	(3.0511)	(0.0022)	(0.0176)	(0.0162)
MARKET_BOOK	0.3563**	0.3567**	0.3674**	0.2797**	-0.0065	-0.0067	-0.0107**	-0.0063*
	(2.2895)	(0.0221)	(0.0496)	(0.0325)	(-1.5291)	(0.1328)	(0.0292)	(0.0882)
Constant	-5.7782***	-5.7759***	-6.3037***	-5.5949***	0.1379**	0.1351**	0.1723***	0.1408**
	(-4.0418)	(0.0001)	(0.0000)	(0.0001)	(2.2278)	(0.0341)	(0.0054)	(0.0146)
Observations	794	794	771	794	794	794	771	794
Pseudo R2 (R-squared)	25%	25%	26%	45%	25%	25%	26%	0.2327

Note. This table presents results from the Heckman two-stage regression models. The main dependent variable is R&D. The first stage includes instrument variables: LAW (dummy variable equal to 1 for 2016 and later) and INDEX (dummy variable equal to 1 for DAX30 and MDAX firms, 0 for SDAX). Interaction terms assess the moderating effects of industry, firm, and individual attributes on the relationship between gender diversity and risk-taking behavior. Standard errors are robust and clustered at the firm level. All variables are winsorized at the 1st and 99th percentiles. For full variable definitions, see Appendix 4A. * p < .10, ** p < .05, *** p < .01

Table 4.7 **Entropy Balancing**

VARIABLES	(1) LEVERAGE	(2) R&D	(3) LEVERAGE	(4) R&D	(5) LEVERAGE	(6) R&D	(7) LEVERAGE	(8) R&D
	Main Model		**Commitment to Status Quo (CSQ) -Index**					
			Industry		**Firm**		**Individual**	
FEM_EB_DUM	-0.0264**	0.0145***	-0.0100	0.0190***	-0.0254**	0.0139***	-0.0328***	0.0120***
	(0.0154)	(0.0000)	(0.5007)	(0.0000)	(0.0174)	(0.0000)	(0.0094)	(0.0000)
IND_lowCSQ			0.0291*	-0.0130***				
			(0.0945)	(0.0004)				
FEM_EB*IND_lowCSQ			-0.0374*	-0.0097**				
			(0.0959)	(0.0281)				
FIRM_lowCSQ					-0.0032	0.0086***		
					(0.5683)	(0.0000)		
FEM_EB*FIRM_lowCSQ					-0.0270***	-0.0030		
					(0.0004)	(0.1849)		
INDIV_lowCSQ							0.0161***	0.0008
							(0.0000)	(0.5887)
FEM_EB*INDIV_lowCSQ							-0.0212***	-0.0019
							(0.0000)	(0.2161)
PROFITABILITY	0.6113***		0.6141***		0.7771***		0.6518***	
	(0.0041)		(0.0031)		(0.0009)		(0.0028)	
LIQUIDITY	-0.0254**	0.0176***	-0.0266**	0.0221***			-0.0227**	0.0181***
	(0.0107)	(0.0000)	(0.0121)	(0.0000)			(0.0226)	(0.0000)
GROWTH	0.1964***	0.0271***	0.1906***	0.0267***	0.2146***	0.0285**	0.2194***	0.0291***
	(0.0000)	(0.0021)	(0.0001)	(0.0084)	(0.0000)	(0.0110)	(0.0000)	(0.0045)
SIZE	0.0229***	-0.0014	0.0230***	0.0004	0.0229***	-0.0029***	0.0248***	-0.0010
	(0.0000)	(0.1713)	(0.0000)	(0.6433)	(0.0000)	(0.0060)	(0.0000)	(0.2897)
TANGIBILITY	0.0560	-0.0395***	0.0689	-0.0671***	0.0659	-0.0274**	0.0630	-0.0388***
	(0.3020)	(0.0007)	(0.1941)	(0.0000)	(0.2127)	(0.0232)	(0.2510)	(0.0008)

VARIABLES	(1) LEVERAGE	(2) R&D	(3) LEVERAGE	(4) R&D	(5) LEVERAGE	(6) R&D	(7) LEVERAGE	(8) R&D
	Main Model		**Commitment to Status Quo (CSQ) -Index**					
			Industry		**Firm**		**Individual**	
NDTAX	-0.5590*	0.6180***	-0.7039*	0.8327***	-0.8799***	0.6299***	-0.5365	0.6363***
	(0.0989)	(0.0000)	(0.0691)	(0.0000)	(0.0068)	(0.0000)	(0.1029)	(0.0000)
MARKET_BOOK	-0.0549***	-0.0034*	-0.0559***	-0.0037**	-0.0597***	-0.0086***	-0.0576***	-0.0033*
	(0.0000)	(0.0622)	(0.0000)	(0.0320)	(0.0000)	(0.0015)	(0.0000)	(0.0656)
Constant	0.0551	0.0063	0.0476	-0.0039	0.0145	0.0527***	0.0275	0.0020
	(0.4070)	(0.6592)	(0.4967)	(0.7698)	(0.8337)	(0.0006)	(0.6875)	(0.8795)
Observations	989	794	989	794	960	771	989	794
R-squared	42%	48%	42%	53%	43%	47%	43%	48%

Note. This table presents results from entropy balancing regression models for LEVERAGE and R&D. Entropy balancing is used to address potential endogeneity by reweighting the data to achieve covariate balance. Interaction terms assess the moderating effects of industry, firm, and individual attributes on the relationship between gender diversity and risk-taking behavior. Standard errors are robust and clustered at the firm level. All variables are winsorized at the 1st and 99th percentiles. For full variable definitions, see Appendix 4A. * p < .10, ** p < .05, *** p < .01

4.7. Conclusion

Our study investigates whether gender diversity affects corporate risk-taking in terms of leverage and R&D expenses and whether this association is moderated by executives' commitment to the status quo. Women are characterized as more risk-averse and less overconfident. However, previous empirical results show mixed results regarding the effect of female executive board members on corporate decisions. One possible explanation may be the different commitment to the firm's status quo (CSQ), in the sense of a "cognitive component of strategic rigidity" (McClelland et al, 2010: 1,252). A CEO with strong commitment to firm's status quo is less likely to make in strategic changes than a CEO with weak commitment to firm's status quo. The underlying reasoning refers to the upper echelons theory, suggesting that a firm's strategic development reflects its executives' beliefs and experiences. Expanding on the argument that the composition of top management teams (TMT) is crucial in decision-making processes (Behr & Fehre, 2019), we investigate the CSQ of the executive board instead of focusing only on the CEO. First, we theorize that gender diversity significantly affects corporate risk in terms of leverage (H1a) and R&D expenditure (H1b). Further, we expect CSQ to moderate the association between gender diversity and corporate risk in terms of leverage and R&D expenditure (hypothesis H2).

Regarding the relationship between gender diversity and leverage (H1a), we find a consistent negative association across all methods. In our main model, this relationship is weakly significant at the 10% level. However, after addressing potential endogeneity concerns through entropy balancing, the association strengthens to a 5% significance level, providing more robust support for H1a. Overall, these results suggest that increased gender diversity on executive boards is associated with lower leverage. We find support for H1b, as our results consistently show a positive and statistically significant association between female board representation (FEM_EB) and R&D expenditure across all models, supporting our hypothesis that gender diversity positively impacts R&D investment. Regarding the moderating role of CSQ (H2), our findings of Heckman procedure suggest no significant moderating effects of CSQ. However, the entropy balancing results provide more subtle insights, particularly showing that lower CSQ tends to amplify the negative relationship between gender diversity and leverage across industry, firm, and individual index levels.

Our study contributes to the upper echelons theory by demonstrating how executives' beliefs and expectations, as captured by their commitment to the status quo, can influence strategic decisions. It also expands previous insights into CEO's CSQ to the entire executive

board team, highlighting the importance of considering board-level dynamics. Although our study provides valuable insights, it is subject to limitations. The restricted data on individual characteristics of female board members and the lack of information on education and board networks limit our ability to fully explore potential endogeneity issues. Future research could address these limitations by incorporating more detailed individual-level data and exploring additional instrumental variables. In conclusion, our study demonstrates that the relationship between gender diversity and corporate risk-taking is multifaceted highlighting the need for thoughtful consideration in board composition and diversity policies.

Appendix 4A: **Definition of Variables**

Variable	Definition
Gender Diversity	
FEM_EB_%	Percentage of female board members in the management board.
FEM_EB_DUM	Women dummy is equal to 1 if there is at least one female member in the management board and 0 otherwise.
Control Variables	
LEVERAGE	Ratio of the sum of short term and long-term debt over book assets.
PROFITABILITY	Return on company's total assets.
GROWTH	Percentage change in total assets over the year.
SIZE	Natural logarithm of total assets
MAKET TO BOOK	Total assets minus the book value of common equity plus the market value of common equity scaled by total assets.
TANGIBILITY	Tangible assets plus inventories over book assets.
NDTAX	Non-debt tax shield is defined as depreciation over total assets.
R&D	R&D expenses scaled by total assets.
CSQ Variables	***For each CSQ index, we sum the standardized relevant variables***
FIRM_lowCSQ	**Firm-based CSQ Index**
PAST_PERFORMANCE	3 year moving average of ROA
LIQUIDITY	Current assets less inventories scaled by current liabilities.
INDIV_lowCSQ	**Individual attributes-based CSQ Index**
Tenure_FEM _EB	Mean tenure of female management board members.
Age_FEM_EB	Mean age of female management board members.
IND_lowCSQ	Dummy equals to 1 if firms belong to Computers, electrical equipment, IT (High Industry Discretion)
	Dummy equals to 0 if firms belong to Chemical, Textile, Furniture industries (Low Industry Discretion)
Instrumental Variables	
LAW	Dummy variable equal to 1 for the year 2016 and later and 0 otherwise.
INDEX	Dummy variable equal to 1 if firms are part of DAX30 and MDAX indices and 0 if firms are part of SDAX index.

References

Adams, R. B., & Ferreira, D. (2009). Women in the boardroom and their impact on governance and performance. *Journal of Financial Economics*, *94*(2), 291-309.

Adams, R. B., & Funk, P. (2012). Beyond the glass ceiling: Does gender matter?. *Management Science*, *58*(2), 219-235.

Ahern, K. R., & Dittmar, A. K. (2012). The changing of the boards: The impact on firm valuation of mandated female board representation. *The Quarterly Journal of Economics*, *127*(1), 137-197.

Akerlof, G. A., & Kranton, R. E. (2000). Economics and identity. *The Quarterly Journal of Economics*, *115*(3), 715-753.

Almeida, H., & Campello, M. (2007). Financial constraints, asset tangibility, and corporate investment. *The Review of Financial Studies*, *20*(5), 1429-1460.

Altonji, J. G., & Blank, R. M. (1999). Race and gender in the labor market. *Handbook of Labor Economics*, *3*, 3143-3259.

Bandiera, O., Guiso, L., Prat, A., & Sadun, R. (2015). Matching firms, managers, and incentives. *Journal of Labor Economics*, *33*(3), 623-681.

Barber, B. M., & Odean, T. (2001). Boys will be boys: Gender, overconfidence, and common stock investment. *The Quarterly Journal of Economics*, *116*(1), 261-292.

Barker, V. L., & Mone, M. A. (1998). The mechanistic structure shift and strategic reorientation in declining firms attempting turnarounds. *Human Relations*, *51*(10), 1227-1258.

Behr, H., & Fehre, K. (2019). CEO succession and the CEO's commitment to the status quo. *Business Research*, *12*(2), 355-381.

Bernasek, A., & Shwiff, S. (2001). Gender, risk, and retirement. *Journal of Economic Issues*, *35*(2), 345-356.

Bernile, G., Bhagwat, V., & Yonker, S. (2018). Board diversity, firm risk, and corporate policies. *Journal of Financial Economics*, *127*(3), 588-612.

Bertrand, M., Goldin, C., & Katz, L. F. (2010). Dynamics of the gender gap for young professionals in the financial and corporate sectors. *American Economic Journal: Applied Economics*, *2*(3), 228-55.

Bevan, A. A., & Danbolt, J. (2002). Capital structure and its determinants in the UK-a decompositional analysis. *Applied Financial Economics*, *12*(3), 159-170.

Booth, A. L., & Nolen, P. (2012). Gender differences in risk behaviour: does nurture matter?. *The Economic Journal*, *122*(558), F56-F78.

Byrnes, J. P., Miller, D. C., & Schafer, W. D. (1999). Gender differences in risk taking: a meta-analysis. *Psychological Bulletin*, *125*(3), 367.

Cao, C., Li, X., Li, X., Zeng, C., & Zhou, X. (2021). Diversity and inclusion: Evidence from corporate inventors. *Journal of Empirical Finance*, 64, 295-316.

Carpenter, M. A., Geletkanycz, M. A., & Sanders, W. G. (2004). Upper echelons research revisited: Antecedents, elements, and consequences of top management team composition. *Journal of Management*, *30*(6), 749-778.

Carter, D. A., Simkins, B. J., & Simpson, W. G. (2003). Corporate governance, board diversity, and firm value. *Financial Review*, *38*(1), 33-53.

Chang, Y., Benson, K., & Faff, R. (2017). Are excess cash holdings more valuable to firms in times of crisis? Financial constraints and governance matters. *Pacific-Basin Finance Journal*, *45*, 157-173.

Chen, R., Tong, J. Y., Zhang, F. F., & Zhou, G. S. (2021). Do female directors enhance R&D performance?. *International Review of Economics & Finance*, 74, 253-275.

Chen, S., Ni, X., & Tong, J. Y. (2016). Gender diversity in the boardroom and risk management: A case of R&D investment. *Journal of Business Ethics*, *136*, 599-621.

Chiu, S. C. S., Pathak, S., Hoskisson, R. E., & Johnson, R. A. (2022). Managerial commitment to the status quo and corporate divestiture: can power motivate openness to change?. *The Leadership Quarterly*, *33*(3), 101459.

Conyon, M. J., & He, L. (2017). Firm performance and boardroom gender diversity: A quantile regression approach. *Journal of Business Research*, *79*, 198-211.

Croson, R., & Gneezy, U. (2009). Gender differences in preferences. *Journal of Economic Literature*, *47*(2), 448-74.

Deaves, R., Lüders, E., & Schröder, M. (2010). The dynamics of overconfidence: Evidence from stock market forecasters. *Journal of Economic Behavior & Organization*, *75*(3), 402-412.

Faccio, M., Marchica, M. T., & Mura, R. (2016). CEO gender, corporate risk-taking, and the efficiency of capital allocation. *Journal of Corporate Finance*, *39*, 193-209.

Fehr-Duda, H., De Gennaro, M., & Schubert, R. (2006). Gender, financial risk, and probability weights. *Theory and Decision*, *60*(2-3), 283-313.

Ferreira, D. (2010). Board diversity. *Corporate Governance: A Synthesis of Theory, Research, and Practice*, 225-242.

Ferri, M., & Jones, W. (1979). Determinants of financial structure: A new methodological approach. *Journal of Finance*, 34(3), 631–644.

Fields, L. P., Fraser, D. R., & Subrahmanyam, A. (2012). Board quality and the cost of debt capital: The case of bank loans. *Journal of Banking & Finance*, *36*(5), 1536-1547.

Finkelstein, S., & Hambrick, D. C. (1990). Top-management-team tenure and organizational outcomes: The moderating role of managerial discretion. *Administrative Science Quarterly*, 484-503.

Francis, B., Hasan, I., & Wu, Q. (2013). The Impact of CFO Gender on Bank Loan Contracting. *Journal of Accounting, Auditing & Finance*, 28(1), 53–78.

Geletkanycz, M. A. (1997). The salience of 'culture's consequences': The effects of cultural values on top executive commitment to the status quo. *Strategic Management Journal*, *18*(8), 615-634.

Geletkanycz, M. A., & Black, S. S. (2001). Bound by the past? Experience-based effects on commitment to the strategic status quo. *Journal of Management*, *27*(1), 3-21.

Gregory-Smith, I., Main, B. G., & O'Reilly III, C. A. (2014). Appointments, pay and performance in UK boardrooms by gender. *The Economic Journal*, *124*(574), F109-F128.

Grimm, C. M., & Smith, K. G. (1991). Research notes and communications management and organizational change: A note on the railroad industry. *Strategic Management Journal*, *12*(7), 557-562.

Guiso, L., Monte, F., Sapienza, P., & Zingales, L. (2008). Culture, gender, and math. *Science* 320, 1164–1165.

Gungoraydinoglu, A., & Öztekin, Ö. (2011). Firm-and country-level determinants of corporate leverage: Some new international evidence. *Journal of Corporate Finance*, *17*(5), 1457-1474.

Habib, A., & Hasan, M. M. (2017). Social capital and corporate cash holdings. *International Review of Economics & Finance*, *52*, 1-20.

Hainmueller, J. (2012). Entropy balancing for causal effects: A multivariate reweighting method to produce balanced samples in observational studies. *Political Analysis*, 20(1), 25-46.

Hambrick, D. C., & Mason, P. A. (1984). Upper echelons: The organization as a reflection of its top managers. *Academy of Management Review*, *9*(2), 193-206.

Hambrick, D. C., Geletkanycz, M. A., & Fredrickson, J. W. (1993). Top executive commitment to the status quo: Some tests of its determinants. *Strategic Management Journal*, *14*(6), 401-418.

He, Z., & Wintoki, M. B. (2016). The cost of innovation: R&D and high cash holdings in US firms. *Journal of Corporate Finance*, *41*, 280-303.

Henderson, A. D., Miller, D., & Hambrick, D. C. (2006). How quickly do CEOs become obsolete? Industry dynamism, CEO tenure, and company performance. *Strategic Management Journal*, *27*(5), 447-460.

Holst, E., & Wrohlich, K. (2018). Top-decision making bodies of large businesses: Gender quota for supervisory boards is effective-development is almost at a standstill for executive boards. *DIW Weekly Report*, *8*(3), 17-31.

Hong, L., & Page, S. E. (2004). Groups of diverse problem solvers can outperform groups of high-ability problem solvers. *Proceedings of the National Academy of Sciences*, *101*(46), 16385-16389.

Huang, J., & Kisgen, D. J. (2013). Gender and corporate finance: Are male executives overconfident relative to female executives?. *Journal of Financial Economics*, *108*(3), 822-839.

Jurkus, A. F., Park, J. C., & Woodard, L. S. (2011). Women in top management and agency costs. *Journal of Business Research*, *64*(2), 180-186.

Kothari, S. P., Laguerre, T. E., & Leone, A. J. (2002). Capitalization versus expensing: Evidence on the uncertainty of future earnings from capital expenditures versus R&D outlays. *Review of Accounting Studies*, *7*(4), 355-382.

Lennox, C. S., Francis, J. R., & Wang, Z. (2012). Selection models in accounting research. *The Accounting Review*, 87(2), 589-616.

Levin, I. P., Snyder, M. A., & Chapman, D. P. (1988). The interaction of experiential and situational factors and gender in a simulated risky decision-making task. *The Journal of Psychology*, *122*(2), 173-181.

Liu, Y., Wei, Z., & Xie, F. (2014). Do women directors improve firm performance in China?. *Journal of Corporate Finance*, *28*, 169-184.

Lundeberg, M. A., Fox, P. W., Brown, A. C., & Elbedour, S. (2000). Cultural influences on confidence: Country and gender. *Journal of Educational Psychology*, *92*(1), 152.

Luo, J. H., Huang, Z., Li, X., & Lin, X. (2018). Are women CEOs valuable in terms of bank loan costs? Evidence from China. *Journal of Business Ethics*, *153*(2), 337-355.

Malmendier, U., & Tate, G. (2005). Does overconfidence affect corporate investment? CEO overconfidence measures revisited. *European Financial Management*, *11*(5), 649-659.

Malmendier, U., & Tate, G. (2008). Who makes acquisitions? CEO overconfidence and the market's reaction. *Journal of Financial Economics*, *89*(1), 20-43.

Malmendier, U., Tate, G., & Yan, J. (2011). Overconfidence and early-life experiences: the effect of managerial traits on corporate financial policies. *The Journal of Finance*, *66*(5), 1687-1733.

Manning, A., & Saidi, F. (2010). Understanding the gender pay gap: what's competition got to do with it?. *ILR Review*, *63*(4), 681-698.

Mascia, D. V., & Rossi, S. P. (2017). Is there a gender effect on the cost of bank financing?. *Journal of Financial Stability*, *31*, 136-153.

Matsa, D. A., & Miller, A. R. (2013). A female style in corporate leadership? Evidence from quotas. *American Economic Journal: Applied Economics*, *5*(3), 136-69.

Mazur, K. (2007). The determinants of capital structure choice: evidence from Polish companies. *International Advances in Economic Research*, *13*(4), 495-514.

McClelland, P. L., Liang, X., & Barker III, V. L. (2010). CEO commitment to the status quo: Replication and extension using content analysis. *Journal of Management*, *36*(5), 1251-1277.

Miller, D. (1991). *Material culture and mass consumption*. Blackwell Pub.

Mone, M. A., McKinley, W., & Barker III, V. L. (1998). Organizational decline and innovation: A contingency framework. *Academy of Management Review*, *23*(1), 115-132.

Pettigrew, A. M. (1985). Contextualist research and the study of organizational change processes. *Research Methods in Information Systems*, *1*, 53-78.

Phelps, S., & Mason, M. (1991). When women lose their jobs. *Personnel Journal*, 70, 64–66.

Priem, R. L., Lyon, D. W., & Dess, G. G. (1999). Inherent limitations of demographic proxies in top management team heterogeneity research. *Journal of Management*, *25*(6), 935-953.

Quinn, R. E., & Cameron, K. (1983). Organizational life cycles and shifting criteria of effectiveness: Some preliminary evidence. *Management Science*, *29*(1), 33-51.

Rajan, R. G., & Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. *Journal of Finance*, 50(5), 1421–1460

Reguera-Alvarado, N., De Fuentes, P., & Laffarga, J. (2017). Does board gender diversity influence financial performance? Evidence from Spain. *Journal of Business Ethics*, *141*, 337-350.

Sánchez-Vidal, F. J. (2014). High debt companies' leverage determinants in Spain: A quantile regression approach. *Economic Modelling*, *36*, 455-465.

Schwenk, C. R. (1995). Strategic decision making. *Journal of Management*, *21*(3), 471-493.

Sila, V., Gonzalez, A., & Hagendorff, J. (2016). Women on board: Does boardroom gender diversity affect firm risk?. *Journal of Corporate Finance*, *36*, 26-53.

Singh, J. V. (1986). Performance, slack, and risk taking in organizational decision making. *Academy of Management Journal*, *29*(3), 562-585.

Starbuck, W. H., & Milliken, F. J. (1988). Challenger: Fine-tuning the odds until something breaks. *Journal of Management Studies*, *25*(4), 319-340.

Sunden, A. E., & Surette, B. J. (1998). Gender differences in the allocation of assets in retirement savings plans. *The American Economic Review*, *88*(2), 207-211.

Tanaka, T. (2014). Gender diversity in the boards and the pricing of publicly traded corporate debt: evidence from Japan. *Applied Financial Economics*, *24*(4), 247-258.

Thompson, E. P. (1967). Time, work-discipline, and industrial capitalism. *Past & Present*, (38), 56-97.

Titman, S., & Wessels, R. (1988). The determinants of capital structure choice. *The Journal of Finance*, *43*(1), 1-19.

Tushman, M. L., & Romanelli, E. (1985). Organizational evolution: A metamorphosis model of convergence and reorganization. *Research in Organizational Behavior*, 7, 171–222

Usman, M., Farooq, M. U., Zhang, J., Makki, M. A. M., & Khan, M. K. (2019). Female directors and the cost of debt: does gender diversity in the boardroom matter to lenders? *Managerial Auditing Journal*, 34(4), 374-392.

Wilson, N., & Altanlar, A. (2011). The Survival of Newly Incorporated Companies and the Impact of Founding Director Characteristics (Working Paper). *Credit Management Research Centre, University of Leeds* - Division of Accounting and Finance.

Wu, S., Levitas, E., & Priem, R. L. (2005). CEO tenure and company invention under differing levels of technological dynamism. *Academy of Management Journal*, *48*(5), 859-873.

5. Conclusion

This thesis offers a comprehensive overview of corporate governance from two critical perspectives: governance disclosures and firm-level characteristics. The systematic literature review in Chapter 2 reveals that the 'comply or explain' principle can lead to varying economic outcomes, highlighting its effectiveness across different contexts. This is the first review study to focus specifically on the comply-or-explain approach of corporate governance codes. Chapter 3 shows that transparency and quality of explanations for non-compliance do not consistently improve firm performance, suggesting that market mechanisms may favor compliance over explanations. The findings also indicate that the negative impact of explanations on firm performance is driven mainly by deviations from specific chapters related to management and supervisory boards. Naturally, this study has some limitations. Although we employed two different indices to reduce subjectivity in assessing governance disclosure quality, the process of evaluating explanations for non-compliance inherently involves some subjective judgment. Furthermore, while our research provides valuable insights into the German context, its focus on German listed firms may restrict the generalizability of our findings. In Chapter 4, we investigate how board diversity impacts risk-taking behavior in German public non-financial firms. We find that females on executive boards decreases leverage and increases R&D expenditure. We did not find strong evidence for a moderating impact of CSQ attributes on the association between gender diversity and risk, although entropy balancing results suggest that lower CSQ may amplify the negative relationship between gender diversity and leverage. This study addresses endogeneity concerns using two different methods, it may still be subject to omitted variable bias. The limited evidence regarding CSQ as a moderating factor suggests that further research is needed to explore these dynamics more deeply. Overall, this study underscores the complexity of governance issues and the necessity for comprehensive strategies to enhance firm-level governance quality and effectiveness, particularly concerning the comply-or-explain approach.