UCAM

UNIVERSIDAD CATÓLICA
DE MURCIA

ESCUELA INTERNACIONAL DE DOCTORADO

Programa de Doctorado en Ciencias Sociales

"Corporate governance as a driver for firm value creation - Evidence on European-listed firms"

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Murcia, 18 de Septiembre 2021

AUTHORIZATION OF THE DIRECTOR OF THE THESIS FOR SUBMISSION

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SIGN TO COMPLY WITH THE ROYAL DECREE 99/2011, IN MURCIA, SEPTEMBER 18, 2021.

PROF. DR. JOACHIM ROJAHN

ACKNOWLEDGEMENTS

I want to give special thanks to a selection of people who have, academically and personally, supported me during the four years of my doctoral program.

First, I would like to thank my doctoral advisor Prof. Dr. Joachim Rojahn (FOM, Essen) for his strong commitment, constant support, and outstanding mentoring. He was at any time available to discuss and solve problems and further served as a source of inspiration for my personal development. This started during my Bachelor program in 2011 and went on through my Master and doctoral program until today.

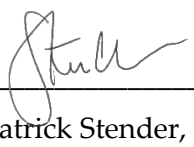
Second, I want to thank my former supervisor Prof. Dr. Gonzalo Wandosell Fernandez de Bobadilla (UCAM, Murcia), my former supervisor Prof. Dra. Simona Popa (UCAM, Murcia), as well as Dr. Florian Zechser (alumni UCAM, Murcia) for their support, fruitful discussions, and guidance during the last years.

Without the support of the beforementioned people, it would not have been possible for me to successfully complete all academic activities and the submission of this thesis.

Further, a general acknowledgement goes to the Universidad Católica de Murcia and the FOM University of Applied Science for allowing me to take part in this this doctoral program and organizing all activities. This acknowledgement goes particularly to Prof. Dra. Mercedes Carmona Martínez (UCAM, Murcia), Prof. Dr. Alexander Zureck (FOM, Essen), and Sarah Furgol (FOM, Essen).

Next to the academic support, strong social and personal support was key for me. My personal thanks go to my family and friends who showed great encouragement and continuous patience whenever my doctoral study came first.

Leichlingen, September 18, 2021



Patrick Stender, M.Sc.

QUOTE

"Learning is like rowing upstream; not to advance is to drop back."

(Chinese proverb)

ABSTRACT AND KEYWORDS

Abstract in English language - The main idea of corporate governance systems is to ensure the protection of shareholder rights and the alignment of shareholder's and other stakeholder's interests with the actions taken by the management. While this shall ultimately create an environment of trust, transparency, and accountability to foster future growth, profitability, and an increase in firm value, empirical evidence on the governance-firm value relation provides mixed results. One major reason why some studies reveal a positive, and others reveal a negative influence on firm value, might be that there is no generally acknowledged approach to reliably measure governance quality.

For this reason, this thesis uses a novel approach to measure corporate governance quality by using a set of recreated governance scores from literature and commercial governance ratings. A principal component analysis (PCA) is used to identify different dimensions of governance quality based on what the scores measure. As a result of the PCA, two composite governance measures are created that represent the two dimensions of internal and external governance.

This doctoral thesis uses a data sample of 419 non-financial firms included in the STOXX® Europe 600 index over a period from 2012 through 2017 to analyze the influence of internal and external governance on firm value. To account for endogeneity, both a fixed effects regression model as well as an instrumental variables (IV) regression model are used. The thesis further includes a moderation analysis using market competition and several controlling variables as the moderators, as well as a mediation analysis using information asymmetries as the mediator.

Results of the fixed effects regression show that external governance has a significant positive impact on firm value measured by Tobin's Q, while internal governance shows a significant negative impact. An explanation for these findings might be that external governance improves shareholder's rights, which results in higher demand for such shares and an increase of their price, i.e., the value of the firm. The negative influence of internal governance might step from costs related to internal governance measures as well as a decrease in flexibility due to operational complexities resulting from compliance with governance regulations.

The regression results are supported by the IV regression model so that they are robust against endogeneity.

The subsequent moderation analysis provides additional insights on internal governance and shows that it can provide value for firms that operate in markets with low competition. Market competition and competitive pressure might therefore act as substitutes for the control functions of internal governance. While internal governance increases firm value in low-competition markets, internal governance mechanisms become redundant when competitive pressure is high.

Key findings of the moderation analysis with controlling variables indicate that the interaction term between external governance and debt ratio shows a negative impact on firm value so that the monitoring effect of debt might substitute external governance. A positive impact of the external governance and cash holds interaction, shows that external governance protects firms with high CASH holdings against value-destroying expenditures, opportunistic management behavior, and overinvestments. In line with the agency theory, the positive influence of the external governance and the ratio of intangible assets indicates that external governance creates firm value when intangible assets, i.e., information asymmetries, are high.

Moderating effects with internal governance and controlling variables reveal a positive influence of the internal governance and debt ratio interaction. Internal governance consequently increases firm value in addition to the monitoring effect of debt. The reported negative impact of internal governance and the intangible assets ratio might stem from the reduction of flexibility through internal governance regulations that firms with high intangible assets usually require.

The empirical analysis concludes with a mediation analysis. Results show that the influence of internal governance on firm value is partially mediated by information asymmetries. This means that internal governance indirectly increases firm value by lowering the level of information asymmetries. This result again relativizes the negative influence of internal governance on firm value as reported in the fixed effects and IV regressions, showing that internal governance mechanisms can have a positive contribution to firm value under specific circumstances.

The thesis has the following limitations: Due to the availability of data, it gives greater weight to developed countries and large firms in the European area. To reinforce the findings, additional research with an increased sample of firms and longer time periods could be conducted. Further, it is possible that other variables such as institutional ownership or accounting accuracy mediate the governance firm-value relation. However, these variables could not be applied due to the unavailability of data. Given that there is no definite approach to measure governance quality, there is room for extending the applied measurement approach by using other scoring techniques, e.g., a weighting of certain governance provisions. Nevertheless, this thesis has shown that all future measurement approaches for governance quality should account for the internal and external dimensions of corporate governance rather than using blended measures.I want to give special thanks to a selection of people who have, academically and

Keywords in English language - 1) Internal and external corporate governance; 2) Governance scores; 3) Principal component analysis; 4) Panel data regressions; 5) Moderation and mediation analysis

Abstract (Resumen) in Spanish language - El objetivo principal de los sistemas de gobierno corporativo es garantizar la protección de los derechos de los accionistas y la alineación de los intereses de los accionistas y de otras partes interesadas con las acciones tomadas por la gerencia. Si bien esto debe crear finalmente un entorno de confianza, transparencia y responsabilidad que fomente el crecimiento futuro, la rentabilidad y un aumento del valor de la empresa, la evidencia empírica existente sobre la relación entre gobierno y valor de la empresa no ofrece resultados concluyentes. Una de las principales razones por las cuales algunos estudios revelan una influencia positiva y otros revelan una influencia negativa en el valor de la empresa, podría ser que no existe un enfoque generalmente aceptado para medir de forma fiable la calidad de la gobernanza.

Por esta razón, esta tesis utiliza un enfoque novedoso para medir la calidad de la gobernanza usando un conjunto de puntajes de gobernanza obtenido a partir de la literatura y calificaciones de gobernanza comercial. Se utiliza un análisis de componentes principales (ACP) para identificar diferentes dimensiones de la

calidad de la gobernanza en base a lo que miden los puntajes. Como resultado del ACP se crean dos medidas compuestas de gobernanza, que representan las dos dimensiones de la gobernanza interna y externa.

Esta tesis doctoral utiliza una muestra de datos de 419 empresas no financieras incluidas en el índice STOXX® Europe 600 durante un período de 2012 a 2017 para analizar la influencia de la gobernanza interna y externa en el valor de la empresa. Para dar cuenta de la endogeneidad, se utilizan tanto un modelo de regresión con efectos fijos como un modelo de regresión con variables instrumentales. La tesis incluye además un análisis del efecto moderación utilizando como moderadores la competencia del mercado y varias variables de control, así como un análisis de mediación utilizando como mediador las asimetrías de información.

Los resultados de la regresión de efectos fijos muestran que la gobernanza externa tiene un impacto positivo significativo en el valor de la empresa medido por la Q de Tobin, mientras que la gobernanza muestra un impacto negativo significativo. Una explicación de estos hallazgos podría ser que la gobernanza externa mejore los derechos de los accionistas, lo que se traduce en una mayor demanda de tales acciones y un aumento de su precio, es decir, el valor de la empresa. La influencia negativa de la gobernanza interna podría deberse a los costes relacionados con las medidas de gobierno interno, así como a una disminución de la flexibilidad debido a complejidades operativas derivadas del cumplimiento de las normas de gobernanza. Los resultados de la regresión están respaldados por el modelo con variables instrumentales, de forma que son robustos frente a la endogeneidad.

El análisis de moderación posterior proporciona información adicional sobre la gobernanza interna y demuestra que puede aportar valor a las empresas que operan en mercados con baja competencia. La competencia del mercado y la presión competitiva podrían, por tanto, estar actuando como sustitutos de las funciones de control del gobierno interno. Mientras que la gobernanza interna aumenta el valor de la empresa en los mercados de baja competencia, resulta redundante cuando la presión competitiva es alta.

Los hallazgos clave del análisis de moderación con variables de control indican que el término de interacción entre la gobernanza externa y el coeficiente de endeudamiento muestra un impacto negativo sobre el valor de la empresa, de

modo que el efecto de seguimiento de la deuda puede sustituir a la gobernanza externa. Un impacto positivo de la interacción entre gobernanza externa y las retenciones de efectivo muestra que la gobernanza externa protege a las empresas con altos niveles de efectivo frente a gastos que destruyen valor, comportamientos de gestión oportunista y sobreinversiones. De acuerdo con lo establecido por la Teoría de Agencia, la influencia positiva de la gobernanza externa y la proporción de activos intangibles indica que la gobernanza externa crea valor empresarial cuando los activos intangibles, es decir, las asimetrías de información, son altas.

Los efectos moderadores con el gobierno interno y las variables de control revelan una influencia positiva de la interacción entre la gobernanza interna y el coeficiente de endeudamiento. En consecuencia, la gobernanza interna aumenta el valor de la empresa además del efecto de seguimiento de la deuda. El impacto negativo del gobierno interno y el ratio de activos intangibles puede deberse a la reducción de la flexibilidad a través de regulaciones de gobernanza que suelen exigir las empresas con un elevado nivel de activos intangibles.

El análisis empírico concluye con un análisis de mediación. Los resultados muestran que la influencia del gobierno interno en el valor de la empresa está parcialmente mediada por asimetrías de información. Esto significa que la gobernanza interna aumenta indirectamente valor empresarial al reducir el nivel de asimetrías de información. Este resultado de nuevo relativiza la influencia negativa del gobierno interno sobre el valor de la empresa, tal y como se deduce de las regresiones con efectos fijos y con variables instrumentales, mostrando que los mecanismos de gobernanza interna pueden contribuir de forma positiva al valor de la empresa bajo determinadas condiciones.

La tesis tiene las siguientes limitaciones: Debido a la disponibilidad de datos, concede mayor peso a los países desarrollados y a las grandes empresas del Espacio Europeo. Con el fin de reforzar las conclusiones alcanzadas, se podría llevar a cabo investigación adicional con una mayor muestra de empresas y durante un período de tiempo más prolongado. Además, es posible que otras variables como la propiedad institucional o la precisión contable medien en la relación entre la gobernanza y el valor empresarial. Sin embargo, estas variables no se pudieron tener en cuenta en el análisis debido a que no se disponía de los datos. Dado que no existe un enfoque definido para medir calidad de la gobernanza, hay margen para ampliar el enfoque de medición aplicado utilizando otras técnicas de

puntuación como, por ejemplo, una ponderación de ciertas provisiones de gobernanza. Sin embargo, esta tesis ha demostrado que todos los enfoques futuros sobre medición de calidad de la gobernanza deben tener en cuenta las dimensiones internas y externas, en lugar de utilizar medidas combinadas.

Keywords (Palabras Clave) in Spanish language - 1) Gobierno corporativo interno y externo; 2) Puntajes de gobernanza; 3) Análisis de Componentes Principales; 4) Regresiones de datos de panel; 5) Análisis de moderación y de mediación

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ACRONYMS AND ABBREVIATIONS

2SLS	Two-stage least squares
3SLS	Three-stage least squares
ADR	American depositary receipt
BCCG	Berlin Centre of Corporate Governance
BLUE	Best Linear Unbiased Estimator
CAPEX	Capital expenditures
CAPM	Capital Asset Pricing Model
CEO	Chief Executive Officer
CG	Corporate Governance
DCF	Discounted Cash Flows
EBIT	Earnings before interest and taxes
ERP system	Enterprise resource planning system
ESG	Environmental, Social and Governance
EUR	Euro (currency in the European Monetary Union)
G20	Group of Twenty
GCGC	German Corporate Governance Code
GIM	Refers to Gompers, Ishii, and Metrick (2003)
GMM	Generalized method of moments
HHI	Herfindahl-Hirschman Index
ICB	Industry Classification Benchmark
IFRS	International Financial Reporting Standards
IRRC	Investor Responsibility Research Center
ISS	Institutional Shareholder Services
IV	Instrumental variable(s)
k	Placeholder for “kilo”, i.e., means 1,000
KMO criterion	Kaiser-Mayer-Olkin criterion
KPI	Key performance indicator

LAV	Least absolute value regression
M&A	Mergers and Acquisitions
max	Maximum
min	Minimum
MSCI	Morgan Stanley Capital International
MTB	Market-to-book
OECD	Organization for Economic Cooperation and Development
OLS	Ordinary least squares
PCA	Principal component analysis
R	Statistics software
R&D	Research and Development
ROA	Return on assets
ROE	Return on equity
ROS	Return on sales
SEM	Structural Equation Model
TSR	Total shareholder return
US	The United States of America
USA	The United States of America
US-GAAP	United States Generally Accepted Accounting Principles
VSS criterion	Very Simple Structure criterion
WACC	Weighted Average Cost of Capital

SYMBOLS

a	Coefficient relating the independent and mediator variable
b	Coefficient relating the mediator and dependent variable adjusted for the effect of the independent variable X
$BASPR_{it}$	Relative bid-ask spread of firm i at time t
c	Coefficient relating the independent and dependent variable
c'	Coefficient relating the independent and dependent variable adjusted for the effect of the mediator variable
$CAPEX_{it}$	Capital expenditures of firm i at time t
$CASH_{it}$	Cash holdings of firm i at time t
d_t	Unobservable time effects
$DEBT_{it}$	Debt ratio of firm i at time t
EIKON-MNG	Eikon corporate governance management score
EIKON-SH	Eikon corporate governance shareholder score
ENTRM	Recreated Entrenchment Score
EXT_{it}	Composite measure for external corporate governance quality of firm i at time t
FCF_t	Free Cash Flow at time t
g	Growth rate
GINDEX	Recreated G-Index
GOV-MNG	Recreated GOV-Score based on Eikon management provisions
GOV-SH	Recreated GOV-Score based on Eikon shareholder provisions
HHI_{it}	Herfindahl-Hirschman Index of firm i at time t
i_1, i_2, i_3	Intercepts
INT_{it}	Composite measure of internal governance quality of firm i at time t
$INTABGIBLES_{it}$	Intangible assets ratio of firm i at time t

L	Number of different firm-specific variables
MED	Mediator
MOD	Moderator
MTBV	Market-to-book value
n	Number of time periods
n_i	Unobservable individual effects
PARS	Recreated Parsimonious index
PCR	Price cashflow ratio
PER	Price earnings ratio
Q_{it}	Tobin's Q of firm i at time t
$RESVOL_{it}$	Residual volatility of firm i at time t
ROA_{it}	Return on assets of firm i at time t
$SIZE_{it}$	Firm size measured by total assets of firm i at time t
sd	Standard deviation
t	Time period
u_{it}	Stochastic disturbance term of firm *i* at time *t*
WACC	Weighted Average Cost of Capital
X	Independent variable
X_{it}	Placeholder for an independent variable of firm i at time t
x_{jit}	Firm-specific control variables of firm i at time t
Y	Dependent variable
Y_{it}	Dependent variable of firm i at time t

β_{con}	Constant regression coefficients
β	Regression coefficient
ε_{it}	Error term of firm i at time t
Σ	Sum

1. INTRODUCTION

1.1 RESEARCH MOTIVATION AND RELEVANCE

The global financial system is based on the idea of a continuous exchange of capital between parties who supply and parties who borrow capital. Those who have a surplus of capital provide equity or debt to those who have a need for capital (Allen, Carletti, & Gu, 2019, p. 39). To ensure that the financial system can perform this principal function, each participant must deal with how a repayment of funds through future returns on such capital can be assured (Shleifer & Vishny, 1997, p. 737). Particularly when providing equity capital, the investing party, i.e., the shareholders, require comprehensive rights and authorities to monitor firms and effectively assess important management decisions. In this way, shareholders can assure that managers act in the best sense of the firm and follow the shareholders' interests rather than pursuing their personal benefits or fulfilments. Adequate protection of ownership and monitoring rights as well as other strong governance regulations within firms are therefore mandatory to incentivize shareholders in providing capital to the financial system (Talamo, 2011, p. 234).

Recent European examples like mis-investments and cartel offenses at the German-based steel conglomerate ThyssenKrupp, the involvement of European banks in the Libor manipulation scandal, the fraud-based Volkswagen "Dieselgate" scandal, or the 2020 accounting scandal at the payment services provider Wirecard show that mechanisms to protect shareholders do not always work as they should. Besides the loss of consumer confidence and reputation, consequences for firms can vary from severe financial or judicial penalties up to complete bankruptcy. In all such cases, it is first the shareholders, not the management, who bear most of the financial losses.

In 2016, the auditing firm KPMG carried out an international survey of 750 fraudsters to analyze the root causes of irresponsible decision-making within firms. The results show that weak internal and organizational control mechanisms were named a key motivator to commit fraud actions. Whereas worldwide, this motivation could be observed in 61% of the analyzed fraud cases, the evidence in

Europe was even more substantial with a value of 72% (KPMG International Cooperative, 2016, p. 10). It is also alarming that KMPG reports 43% of the study's fraud cases as detected with the help of whistleblowers and other tips, while only 22% of the cases could be uncovered through management reviews or other forms of internal and external audits.

To avoid fraud and other cases of exploitation of shareholders, pressure on firms to implement and comply with frameworks "in which suppliers of finance to corporations assure themselves of getting a return on their investment" (Shleifer & Vishny, 1997, p. 737) has increased. Such frameworks can consist of principles, processes, mechanisms, policies, or institutions within a firm and are generally characterized as corporate governance frameworks.

In theory, an effective corporate governance framework should substantially contribute to ensure better decision making, avoid financial losses, minimize reputational costs, as well as acts of mismanagement. In addition, corporate governance should support the efficient use and allocation of resources within a firm (Lin & Hwang, 2010, p. 59). These effects shall positively contribute to better access to capital markets, create investor confidence, and, finally, guarantee a constant improvement of firm value and organizational performance (Claessens & Yurtoglu, 2013, pp. 11–19).

The assumption of a positive influence of corporate governance on firm value and other organizational performance measures can be justified from several underlying theories. Berle and Means (1934) define problems arising from a separation of ownership and control whenever managers operate firms that they do not own. Jensen and Meckling (1976) develop the theory of a principal-agent relationship where managers use their informational advantage to exploit shareholders. Therefore, Lombardo and Pagano (2002) argue that effective corporate governance should reduce a firm's level of information asymmetries. Thereby, overall agency costs are reduced and shareholders, as they become better informed, need fewer resources for monitoring or auditing activities. Lower cost and risk on the shareholders' side finally result in lower expectations on the required return on equity (Callahan, Lee, & Yohn, 1997, p. 58). Thus, the mitigation of agency risk through effective corporate governance reduces the cost of capital on firm-level and should contribute to a higher firm value.

For these reasons, corporate governance has globally developed to be an integral part of a firm's organizational structure (Prusty, 2013, p. 340). In recent days, compliance with corporate governance also became an essential part of investment strategies. With shareholders increasingly focusing on environmental, social, and governance criteria, in short, ESG criteria, good governance quality can increase a firm's attractiveness as a potential investment opportunity (Tseng et al., 2019, p. 2108).

Although from a theoretical point of view, it seems logical that the impact of corporate governance on firm value is of positive nature, overall research results provide mixed evidence. Among others, Aggarwal and Williamson (2006) as well as Gompers et al. (2003) find a positive influence of corporate governance on financial performance indicators like sales growth, profit, and firm valuation. However, other scholars like Gupta, Kennedy, and Weaver (2009) find no evidence for a significant influence on valuation. Daines, Gow, and Larcker (2010) even show that the influence of good governance on firm valuation differs between specific governance ratings, i.e., the approach by which governance quality is measured. Durden and Pech (2006, pp. 92–94) argue that the development of corporate governance since the early 2000s has led to an over-regulated environment with an increasing focus on control and compliance rather than on the organizational performance of a firm. Thereby, corporate governance shall negatively influence firm value as it reduces flexibility and competitive capability while decision delays and additional bureaucratic layers are created.

Due to the situation that there is no generally agreed approach to how governance quality on a firm level can be reliably determined, current research results are further hardly comparable (Bhagat & Bolton, 2019, pp. 143–144). While some studies apply scoring models that use a set of governance-related provisions to create a governance index, other studies use single governance provisions, commercial ratings, or collect data through questionnaires. Differences in the measurement approaches among scholars might lead to different measurement results for governance quality which, as a result, might contribute to the inconsistent empirical evidence regarding its influence on firm value.

Further, it needs to be clarified if the different measurement approaches measure different dimensions of governance quality. While European studies focus more on a shareholder perspective when measuring governance quality, US studies

are generally more focused on the shareholder and, specifically, shareholder rights. This leads to the separation of two general dimensions of corporate governance: The stakeholder-focused "internal" governance quality on the one hand and the shareholder-focused "external" governance on the other hand (Huyghebaert & Wang, 2012, p. 329). Both dimensions may, in turn, have different influences on organizational performance and firm value (Stender & Rojahn, 2020, p. 156).

Besides the problem of how governance can be measured, one additional question is which dependent variable is used for the empirical analyses. Previous studies offer broad definitions of how organizational performance and firm value are defined. Consequently, studies apply a wide range of different KPIs and measurement approaches. These indicators vary between accounting-based indicators like revenue, earnings, return on invested capital, or return on equity, but also include product market-based performance indicators like market share, and capital market-related indicators like share price level, total shareholder return, price-earnings ratio, or Tobin's Q. However, it remains unclear which of these indicators are generally positively affected by governance and which are not.

1.2 RESEARCH OBJECTIVE AND DIFFERENTIATION

Specific research gaps have been identified for which this thesis seeks to contribute to the current state of research on the influence of corporate governance on firm value. These contributions can be divided into three major aspects:

First, this thesis applies a more holistic measurement approach instead of using a single governance score to determine the firm-specific level of corporate governance quality. The approach is based on a Google Scholar and Web of Science analysis that identifies the most frequently used governance scores from academic literature. The complete set of five identified scores is then recreated on a common database by using the originally applied scoring methodologies. After two prevailing commercial governance ratings are added to the set, a principal component analysis is used to analyze the scores and find similarities between them. Results of the PCA reveal two general dimensions of corporate governance quality. These can be described as internal and external governance quality. Consequently, this thesis promotes two newly developed composite estimators for measuring governance quality. The application of these composite measures

representing different dimensions of corporate governance represents a first of its kind approach in academic literature to shed light on how governance quality can be measured more reliably. In contrast to other studies which predominantly use blended corporate governance ratings that do not differentiate between internal and external governance dimensions, such novel and more differentiated measurement approach might reveal if the different dimensions of governance have diverse or even contradicting influences on firm value.

Second, most studies on corporate governance are based on the US market and, therefore, might not be generalizable for a European environment (Carcello, Hermanson, & Ye, 2011, pp. 2–4). Differences in the legal and regulatory requirements[1] between the US and continental European countries like Germany, Italy, or France may lead to differences in the influence of governance on firm value. Further, there are material differences between the shareholder-centric US approach to governance and the European stakeholder approach. With its focus on European firms and capital markets, this thesis may provide additional insights on the governance-firm value relation outside of the US capital market and enrich empirical evidence for Europe. This approach is supported by the methodology to capture both the internal and external dimensions of governance quality as there might be differences in the influence of such dimensions in the stakeholder-friendly European environment.

Third, this thesis not only seeks to analyze the influence of corporate governance on firm value but also aims to find an answer to why there are differences between the influence of internal and external governance on firm value and especially under which conditions or circumstances these influences change their sign. For this purpose, several moderation analyses using interaction terms as well as mediation analyses are carried out.

The moderation analysis assumes that the governance-firm value and performance relation is moderated by the level of market competition. The author follows concerns raised by Giroud and Mueller (2011) as well as Mishra and Mohanty (2018) by which market competition and competitive pressure can serve as a substitute for corporate governance. Therefore, the influence of corporate

[1] Legal and regulatory requirements explicitly refer to the differences between common law and civil law.

governance on firm value and performance could be stronger in less competitive markets and weaker in competitive ones. Liu, Qu, and Haman (2018, p. 69) have already analyzed interactions between governance and market competition, however, only with regard to state-owned firms in China. To the best knowledge of the author of this thesis, no study has been done so far that analyses the moderating effects of market competition on the impact of internal and external governance quality on firm value for a sample of European non-financial firms. Further, additional interaction terms with selected controlling variables are analyzed to answer the question if the influence of corporate governance on firm value is positive or negative in combination with specific firm characteristics like, e.g., firm size, debt ratio, cash holdings, or the intangible assets ratio.

Moreover, a mediation analysis tests a possible mediation effect on the governance-firm value relation through information asymmetries. This analysis shall verify if the influence of governance on firm value is of a direct nature or mediated by a third variable. Such mediator variable is assumed to be the firm-specific level of information asymmetries (Latif, Bhatti, & Raheman, 2017, p. 273). Results of the mediation analysis will show if governance directly influences firm value or if such effect works indirectly through a reduction of information asymmetries.

1.3 OUTLINE OF THE DISSERTATION

This thesis seeks to provide an empirical analysis regarding the measurement of corporate governance and the influence of governance quality on firm value. The outline of this thesis is therefore organized as follows:

After introducing the topic through chapter one with motivation, relevance, objectives, and differentiation of the research, chapter two focuses on the theoretical foundation of corporate governance and explains its overall value to investors. This includes a comprehensive overview of underlying theoretical frameworks like the agency theory, the stewardship theory, as well as the resource dependence theory. In addition, the general concept of corporate governance is explained through describing the governance problem, giving a definition of the term, calling out major stakeholders, and providing a classification of different governance concepts.

Based on the OECD principles of corporate governance, basic guidelines, mechanisms, and provisions that reflect good governance practice are explained and reviewed. Chapter two concludes with an overview of the different theoretical causal chains that justify the potentially positive influence of corporate governance on firm value and organizational performance.

Chapter three starts with a summary of the current state of research on the measurement of governance quality. This includes an analysis of how governance scores and other measures are composed and a further systematization and comparison of different governance scores. By conducting a comprehensive literature research, the chapter aims to present the current state of research on the influence of corporate governance on firm value and organizational performance considering different approaches to measure governance quality. This includes a review of reliable KPIs to measure firm value and operational performance and a critical analysis of the potential influence of endogeneity on empirical research. Chapter three concludes with the development of the research questions and hypotheses.

Chapter four sets out several empirical analyses to cover the previously identified research gaps and contributions of this thesis. It first describes the sample selection process and all variables used for the empirical model. It then explains the recreation of the different governance scores as well as the computation of the newly created composite governance measures for internal and external governance quality through a PCA approach. The derivation of the composite governance measures as independent variables for the subsequent empirical analyses corresponds to the first research contribution of this thesis as set out in section 1.2.

The applied empirical methodologies used for the panel data regression and additional analyses are outlined in a separate sub-chapter. Basic regression results of the fixed effects regression are presented and robustness checks with an instrumental variables regression to account for endogeneity, an analysis of non-linear relationships, and a regression based on alternative dependent variables for firm value are carried out and interpreted. These analyses aim to contribute to a better understanding of the impact of corporate governance in a European market environment as per the second research contribution of this thesis.

Chapter four also includes results of a moderation analysis with interaction terms between the governance variables and market competition, an analysis of further interactions with controlling variables, as well as the mediator analysis based on information asymmetries. These additional analyses focus on research contribution number three of this thesis as described in section 1.2.

Chapter five concludes this thesis by summarizing the main empirical findings, calling out limitations of this thesis, giving an outlook on the future development of corporate governance, and providing recommendations for further research.

2. FUNDAMENTALS ON CORPORATE GOVERNANCE

2.1 THEORETICAL FRAMEWORK OF CORPORATE GOVERNANCE

2.1.1 SYSTEMATISATION OF UNDERLYING THEORIES

As corporate governance can be looked at from different standpoints, e.g., from a financial, economic, sociological, or psychological one, the debate about the underlying theoretical model is ongoing and has led to different theoretical views which all aim to explain the complex nature of the concept (Kultys, 2016, p. 613). Thereby, the relation between the management, the shareholders, and the other stakeholders is a particular focus of these theories.

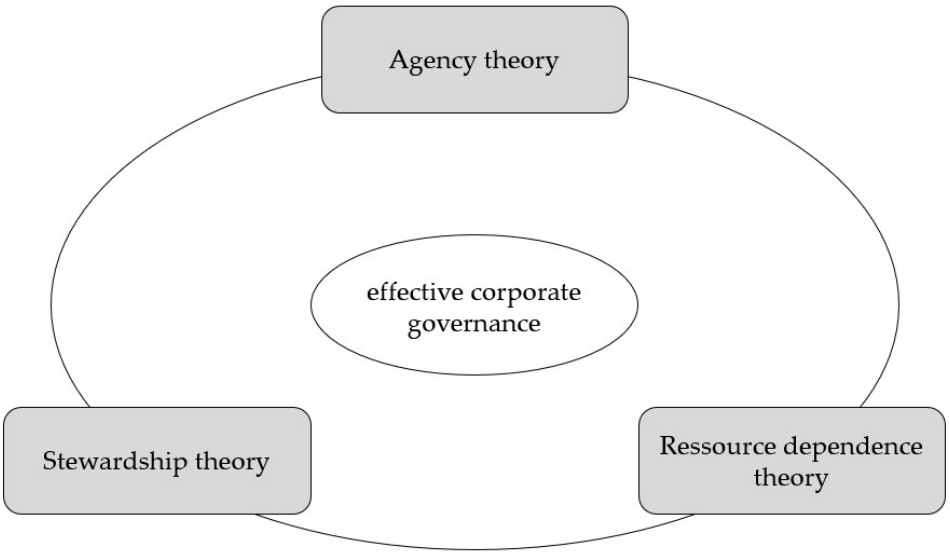
Today, the prevailing theory in literature is the agency theory. This theory assumes an opportunistic and self-interested management that needs to be closely monitored and kept under control and aligned through the right incentives (Madhani, 2017, p. 11). The agency theory is further supported by the separation of ownership and control and forms the basis for the shareholder primacy model. In contrast, the frequently applied stewardship theory is based on a convergence of the management's and shareholder's interests to create a trustful stewardship relation between these two parties. Last, there are approaches that extend the concept of corporate governance by using the resource dependence theory. Such approaches mainly focus on how access to resources and linkages to the external environment can be established.

These three main theories are closer reviewed in the following sub-sections. As illustrated in Figure 1, effective corporate governance needs to be seen as a product of its underlying theories. While on the one hand, governance frameworks need to mitigate conflicts of interests between management and shareholders to mitigate the risk of mismanagement, financial losses, and reputational costs, governance also has to enable better decision making, create trust and confidence in the firm, and establish better access to capital markets (Claessens & Yurtoglu, 2013, pp. 11–19).

Therefore, all three theories are needed to fully explain the concept since one single theory alone could not cover the topic as a whole. Combining the theories

can satisfy the business needs while balancing the manager's and shareholder's rights.

Figure 1: Underlying theories for effective corporate governance
[Source: own representation based on Al Mamun, Rafique Yasser, and Ashikur Rahman (2013, p. 45)]



2.1.2 AGENCY THEORY PERSPECTIVE

The primary root cause why corporate governance mechanisms are required within a firm structure is derived from the separation of ownership and control and the resulting agency problems. According to the transaction cost and property rights theory, owners of a firm, i.e., the shareholders, receive residual monitoring rights to act as efficient managers who directly participate from losses and profits of their firm (El-Faitouri, 2014, pp. 82–83). However, in practice, shareholders cannot manage commercial operations and daily activities. Considering the cost and time it would take to reach a consensus on a business decision among all different shareholders, a separation of ownership and control is economically rational. Particularly in firms with a large number of shareholders who only own a fraction of the whole firm, control rights need to be delegated to experienced and

skilled managers acting on behalf of the owners (Kapopoulos & Lazaretou, 2007, p. 144).

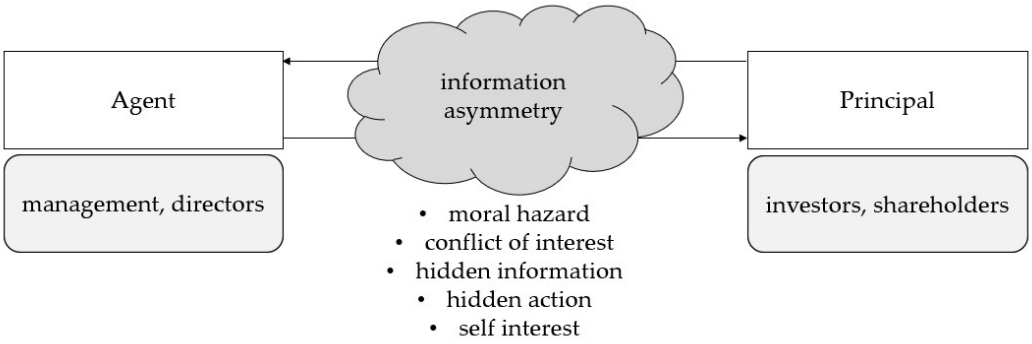
Besides the advantages of such separation, Smith (1776, p. 741) already argues that managers with no shares in the firm do not operate with the same vigilance as shareholding managers. As shareholders are residual claimants of a firm and directly participate in its success, they have a natural economic incentive to allocate resources efficiently, carry out strategic business decisions, and maximize returns over time. The separation of ownership and control consequently bears the risk that the actions of managers depart from the interests of the shareholders. Instead, managers may pursue personal benefits and do not act in the firm's best interest (Hope & Thomas, 2008, p. 592).

The separation of ownership and control introduced by Berle and Means (1934) forms the basis for research on the relationship between managers and shareholders. Fama (1965) extends this theory by adding the concept of new institutional economics, assuming self-interested and rational thinking individuals. Jensen and Meckling (1976) derive the principal-agent theory by using a simplified model that defines managers as better-informed agents and shareholders as less informed principals (Jensen & Meckling, 1976, p. 308). Their theory is based on the premises of information asymmetry and conflicting interests between the two parties. On the one hand, managers generally have the advantage of deep know-how, experience, and insights in the firm's activities as they participate in the daily business. On the other hand, shareholders can only rely on publicly available information or information provided during the annual meetings but might not have access to specific insider knowledge. Any effort to obtain additional information comes at a high cost. Such unequally distributed information consequently leads to a situation where managers are generally better informed than the shareholders (Khatali, 2020, p. 81).

As both parties are rational actors, they seek to maximize their individual welfare and benefits. Given their informational advantage, managers may act opportunistically and misuse their position to increase personal benefits at the firm's expense. With limited access to internal information, it is often not possible for shareholders to transparently monitor management decisions and detect morally hazardous actions. Diverging management actions remain hidden and shareholders can only rely on the management's good intention (Marashdeh, 2014,

pp. 23–25). In theory, this is described as the moral hazard and the hidden actions problem as set out in Figure 2 below (Braun & Guston, 2003, p. 303).

Figure 2: Principal and agent relationship
[Source: own representation based on Kreipl (2020, p. 48)]



When managers pursue individual interests, shareholders need to find ways to align the manager's interests and behaviors with the firm's interests and select loyal agents having the right skills and intentions before a contract is concluded.

Agency problems before the conclusion of a contract are usually present in the form of hidden characteristics of an agent, e.g., when information on the labor market for managers is imperfect. Hidden characteristics describe a situation in which a manager's actual quality and skills can only be assessed reliably after a contract is established. Consequently, the decision to enter into a contract with an agent bears the risk of an adverse selection when the wrong managers are hired. Possibilities to overcome the hidden characteristics and adverse selection problems include the reduction of information asymmetries by screening and observing signals given by the agent. Further, opportunities for self-selection can be provided.

Screening can include various information-gathering strategies such as personal interviews with the agent, verifications of the agent's references, and other aptitude tests. As screening activities create additional costs, there is always a trade-off between the comprehensiveness of screenings before entering into a contract and the cost from the poor performance of the agent when an inappropriate agent was hired (Bergen, Dutta, & Walker, 1992, p. 6). Therefore,

screening is a popular instrument whenever it is relatively easy, i.e., inexpensive, for the principal to gather information.

Especially in situations where screening cost are high, a signaling or a self-selection strategy might be a more preferred solution. When an agent knows that he or she has the suitable characteristics, knowledge, and experience, the agent may engage in actions that signal the principal that he or she fulfills the requirements for which the principal is looking. Consequently, sending out signals to the principal might influence and facilitate its decision.

As there is the risk of wrong and misleading signals, the principal can also select a self-selection strategy. In this case, the principal would "proactively construct choices that enable potential agents to signal their abilities and/or willingness to expend effort through self-selection" (Bergen et al., 1992, p. 7). In practice, potential employees could drop or self-select them out, e.g., whenthe principal requires an extensive and rigorous training or application process that only suitable agents would be willing to complete.

After a contract is concluded, one instrument to achieve an alignment between managers and shareholders is by incentivizing managers through contracts. A complete contract shall represent the shareholders' expectations concerning the manager's performance. This can be achieved by setting transparent and controllable performance objectives so that managers will be rewarded with higher remuneration in case they achieve their targets (Tosuni, 2013, p. 14). The opportunity to increase income and receive bonuses consequently motivates managers to fulfill the contracted performance expectations. From a shareholder's perspective, targets must be based on objectively measurable indicators linked to the firm's performance. Indicators that can be manipulated or influenced by using accounting instruments and measures should be avoided.

In addition, incentives need to be set in a way that an achievement is always more favorable than the opportunity cost gained by non-compliant or opportunistic behavior (Shleifer & Vishny, 1997, p. 741). These contractual relationships are not limited to the management only but can also apply to other stakeholders like suppliers, customers, or employees to avoid pursuing conflicting benefits.

Besides contractual incentives, shareholders spend financial resources on controlling and monitoring the management's actions. Those shall ensure that management decisions can be evaluated transparently and that no significant information remains hidden (Welge & Eulerich, 2014, p. 15). Some control mechanisms might even be mandatory by law, like the existence of a supervisory board in Germany or year-end audits by independent external auditors (Dienes & Velte, 2016, p. 63).

The degree to which agency problems occur in practice depends on the degree of existing information asymmetries between management and shareholders. The lower the delta of information between these two parties, the lower are the resulting agency problems and cost. All costs and resources necessary to limit opportunistic management behavior, identify suitable agents, and align management actions with the interests of the shareholders can be defined as costs of the separation of ownership and control. However, in the context of the agency theory, the term "agency costs" has become more commonly used as a general description. Agency costs consist of the cost of providing incentives to the management, expenditures that shareholders need to raise to meet their own informational needs, cost of monitoring and controlling the management actions, and opportunity costs that occur when managers keep pursuing individual goals (Le Hoang, Tuan, van Nha, & Phuong, 2019, p. 296). In theory, agency costs negatively influence organizational performance and the shareholder's return which has direct implications on firm value. This is why high agency costs should also lead to a lower valuation of a firm (Fauver & Naranjo, 2010, p. 719).

Prior studies show that there are various proxies that can indicate a potentially high risk of agency cost. For example, especially firms with high growth opportunities are more likely to have high information asymmetries and agency costs due to the risks and unpredictability related to their potential growth (Cai, Qian, & Liu, 2015, p. 8). This aligns with findings from Harford, Mansi, and Maxwell (2008, p. 554) who show that the risk of agency cost is especially high in firms with high capital expenditures (CAPEX). They justify this with the increased risk of unprofitable investment decisions when CAPEX is high as well as the simplified opportunity to hide transactions through which capital is diverted for individual benefits.

Another indicator for a high risk of agency cost can be the level of cash holdings. When information asymmetries and cash holdings are high, it might be less cumbersome for morally hazardous managers to channel cash into non-profitable investments, unnecessary expenses, or investments that increase their personal benefits (Kalcheva & Lins, 2007, p. 1089). Therefore, excess cash in high cash holding firms can incentivize managers to diverge from pursuing the shareholders' interests.

Rojahn and Zechser (2019, p. 2684) state that information asymmetries can be severe in diversified firms, as financial information of diversified firms include information from different market segments, making them more difficult to analyze and compare to peer groups. Also, financial reports of diversified firms might be less informative as they can be biased by hidden subsidization of low-performing business segments. In addition, capital structure decisions can be driven by information asymmetries as firms with high information asymmetries rather avoid information-sensitive equity capital and prefer less information-sensitive sources of capital such as debt (Fosu, Danso, Ahmad, & Coffie, 2016, pp. 141–142). However, especially firms with low debt ratios might have a high risk of agency cost, as debt could be easily borrowed to pursue unprofitable investments while a monitoring effect through creditors is not yet maintained at low debt rates.

So far, the agency problem has only been reviewed from a management control bias perspective, i.e., focusing on the conflict between shareholders and management which, in literature, is described as agency conflict type "one". However, there is also an agency conflict type "two" which focuses on conflicts between controlling and minority shareholders. As this conflict is between two shareholders, i.e., two principals, it is sometimes referred to as the "principal-principal conflict" as well (Martin, Gómez–Mejía, Berrone, & Makri, 2017, p. 1001).

Shareholders who hold large numbers of shares or otherwise have a dominant role in the company, e.g., a family ownership or a large institutional investment, might have the incentive to use their power to pursue individual interests. For example, a controlling shareholder might try to influence strategic decisions that overall destroy firm value but serve its interest or secure its control.

Imposing their will on the remaining shareholders or pursuing non-economic goals, especially smaller or more dispersed shareholders lacking the information

and expertise to identify such actions, might be expropriated (Huu Nguyen, Thuy Doan, & Ha Nguyen, 2020, pp. 107–108). In order to curb problems related to agency conflict type two, corporate governance frameworks can implement regulatory procedures such as the supervision of significant transactions or promote equal shareholder rights, support shareholding activism, and the engagement of minority shareholders (Martin et al., 2017, p. 1002).

In summary, the agency theory overall supports the concept of corporate governance, as governance regulations set up rules under which the management operates a firm and supports shareholders to restore and promote their interests (Shousha & Rady, 2021, p. 460).

2.1.3 STEWARDSHIP THEORY PERSPECTIVE

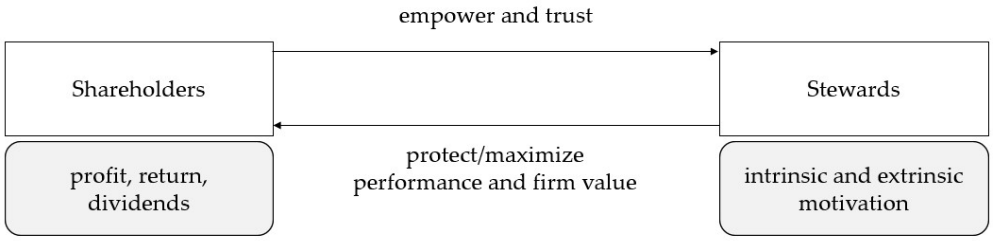
In contrast to the agency theory, the stewardship theory assumes that managers are trustworthy individuals who act in line with the shareholders' interests (El-Faitouri, 2014, pp. 83–84). Stewards are defined as motivated to make the right decisions due to the strong incentive that they will personally benefit when the firm prospers (Al Mamun et al., 2013, p. 42). Davis, Schoorman, and Donaldson (1997, p. 20) criticize the agency theory for not being able to explain scenarios where managers make non-opportunistic decisions without being specifically incentivized by contracts. They argue that the agency theory ignores the complexity of an organization and needs to be supplemented by assumptions based on behavioral science. This will allow explaining situations in which managers do not pursue personal benefits and are good managers of the firm's resources (Davis et al., 1997, p. 21).

As set out in Figure 3, the fundamental basis of the stewardship theory is a cooperative relationship between managers and shareholders with both parties sharing the same interests. In this environment, the separation of ownership and control does not constitute a major issue (Nicholson & Kiel, 2007, p. 588). Conflicts of interest between principals and agents and the resulting agency costs are insignificant (Davis et al., 1997, pp. 27–29). This is further supported by the principle that managers need to build up their personal reputations to remain competitive in the labor market (Nicholson & Kiel, 2007, p. 588). The collaborative atmosphere creates a collective identity in which managers follow their intrinsic

motivation to make responsible decisions that support organizational performance. As a side effect, successful leadership of the firm increases individual self-actualization (Davis et al., 1997, pp. 24–27).

According to the stewardship theory, the management does not represent the classic homo economics but is more seen as individuals who serve the collective as trustees. To make the stewardship relationship work, shareholders must demonstrate trust, confidence, and support so that managers have full authority to direct business activities (Bresser & Valle Thiele, 2008, p. 178). If those circumstances are fulfilled and managers have the required discretionary power, they will ultimately maximize both, the benefits for the firm and their shareholders as well as their own benefits and reputation (Muth & Donaldson, 1998, p. 6).

Figure 3: Shareholder and Steward relationship
[Source: own representation based on Al Mamun et al. (2013, p. 43)]



The stewardship theory shall not be seen as a criticism of the agency theory but more as complementation in cases that cannot be described using the default principal-agent relation. For this purpose, it uses psychology-related mechanisms like intrinsic motivation and self-actualization (Muth & Donaldson, 1998, p. 6). An example of such psychological mechanisms could be that managers perform better with job satisfaction and greater empowerment. The stewardship theory is therefore characterized by an involvement-oriented management philosophy whereas the agency approach is control-oriented. In an involvement-oriented philosophy, the organizational structure has a higher orientation towards collectivism and generally lower power distance. Managers are more focused on participation than on control and face risks of delegating tasks with trust (Davis et al., 1997, p. 37).

The idea of a firm that is managed and controlled in compliance with the stewardship theory finally bears the risk of ending up in a prisoner's dilemma whenever the individuals have the option to choose between acting as a principal, an agent, or a steward. Whenever one of the individuals chooses to act as a steward, the others might misuse the trust and switch to an agent position in which they maximize their individual gains at the other party's cost. This is why the stewardship approach needs the support of effective governance structures to avoid a prisoner's dilemma in which high agency costs arise (Davis et al., 1997, p. 38).

2.1.4 RESOURCE DEPENDENCE THEORY PERSPECTIVE

The resource dependence theory focuses on access to resources and how such access can be facilitated. In general, it suggests that the existing definition of governance mechanisms needs to be extended. Next to the monitoring or controlling function derived from the agency theory perspective, a second resource provision function based on the resource dependence theory needs to be added. Therefore, the role of corporate governance is extended to a dimension that better connects the firm with outside resources and establishes better access to expertise, network, knowledge, reputation, and capital (El-Faitouri, 2014, p. 84). Better access to resources contributes to an increase in the firm's organizational performance (Kiel & Nicholson, 2003, pp. 201–202).

One major governance mechanism to connect a firm with resources is the board of directors. It is regarded as an instrument that actively supports a firm with its network to external stakeholders like customers, suppliers, creditors, governments, institutions, investors, or competitors (Muth & Donaldson, 1998, p. 6).

In the USA and countries which follow a common law system, members of the board of directors are directly elected by the shareholders and consist of executive and non-executive members. Executive members include the C-level positions like, e.g., the CEO, COO, or CFO, who are responsible for the operational management, whereas non-executive managers have consulting and supervisory functions. In addition, firms in common law systems differentiate between inside and outside directors. While inside directors usually are direct employees or

shareholders of a firm, outside directors are external resources who get paid an annual retainer fee for their services. Especially outside directors who previously did not serve the firm as executive directors can enrich the firm's access to a broader network. This includes business and political contacts as well as access to better information (Kiel & Nicholson, 2003, p. 194).

Civil law countries such as Germany, however, follow a two-tier system in which the management is divided into a non-executive supervisory board and an executive board of directors (Tricker, 2019, pp. 150–153). While the executive board is responsible for managing the daily operations of the firm, the supervisory board is responsible for electing the executive board, providing advice and expertise, and monitoring management decisions. In this way, the board structure itself is already designed to mitigate agency risks.

Under the resource dependence theory, the role of the board of directors (common law) and the executive and supervisory board (civil law) is not regarded to execute managerial control (agency theory) or managerial empowerment (stewardship theory) but more to bring in valued resources to the firm which then serve as a source of advice and counsel for managers and management decisions (Hillman, Withers, & Collins, 2009, pp. 1410–1411). Ideal boards should therefore have a diverse composition that includes experienced directors with extensive inside knowledge about the organization but also several directors who join from the outside and therefore can contribute with new viewpoints and make the firm benefit from their network. Ultimately, this helps firms surviving the competition and improving organizational performance (Pearce & Zahra, 1992, p. 422).

In firms with weak organizational performance, Kaplan and Minton (1994) identify that US companies tend to replace directors with new directors from outside of the organization, as they expect potential gains from the new director's network and connections. Also, companies often appoint board members who are representatives of financial institutions which shall consequently improve the access to fresh capital (Mizruchi, 2004, p. 600). All this lines up to the resource-based approach by which board members are selected according to their ability to provide access to resources which a firm requires to increase its performance (Hillman, Cannella, & Paetzold, 2000, pp. 236–238).

2.2 CONCEPT OF CORPORATE GOVERNANCE

2.2.1 DEFINITIONS OF CORPORATE GOVERNANCE

The necessity for corporate governance originates from the separation of ownership and control. When shareholders provide equity to companies, they enter a trust relationship with the management. While shareholders trust the managers to take care of their invested capital, managers might misuse their informational advantage in their favor. The governance problem describes a situation in which investors are incapable to efficiently control management actions so that they risk being exploited (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 2000, pp. 3–5). Hart (1995, pp. 678–680) already concludes that governance problems will likely arise whenever an agency problem cannot efficiently be solved through a contract. As mitigation, companies implement mechanisms to limit self-interested behavior, promote shareholder rights, ensure an efficient operation of the firm, and finally secure financial returns for their shareholders. Such mechanisms can generally be summarized as frameworks of corporate governance.

However, the concept of corporate governance is "widely used but rarely defined" (Larcker & Tayan, 2013, p. 9) and can be reviewed from various standpoints. The ongoing debate about a generalizable definition of corporate governance leads to two main classifications. It can either be defined in a narrow sense, i.e., addressing only the firm's shareholders, or, in a broad sense, i.e., addressing the stakeholders of a firm (Gillan, 2006, p. 382). From a shareholder point of view, corporate governance focuses mainly on the protection of shareholder rights, whereas in the broader sense, the responsibility for other stakeholders such as the board of directors, management, employees, or internal auditors is included as well.

Shleifer and Vishny (1997, p. 737) describe corporate governance from the shareholder view and define it as a concept that secures investment returns for those who supply finance to firms. La Porta et al. (2000, p. 3) also focus on shareholder rights by arguing that "corporate governance is, to a large extent, a set of mechanisms through which outside investors protect themselves against expropriation by insiders" (La Porta et al., 2000, p. 3). Walker (2009) identifies corporate governance as an instrument "to protect and advance the interests of

shareholders through setting the strategic direction of a firm and appointing and monitoring capable management to achieve this" (Walker, 2009, p. 23). A similar definition is given by Sternberg (2004), who views governance as a way of "ensuring that corporate actions, agents, and assets are devoted to achieving the corporate purpose established by the shareholders" (Sternberg, 2004, p. 41).

The above definitions of corporate governance all have in common that they focus on the shareholder as the primary beneficiary of governance regulations. This perspective is mostly consistent with the financial perspective on corporate governance, according to which governance shall mitigate agency problems by ensuring shareholder rights and legal protection of investors. Shareholder-focused definitions see corporate governance as a part of regulations that govern the relationship between those who manage and those who supply capital to a firm (Oman, 2001, p. 13).

Other definitions, especially from European scholars and the OECD, focus more on the relationship between multiple stakeholders and the distribution of rights between them. In this sense, Cadbury (1992) generally defines corporate governance as "the system by which companies are directed and controlled" (Cadbury, 1992, p. 5). According to his definition, investors are responsible for appointing board members and auditors which shall ensure compliance with governance principles inside the firm. The OECD (1999), e.g., sees corporate governance more as a system that defines the rules for decision making and regulates the responsibilities of the board, the management, the investors, and other parties (OECD, 1999, pp. 41–43). Demb and Neubauer (1992) even state that corporate governance is an instrument that all stakeholders can use to make the firm responsive to their claims (Demb & Neubauer, 1992, p. 9).

Nevertheless, there are also definitions regarding the societal perspective of governance systems. Wijesuriya, Thompson, and Young (2013) set another definition in which governance systems are described as mediators that ensure a "balance between economic and social as well as individual and communal goals" (Wijesuriya et al., 2013, p. 74). This implies that corporate governance is not only a tool that serves the interests of the shareholders but also protects rights and claims from stakeholders like, e.g., the employees, the society, and others.

Resource-based definitions of corporate governance claim that governance mechanisms foster efficient use of available resources and align the interests of

corporations with those of their shareholders (Lin & Hwang, 2010, p. 59). An efficient use in accordance with the interest of the shareholders lowers costs of the separation of ownership and control and encourages managers to demonstrate and pursue ownership behavior.

A comprehensive definition of governance was given by Rezaee (2009). It includes all major characteristics as well as the focus on both shareholders and stakeholders. With regards to this thesis and the following empirical analysis, this approach seems to suit well to get a universal understanding of corporate governance. Rezaee (2009) regards corporate governance as "the process affected by a set of legislative, regulatory, legal, market mechanisms, listing standards, best practices, and efforts of all corporate governance participants, including the company's directors, officers, auditors, legal counsel, and financial advisors, which creates a system of checks and balances with the goal of creating and enhancing enduring and sustainable shareholder value, while protecting the interests of other stakeholders" (Rezaee, 2009, p. 30).

2.2.2 STAKEHOLDERS OF CORPORATE GOVERNANCE

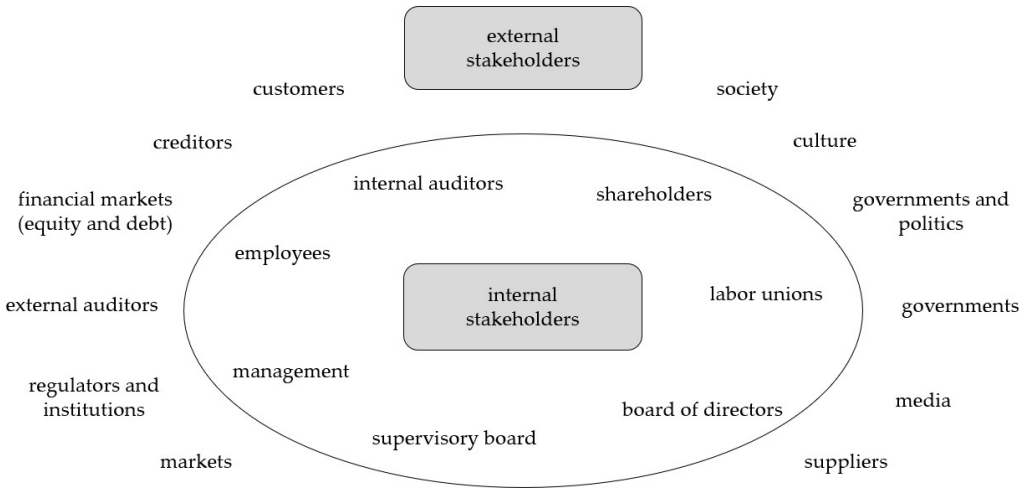
A firm's management and its shareholders can be regarded as the two key stakeholders of corporate governance. The management group generally includes the board of directors (common law) or the executive board and the supervisory board (civil law) as well as lower management levels.

As the second key stakeholder, the group of shareholders includes major shareholders like influential private investors and families or institutional investors such as pension funds, investment funds, life assurance funds, or hedge funds. Less influential private investors and minority shareholders with small share volumes are also part of the shareholder group (Tricker, 2019, p. 67).

Next to the two key stakeholders of corporate governance systems, various other parties that can exert a significant impact on corporate governance are summarized in Figure 4. One of these parties is the group of external auditors. Auditors are appointed by the firms themselves to ensure compliance with laws and accounting standards. They ensure that the financial information such as balance sheet, profit and loss, or cash flow statements are reflecting a fair picture of a firm's financial situation. As they are paid to detect and point out discrepancies

and mismanagement, they need to have the power to act independently from shareholders and managers (Mihret & Admassu, 2011, pp. 67–69).

Figure 4: Stakeholders of corporate governance
[Source: own representation based on Gillan (2006, p. 383)]



Regulating institutions like governments, supervisory authorities, or stock exchanges also belong to stakeholders of corporate governance. By implementing laws, regulations, and listing requirements, they create the baseline for good corporate governance practices (Gillan, 2006, p. 383). Firms can then use these baselines to derive and set up individual governance systems and measures (Tricker, 2019, pp. 147–155). Firms that do not comply with government regulations must expect adverse impacts on their reputation in society and on the capital markets. This is why, in general, banks, potential investors, customers, suppliers, the media, society, the environment, and others can be regarded as stakeholders of corporate governance in the broader sense (Tosuni, 2013, pp. 12–13).

Assuming that all stakeholders of a firm can also be seen as stakeholders of corporate governance, it is one of the main questions to determine whose interests should be considered and with which priority. In general, there are two different approaches to answer this question. The first approach embraces scholars like Gompers et al. (2003), Shleifer and Vishny (1997), and La Porta et al. (2000) who

focus their research on the so-called shareholder approach. Their approach points towards the main goal of a maximization of the shareholder's value. This implies that the interests of shareholders should always be regarded with priority (Tosuni, 2013, p. 13).

Other scholars like Tirole (2001) or Brown and Caylor (2009) represent a more balanced stakeholder approach. They argue that critical corporate decisions should also take into consideration the interests of other parties than only those of the shareholders (Brown & Caylor, 2009, p. 131). In practice, the stakeholder approach causes the problem of diverging objectives. Following the interests of one party might result in benefits for such party but most likely create a disadvantage for one or more other parties. A stakeholder approach that maximizes the benefits of all parties is therefore hard to achieve in practice (Jensen, 2001, p. 11).

2.2.3 CLASSIFICATION OF CORPORATE GOVERNANCE

One essential aspect when talking about the fundamentals of corporate governance is the classification into different governance systems. Reasons for the existence of different systems mainly derive from differences in sources of corporate governance between countries. Besides others, these sources can be characterized as corporate laws, legal frameworks of capital markets, or best practices (Bottenberg, Tuschke, & Flickinger, 2017, pp. 167–168). Although it depends on the firm itself in which way corporate governance is implemented, the legal framework plays an essential role in defining the baseline. For these reasons, a commonly accepted and simplified approach is to categorize countries as either shareholder or stakeholder-oriented (Groot, 1998, p. 212).

An orientation towards the shareholder thereby is expressed through a strong focus on protecting shareholder rights, especially those of minority shareholders, a high influence on corporate control, and a tendency towards equity financing through capital markets. Consequently, the interests of other stakeholders such as employees, customers, or suppliers are given less priority (Soskice & Hall, 2001, p. 61). Countries like the United States as well as Anglo-Saxon countries represent typical examples of shareholder-oriented countries and governance systems. A major purpose of corporate governance in the USA, for example, is to promote shareholder interests by giving them solid legal protection

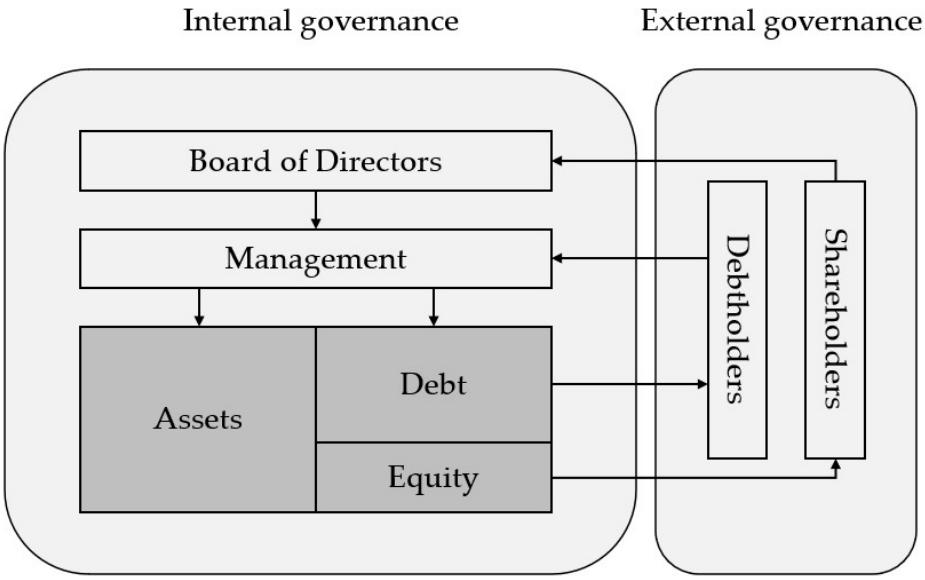
(Hasan, 2009, p. 280). Without a focus on such legal protection, the effect of shareholders on management would be considerably weaker, especially when the structure of corporate ownership is widely dispersed with only a few major shareholders (Tosuni, 2013, p. 43). The shareholder approach, often referred to as external corporate governance, is based on a fiduciary relationship between shareholders and the board of directors. Shareholders have the right to elect board members who, in turn, control and monitor business activities to maximize shareholder value. Shareholders can also directly reward or punish directors regarding their management performance (Shleifer & Vishny, 1997, pp. 744–745). This relationship may bear the risk of managers being focused on short-term performance to satisfy shareholders. While the maximization of shareholder value is a strong advantage of the Anglo-American system, it may not always allow managers to pursue long-term and strategic objectives (Becht, Jenkinson, & Mayer, 2005, pp. 158–159).

On the contrary, countries with a stakeholder orientation show more equal treatment across different stakeholders through balancing their interests. This complies with the stakeholder theory which holds "that managers should make decisions that take account of the interests of all the stakeholders in a firm" (Jensen, 2001, p. 8). Depending on the country specifics, this can be further strengthened by the involvement of labor unions, societal conventions, or legal regulations which allows stakeholders to directly participate in corporate decision making (Chun & Shin, 2018, p. 1926). Prime examples of stakeholder-oriented systems are Japan, France, or Germany, where, depending on the number of employees, the composition of supervisory boards can include mandatory employees and labor union representatives. In this way, all stakeholders' interests merit consideration and corporate decision-making does not primarily focus on the shareholder (Donaldson & Preston, 1995, p. 67).

As shown in Figure 5, Governance systems in stakeholder-oriented countries, therefore, focus on a more holistic approach that includes characteristics of external governance as well as internal governance (Iqbal & Mirakhor, 2004, p. 46). In this context, internal governance can be described as characteristics related to specifics of the board of directors like, besides others, board size, average age of board members, experience of board members, number of board meetings, board structure, existence of board committees, and independence of the board as well as

internal audit, guidelines, policies, director's compensation, or a firm's ownership structure (Ahmed Sheikh, Wang, & Khan, 2013, p. 40).

Figure 5: Internal and external corporate governance
[Source: own representation based on Gillan (2006, p. 382)]



It needs to be mentioned that the separation between internal and external governance in literature is not entirely consistent. Some scholars, e.g., Refakar and Ravaonorohanta (2020, pp. 13–14), define external governance as mechanisms like product market competition, managerial labor market, as well as takeover and M&A markets. In this case, shareholder and debtholder provisions would belong to the group of internal governance mechanisms instead of external ones. This thesis, however, follows the approach to divide internal and external governance by those groups which are internal to firms and those external to firms as set out in Figure 5 below (Gillan, 2006, p. 382).[2]

[2] The concept of product market competition as a corporate governance mechanism is further considered in the empirical analysis of this thesis. When conducting a moderation analysis in section 4.5.1., product market competition is used as a moderator of the governance-firm value relation.

In a European context, it can be differentiated between countries like Germany, Austria, Belgium, Hungary, most northern European countries, and, to a lesser extent, France and Switzerland, whose corporate governance frameworks follow a stakeholder orientation, while countries from the United Kingdom follow the shareholder approach (Kluyver, 2009, pp. 18–19). However, in the last decades, globalization of financial markets and convergence of accounting principles such as US-GAAP and IFRS, as well as an increasing number of European firms focusing on international and US capital markets have led to a steady alignment between shareholder and stakeholder-oriented corporate governance systems (Goergen, Manjon, & Renneboog, 2008, pp. 41–43).

This convergence can be split into a convergence "in form" and convergence "in function" (Salvioni, Gennari, & Bosetti, 2016, p. 1207). The convergence "in form" refers to a convergence of rules and principles at an international and European level. These are, e.g., the G20 and OECD "Principles of Corporate Governance" published by the OECD (2015), the green paper on "The EU Corporate Governance Framework" published in 2011, as well as various other EU recommendations and directives which have also found their way into national law and governance codes. The convergence "in function" describes voluntarily adopted practices by firms to remain attractive to investors and keep up with international competitors. Nowadays, it is widespread that international firms share very similar governance frameworks and strategies, although they originate from different countries. Global competition for the best financial and human resources has resulted in an emulation of successful governance strategies (Salvioni et al., 2016, p. 1208).

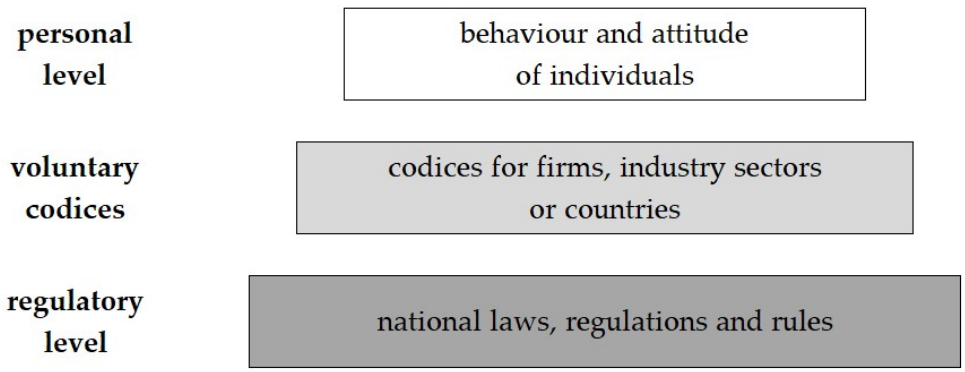
Comparing both systems, scholars have come to different results regarding the question of which system better contributes to a long-term and sustainable increase of firm value. While some state that the shareholder approach to corporate governance provides a better environment for development and growth, stakeholder systems have proven to handle governance problems successfully and provide "financial support at competitive cost and short time" (Tosuni, 2013, p. 34). Khanna, Kogan, and Palepu (2006, pp. 70–71) find that a general convergence to one of the two systems cannot be observed. Governance systems develop independently in their specific institutional, regulatory, and political environments. A country with a high level of economic and legal development may

require different corporate governance regulations compared to a country with a lower level. Consequently, corporate governance systems are constantly subject to changes and adaptations.

2.3 PRINCIPLES OF CORPORATE GOVERNANCE

Corporate governance can be divided into three general levels of paradigms as set out in Figure 6 below. These are the regulatory level, the personal level, and the voluntary codices level. The regulatory level is formed by laws and regulations which are set by countries and their jurisdiction. In this way, national legislation has a direct impact on a corporate governance structure. The personal level is formed by the behavior of each individual who shall act according to the laws, regulations, and codices set by governments and firms. In between these two levels is the voluntary codices level. This level contains codices for firms, industry sectors, or countries that should be followed, but, in most countries, are not legally binding.

Figure 6: Paradigms of corporate governance
[Source: own representation based on Tricker (2019, p. 235)]



There are several important publications of such codices which set global standards of good governance in the history of corporate governance. These are, e.g., the Cadbury report in 1992, the Greenbury report in 1995, the Hampel report in 1998, and, most of all, the Organisation for Economic Cooperation and Development, in short OECD, "Principles of Corporate Governance" published in

1999 (Tricker, 2019, pp. 15–16). These principles were revised in 2004 and 2015, with the 2015 version being published in cooperation with the Group of Twenty countries, often referred to as the G20 (OECD, 2015, p. 3). Although the OECD principles are not legally binding and voluntary, they serve as a role model for good governance that firms around the world use as guidance to set up corporate governance principles (OECD, 2015, p. 11). For this reason, the principles have been designed to be adaptable for different countries and jurisdictions. In contrast to laws, the principles shall only be seen as a proposal that is calling for recognition and attention to be respected (Tosuni, 2013, pp. 62–65).

The OECD principles include six categories which cover the following: a general description of how an effective corporate governance framework can be ensured, rights and equitable treatment of shareholders, the role of institutional investors, stock market, and other intermediaries, the role of stakeholders, transparency and disclosure, and the role and responsibilities of the board.

To provide a general overview of corporate governance principles, this thesis explains the six OECD categories in more detail and also provides a critical evaluation of governance principles in the following paragraphs (OECD, 2015, p. 11).

2.3.1 EFFECTIVE GOVERNANCE FRAMEWORKS

Besides the firm-specific corporate governance principles, the OECD first describes general legal, regulatory, and institutional requirements which should be fulfilled to ensure proper implementation and execution of good governance (OECD, 2015, pp. 13–17). The role of this basic framework is to provide legal security and promote overall confidence in a system. In this context, a particular focus lies on the environment in which a firm operates. Such an environment can influence governance principles and may lead to specific elements within the governance regulations resulting from country-specific circumstances or history. Politicians and governments need to ensure that the overall framework remains flexible enough and, at any time, supports the business operations of firms. This can be achieved by allowing for proportionality, e.g., in respect to a firm's size, stage of development, or ownership structure. New laws should be designed in a clear way that can efficiently be implemented and enforced. However, law systems

shall not be over-regulated or impose unenforceable or too onerous laws as they would otherwise negatively impact business dynamics (OECD, 2015, p. 13).

Effective corporate governance requires a clear division of responsibility between all different authorities involved with no overlap between the different legal influences. This implies that responsibilities for implementation, supervision, and enforcement are well-defined and corporate laws, accounting standards, stock market regulations, and other laws have no conflicts (OECD, 2015, pp. 13–14). This should be supported by providing these authorities with sufficient resources, rights, and capacity to perform their functions. Due to globalization and the international activities of firms, cross-border cooperation and the exchange of information between countries are appreciated (OECD, 2015, p. 17). In this context, a good example is the global convergence of accounting standards between US-GAAP, IFRS, and other local standards.

2.3.2 SHAREHOLDER RIGHTS AND PROTECTION

The equitable treatment and protection of shareholders form a primary function of corporate governance. As shareholders usually do not manage the daily business activities themselves but delegate this task to the board of directors and the management, firms need to ensure that sufficient rights are in place that protect the shareholders from being exploited by the management. Among others, these shall include the right to influence management decisions on fundamental corporate decisions. Thereby, a firm's corporate governance policy shall ensure that these rights reflect at least fundamental rights that are anyway recognized by law but also include additional rights that go beyond statutory regulations (OECD, 2015, pp. 18–19). According to Klapper and Love (2004, p. 724), this function is particularly important in countries with weak law enforcement as firm-specific governance systems need to close the gaps of national legislation.

The fundamental shareholder rights shall at least include six principles to achieve a good level of corporate governance. Shareholders shall have the right of:

- a secured registry of ownership of a firm,
- conveying and transferring such ownership at any time,
- regular receipt of relevant and up-to-date corporate information,
- participation in the annual meeting and executing voting rights,

- electing of the board members, and
- participation in the profits of a firm (OECD, 2015, p. 20).

These above shareholder rights can be further broken down. For example, on the right to participate and vote in the annual meeting, shareholders should be timely invited to such meetings, be provided with sufficient information regarding date, location, and agenda, and firms shall further promote shareholder participation by removing of any sort of barriers. These can include the permission of electronic voting in absence or facilitating cross-border voting. Shareholders shall further be able to ask questions to the board or place new items on the agenda. All these measures shall ensure that topics which concern the shareholders will be addressed appropriately (OECD, 2015, pp. 20–23).

Any amendments to the statutes of the firm, an increase of equity capital through additional shares, compensation schemes for board members, or further extraordinary transactions shall be subject to approval by the shareholders. Regarding the issuance of additional shares, this OECD requirement specifically deviates from how public offers, rights offers, and private placements can be executed in the US. While most European countries like Finland, France, Germany, France, Spain, Italy, or Greece require shareholder voting to issue new shares, US firms require no shareholder approval for public offers. For private placements in the US, an approval is only required in cases where either more than 20% of the equity is issued at a discount to the exchange price, when equity is issued to insiders, or if it results in a change in control (Holderness, 2019, pp. 26–29).

Further, whenever it comes to voting, it needs to be ensured that shareholders of the same series and classes of shares are treated equally and have fair voting power according to the number of owned shares (OECD, 2015, p. 24). A firm shall not be allowed to change voting rights unless it is approved in a shareholder meeting. Important in this regard is the protection of minority shareholders in cases where a firm has controlling shareholders. To avoid disadvantages for shareholders with only a small number of shares, they can be given pre-emptive rights for new share issues or allow for the possibility to gather with other minority shareholders to use cumulative voting in elections (Rühmkorf, Spindler, & Samanta, 2019, p. 1062). In general, it is perceived as positive if shareholders consult with each other and exchange information. Of course, this needs to be exercised without the intent of misuse or abuse (OECD, 2015, p. 23).

Last, shareholders should be protected against fraudulent management actions. Any board member or key executive shall disclose cases where they have a direct or indirect personal interest in a firm's transactions and anti-takeover provisions shall not be misused to defend the control of the existing management (OECD, 2015, pp. 25–28). While some anti-takeover provisions may make reasonable sense, the management could also use these to shield themselves from shareholder monitoring and accountability.

Talamo (2011, p. 238) argues that good protection of shareholder rights makes it more likely to attract capital, especially when it comes to riskier investments. In many firms, the protection of shareholder rights constitutes the main part of the corporate governance system (Mallin & Melis, 2012, p. 171).

2.3.3 INSTITUTIONAL INVESTORS, STOCK MARKETS, AND OTHER INTERMEDIARIES

Corporate governance principles shall also consider the role of institutional investors, stock markets, and other intermediaries. As in many cases, institutional investors hold significant shares of firms, their willingness to make use of ownership functions and rights can determine the effectiveness of a corporate governance framework. Consequently, these investors must disclose information on how they execute ownership rights, how voting policies are handled, and how conflicts of interests are managed (OECD, 2015, p. 30).

Advisors, analysts, brokers, and rating agencies that analyze firms and consult investors on relevant decisions shall disclose any conflict of interest that may have an impact on the provided services or advice (OECD, 2015, p. 32). Insider trading or manipulation of capital markets shall be actively prevented as this violates effective governance principles. In cases where firms are listed in multiple jurisdictions or stock exchanges, compliance with all applicable rules and regulations shall be considered (OECD, 2015, p. 33).

This OECD principle is fundamental with regard to the described agency conflict type two which is often referred to as a principal-principal conflict. When families or other controlling shareholders hold significant shares of firms, corporate governance needs to provide transparency through monitoring mechanisms on how these parties execute their control rights. It should be avoided that controlling

shareholders have an information advantage over minority shareholders and further use such an advantage to expropriate other shareholders. Firms led by an owner CEO are especially vulnerable to such issues as they often lack supervision and are more likely to set up structures that grant themself better control rights (Jiang & Peng, 2011, p. 687). Further, governance measures that support minority shareholders shall be implemented. These can include, e.g., the avoidance of a minimum number of shares required to vote or motivation of minority shareholders to show engagement, make resolutions, or other proposals.

Shareholders should also be allowed to cumulate their votes during an annual meeting. Such cumulative voting rights can permit minority shareholders to amass their votes and form an opponent block holder in contrast to the controlling shareholder. Multiple block holders, therefore, form a major path to solve principal-principal problems (Jiang & Peng, 2011, p. 686). From a long-term perspective, controlling shareholders should also be interested in implementing such principles as minority shareholders may lose confidence to invest in the firm which, as a consequence, can destroy firm value.

Next to the listed advantages of minority shareholder engagement, there might also be advantages of controlling shareholders such as faster decision processes as well as a more socially responsible behavior which can be observed in some family-owned businesses that pay more consideration to stakeholder interests (Niehm, Swinney, & Miller, 2008, pp. 332–333).

2.3.4 THE ROLE OF STAKEHOLDERS IN CORPORATE GOVERNANCE

Stakeholder principles focus on the relationship between firms and their stakeholders and cover the interaction and treatment of interests from employees, creditors, suppliers, shareholders, the society, the environment, and other stakeholders (Cheung, Connelly, Jiang, & Limpaphayom, 2011, p. 169). While good stakeholder management does not always follow the strict rule of shareholder value maximization, Flammer (2015, p. 2554) as well as Jensen (2010, p. 32) argue that firms cannot maximize sustainable value when the stakeholders' interests are ignored. Especially in industries that are "stakeholder-sensitive", i.e., in which a firm's performance highly depends on a good relationship with employees, suppliers, customers, etc., firms need to consider the interests of such parties

(Flammer, 2015, p. 2550). For example, a firm that depends on employees with very specific skills and knowledge should consider the interests of their employees to be represented in the firm's corporate governance framework.

Consequently, good stakeholder management and cooperation will positively contribute to long-term competitiveness, shareholder value, and organizational performance. It is the management's job to ensure that stakeholder rights are in place and can be enforced. This may be, e.g., in the form of an employee representation on the board of directors, the allowance of workers councils, or employee stock ownership and profit-sharing (OECD, 2015, p. 35).

To respect the rights of creditors like banks or suppliers, governance frameworks should include an effective insolvency framework that allows creditors to enforce their rights (OECD, 2015, p. 36). All stakeholders should have the right to be timely informed about and have access to relevant information. Unethical or illegal practices can be avoided by having channels in place through which stakeholders can communicate concerns and non-compliant behaviors without being discriminated against or being fearful of discriminatory and disciplinary actions (OECD, 2015, p. 35).

Nevertheless, it needs to remain the firm's primary focus to survive against competitors and ensure that its business model is profitable. This is why the stakeholder approach is often criticized as putting a competitive disadvantage on a firm. As an example, a firm that overpays employees and suppliers might have satisfied the interests of these two specific groups of stakeholders, but, eventually, will need to increase prices of their products and services. In cases where the satisfaction of the employees and suppliers does not result in an additional value to the customer, the firm will consequently lose market share, have less future cash flows and a decrease in its firm value. Also, in practice, it is often difficult to identify relevant stakeholders which then again might have contradicting interests. Being confronted with a variety of different interests, a firm that takes care of all stakeholders would become unable to be managed (Ambler & Wilson, 1995, pp. 33–34).

2.3.5 TRANSPARENCY AND DISCLOSURE

Corporate governance mechanisms shall support the disclosure of relevant information and material developments of the firm (Cheung et al., 2011, p. 170). Regardless of the level of mandatory public disclosure requirements which usually vary between countries, firm size, or stock exchange segments, firms shall ensure an adequate level of transparency that enables proper monitoring and informed decision-making by shareholders and other stakeholders. Disclosing information may thereby contribute to the firm's market integrity, increase the investors' confidence in a firm, and help to attract new capital. It can also help to make a firm stand out from competitors that disclose less information and is generally perceived as a positive signal to investors, banks, analysts, and financial intermediaries. Thereby, disclosure can be a valuable tool for corporate financing as it leads to a reduction of information asymmetries and external funds costs (García Sánchez, Rodríguez Domínguez, & Gallego Álvarez, 2011, p. 472).

Regarding disclosure of information and transparency, the OECD has defined criteria that should be fulfilled to meet a good level of governance quality. Public disclosures should thereby include financial statements[3] that fairly reflect the performance and financial situation of a firm. These statements should be audited by qualified auditors to ensure compliance with the relevant standards of accounting. To get a complete picture of a firm, it is further required to disclose information about the forecasted future performance, corporate targets as well as off-balance sheet obligations and contingent liabilities. This also includes the reporting of foreseeable material risks that may arise within the industry or the region in which the firm operates. Providing information about non-financial information such as business ethics, environmental policies, social engagement, handling of human rights, or other topics of public interest like key issues with employees, creditors, creditors, or other stakeholders is perceived as a positive signal for good governance (OECD, 2015, pp. 38–42).

Shareholders should have transparency about the firm's ownership structure and major shareholders to assess potential conflicts of interest. This includes transparency about special voting rights, existing shareholder agreements, or any

[3] These usually include balance sheet information, profit and loss statement, and cash flow statement.

form of cross-shareholding or cross guarantees with other firms (OECD, 2015, p. 39). A transparent reporting about related party transactions as well as the qualification, remuneration, selection process, and independence of board members and key executives is perceived as a feature of good disclosure activities.

However, firms shall not be obliged to disclose information that may jeopardize their competitive advantages unless such information is material for shareholders to make investment decisions (OECD, 2015, p. 37). Therefore, a decision about disclosing information goes beyond a sole focus on corporate governance as managers need to find an optimal level of voluntary disclosure of proprietary information by considering a trade-off between its benefits and costs (García Sánchez et al., 2011, p. 474). The disadvantages of disclosure should not outweigh its benefits.

Based on the theory of proprietary cost, firms need to consider two general types of costs when disclosing information. First, these are the direct costs that have to do with collecting, preparing, and disseminating of information. Here, especially large firms have advantages as these costs better amortize. However, it is likely that these costs are generally low because in most cases such information should be already prepared and available for making internal management decisions and have decreased significantly with the emergence of ERP systems and online reporting platforms (García Sánchez et al., 2011, p. 474). It is generally more the second type of cost which includes the risk of potential competitive damage when information is not only available for current and potential investors but also for competitors. These might misuse such information to improve their market positions by copying, e.g., strategic decisions, products, market entry strategies, and other firm characteristics. Disclosure also increases the possibility of interventions and demands by other interested parties, such as governments, tax authorities, labor and trade unions, consumer associations, customers, or suppliers (García Sánchez et al., 2011, p. 474).

Even though the influence of voluntary disclosure is generally assumed to have a positive value for shareholders, there remains the risk of overdisclosure, i.e., a situation in which firms reveal excessive information that is not entirely relevant to shareholders (Mukhtaruddin, Ubaidillah, Dewi, Hakiki, & Nopriyanto, 2019, p. 57). Overdisclosure of financial and corporate information might then lead to the opposite effect of a decrease in firm value as it creates increased costs of selecting

information on the shareholder side. In addition, costs to disclose information on firm-level would outweigh its benefits (Hermalin & Weisbach, 2012, p. 203).

Information transparency also relates to compliance with corporate governance principles in general. Therefore, it is recommended to implement regular corporate governance reports that inform stakeholders about firm-specific governance principles as well as in how far a firm has complied with these principles or not (OECD, 2015, p. 42). The so-called "comply or explain" principle also bears the opportunity to justify deviations from generally accepted governance principles. As mentioned above, there might be good reasons not to fully comply with a governance standard. For firms that have not fulfilled certain governance principles, a justified explanation can potentially heal such violation. With regard to the proprietary cost theory, having the option not to disclose information can be especially valuable to smaller firms, where disclosure is often connected with high cost of collecting and preparing.

Most important is that all information is provided through adequate information channels. Access to such channels should be provided timely and in a cost-effective way (OECD, 2015, p. 44). Therefore, most firms maintain investor relation websites to publish and store relevant financial and non-financial information.

2.3.6 BOARD OF DIRECTORS

Effective corporate governance heavily relies on a functioning board of directors. A governance framework needs to ensure that the board of directors gives strategic guidance to the firm and effectively monitors management actions. It is accountable to the firm and its shareholders, shall align the interests of these two parties, and shall ensure an adequate return on investment (OECD, 2015, p. 45). Board decisions shall be made with due diligence, in good faith, on a fully informed basis, and in the firm's best interest (OECD, 2015, p. 45). This also includes taking the interests of other stakeholders into regard and balance their competing demands. Aside from the monitoring and controlling function, the board also provides knowledge, experience, advice, and network to support the business (OECD, 2015, pp. 47–50).

The OECD has broken down major responsibilities, principles, and best practices of the board of directors into several provisions. These can be used to determine the level of governance quality in relation to the board of directors by reviewing the number of fulfilled OECD recommendations. One of these recommendations relates to the remuneration of the board and other executives. It is considered good governance if a firm has certain policies in place that regulate the remuneration of board members. For example, the total remuneration packages, including stock options and pension plans for board members and key executives should be disclosed and details on how remuneration is linked to organizational performance and long-term business targets (OECD, 2015, p. 48). In recent times, firms more often link remuneration to sustainability or environmental targets as well.

On the overall composition of the board, the OECD recommends that board members require sufficient background and skills to perform their job well. Usually, firms disclose the specific experience, qualifications, attributes, or skills of each board member, which justify that such person is qualified enough to serve as a director. From a resource dependence theory point of view, it is generally favorable when firms indicate what each board member contributes to the board by highlighting their industry-specific, international, management, or financial experiences and qualifications. In this context, Yarbrough Jr, Abebe, and Dadanlar (2017, pp. 401–403) show that a director's political experience can increase a firm's performance, as such directors can provide guidance, resources, and network access.

The board should carry out regular evaluations to assess their competencies. Such a procedure can be written down in a policy for board experience (OECD, 2015, p. 53). To avoid groupthink, firms are encouraged to promote gender and cultural diversity on boards and in senior management positions. A policy for board diversity is considered a positive signal. Firms shall have policies in place that regulate the size of a board as well as specific membership and board tenure limits. Boards that are too small might not have enough resources available, while large boards may not work efficiently. Scenarios shall be avoided where the CEO and chairman positions are held by the same individual or where the chairman is the former CEO. It is considered positive if the board has non-executive members and that each board member can act independently. For key executives, there

should be an overall succession plan to ensure stable and long-term management of the firm (OECD, 2015, p. 48).

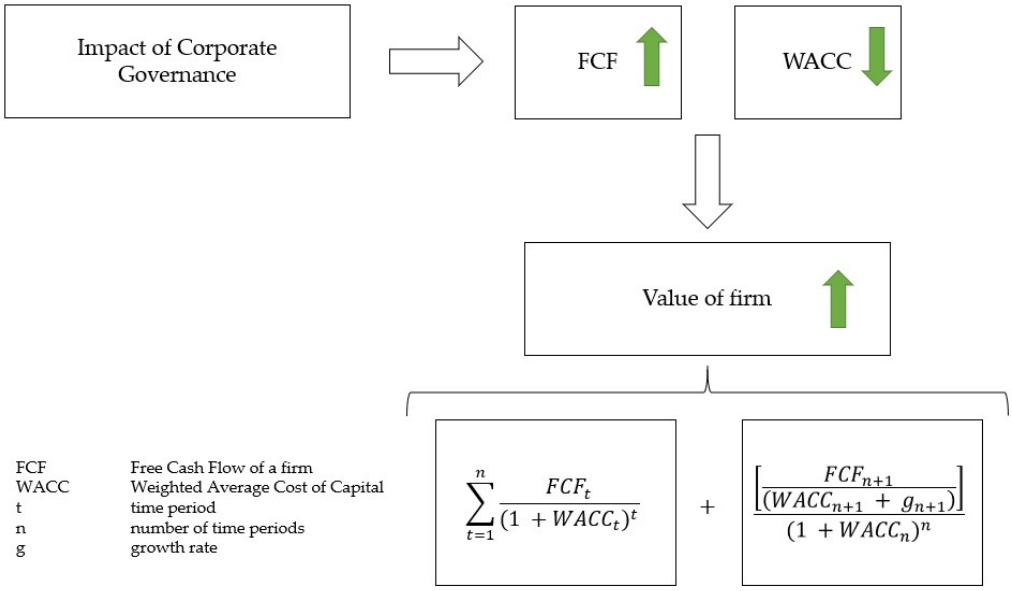
Regular board meetings are essential instruments to review a firm's performance, address problems, get approval for major corporate decisions, and ensure communication between board members. Board members should attend these board meetings and commit themselves to their responsibilities. It can interfere with a board member's performance if a significant number of board meetings were not attended or if the member is servicing too many boards for different firms at the same time (OECD, 2015, p. 53).

Regarding audit activities, the board shall ensure the integrity of accounting and financial reports. It can set up internal audit systems for risk management, financial and operational control to break down this task into the organization. The handling of other key board responsibilities in special committees is considered a feature of good governance. Specialized committees shall avoid conflicts of interest, ensure transparency and quality, and actively support the board to better perform its core functions. Board committees can be set up, e.g., for corporate governance, the nomination of board members, audit, internal control, as well as for board compensation topics. It is important that members of these committees can act independently to properly fulfill their mandate (OECD, 2015, p. 52).

2.4. IMPROVEMENT OF FIRM VALUE THROUGH CORPORATE GOVERNANCE

In perfect capital markets under the Modigliani and Miller (1958) assumptions of no agency cost and no asymmetric information, corporate governance would be of limited value since the problems and conflicts it is supposed to solve would not exist (Claessens & Yurtoglu, 2013, pp. 11–12). However, under real market conditions, the before mentioned underlying theories justify and explain how corporate governance can improve firm value. The causal relationship between corporate governance and firm value can be summarized by using a simple discounted cash flow model as set out in Figure 7.

Figure 7: How corporate governance affects firm value
[Source: own representation based on Larrabee and Voss (2012, pp. 105–115)]



The above DCF model determines the value of a firm by looking at future free cash flows which are then discounted at the rate of the weighted average cost of capital, the WACC. The WACC represents the firm's weighted average cost of equity and debt after tax. In this way, the net present value of the free cash flows, or in other words, the value of the firm, can be determined.

Corporate governance is supposed to impact the DCF model in two ways: First, it leads to a sustainable increase in future free cash flows and, second, it reduces the firm's WACC at which the cash flows are discounted. An increase of the numerator, i.e., free cash flows, and a decrease of the denominator, i.e., the WACC, consequentially leads to a higher expected firm value. With the free cash flows and the WACC being identified as the two major determinants of firm value, the following section focuses on several factors that show why and how governance positively influences these two determinants.

From a future cash flow perspective, corporate governance principles support the enforcement of shareholder rights and increase transparency about how a firm is managed. Shareholders will have better access to information for assessing and monitoring corporate decision-making. Costs for managers to carry

out hazardous actions, e.g., tunneling of resources or other unethical and illegal practices, significantly increase and might become greater than their potential benefits (Claessens & Yurtoglu, 2013, p. 13). In this way, diverting cash from the firm to increase personal benefits becomes less attractive to managers and reduces their tendency to absorb "appropriate perquisites out of the firm's resources for his own consumption" (Jensen & Meckling, 1976, p. 313). Less diversion of resources has the positive effect that more capital for operations and investments is available.

According to Shleifer and Vishny (1997) firms with effective corporate governance frameworks are also likely to carry out more profitable investment decisions. Not only can managers channel capital to the most valuable investments and thereby accumulate new capital, but the external control by shareholders over investments further ensures the efficiency of resource allocation and investment selection (Al Manaseer, Al-Hindawi, Al-Dahiyat, & Sartawi, 2012, p. 350). Corporate governance consequently encourages the management to show ownership behavior (Shleifer & Vishny, 1997, pp. 749–752). This supports the assumption that governance leads to better handling of capital and secures future cash flows and profitability for the firm. However, it also secures future cash flows to the shareholders in the form of dividends, which, for many investors, is a key criterion for evaluating an investment.

From a stakeholder point of view, corporate governance supports establishing an effective stakeholder management, as it is not entirely focused on shareholder value. Important stakeholders like banks, employees, governments, or suppliers can have a huge impact on profitability, the ability to secure future cash flows, and to leverage the growth of a business. Banks, for example, have certain control and property rights which they can execute in case debt is not repaid. However, when there is a trust relationship between banks and firms, they can be a valuable partner to finance investments and utilize business opportunities. Employees carry huge parts of the knowledge and expertise and will provide better performance and not terminate their contracts when incentivized with financially attractive remuneration. Suppliers may agree to more favorable payment and delivery conditions and significantly determine the quality of a firm's products. Although the benefits of good stakeholder management are often underestimated and only little empirical evidence exists, improving relations with shareholders

through measures of good corporate governance may offer additional value and can be beneficial to the firm and its firm value (Claessens & Yurtoglu, 2013, p. 17).

From a WACC perspective, corporate governance cannot directly reduce the cost of capital, but there are several factors through which it can support and contribute to do so. All these factors rely on a decrease of information asymmetries for investors to eventually lower their return expectations. Although the Capital Asset Pricing Model (CAPM) cannot strictly apply in non-efficient markets, investors generally demand higher returns on their equity or higher interest on debt when they take additional systematic risk. When there is less certainty on the returns or it is likely that a firm will not be able to pay back debt, investors are cautious about providing capital and will require an adequate premium to cover their calculated risk. As a result, firms with uncertain or risky business models as well as firms that have a high probability of default generally have comparably higher WACC rates. In contrast, lower rates of return are requested when the assurance of returns is high and firms have a good financial standing that allows them to repay debt (Merton, 1987, pp. 489–495).

Another effective instrument of corporate governance is its aim to better protect the rights of creditors and shareholders. This generally has a positive influence on a firm's access to capital markets and, if enforced by national law, can foster the market sentiment and the development of an entire capital market (Claessens & Yurtoglu, 2013, p. 13). When investor protection is supported or improved through governance regulations and national laws, the ability of better-informed agents to expropriate less-informed principals as well as emerging principal-principal problems are generally less likely to occur. Therefore, investors have more confidence to invest in well-protected markets and firms rather than in unprotected ones (Djankov, La Porta, Lopez-de-Silanes, & Shleifer, 2008, p. 431). Countries and firms in which shareholder rights are well protected and enforced by regulators are therefore more attractive to investors and benefit from a higher willingness to supply capital (La Porta et al., 2000, p. 18). Simplified access to external financing can accelerate a firm's development and economic growth.

In addition to promoting shareholder rights, information asymmetry can further be reduced through more transparency and disclosure (Zhu, 2014, pp. 393–395). Regarding the increase in transparency of financial information, Habib (2006, p. 131) argues that transparent reporting reduces information asymmetries as

investors can better monitor management actions. The disclosure of information can further reduce the adverse selection problems when it comes to investment decisions (Glosten & Milgrom, 1985, p. 72). When information is transparent, investors can judge the true economic value of firms and the quality of management decisions. Being able to properly analyze a firm's financial situation and have more reliable information, investors face fewer investment risks.

When governance can reduce agency costs by providing shareholder rights and transparent information, investment risks decrease, and investors face less costs for monitoring and auditing activities. Overall, this leads to a reduction of potential cost on the shareholders' side so that they would be willing to accept lower expected rates of return (Callahan et al., 1997, p. 58). Following this assumption, Lombardo and Pagano (2002) prove that effective corporate governance leads to reduced shareholder expectations of the return on equity due to a reduction of systematic risk measured through a firm's beta-factor. The reduced cost of equity and debt leads to less capital cost, i.e., a lower WACC, in general, resulting in higher firm value as per the DCF model (Zhu, 2014, p. 393).

As Habib (2006, p. 131) points out, the positive impact of governance of firm value results from an implementation of an overall functioning governance system that provides sufficient right to shareholders, enables the monitoring of managerial decision making, delivers reliable corporate information, and finally supports an analysis of prospects of the firm. All these factors contribute to an increase in firm value through effective corporate governance resulting from an increase in future cash flows and a reduction of capital cost.

Next to the DCF approach, a more general aspect of why governance might affect firm value is that good corporate governance can also decrease financial volatility. When information is asymmetric and not well protected, the risk of insider trading increases. Investors may not have the possibility to collect necessary information so that insiders can trade on this information before it is public (Claessens & Yurtoglu, 2013, p. 16). Morck, Yeung, and Yu (2000, p. 258) argue that synchronous stock price movements in emerging economies result from less respect for private property and shareholder protection by governments. Brockman and Chung (2003, pp. 935–936) show that less investor protection is connected with higher relative bid-ask spreads. These results show that corporate governance can overall contribute to the better functioning of financial markets and

make stocks of well-governed firms a better processor of financial information (Claessens & Yurtoglu, 2013, p. 16).

However, there are also theories that do not support the positive influence of corporate governance on firm value. As set out earlier, Hermalin and Weisbach (2012, p. 203) as well as Mukhtaruddin et al. (2019, p. 57) describe scenarios in which proprietary cost connected to the disclosure of financial information as well as the potential risk of overdisclosure can have a negative impact on firm value as they create agency cost. In addition, the internal cost to comply with governance regulations, occupancy of managers or other resources, and a potential loss of decision speed and agility through excessive governance regulations can have disadvantages for firms that operate on fast-moving markets or which do not have the size to amortize governance costs (Durden & Pech, 2006, pp. 84–86).

3. MEASUREMENT AND VALUE EFFECTS OF CORPORATE GOVERNANCE

This chapter covers the measurement and value effects of corporate governance in three separate sections:

The first section focuses on the measurement of corporate governance quality. It introduces governance ratings and individual governance provisions, i.e., characteristics, which can be used to compute governance scores. In addition, several prevailing governance ratings are described and analyzed, including a critical evaluation and comparison between them.

The second section of this chapter deals with how organizational performance and firm value can be reliably measured and provides examples of KPIs used in academic research on corporate governance. It also gives an overview of the current state of research on the influence of corporate governance on organizational performance and firm value measures.

As a conclusion of the third chapter, the research question and hypotheses are developed.

3.1 MEASUREMENT OF CORPORATE GOVERNANCE QUALITY

3.1.1 INTRODUCTION TO CORPORATE GOVERNANCE RATINGS

Given the multidimensional character of corporate governance, approaches to determine the firm-specific level of governance quality are diverse. Even though each of the existing approaches claims to be justified and based on the underlying theoretical concept of corporate governance, the perception of what matters in corporate governance can vary between countries, law systems, and stakeholders. Therefore, to date, there is no general and universally acknowledged measurement approach for governance quality (Pargendler, 2016, p. 369). Analyzing the composition of prevailing governance scores from the literature shows that scores are typically based on a set of individual governance provisions that serve as a basis for constructing a firm-specific rating. Thereby, a governance provision reflects a certain characteristic, criterion, or KPI related to a specific aspect of corporate

governance. Most ratings apply so-called pass-fail scoring methodologies by which a score is calculated based on the total sum of governance provisions that fulfill standards for good governance, while provisions that are not fulfilled do not count towards the score. However, the number, weighting, and choice of provisions can substantially differ between scores (Louizi & Kammoun, 2016, p. 364).

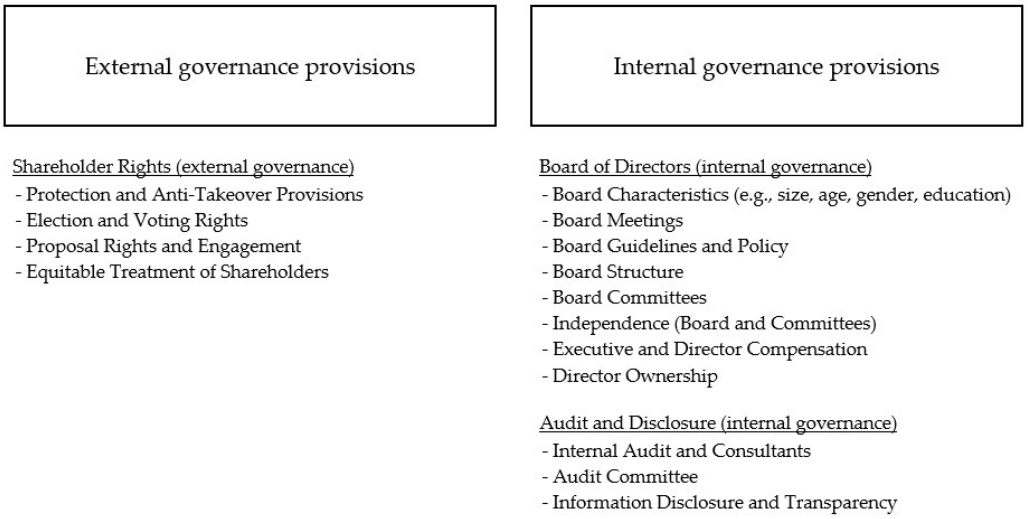
There are several ways to classify governance ratings in general. Next to many, one is to differentiate between academic governance ratings which are developed and set up by scholars on the one hand and commercial governance rating which are computed by rating firms on the other hand (Daines et al., 2010, p. 441). Bhagat and Bolton (2019, p. 143) use a different approach by dividing ratings into single governance provision ratings which are based on only one specific firm-specific governance characteristic and ratings that include several provisions summarized as a governance score.

This thesis, however, classifies corporate governance ratings by separating them into the categories of "external governance" and "internal governance" measures. This approach aligns with the classification of corporate governance into shareholder and stakeholder-oriented governance systems as described in the previous sections. It will further play a key role in the empirical analysis in chapter four, where the influence of different corporate governance dimensions on firm value is examined as part of the research contribution of this thesis. It generally depends on the underlying provisions on which a rating is based whether it falls into the category of external or internal governance. In case a governance score or rating includes provisions that predominantly focus on shareholder rights, it can be classified as an external governance rating, while provisions that focus on the board of directors and other stakeholders would constitute an internal governance rating. Both internal and external ratings can provide valuable information about a firm's level of governance quality. However, they might capture different dimensions of governance quality that differ regarding their influence on a firm's valuation (Stender & Rojahn, 2020, pp. 159–160). As set out in the introduction of this thesis, the lack of a differentiation between different dimensions of corporate governance and its influence on firm value is one major existing research gap in today's academic literature.

Following Shahzad, Rutherford, and Sharfman (2016, p. 100) who have divided corporate governance provision into shareholder-centric and stakeholder-

centric provisions, the overview in Figure 8 shows a selection of the most commonly used governance provisions. They are subdivided into the internal governance categories "Board of Directors" and "Audit and Disclosure" as well as the external governance category "Shareholder rights". A description of these individual provisions is provided in the following sections.

Figure 8: Systematization of corporate governance
[Source: own representation based on literature review]



3.1.2 CORPORATE GOVERNANCE PROVISIONS

To determine the quality of corporate governance, it is required to derive specific governance provisions out of general principles for good governance. Corporate governance has various aspects and dimensions which make measuring governance quality a complex problem. Therefore, evaluating governance in a shareholder-oriented country might differentiate from measuring governance in a stakeholder-oriented legal environment. Even though the perception of good governance varies across different countries and legislations, there are generally accepted regulations like, besides others, the OECD principles of corporate governance. These principles reflect both internal (stakeholder) and external (shareholder) governance characteristics. Those generally accepted principles can be broken down into single governance provisions which can form the baseline for

measurement approaches of governance quality. Governance provisions describe specific characteristics of a firm concerning governance practices so that investors can verify if an acceptable level of good governance is achieved for a specific attribute.

To provide an overview of market standard governance provisions, the Refinitiv Eikon ESG database is used as an example. This database is also applied as the underlying database for the empirical analysis in this thesis and includes a comprehensive set of governance provisions to quantify overall governance quality. It further differentiates between internal and external governance by classifying provisions into a management or shareholder category. The shareholder category reflects provisions of external governance. These include provisions related to shareholder rights, shareholder participation, charter, bylaws, voting rights, anti-takeover, and protection mechanisms. All provisions shall ensure that ownership rights are appropriately treated and protected. Good shareholder participation, e.g., is reflected through provisions like the existence of a shareholder engagement policy, the inclusion of shareholders on significant transactions and investment decisions, or the possibility for shareholders to make proposals at the annual meetings. Voting rights provisions mainly focus on the fairness and equality of shareholder voting rights like a "one share, one vote" principle. This shall explicitly promote minority shareholders and avoid putting them at a disadvantage. Anti-takeover provisions reflect measures taken by the management to limit shareholder rights and complicate or slow down take-overs. Examples are a staggered board structure or a limitation on the removal of directors. In this way, a board cannot be immediately exchanged but only over time. Other anti-takeover provisions are golden parachutes, capital blank checks, or poison pills which shall make a take-over unattractive and expensive. In general, it is not perceived as good governance practice if anti-takeover provisions are put in place as they reduce shareholder rights and make it more difficult to control and discipline the management when it is entrenched (Harford, Humphery-Jenner, & Powell, 2012, pp. 247–250). Table 1 provides the full list of external governance provisions included in the Eikon shareholder category.

Table 1: Governance provisions of the Eikon Shareholder score
[Source: own representation based on downloads from the Refinitiv Eikon ESG database]

Refinitiv Eikon ESG Shareholder Score			
1	Shareholder Rights Policy	18	Staggered Board Structure
2	Policy Equal Voting Right	19	Supermajority Vote Requirement
3	Policy Shareholder Engagement	20	Golden Parachute
4	Dual Class Stock	21	Limited Shareholder Rights to Call Meetings
5	Equal Voting Rights	22	Elimination of Cumulative Voting Rights
6	Voting Cap	23	Pre-emptive Rights
7	Voting Cap Percentage	24	Company Cross Shareholding
8	Minimum Number of Shares to Vote	25	Confidential Voting Policy
9	Director Election Majority Requirement	26	Limitation of Director Liability
10	Shareholders Vote on Executive Pay	27	Shareholder Approval Significant Transactions
11	Public Availability Corporate Statutes	28	Limitations on Removal of Directors
12	Veto Power or Golden share	29	Advance Notice for Shareholder Proposals
13	State Owned Enterprise SOE	30	Earnings Restatement
14	Anti-Takeover Devices Above Two	31	Profit Warnings
15	Poison Pill	32	Non-audit to Audit Fees Ratio
16	Unlimited Authorized Capital or Blank Check	33	Insider Dealings Controversies
17	Classified Board Structure	34	Accounting Controversies

In contrast to shareholder-related provisions, provisions included in the Eikon management category, shall reflect internal governance quality. These include characteristics related to specifics of the board of directors as well as provisions related to internal audits, guidelines, policies, director's compensation, or a firm's ownership structure. Within this category, the board characteristics form the largest group as they comprise provisions like board size, the average age of the board members, board diversity, board independence, the average tenure of board members, number of board meetings per year, board meeting attendance, board structure, board skills, and education level of the members.

Table 2: Governance provisions of the Eikon Management score
[Source: own representation based on downloads from the Refinitiv Eikon ESG database]

Refinitiv Eikon ESG Management Score			
1	Board Functions Policy	31	Board Structure Type
2	Corporate Governance Board Committee	32	Board Size More Ten Less Eight
3	Nomination Board Committee	33	Board Size
4	Audit Board Committee	34	Board Background and Skills
5	Compensation Board Committee	35	Board Gender Diversity, Percent
6	Board Structure Policy	36	Board Specific Skills, Percent
7	Policy Board Size	37	Average Board Tenure
8	Policy Board Independence	38	Non-Executive Board Members
9	Policy Board Diversity	39	Independent Board Members
10	Policy Board Experience	40	CEO-Chairman Separation
11	Policy Executive Compensation Performance	41	CEO Board Member
12	Policy Executive Compensation ESG Performance	42	Chairman is ex-CEO
13	Policy Executive Retention	43	Board Member Affiliations
14	Compensation Improvement Tools	44	Board Individual Reelection
15	Internal Audit Department Reporting	45	Board Member Membership Limits
16	Succession Plan	46	Board Member Term Duration
17	External Consultants	47	Executive Compensation Policy
18	Audit Committee Independence	48	Executive Individual Compensation
19	Audit Committee Mgt Independence	49	Total Senior Executives Compensation
20	Audit Committee Expertise	50	Highest Remuneration Package
21	Audit Committee NonExecutive Members	51	CEO Compensation Link to TSR
22	Compensation Committee Independence	52	Executive Compensation LT Objectives
23	Compensation Committee Mgt Independence	53	Sustainability Compensation Incentives
24	Compensation Committee NonExecutive Members	54	Shareholders Approval Stock Compensation Plan
25	Nomination Committee Independence	55	Board Member Compensation
26	Nomination Committee Mgt Independence	56	Board Member LT Compensation Incentives
27	Nomination Committee NonExecutive Members	57	Executive Compensation Controversies
28	Board Attendance	58	Board Cultural Diversity, Percent
29	Number of Board Meetings	59	Executive Members Gender Diversity, Percent
30	Board Meeting Attendance Average		

Good governance practice regarding the board of directors is often determined through margins or thresholds. Board members should, for example, attend at least 75% of the board meetings in a year and that at least 10% of the board members should be female (Institutional Shareholder Service, 2020, p. 26). The existence of board committees such as audit or compensation committees and their independence from the management are included as separate provisions as well. Governance quality is perceived as high if a firm has set up committees that independently address topics like compensation, audit, or nomination. Table 2 above lists all Eikon management provisions which describe internal governance quality as they go beyond a sole orientation towards the shareholder.

3.1.3 CORPORATE GOVERNANCE SCORES AND RATINGS

There are various governance scores and ratings applied in academic research that differ by the number or the selection process of provisions, the use of specific databases, the weighting of provisions, or other, sometimes study-specific, factors. Therefore, this thesis focuses on providing a general overview of different prevailing governance rating approaches and describes these in more detail.

To identify prevailing rating approaches from academic literature, a Web of Science and Google Scholar ranking of frequently applied and cited scores is used for support. The ranking was conducted in June 2021 and uses the search keywords „corporate governance" and "score" or "rating" or "measure" or "index". The search has been carried out on both Google Scholar and Web of Science using the same search criteria. Results show that the most relevant studies which include the keywords as well as an individual approach to measure governance quality are the Gompers et al. (2003) study using the "G-Index" (2,957 citations), the Bebchuk, Cohen, and Ferrell (2009) study which refines the G-Index by setting up the "Entrenchment Index" (1,204 citations), as well as the Brown and Caylor (2006) study which sets up the "GOV-Score" and "Parsimonious Index" (1,474 citations each).

The following sections provide a deeper look at how these measures assess governance quality and in which way they are set up and computed. In conclusion, an analysis regarding the composition of the ratings and a comparison between them is provided. The scores include the identified prevailing scores from

literature, commercial governance rating with a particular focus on the Eikon shareholder and management scores, as well as ratings based on single governance provisions.

3.1.3.1 Governance-Index (G-Index)

Gompers et al. (2003) were among the first to suggest a composite score based on a set of firm-specific provisions to measure governance quality. While earlier studies base their underlying datasets on hand-collected data provided through questionnaires like, e.g., Drobetz, Schillhofer, and Zimmermann (2004), Gompers et al. (2003) make use of the Investor Responsibility Research Center dataset, in short IRRC, to construct the so-called "G-Index". The G-Index includes 24 provisions which are mostly based on shareholder rights and anti-takeover characteristics such as staggered or classified boards, golden parachutes, voting rights regulations, and others. Due to duplication between the initial 22 firm-level provisions and the six state law IRRC provisions (28 overall provisions), Gompers et al. (2003) reduce the overall number of provisions to 24 unique characteristics. As set out in the overview of the G-Index in Table 3 below, the 24 provisions are further divided into the five categories: Delay, protection, voting, state characteristics, and a group of others. Thereby, provisions from the delay group shall target to slow down hostile take-overs, provisions from the protection group shall protect and secure jobs of the management and directors, voting provisions include shareholder right and voting right characteristics, state provisions include US state law regulations for take-overs, and provisions categorized as others are those which to not fit into any of the before-mentioned categories.

The construction of the G-Index then follows a simple scoring approach by adding one point to the overall firm-specific score for each absence or non-fulfillment of a shareholder rights provision. According to Gompers et al. (2003), any criterion that reduces shareholder rights and increases managerial power within a firm negatively impacts governance quality. By applying an investment strategy that buys shares with strong shareholder rights and sells shares with strong managerial power, Gompers et al. (2003) show that their governance portfolio realizes an abnormal return of 8.5% per year during a period from 1990 to 1999. As their study is focused on the US market only, the applied approach to measure governance quality is mainly oriented towards the shareholder. However,

the G-Index was the starting point of the development of further governance measurement approaches and related research activities. Table 3 provides an overview of the set of governance provisions used in the G-Index.

Table 3: Governance provisions of the G-Index
[Source: own representation based on Gompers et al. (2003, p. 152)]

Governance-Index (G-Index) based on IRRC corporate governance provisions			
Delay		**Others**	
1	Blank Check	17	Anti-Greenmail
2	Staggered or Classified Board	18	Directors' Duties provisions
3	Special Meeting limitations	19	Fair-Price provisions
4	Limitations on action by Written Consent	20	Pension Parachutes
Protection		21	Poison Pills
5	Compensation Plans	22	Silver Parachutes
6	Contracts	**State characteristics**	
7	Golden Parachutes	23	Anti-Greenmail Laws
8	Director Indemnification	24	Business Combination laws
9	Limitations on director Liability	25	Control-share Cash-out laws
10	Executive Severance agreements	26	Directors' Duties Law
Voting		27	Fair Price Law
11	Bylaw amendment limitations	28	Control-Share Acquisition laws
12	Charter amendment limitations		
13	Cumulative Voting		
14	Confidential Voting / Secret Ballot		
15	Supermajority to approve a Merger		
16	Unequal Voting rights		

The G-Index approach to measuring corporate governance quality is still often applied in literature and rarely criticized. However, Brown and Caylor (2006, pp. 412–414) argue that the provisions used for the G-Index are too narrow and disregard internal factors of corporate governance while shareholder rights and other factors are overrepresented. Today, the originally used IRRC database is no longer available as IRRC became RiskMetrics in 2006 and RiskMetrics was subsequently acquired by MSCI which was then spun off to ISS (Bhagat & Bolton, 2019, p. 143). Therefore, it is difficult to reconstruct the G-Index based on the same

data so that it is often the case that alternative databases are used to reconstruct the G-Index.

3.1.3.2 Entrenchment Index

Bebchuk et al. (2009) extend results from Gompers et al. (2003) by using the same underlying IRRC dataset to construct the so-called Entrenchment Index. The scholars raise concerns that only some of the 24 governance provisions from the G-Index have a significant positive impact on performance indicators such as firm valuation, whereas the other provisions do not. In this way, they prove that their measurement approach, existing of only six selected provisions from the original 24 provisions used by Gompers et al. (2003), fully drives the influence between governance quality and firm valuation. Therefore, the Entrenchment Index is based only on those "IRRC provisions that have systematically drawn substantial opposition from institutional investors" (Bebchuk et al., 2009, p. 784) as these provisions negatively impact takeovers. Bebchuk et al. (2009) have further verified these six provisions through interviews with leading M&A practitioners and other analyses. Given that all six extracted provisions either reflect shareholder rights restrictions or anti-takeover measures, the index was given the name "Entrenchment" Index.

With more than 1,204 studies that apply or quote the Bebchuk et al. (2009) Entrenchment Index in further research, it is one of the most widely used approaches to measure governance quality. The six entrenchment provisions which are used in the score are set out in Table 4 below.

Table 4: Governance provisions of the Entrenchment Index
[Source: own representation based on Bebchuk et al. (2009, p. 783)]

Entrenchment Index based on IRRC corporate governance provisions			
1	Bylaw amendment limitations	4	Poison Pills
2	Charter amendment limitations	5	Staggered or Classified Board
3	Golden Parachutes	6	Supermajority to approve a Merger

As the Entrenchment Index is based on a selection of those six provisions that have drawn substantial opposition from leading M&A practitioners, the theoretical justification of such provisions assumes that a limitation of a shareholder's voting

rights is a more important aspect of corporate governance than other shareholder rights or the rights of other stakeholders. Therefore, the Entrenchment Index cannot strictly be regarded as a reliable measure of governance quality in general, but more to be an instrument that can detect investment opportunities with a high potential of shareholder value creation. It measures the entrenchment level of a firm but not the overall internal and external governance quality. Consequently, it shall more be seen as a score that measures one specific aspect of governance quality only (Schnyder, 2012, p. 6).

3.1.3.3 GOV-Score

Brown and Caylor (2006) make use of a dataset provided by the Institutional Shareholder Services, in short ISS, to capture both internal and external characteristics of governance. They create a summary governance score called the "GOV-Score", for which Brown and Caylor (2006) code each of the 51 firm-specific ISS provisions with either "1" or "0" depending on whether a minimal threshold of governance quality is achieved or not. In a second step, they compute the score as the sum of each provision's binary value. The ISS database originally includes 61 provisions of which Brown and Caylor (2006) omit ten provisions as they only apply to a subset of the included firms. The advantage of the ISS database compared to the IRRC dataset used by Gompers et al. (2003) as well as Bebchuk et al. (2009), is the focus on external and internal governance aspects. Next to shareholder rights provisions that measure external governance, the ISS data further includes characteristics related to the executive board, management compensation, audit activities, the director's qualification, ownership structure, and other progressive practices like, e.g., if a firm has a policy for a retirement age for directors. Table 5 provides an overview of the original 61 provisions included in the ISS dataset which was used to compute the GOV-Score.

Table 5: Governance provisions of the Institutional Shareholder Services
[Source: own representation based on Brown and Caylor (2006, pp. 431–433)]

Institutional Shareholder Services (ISS) corporate governance provisions	
Board	
1	Board Composition
2	Nominating Committee
3	Compensation Committee
4	Governance Committee
5	Board Structure
6	Board Size
7	Changes in Board Size
8	Cumulative Voting
9	Boards Served – CEO
10	Boards Served – Other Than CEO
11	Former CEO's
12	Chairman/CEOs Separation
13	Board Guidelines
14	Response to Shareholder Proposals
15	Board Attendance
16	Board Vacancies
17	Related Party Transactions
Audit	
18	Audit Committee
19	Audit Fees
20	Auditor Rotation
21	Auditor Ratification
Charter/Bylaws	
22-27	Features of Poison Pills
28-29	Vote Requirements
30	Written Consent
31	Special Meetings
32	Board Amendments
33	Capital Structure
Anti-Takeover Provisions	
34-40	Takeover Provisions Applicable Under Country (local) / State Law
Executive and Director Compensation	
41	Cost of Option Plans
42-43	Option Re-pricing
44	Shareholder Approval of Option Plans
45	Compensation Committee Interlocks
46	Director Compensation
47	Pension Plans for Non-Employee Directors
48	Option Expensing
49	Option Burn Rate
50	Corporate Loans
Progressive Practices	
51	Retirement Age for Directors
52	Board Performance Reviews
53	Meetings of Outside Directors
54	CEO Succession Plan
55	Outside Advisors Available to Board
56	Directors resign upon job change
Ownership	
57	Director Ownership
58	Executive Stock Ownership Guidelines
59	Director Stock Ownership Guidelines
60	Officer and Director Stock Ownership
Director Education	
61	Director Education

Brown and Caylor (2006) compute their GOV-Score for a set of 2,327 firms and show that governance quality is positively related to accounting performance measures such as return on equity (ROE) and net profit margin, but also to firm value (Tobin's Q) and dividend yields. Their study proves that not only good external governance, but also internal governance, can have a positive influence on a firm's financial performance and valuation.

While previous scores like the G-Index and Entrenchment index were criticized for using to a too narrow set of governance provisions, some publications criticize the GOV-score for being too broad. Bhagat and Bolton (2019, p. 144), for example, state that the GOV-Score suffers from a high measurement error, since a measurement error usually increases with the number of governance provisions included in a score. Also, they claim that the measurement of the GOV-Score is unspecific as it gives equal weight to provisions with different importance for the overall governance quality (Bhagat & Bolton, 2019, p. 144).

Similar criticism was raised by Wood and Small (2019) who argue that the use of large and unselective scores leads to the so-called "kitchen sink" problem. When scores do not pay sufficient attention to provisions that really matter, but instead include a large number of governance provisions of which some might not have a theoretical justification, the measurement of corporate governance quality becomes less accurate (Wood & Small, 2019, p. 50).

3.1.3.4 Parsimonious Index

Next to proposing the GOV-Score, Brown and Caylor (2006) further introduce the "GOV-7" score, also known as the "Parsimonious" Index. This score only includes those seven out of the original 51 governance provisions which show a significant positive impact on Tobin's Q. The Parsimonious Index should not be confused with the Entrenchment Index as, in contrast to the Entrenchment Index, it not only includes external governance provisions that are anti-takeover or protection related. By including characteristics like the board structure, board attendance, board guidelines, and executive stock ownership guidelines, Brown and Caylor (2006) prove that the relation between governance quality and Tobin's Q is not only driven by shareholder-related but also by internal governance factors. This research result extends prior research from Gompers et al. (2003) or Bebchuk

et al. (2009) who only considered external governance quality to be of importance. All seven provisions included in the Parsimonious Index are summarized in Table 6.

Table 6: Governance provisions of the Parsimonious Score
[Source: own representation based on Brown and Caylor (2006, p. 419)]

Parsimonious Score based on ISS corporate governance provisions			
1	Board Structure	5	Board Attendance
2	Features of Poison Pills	6	Board Guidelines
3	Option Re-Pricing	7	Executive Stock Ownership Guidelines
4	Option Burn Rate		

As Brown and Caylor (2006) have selected those seven provisions which show a significant positive impact on Tobin's Q, the Parsimonious Index, similar to the Entrenchment Index, is not set up to measure overall governance quality. Instead, it intends to prove the governance-firm value relation based on a set of selected internal and external governance provisions. The explanatory power of the Parsimonious Index for the overall governance quality is therefore limited as the set of governance provisions might need to encompass more than only seven provisions. As some corporate governance mechanisms seem to matter only in conjunction with other governance provisions, reducing a score's number of provisions might also result in a loss of important information. Therefore, the composition of a governance rating or score always needs careful judgement (Schnyder, 2012, p. 24).

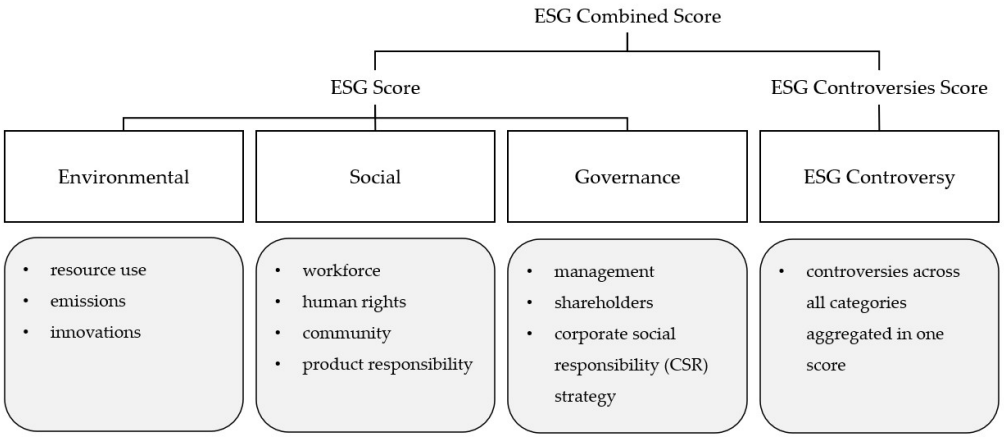
3.1.3.5 Agency and commercial ratings

Due to the importance of corporate governance for investment decisions, more and more rating agencies integrate measures of corporate governance quality into their credit risk assessment. Standard and Poor's, for example, issue combined management and governance scores in which they assess management factors such as strategy, risk management, and organizational effectiveness as well as governance factors like board characteristics, ownership, culture, infractions, communication, internal controls, and reporting transparency (Standard & Poor's Financial Services, 2018, p. 9). Other agencies like Moody's or Fitch have incorporated the quality of corporate governance systems into their credit risk

assessments to provide additional value to their rating approaches (Louizi & Kammoun, 2016, pp. 367–370).

Next to credit rating agencies, providers of financial market data like Refinitiv Eikon or Bloomberg also provide Environmental, Social, and Governance data which deliver firm-specific information related to corporate governance. As an example, the Refinitiv Eikon ESG module is based on a set of more than 450 ESG provisions from which about 186 provisions are directly related to corporate governance. Next to the individual provisions, Refinitiv also offers several sub-scores for management, shareholder, and corporate social responsibility quality. According to information released by Refinitiv, their ESG database is one of the most comprehensive ones within the industry and covers more than 10,000 firms which together constitute about 80% of the global market capitalization (Refinitiv, 2020, p. 3). The ESG data is collected from direct sources like annual reports, corporate websites, stock exchange filings, and CSR reports. However, it also uses indirect sources like analysts' reports, news, or information from non-governmental organizations. All data entries follow high-quality standards. Refinitiv states that their ESG data reaches back to the year 2002 and is weekly updated in line with corporate reporting schedules. Due to the outlined reasons, the Refinitiv Eikon ESG database is one of the most accurate and comprehensive corporate governance databases available for academic research. The structure on how Refinitiv Eikon is structuring their ESG database and scores is set out in Figure 9 below.

Figure 9: Refinitiv Eikon ESG database and scores
[Source: own representation based on Refinitiv (2020, p. 3)]



As it is part of the business model of rating agencies and financial data providers, detailed methodologies and mechanisms for the computation of their governance scores are kept proprietary (Larcker, Richardson, & Tuna, 2007, p. 964). This makes it challenging to analyze the composition of commercial rating mechanisms and impedes the reproduction of commercial ratings for the sake of academic research purposes. However, in the case of Refinitiv Eikon, the underlying dataset of provisions on which their ESG scores are based is made available. As this thesis specifically focuses on the research area of corporate governance, Eikon's environmental and social scores are not further considered.

3.1.3.6 Single-provision measures

Besides academic scores and commercial ratings, a strand of academic literature considers single characteristics of corporate governance as reliable determinants for governance quality. Vafeas (1999) argue that the number of board meetings positively impacts firm performance through an increase in the directors' monitoring efforts, Hermalin and Weisbach (2003) use board independence as a measure for governance quality, Bhagat and Bolton (2008) use the stock ownership of board members as well as CEO and chairman separation to show that these provisions have a significant positive impact on financial performance, and Bhagat and Bolton (2019) find that director stock ownership is significantly positively correlated with better operating performance.

The option to measure corporate governance quality through a single characteristic is not further focused on in this thesis. Although it ultimately remains an empirical question if a single characteristic can be as effective as a multi-provision governance score, it seems likely that using a single provision indicator to measure a complex construct like governance quality will result in a high level of measurement error (Larcker et al., 2007, p. 964).

3.1.3.7 Comparison of governance scores

Based on the systematization and analysis of corporate governance scores in the previous sections, Table 7 provides a breakdown of the provisions used in the G-Index, the Entrenchment Index, the Refinitiv Eikon ESG shareholder score, the GOV-Score, the Parsimonious Index as well as the Refinitiv Eikon ESG management score. All underlying provisions are split between the three categories of "Shareholder Rights" for external governance and "Board of Directors" and "Audit and Disclosure" for internal governance. If a score includes provisions from a specific category, the matrix is marked with an "X", otherwise left blank.

Results show that the G-Index, the Entrenchment Index as well as the Refinitiv Eikon ESG shareholder score predominantly use provisions that fall in the Shareholder Rights category. Consequently, these scores can be classified as ratings of external governance.

The Parsimonious Index and the GOV-Score both include provisions from the internal and external governance categories. While the number of internal and external provisions is mostly balanced in the GOV-Score, the Parsimonious Index mainly includes external governance provisions. The Eikon ESG management score is exclusively based on provisions from two internal governance categories and therefore can be categorized as an internal and stakeholder-oriented governance measure.

Table 7: Analysis of corporate governance scores
[Source: own representation based on Stender and Rojahn (2020, p. 155)]

	G-Index	Entrenchment Index	Eikon ESG Shareholder	GOV-Score	Parsimonious Index	Eikon ESG Management
1. Shareholder Rights (external CG)						
Protection and Anti-Takeover Provisions	X	X	X	X	X	
Election and Voting Rights	X	X	X	X		
Proposal Rights and Engagement	X		X	X		
Equitable Treatment of Shareholders	X		X	X		
2. Board of Directors (internal CG)						
Board Characteristics (size, age, gender, education, etc.)				X		X
Board Meetings				X	X	X
Board Guidelines and Policy				X	X	X
Board Structure	X	X	X	X	X	X
Committees				X		X
Independence (Board and Committees)				X		X
Executive and Director Compensation	X			X		X
Director Ownership				X	X	
3. Audit and Disclosure (internal CG)						
Internal Audit and Consultants				X		X
Audit Committee				X		X
Information Disclosure and Transparency				X		X

3.2 INFLUENCE OF CORPORATE GOVERNANCE ON ORGANISATIONAL PERFORMANCE

3.2.1 MEASURING ORGANISATIONAL PERFORMANCE AND FIRM VALUE

To summarize empirical evidence regarding the influence of corporate governance on firm value and other measures for organizational performance, it is first important to have a closer look at the measurement and definition of the dependent variables used in academic research. Even though many researchers use terms like firm value, firm performance, financial performance, or organizational performance, there is no consensus on how these indicators are generally defined (Klier, 2009, p. 35). The dependent variable in the governance-firm value relation, therefore, differs significantly between studies.

According to Richard, Devinney, Yip, and Johnson (2009, p. 722), organizational performance can be categorized into three specific areas of firm outcome: accounting-based financial performance, market-product-based performance, and financial market performance which measures performance from a shareholder perspective.

Financial performance is generally based on accounting measures. Accounting measures are usually readily available and easily accessible measures of organizational performance as they can be derived from financial statements or annual reports. Examples of accounting measures can be stated in absolute values like revenue, EBIT, or the net profit of a firm, as well as in relative values. Relative accounting measures use two or more absolute measures and set them into relation to one another so that they provide more information about a relative size or effect. The return on assets or return on equity, for example, set absolute values like the return of a firm in relation to its assets or shareholder's equity.

Although accounting measures are easily accessible, they come with disadvantages. One is that accounting measures generally emphasize the historical performance of a firm within specific reporting periods. Their value to provide information on the future performance of a firm is therefore limited (Richard et al., 2009, p. 728). Further, accounting measures can be impacted by changes in accounting standards and strategic accounting or balance sheet management. For

example, a firm could purposely make certain choices on how assets are depreciated over time, accruals are posted, or research and development expenses are capitalized.

The second area of operational performance comprises sales or market indicators and can be summarized as product market performance indicators. Although these figures are not directly derived from accounting figures, many are calculated by using specific accounting figures concerning the market or industry volumes. Market share, as a performance indicator, for example, is based on the relation between accounting sales and market volume, i.e., the total sum of accounting sales in a specific market. For this reason, some studies categorize market performance indicators as accounting measures in the broader sense (Richard et al., 2009, p. 728).

Third, organizational performance can be measured from a shareholder perspective by using indicators from the financial market. Thereby, organizational performance measures express an estimate of the future development of a firm (Haryanto, Moutinho, Aldas-Manzano, & Hadiansah, 2018, pp. 544–546). In contrast to backward-looking accounting measures, financial market measures are forward-looking long-run indicators that, in theory, include an expectation on the net present value of future cash flows (Richard et al., 2009, p. 728). Consequently, financial market indicators are mostly robust to strategic accounting or balance sheet management (Klier, 2009, p. 35).

From a resource and knowledge-based view on firms, one additional advantage is the more effective incorporation of intangible assets compared to accounting measures (Lev, 2001, pp. 79–104). Often used financial market performance indicators can be measured by, e.g., Jensen's alpha, Sharpe ratio, market value, or the total shareholder return. However, one major drawback of financial market measures is that market values may not be an efficient estimate of future cash flows and the economic effect. Instead, they include additional factors such as market volatility, momentum, emotions, or herding behavior. In addition, financial market data evaluates firms as one overall organization. Especially when looking at diversified firms, it is not possible to disaggregate the performance of different business units (Richard et al., 2009, pp. 730–732).

Consequently, measuring organizational performance through accounting measures, product market performance, or financial market performance, can lead

to wrong assumptions about the actual performance of a firm. As proposed by Peasnell, Yin, and Lubberink (2016, p. 5), a meaningful indicator of organizational performance needs to include three general factors which are earnings, growth, and corporate risk. Therefore, it is recommended to use so-called hybrid measures that combine accounting and financial market data into single performance indicators (Richard et al., 2009, p. 732). Weaknesses of the individual measures can consequently be balanced and reduced.

A popular hybrid measure in research is Tobin's Q. Tobin's Q can be calculated as the ratio of the market value of a firm's assets to their replacement cost so that, in theory, it measures how much above or below a firm's asset's replacement costs the market is willing to pay (Chung & Pruitt, 1994, pp. 70–71). Other hybrid measures include the price-earnings ratio, which measures the ratio of the market value per share and the earnings per share, the price-cash flow ratio which measures the ratio of the market value per share and the cash flow per share, or the market-to-book-value which reflects the firm's current market value relative to its book value.

3.2.2 CORPORATE GOVERNANCE AND ORGANIZATIONAL PERFORMANCE: SOME EMPIRICAL EVIDENCE

As set out in the previous section, a reliable measurement of organizational performance should be conducted by using performance indicators that include the three general factors "earnings", "growth", and "corporate risk" (Peasnell et al., 2016, p. 5). However, research on corporate governance and organizational performance is often based on KPIs which are solely accounting based and therefore do neither include the forward-looking "growth" nor the "corporate risk" factors. The below Table 8 summarizes some empirical evidence on the corporate governance firm value and organizational performance relation by providing details on the selected data and sample, the applied variables, the empirical methodology, and the key findings of the empirical analysis. The remainder of this section focuses on similarities and differences between these studies.

Table 8: Overview of empirical studies on the influence of corporate governance and organizational performance
[Source: own representation]

Publication	Data and sample	Methodology	Findings
Gompers et al. (2003)	*Market:* USA; *Period:* 1990 - 1999; *Firms:* 1,500 firms; *Rating:* 24 provisions; *Data source*: Investor Responsibility Research Center (IRRC)	*Dependent variable:* Tobin's Q; *Controls:* total assets, industry dummy variables; *Method:* multiple linear regression (OLS); *Endogeneity approach:* n.a.	*Findings:* weaker Corporate Governance is associated with lower firm value, lower profits, lower sales growth, higher capital expenditures and higher amount of corporate acquisitions
Drobetz et al. (2004)	*Market:* Germany; *Period:* 1998 - 2002; *Firms:* 91 firms; *Rating:* 30 provisions; *Data source*: questionnaire	*Dependent variable:* Market-to-Book ratio; *Controls:* total assets, average sales and asset growth, years of listing; leverage, industry dummy variables; *Method:* two-stage least squares regression; *Endogeneity approach:* stock index membership as instruments	*Findings:* positive relationship between CG and firm value as well as historical returns
Durnev and Kim (2005)	*Market:* 27 developed and emerging countries; *Period:* 2000; *Firms:* 859 firms; *Rating:* 57 provisions; *Data source*: Credit Lyonnais Securities Asia Governance Score	*Dependent variable:* Tobin's Q; *Controls:* legal environment, total sales, R&D expenditures, export intensity, dummy for ADR listing; *Method:* multiple linear regression (OLS); three-stage least squares regression; *Endogeneity approach:* lagged values of investment opportunities and need for external finance as instruments	*Findings:* firms with better governance are valued higher; positive relations are stronger in countries with weaker legal frameworks
Black, Jang, and Kim (2006)	*Market:* Korea; *Period:* 2001; *Firms:* 515 firms; *Rating:* 38 provisions; *Data source*: survey by the Korea Stock Exchange (KSE)	*Dependent variable:* Tobin's Q; *Controls:* total assets, bank status, chaebol membership, industry dummy variables; *Method:* multiple linear regression (OLS), two-stage and three-stage least squares regression; *Endogeneity approach:* years listed as instrument	*Findings:* corporate governance positively affects market value of Korean firms
Brown and Caylor (2006)	*Market:* USA; *Period:* 2003; *Firms:* 1,868 firms; *Rating:* 51 and 7 provisions; *Data source*: Institutional Shareholder Services (ISS)	*Dependent variable:* Tobin's Q; *Controls:* total assets, firm age, incorporation in Delaware; *Method:* multiple linear regression (OLS); *Endogeneity approach:* lagged value of industry mean-adjusted Tobin's Q	*Findings:* set up of an alternative measure which represents internal and external governance; the parsimonious index (only 7 provisions) fully drives the positive impact on firm value
Core, Guay, and Rusticus (2006)	*Market:* USA; *Period:* 1990 - 1998; *Firms:* 9,917 observations; *Rating:* 24 provisions; *Data source*: Investor Responsibility Research Center (IRRC)	*Dependent variable:* stock returns and operating performance (return on assets); *Controls:* market cap, book-to-market equity; *Method:* multiple linear regression (OLS); *Endogeneity approach:* n.a.	*Findings:* firms with weak shareholder rights exhibit significant operating underperformance but does not cause poor stock returns
Larcker et al. (2007)	*Market:* USA; *Period:* 2002 - 2003; *Firms:* 2,106 firms; *Rating:* 39 provisions; *Data source*: TrueCourse, Equilar Data	*Dependent variable:* future operating performance, future excess stock returns; *Controls:* market cap, industry dummy variables; *Method:* multiple linear regression (OLS); *Endogeneity approach:* addressing	*Findings:* corporate governance has ability to explain future operating performance and future excess stock returns

Publication	Data and sample	Methodology	Findings
		endogeneity by adjusting for the systematic part of governance choices	
Bhagat and Bolton (2008)	*Market:* USA; *Period:* 1990 - 2004; *Firms:* 11,736 observations; *Rating:* several governance variables (e.g. GIM, BCF E-Index, TCL Score); *Data source*: Investor Responsibility Research Center (IRRC), TCL and Institutional Shareholder Service (ISS)	*Dependent variables:* operating performance (ROA), Stock Return, Tobin's Q, Leverage; *Controls:* Total assets, R&D Expenses, Board Size, CEO age and tenure, Director age and tenure, Risk (standard deviation); *Method:* fixed effects panel regression; *Endogeneity approach:* two-stage and three-stage least squares regression	*Findings:* governance measured by GIM and BCF, stock ownership of board members, and CEO-Chair separation is positively correlated with better ROA; board independence is negatively correlated with ROA; none of the governance measures are correlated with future stock market performance
Bebchuk et al. (2009)	*Market:* USA; *Period:* 1990 - 2003; *Firms:* 1,800 firms; *Rating:* 24 and 6 provisions; *Data source*: Investor Responsibility Research Center (IRRC)	*Dependent variable:* Tobin's Q and industry-adjusted Tobin's Q; *Controls:* total assets, firm age, incorporated in Delaware, level of insider ownership, return on assets (ROA), CAPEX to assets, leverage, R&D expenditures; *Method:* multiple linear regression (OLS); *Endogeneity approach:* n.a.	*Findings:* staggered boards significantly contribute to a negative correlation between Corporate Governance and firm value
Chhaochharia and Laeven (2009)	*Market:* 23 developed countries; *Period:* 2003 - 2005; *Firms:* >2,300 firms; *Rating:* 17 provisions; *Data source*: Institutional Shareholder Service (ISS)	*Dependent variable:* Tobin's Q; *Controls:* total sales, past sales growth, financing constraints, required capital, debt to assets, dummy for ADR listing, industry dummy variables; *Method:* multiple linear regression (OLS); two-stage least squares regression; GMM (Arellano & Bond, 1991); *Endogeneity approach:* lagged values of corporate governance scores as instruments	*Findings:* improvements in corporate governance are positively associated with firm valuation
Gupta et al. (2009)	*Market:* Canadian S&P / TSX index; *Period:* 2002-2005; *Firms:* 158 firms; *Rating:* 100 points scoring approach; *Data source*: reported data to the Ontario Securities Commission	*Dependent variable:* Tobin's Q and ROA; *Controls:* total sales, cross-listing status, Book-to Market value; *Method:* random and fixed effects regressions; *Endogeneity approach:* n.a.	*Findings:* no impact of composite governance scores and firm value or firm performance
Aggarwal, Erel, Stulz, and Williamson (2010)	*Market:* 23 developed countries and matching US firms; *Period:* 2005; *Firms:* 1,527 firms; *Rating:* 44 provisions; *Data source*: Institutional Shareholder Service (ISS)	*Dependent variable:* Tobin's Q; *Controls:* total assets, sales growth, R&D expenditures to sales, foreign sales to total assets, cash holdings to assets, CAPEX to assets, property, plant and equipment to sales, EBIT to sales, leverage; *Method:* multiple linear regression (OLS); instrument variable; *Endogeneity approach:* governance gap (difference between a firm's GOV index value and the index value of its matching US firm) as instrument	*Findings:* governance gap is strongly related to firm value; firms which invest less in internal governance than their matching US firm have lower firm value
Reddy, Locke, and	*Market:* New Zeeland; *Period:* 1999-2007; *Firms:* 50 firms; *Rating:* four	*Dependent variable:* return on assets, market-to-book ratio, Tobin's Q; *Controls:* leverage, total assets, dividend, firm level risk,	*Findings:* New Zealand's governance recommendations have a

Publication	Data and sample	Methodology	Findings
Scrimgeour (2010)	governance provisions; *Data source:* NZX Deep Archive	business risk; *Method:* OLS; *Endogeneity approach:* two-stage-least-squares	positive influence on firm performance measured by Tobin's Q, market-to-book ratio and ROA
Renders, Gaeremynck, and Sercu (2010)	*Market:* Europe; *Period:* 1999-2003; *Firms:* all firms listed in any of the 14 European countries and included in Worldscope; *Rating:* corporate-governance ratings from Deminor Rating; *Data source:* Deminor Rating and Worldscope.	*Dependent variable:* return on assets, return on equity, Tobin's Q, market-to-sales ratio, market-to-book value; *Controls:* market value of equity, firm age, sales growth, leverage, ownership concentration, capital intensity, dummy negative income, dummy IFRS, shareholder protection; *Method:* fixed effects panel regression; *Endogeneity approach:* two-stage-least-squares	*Findings:* influence of corporate governance on all performance indicators (accounting and market based) is significant and positive after controlling for sample-selection and endogeneity bias in the design of the model.
Cheung et al. (2011)	*Market:* Hong Kong listed firms; *Period:* 2002 - 2005; *Firms:* 174 firms; *Rating:* 86 provisions included in scorecard based on OECD principles; *Data source*: publicly available data	*Dependent variable:* Tobin's Q; *Controls:* total assets, ROA, leverage, sales growth, cash ratio, CAPEX ratio, MSCI member, red-chip; *Method:* OLS and fixed effects panel regression; *Endogeneity approach:* Generalized Method of Moments	*Findings:* improvements in the governance quality over time display lead to an increase in market valuation and market-to-book value and vice versa
Stiglbauer and Velte (2012)	*Market:* Germany; *Period:* 2003 - 2010; *Firms:* German listed firms; *Rating:* compliance with the German governance code; *Data source*: Berlin Centre of Corporate Governance (BCCG)	*Dependent variable:* n.a.; *Controls:* n.a.; *Method:* Meta-Analysis; *Endogeneity approach:* n.a.	*Findings:* compliance with the German governance code (GCGC) does not positively affect German listed firms' capital market performance
Cremers and Ferrell (2014)	*Market:* USA; *Period:* 1978-2006; *Firms:* 1,000 firms; *Rating:* G-Index (24 provisions) and E-Index (7 provisions); *Data source:* IRRC data	*Dependent Variable:* Tobin's Q; *Controls:* Lagged alpha, market cap, institutional ownership, ROE, sales growth, HHI, dividend yield, S&P 500 dummy; *Method:* OLS (fixed effects); *Endogeneity approach:* fixed effects	*Findings:* negative influence between the G-Index and E-Index and Tobin's Q for the 1978-2006 period
Rossi, Nerino, and Capasso (2015)	*Market:* Italy; *Period:* 2012; *Firms:* 215 firms; *Rating:* governance index based on 48 provisions; *Data source:* n.a.	*Dependent variable:* return on assets, return on equity, Tobin's Q; *Controls:* ownership concentration, annual sales growth, market cap, firm age, capital structure, foreign ownership; *Method*: cross-sectional regression; *Endogeneity approach:* n.a.	*Findings:* negative influence of governance on Tobin's Q, positive influence on return on equity and no influence on return on assets
Shahwan (2015)	*Market:* Egypt; *Period:* 2008; *Firms:* 86 non-financial firms; *Rating:* CGI score based on 15 provisions; *Data source:* annual reports	*Dependent Variable:* Tobin's Q; *Controls:* Altman Z-Score, firm size, leverage, market-to-book ratio, capital intensity, current ratio, return on sales, ownership concentration, ownership type; *Method:* OLS; LAV regression, logistic regression; *Endogeneity approach:* n.a.	*Findings:* no positive association between CG and financial performance; insignificant negative relationship between CG and likelihood of financial distress
Zagorchev and Gao (2015)	*Market:* USA; *Period:* 2002 - 2009; *Firms:* 820 US financial institutions; *Rating:* 41 internal and external governance	*Dependent variable:* Tobin's Q, assets ratio; *Controls:* sales growth, liquid assets ratio, reserves for loan/assets losses, non-performing assets ratio, total loans ratio; *Method:* fixed effects panel regression;	*Findings:* Good governance is associated with less non-performing assets, less real estate non-performing assets and higher Tobin's Q

Publication	Data and sample	Methodology	Findings
	provisions; *Data source*: RiskMetrics' Corporate Governance Index	*Endogeneity approach:* one-year lagged values of independent variables, Generalized Method of Moments	
Arora and Sharma (2016)	*Market:* India; *Period:* 2001-2010; *Firms:* 2,431 firms; *Rating:* five governance provisions; *Data source:* PROWESS database	*Dependent variable:* return on equity, return on assets, adjusted Tobin's Q, net profit margin, stock returns; *Controls:* total sales, leverage, firm age, advertising intensity, R&D intensity; *Method:* fixed effects panel regression; *Endogeneity approach:* GMM	*Findings:* return on equity and profitability is not related to any of the corporate governance indicators
Singh, Tabassum, Darwish, and Batsakis (2018)	*Market:* Pakistan; *Period:* 2009 - 2015; *Firms:* 324 listed firms; *Rating:* 5 governance attributes; *Data source*: annual reports	*Dependent variable:* Tobin's Q; *Controls:* firm age, total sales, leverage; *Method:* multiple linear regression (OLS); *Endogeneity approach:* Generalized Method of Moments	*Findings:* Board size, number of Board committees and Ownership concentration are positively linked with Tobin's Q; Board independence and CEO duality display a negative relationship

Market. As the above table does not claim to provide a complete picture of research studies on corporate governance, a comparison of different markets on which empirical analyses have been conducted is highly dependent on the choice of selected studies. However, there is a tendency that earlier studies until the late 2000s are generally focused on the US capital market such as Gompers et al. (2003), Core et al. (2006), Larcker et al. (2007), or Bebchuk et al. (2009). This might be due to availability of data, as comprehensive governance databases like those from the IRRC or the ISS started with a clear focus on the US market in the late 1990s. Early studies outside of the US are generally focused on developed countries like Drobetz et al. (2004) who focus on the German market, Black et al. (2006) who use Korean firms, Gupta et al. (2009) who focus on the Canadian market, or Chhaochharia and Laeven (2009) and Aggarwal et al. (2010) whose studies both cover a set of 23 developed countries. Only in the years after 2010, it becomes more common to analyze the influence of corporate governance for emerging and developing markets. Shahwan (2015), e.g., analyses governance in an Egyptian environment, Arora and Sharma (2016) use market data from India, or Singh et al. (2018) focus on Pakistani firms.

Period. Empirical analyses on corporate governance are usually carried out based on panel data. The studies summarized in Table 8 comprise different time periods between four and eight years. However, there are exceptions in both

directions. While Durnev and Kim (2005) or Rossi et al. (2015) based their analyses on a one year sample only, other scholars like Bhagat and Bolton (2008) cover up to 14 years of financial market data or Cremers and Ferrell (2014) include a sample that encompasses a 28-year period.

Governance rating (independent variable). The comparison of the independent variable, i.e., the corporate governance measure, is one of the critical factors and differentiators of a study. As described in section 3.1 of this thesis, approaches to measure corporate governance quality are numerous and not consistent. This complicates the interpretation of research results as the impact of governance might differ depending on the measurement approach applied for governance quality. Especially in the early 2000s, an often-used governance measure is the Gompers et al. (2003) G-Index using 24 governance provisions. This index is applied based on the same principles in several other studies, e.g., by Core et al. (2006) or Bhagat and Bolton (2008). Studies like Bebchuk et al. (2009) use the G-Index as an underlying score but further develop "enhanced" governance measures such as the Entrenchment Index. In general, it is common practice to use a set of underlying governance provisions and compute a governance rating based on a scoring approach. The number of provisions can vary between only a few provisions, e.g., Singh et al. (2018) use five governance attributes only, or a large set of provisions, e.g., Cheung et al. (2011) use 86 governance provisions to compute a score. It is further important to mention that most studies do not account for a differentiation between measures of internal and external governance. Even though some studies like Brown and Caylor (2006) specifically mention differences between these two governance dimensions, they still apply blended governance ratings consisting of both the internal and external provisions, e.g., the GOV-Score or Parsimonious Index.

Data source. Another critical factor is the underlying data source from which information on corporate governance is provided. While it is still common in older studies to use questionnaires to acquire data, more recent studies are usually based on data published by providers of financial market data or corporate governance institutions. In the early years of research on corporate governance, two major providers of such data are the ISS and the IRRC. More recent studies use databases from various private rating agencies or stock exchange filing information. While it is difficult to assess the quality of each database, one important differentiator is the

target or focus group of the different databases. While some databases, e.g., the IRRC database, mainly focus on shareholder rights, other databases like the Eikon database or the ISS database also include internal governance provisions covering characteristics of the board of directors and other stakeholder-relevant information.

Dependent variables. Even though this thesis focuses on the influence of corporate governance on firm value, it needs to be mentioned that the use of the dependent variable in academic research is often inconsistent. Many studies use general terms like "performance", "financial performance", "organizational performance", "firm value", or simply "value" when talking about positive or negative effects of governance. When looking at the use of dependent variables, it can be seen, that some studies apply performance and firm value indicators which capture different aspects of organizational performance.

One very frequently used indicator is the return on assets (ROA) which is the ratio of earnings before interests and taxes to the firm's value of total assets. However, ROA cannot reflect expected future growth of a firm and does not include an adjustment for corporate risk. Therefore, its informative value regarding a firm's organizational performance is limited. Similar limitations apply to other frequently used indicators like the return on equity (ROE), the net profit margin, earnings per share (EPS), or stock returns. Nevertheless, many studies such as Reddy et al. (2010) and Renders et al. (2010) include these indicators into their set of organizational performance measures and then analyze for which of these variables positive influences can be found.

Across all studies, the most frequently applied measure is Tobin's Q. Tobin's Q is defined as the sum of the market value of equity and total assets less common equity and deferred taxes divided by total assets (Aggarwal & Williamson, 2006). In this way, the measure can indicate whether a firm is relatively over or undervalued on the market compared to the replacement costs of its assets. If Q is below 1, this means that the cost to replace a firm's assets is greater than its market value. A Q-ratio above 1, however, indicates that the market value of a firm is greater than the replacement costs of its assets. For this reason, it is a reliable indicator to determine firm value.

Another frequently applied KPI is the market-to-book value (MTB). It is defined as the relation between a firm's market value and its book value and can

be calculated by dividing the market value of the equity, the so-called market capitalization, with the net book value, i.e., total assets minus total liabilities. MTB is used by, e.g., Drobetz et al. (2004) or Renders et al. (2010).

Controlling variables. Often used controlling variables are proxies for firm size such as the value of total assets or total sales. Other studies include variables that focus on a firm's capital structure by expressing, e.g., the leverage ratio, the debt to asset ratio, or the equity ratio. Especially when Tobin's Q is included as the dependent variable, scholars tend to include a variable that reflects accounting performance, e.g., ROA, ROE, or the net profit margin. To account for a growth component, often seen variables are capital expenditures to total assets (CAPEX), R&D expenditures to total assets, or sales growth. Also, index membership, the cash ratio, and firm and business risk-related variables are often included.

Empirical methodology. In most cases, studies use a multiple linear regression model with either fixed effects or random effects when analyzing panel data. Those studies that do not use panel data apply pooled regression models. To account for a possible influence of endogeneity on the regression results, methodologies like the two-stage least squares (2SLS), three-stage least squares (3SLS), the generalized method of moments (GMM), or instrumental variables (IV) regressions are applied. However, like in the case of Gupta et al. (2009) or Rossi et al. (2015), it is usual that scholars do not account for endogeneity although this might lead to biased empirical findings so that results should be interpreted with caution.

Empirical findings. The above Table 8 provides an overview of representative studies that assess the influence of corporate governance on organizational performance and firm value. Based on the causal chain for firm value improvement through corporate governance, it could be expected to find a positive relationship between corporate governance quality and firm value. However, the literature review provides mixed evidence. While some studies reveal a positive influence, other studies reveal contrary findings or mixed evidence.

In this context, Gompers et al. (2003) have been a template for further research on the governance-firm value relation. In a US environment, they set up the G-Index and analyze the influence of such score on forward-looking performance indicators like stock returns, dividend yields, and Tobin's Q. Their results reveal empirical evidence that weaker protection of shareholders relates to lower sales growth, higher cost of capital, and lower firm value measured by Tobin's Q.

Bebchuk et al. (2009) use the similar 24 provisions but look at the individual influence of each provision on firm value and abnormal returns. They find that only the six provisions staggered boards, limits to shareholder bylaw amendments, poison pills, golden parachutes, and supermajority requirements for mergers and charter amendments fully drive the influence on firm value and returns. In this way, they show that fewer shareholder rights through entrenching measures lead reduce firm value and returns, while the other 18 governance provisions were uncorrelated. A comparable study based on shareholder-related governance characteristics by La Porta et al. (2000) further provides evidence that insufficient shareholder rights cause a lower level of corporate valuation expressed through a firm's share price level. Cremers and Ferrell (2014) track governance data of 1,000 firms over thirty years starting in 1978. They find empirical evidence that a restriction of shareholder rights has a negative association with firm value measured by Tobin's Q.

Brown and Caylor (2006) further use provisions from the ISS database related to internal and external governance mechanisms and show that the positive influence of governance on firm value is not only driven by the promotion of shareholder rights or the absence of entrenching provisions but also by internal governance provisions. Consecutive studies by Chhaochharia and Laeven (2009) as well as Aggarwal et al. (2010) make use of the same source of ISS data. While Aggarwal et al. (2010) find that foreign firms have lower firm value compared to their matching US firms due to differences in their corporate governance quality, Chhaochharia and Laeven (2009) reveal that improvements of the governance quality are positively related to firm valuation for firms in 23 developed countries. Zagorchev and Gao (2015) show that governance is associated with higher firm value and less non-performing assets. Durnev and Kim (2005) show that firms with better Credit Lyonnais governance ratings have a higher firm value and that these positive relations are stronger in countries that provide weaker legal frameworks. Cheung et al. (2011) reveal that improvements in the governance quality of Hongkong-listed firms lead to an increase in market value measured by Tobin's Q and the market-to-book ratio. Making use of governance data collected by questionnaire, Drobetz et al. (2004) find a positive relationship between corporate governance and firm value, i.e., Tobin's Q, for German firms. Their investment

strategy focused on buying well-governed firms and selling those with poor governance reached an abnormal return of 12% per year between 1998 and 2002.

However, a high number of studies report no or even a significant negative impact of governance quality on firm value. Gupta et al. (2009) find no impact of their composite governance score on the firm value of Canadian firms between 2002 and 2005. Bhagat and Bolton (2008) find a positive influence of governance provisions on accounting measures but find no evidence that the governance measures are correlated with future stock market performance or firm value. Stiglbauer and Velte (2012) show that compliance with the German governance code does not positively affect the capital market performance of German listed firms between 2003 and 2010 and Shahwan (2015) reports no association between his Indian governance index and Tobin's Q. He further reports an insignificant but negative relationship between governance quality and the likelihood of financial distress. Stender and Rojahn (2020) even find differences in the impact of internal and external governance on firm valuation. While they report a positive influence of external governance on Tobin's Q, they show that internal governance has a negative impact after accounting for endogeneity.

As the empirical research has not provided consistent evidence on the governance-firm value relation, many studies such as Larcker et al. (2007), Stender and Rojahn (2020), or Bhagat and Bolton (2019) state that the mixed evidence might be attributable to the difficulty to effectively measures governance quality overall.

3.2.3 CORPORATE GOVERNANCE AND ENDOGENEITY

Early research on corporate governance has been criticized for simply assuming that the governance-firm value relation is exogenous. In fact, many studies do not apply appropriate research methodologies to control for endogeneity in their samples (Schultz, Tan, & Walsh, 2010, p. 146). Next to uncertainty on how corporate governance can be reliably measured, the lack of consistent results from prior studies might be attributable to endogeneity problems. More specifically, the inadequacies in the applied empirical methodologies do not sufficiently control for endogeneity (Hassouna, Ouda, & Hussainey, 2017, p. 191). When endogeneity is not properly addressed, the results of the studies may be biased and inconsistent (Schultz et al., 2010, p. 145).

The problem of endogeneity can be described by looking at a standard OLS regression model where the coefficient of the independent variable is estimated based on the assumption that the independent variable is exogenous. In this case, exogeneity means that the independent variable (X_i) is uncorrelated with the error term ($\underline{u_i}$). In literature, this is often described as the orthogonality of the error term with the independent variable (Antonakis, Bendahan, Jacquart, & Lalive, 2010, p. 1089). However, in cases where the independent variable (X_i) correlates with the error term ($\underline{u_i}$), it is likely that the estimated coefficients are affected by an endogeneity bias and do not return true values.

Wooldridge (2010, pp. 49–51) identifies three potential sources which can lead to endogeneity issues: omitted variables, measurement errors, and simultaneity. While measurement errors can occur when researchers want to measure an effect of a variable for which they can only derive an imperfect measure or variable, simultaneity describes a situation where the independent variable is determined simultaneously along with the dependent variable (Wooldridge, 2010, p. 51).

Endogeneity in the form of omitted variables arises when certain influential variables cannot be included in the regression model. This might, for example, be due to unavailability of data or difficulties in reliably measuring variables (Wooldridge, 2010, p. 51). Consequently, the regression analysis omits a factor that somehow affects the dependent variable and is directly correlated with at least one of the independent variables (Clougherty, Duso, & Muck, 2016, p. 287). By omitting this factor, a violation of the exogeneity assumption is committed and the independent variable might correlate with the error term ($\underline{u_i}$). Antonakis et al. (2010, p. 1086) describe that endogeneity in the form of omitted variables involves several different subdimensions.

A particularly salient subdimensions is endogeneity caused by a self-selection bias (Clougherty et al., 2016, p. 287). Self-selection arises when the underlying population is not randomly sampled (Antonakis et al., 2010, p. 1089). This can be the case when relations between the independent and the dependent variables are affected by constructs in which decisions are purposely selected with the implication to create a certain outcome (Clougherty et al., 2016, p. 287). When a population is distorted by self-selected decisions by the objects or firms being

observed, the description of the population distribution of characteristics within the population does not accurately reflect the true distribution of characteristics. Consequently, the selected sample is not appropriate to produce reliable sample descriptions (Heckman, 2010, p. 242).

The firm-specific corporate governance frameworks could be affected by a self-selection bias through firms that choose their respective governance measures as part of a performance maximization process, due to competitive and institutional pressure, or as part of an investor relations measure (Iyengar & Zampelli, 2009, p. 1092). When a firm purposely decides to implement certain governance structures, it might not be the result of a random choice or external force but a decision within the firm's control. When endogeneity is of concern, it is problematic to determine if the influence on performance and firm value is causal or whether firms and managers have purposely chosen a certain level of governance quality that meets their goals or preferences (Wintoki, Linck, & Netter, 2012, pp. 585–590).

For firms operating in highly competitive markets, improving the corporate governance quality might be an opportunity to differentiate themselves from other firms. Better governance standards might attract capital as investors evaluate the level of governance quality when making investment decisions (Bear, Rahman, & Post, 2010, p. 207). Consequently, firms trading at discounts might target to improve their valuation by implementing good governance as a positive signal that indicates good management quality. However, such measures would not have an actual impact on the business itself (Renders et al., 2010, p. 88). A sustainable impact of good governance on performance and firm value is therefore questionable. Studies that do not appropriately address endogeneity concerns should be considered with caution (Schultz et al., 2010, p. 146).

3.3 DEVELOPMENT OF RESEARCH QUESTION AND HYPOTHESIS

When the ownership and control of firms is separated into a management and a shareholder group, strong corporate governance frameworks which ensure an alignment between the interests of the shareholders and the actions taken by the management are required. Corporate governance frameworks are globally

recognized as an integral part of corporate management and, from a theoretical point of view, should increase firm value (Lin & Hwang, 2010, p. 59).

However, the analysis of the current state of research in section 3.2 shows that overall research results reveal mixed evidence on the governance-firm value relation. Further, empirical studies use different estimators and measurement approaches to determine the firm-specific quality of governance. While some researchers base their analyses on single governance provisions, other studies use scores that measure shareholder rights, scores that include characteristics of the board of directors, or both. Consequently, it is essential to have a differentiated review of the influence of corporate governance on firm value by considering different dimensions of corporate governance. Governance needs to be seen as a complex framework consisting of several areas like, e.g., shareholder rights, board of directors, financial disclosure standards, audit activities, etc.

Following the classification of corporate governance into internal and external governance mechanisms as set forth previously, this thesis develops a comprehensive measurement approach that determines governance quality by making use of the results of a principal component analysis. The PCA includes several prevailing scores from literature that are re-created on a common database as well as commercial governance ratings. Results of the PCA are then used to create composite governance measures for the identified internal and external governance dimensions. As a starting point for analyzing the governance-firm value relation, the created composite governance measures as per the newly developed measurement approach are then used to test the following hypotheses:

Hypothesis 1a: External corporate governance quality has a positive influence on firm value.

Hypothesis 1b: Internal corporate governance quality has a positive influence on firm value.

Recent research studies by Giroud and Mueller (2010) and Mishra and Mohanty (2018) report that the positive influence of governance on firm value decreases with the degree of market competition in which a firm operates. While, in markets that are not competitive, governance has a strong and positive influence

on firm value, there shall be no significant positive influence in competitive markets. Consequently, Giroud and Mueller (2011, pp. 563–565) argue that market competition can serve as a substitute for corporate governance as the competitive pressure on markets automatically aligns management incentives without the need for further governance mechanisms. This argument would also consider the previously discussed concept of product market competition as an additional external governance mechanism according to the definition of external governance by Refakar and Ravaonorohanta (2020, pp. 13–14).

To analyze if governance mechanisms can contribute to the creation of firm value in competitive and non-competitive industries, this thesis controls for market competition as a moderator of the governance-firm value relation:

Hypothesis 2a: The relationship between external corporate governance quality and firm value is moderated by market competition.

Hypothesis 2b: The relationship between internal corporate governance quality and firm value is moderated by market competition.

Next to a moderating effect by market competition, other interactions with specific firm characteristics and the composite governance measures might provide additional insights on the nature of the governance-firm value relation. As set out in section 2.1.2, the risk of agency cost and, consequently, the need for governance mechanisms is especially high when firms show specific attributes.

For example, firms with high capital expenditures might need more effective governance mechanisms than firms with low CAPEX, as they need to ensure that investment decisions are properly made to ensure future profitability and positive cashflows. Firms with high cash holdings need governance measures to ensure that such excess cash is not channeled into non-profitable investments or into private benefits of the management. Regarding a firm's capital structure, those with low debt ratios need to ensure that the management does not take advantage of this situation and pursue unprofitable investments or steal money behind the back of the shareholders whenever the monitoring effect of debt is not in place. Firms with high intangible assets are often connected with high information asymmetries. This is because analysts might not have all required information available to determine

a fair firm value when large parts of such value consist of intangibles. Such information asymmetry can result in valuation discounts and a lower firm value accordingly (Cuypers, Cuypers, & Martin, 2017, p. 612). The valuation of intangible assets often comes to different results as value drivers are hardly comparable and valuation assumptions can depend on the individual assessment of their future value to potential investors (Moro Visconti, 2020, pp. 9–11).

For the above reasons, interaction terms between governance variables and specific controlling variables are analyzed to test for possible moderations on the governance-firm value relation. The four described research concepts can be summarized by the following hypothesis:

Hypothesis 3a: The relationship between external corporate governance quality and firm value is moderated by variables such as capital expenditures, cash holding, debt ratio, or the ratio of intangible assets.

Hypothesis 3b: The relationship between internal corporate governance quality and organizational performance is moderated by variables such as capital expenditures, cash holding, debt ratio, or the ratio of intangible assets.

As described in the agency theory perspective in section 2.1.2, the need for governance mechanisms is substantially driven by information asymmetries and the risk of agency costs within firms. When analyzing the governance-firm value relation, the role of information asymmetries needs to be considered as a potential root cause for the governance problem.

Prior literature shows that effective governance can increase the reliability of disclosed financial information, reduce information asymmetries, as well as the amount of systematic risks (Kang & Kim, 2011, p. 64). Therefore, it could be possible that the influence of corporate governance on firm value is indeed executed through a reduction of information asymmetries which acts as a mediator variable.

This would imply that governance works through an indirect effect that first causes a reduction of information asymmetries, while the reduced information asymmetries actually cause a positive impact on firm value in a second step. Such

hypothesis is supported by Latif et al. (2017, p. 273) who, next to a positive direct effect on firm value, also report a positive indirect effect of corporate governance through the channel of various attributes which reduce information asymmetries. Further, Tahir, Qamar, Nayir, and Usman (2019, p. 1068) report an indirect effect of corporate governance which reduces the expropriation of the firm's resources and mitigates overinvestment of free cash flows. Such indirect effect works through the monitoring channel of information asymmetry as governance improves transparency and forces managers to produce and disclose valid information.

Therefore, the indirect effect of governance of firm value through a mediation model can be hypothesized as follows:

Hypothesis 4a: The relationship between external corporate governance and firm value is mediated by information asymmetries.

Hypothesis 4b: The relationship between internal corporate governance and firm value is mediated by information asymmetries.

4. EMPIRICAL ANALYSIS

4.1 SAMPLE AND DATA

4.1.1 SAMPLE SELECTION

The empirical analysis of this thesis covers the period from 2012 to 2017. As it starts about two years after the peak of the European debt crisis, the sample period does not include any major financial crises which, otherwise, could have an impact on empirical results. The initial sample consists of all firms listed in the STOXX® Europe 600 index. This index includes the largest European firms measured by their free-float market capitalization. To comply with this fundamental principle, index members are reviewed and, where necessary, exchanged quarterly. As the STOXX® Europe 600 index includes large and mid-size firms from 17 different European countries, it provides a fair picture of the overall economy in the European area (Velte, 2021, p. 45). Thereby, the STOXX® Europe 600 index is not limited to firms from Eurozone member countries only and includes firms from countries like Great Britain, Switzerland, Denmark, Sweden, Norway, or Poland as well. Although the sample includes firms from multiple European countries, no negative impact on the empirical results is expected and as international convergence and emulation of successful governance strategies and frameworks has aligned governance regulations of listed firms (Salvioni et al., 2016, p. 1208). To avoid negative impacts caused by survivorship bias, this thesis uses the composition of the STOXX® Europe 600 index as of January 2012 for its sample selection.

In the first step, the initial sample of 3,600 annual observations from 600 firms is reduced by 134 firms with 804 annual observations which are considered "financial firms" according to the ICB sector classification. Financial firms are strictly regulated which might impact their accounting performance indicators as well as their governance regulations (Adams, 2012, pp. 10–12). Moreover, to avoid any distortion of the regression results, e.g., because one of the controlling variables is debt to total assets, financial firms are excluded from the sample.

In a second step, 166 annual observations are removed due to incomplete or missing governance data. In step three, incomplete or missing observations on the

dependent and control variables are removed. Overall, this leads to a reduction of 239 observations over the 6-year period. In a fourth and last step, the Cook's distance is used to define outliers. Thereby, an outlier is defined as an observation for which the Cook's distance exceeds a value of "4/n" with "n" denoting the number of observations in the dataset. In total, 109 outliers are dropped for the dataset. Although the Cook's distance does not explicitly indicate why exactly an observation is dropped, an analysis of the outliers shows that the high Cook's distances might specifically be related to outlying values from the variables intangible assets, debt to total capital, and Tobin's Q. The sample selection results in a final sample size of an unbalanced panel dataset with 419 firms and 2,282 annual observations over the period from 2012 to 2017. Details of the sample selection process are provided in Table 9.

Table 9: Sample selection process

STOXX® EUROPE 600 Index	2012	2013	2014	2015	2016	2017	Total
Initial sample:	600	600	600	600	600	600	3,600
less financials	-134	-134	-134	-134	-134	-134	-804
less missing data governance	-18	-18	-20	-27	-36	-47	-166
less missing data control and less dependent variables	-47	-38	-46	-39	-35	-34	-239
less outliers	-16	-20	-23	-19	-12	-19	-109
total observations	385	390	377	381	383	366	2,282

For a better overview of the industrial distribution of the dataset, Table 10 provides a summary of all observations categorized into industries as per the sample firms' ICB super sector classification. Most of the observations belong to the industrial goods and services sector with a 20.6% share (471 observations), followed by the sectors for basic resources with 8.0% (183 observations) and energy with a 7.4% share (170 observations).

Table 10: ICB industry classification of dataset

ICB super sector	Number of observations
Industrial goods and services	471
Basic resources	183
Energy	170
Health care	156
Food, beverage, and tobacco	152
Telecommunications	139
Utilities	138
Media	124
Consumer products and services	123
Construction and materials	116
Chemicals	116
Technology	103
Travel and leisure	93
Personal care, drug, and grocery stores	91
Automobiles and parts	68
Retailers	39
Final sample	2,282

All data on the dependent as well as the controlling variables included in the empirical analysis are collected from the Thomson Reuters Eikon Datastream. All data on the independent variables, i.e., the corporate governance data, is taken from the Refinitiv Eikon Environmental Social and Governance ESG module. The Refinitiv Eikon ESG module is a comprehensive database for corporate governance information used by several recent publications such as Del Giudice and Rigamonti (2020) or Garcia, Mendes-Da-Silva, and Orsato (2017). It is also one of the few data sources which offer detailed information on a single governance provision level for most European-listed firms. The empirical analyses are carried out with the statistics and data science software “R” and “Stata”.

4.1.2 CORPORATE GOVERNANCE VARIABLES

4.1.2.1 Recreation of common corporate governance scores

This thesis uses a comprehensive approach to construct a corporate governance rating compared to studies that use a single governance score or simply a single governance provision. This comprehensive approach is based on creating composite governance scores which consist of several underlying governance scores measuring different dimension of corporate governance.

In a first step, the identified academic governance scores from the Web of Science and Google Scholar ranking as set out in section 3.1.3 are selected. These are the Gompers et al. (2003) "G-Index", the Bebchuk et al. (2009) "Entrenchment Index", as well as the Brown and Caylor (2006) "GOV-Score" and "Parsimonious Index". As these four academic scores are governance measures that represent the state of research on corporate governance around their publication dates in the early 2000s, two more recent commercial governance ratings provided by Refinitiv Eikon are further included. The "Eikon ESG shareholder" and "Eikon ESG management" scores represent established commercial ratings of corporate governance quality. This approach is justified by the emergence of commercial governance ratings over the last years and their increasing importance for research and corporate decision-making (Tarmuji, Maelah, & Tarmuji, 2016, p. 67).

In a second step, the identified scores from literature are recreated on a common data basis, while the two Eikon scores are used without any further amendments. The underlying source of governance data is the Refinitiv Eikon ESG database which is accessible through Thomson Reuters and provides not only governance ratings but also a comprehensive set of underlying internal and external governance provisions and further governance-related information. Out of this pool of data, 65 provisions are identified to be relevant for a firm's overall governance quality, 41 of which relate to internal governance, i.e., the Eikon "Management" category, and 24 of which relate to external governance, i.e., the Eikon "Shareholder" category.

The selection of the individual provisions was conducted by the author of this thesis but followed the clear strategy to only exclude provisions that are repetitive or only included for informational purposes. For example, next to the provisions "Compensation Committee" and "Compensation Plan" which have

been included, Eikon also provides detailed data on the total senior management remuneration packages, such as the total value, the average value, and the highest remuneration value. Another example is the board size of a firm. While the provision "Board Size" shows the total number of board members, the provision "Board Size above ten" shows only the number of board members beyond the value of ten members. Other exclusions resulted from the cause that provisions are included both as percentages as well as total values. The selection of the 65 relevant provisions should, therefore, not reduce the explanatory value of the dataset.

The general methodology to recreate the scores follows the scoring approach applied by Brown and Caylor (2006). The latest 2020 version of the Institutional Shareholder Services governance methodology guide is used to assess whether a governance provision positively or negatively contributes to overall governance quality. Provisions are coded with "1" when they positively contribute to the overall governance quality and "0" when they do not. Whenever a provision provided by Eikon is stated as a number or percentage, it is considered as fulfilled as long as it achieves the respective threshold according to the Institutional Shareholder Service (2020) without making any further gradations (Gompers et al., 2003, pp. 115–119).

In practice, this means that when, for example, the overall level of board meeting attendance exceeds the suggested threshold of 75% per year, the provision is deemed to be fulfilled. In this case, an attendance of 80% and an attendance of 100% would both be coded with "1", although, in absolute values, 100% is better attendance. A detailed description of how each of the Eikon provisions is defined is provided in Appendix 1 for the Eikon management provisions and in Appendix 2 for the Eikon shareholder provisions. As Eikon uses different naming of their provisions compared to the ISS methodology, Appendix 3 and Appendix 4 map the Eikon governance provisions with the respective ISS provisions.

After the provisions are coded, the computation of the governance scores is based on a straightforward scoring model. It sums up the binary value "1" or "0" for each of the relevant provisions for the re-created score. To make scores comparable, they are scaled and expressed as a total percentage of provisions fulfilled relative to the number of provisions included in the respective score. Although the overall target was to follow the original composition of the scores, the following modifications have been made to the re-created governance scores:

- *ENTRM* refers to the recreated Entrenchment Index by Bebchuk et al. (2009). Due to data availability, the index does not include the original anti-takeover and protection provisions, but all provisions related to anti-takeover and protection from the Eikon dataset instead. In this way, an Eikon-based Entrenchment Index is set up and includes a total set of 14 entrenching provisions. These provisions are the individual re-election of the board, veto power, golden share, anti-takeover devices above two, unlimited authorized capital or blank check, shareholder rights policy, classified board structure, staggered board structure, supermajority vote requirement, golden parachute, limited shareholder rights to call meetings, equal voting rights policy, pre-emptive rights, and advance notice for shareholder proposals.
- *GINDEX* denotes the recreated G-Index by Gompers et al. (2003). The recreated score uses a total number of 11 Eikon provisions which are similar or overlap with 16 out of the original 24 provisions from the IRRC dataset used to form the G-Index. The included provisions are golden parachutes, shareholder's approval of stock compensation plan, limitation of director liability, limited shareholder rights to call meetings, anti-takeover devices above two, staggered board structure, unlimited authorized capital or blank check, supermajority vote requirement, voting cap, equal voting rights policy, and limitations on removal of directors.
- *GOV-MNG* denotes Brown and Caylor (2006) GOV-Score based on only the 41 management provisions from the Eikon dataset. As the underlying Eikon dataset provides a separation of their governance provisions into the two categories "shareholder" and "management", the recreation of the GOV-Score is done by creating two separate scores. One is based on the Eikon management provisions (GOV-MNG), and one is based on the Eikon shareholder provisions (GOV-SH). It thereby follows the original Brown and Caylor (2006) logic to include the entire provisions from a dataset into one score with the exception of separating between the two categories.
- *GOV-SH* denotes the Brown and Caylor (2006) GOV-Score based only on the 24 shareholder provisions from the Eikon dataset.
- *PARS* represents the recreated Parsimonious Index which follows a similar methodology as Brown and Caylor (2006). However, the reconstructed

PARS score includes only six from the original seven provisions from the ISS database. This is due to the relevant provision for "option burn rate"[4] not being available in the Eikon ESG data. However, the score includes the provisions board meeting attendance, individual re-election of the board, shareholders' vote on executive pay, public availability of corporate statutes, anti-takeover devices above two, and executive compensation policy.

In addition to the five re-created scores from literature, the Eikon ESG Shareholder score (EIKON-SH) and the Eikon ESG Management score (EIKON-MNG) are included in the set of governance scores based on the original Eikon score results without any modifications. Thereby the EIKON-SH represents a commercial governance rating based on shareholder provisions while the EIKON-MNG is based on management provisions. In total, this leads to a set of seven governance scores.

Table 11 summarizes the descriptive statistics for the seven corporate governance scores applied in this thesis. The scores vary from a minimum of zero to the maximum value of one, indicating the percentage of governance provisions fulfilled in the respective score. All scores offer a wide range of governance quality results indicating different governance concepts and qualities among the firms. The EIKON-MNG and EIKON-SH show the largest range by taking values from 0.0054 to 0.9988 and 0.0013 to 0.9987, while the GOV-MNG and GOV-SH show the smallest range from 0.3058 to 0.9512 and 0.3000 to 1.0000. This aligns with the results of the standard deviations which are the largest for the wide-range EIKON scores (0.2819 and 0.2858) and the smallest for the small-range GOV scores (0.1166 and 0.1174). For all governance measures, the Shapiro-Wilk test for normal distribution is rejected at the 0.01 level so that the scores do not follow a normal distribution.

[4] An option burn rate indicates the rate at which stock options are granted. As stock-based incentive plans may constitute a significant transfer of shareholder equity out of the firm, the rate at which stock options are granted should not be higher than three percent of the outstanding shares over a three-year period.

Table 11: Descriptive statistics of the governance variables

Governance score	Mean	Median	sd	Max	Min	Shapiro-Wilk test
EIKON-MNG	0.5650	0.5938	0.2819	0.9988	0.0054	66.6290***
EIKON-SH	0.5067	0.5104	0.2858	0.9987	0.0013	58.5260***
ENTRM	0.6358	0.6429	0.1580	1.0000	0.1111	12.9910***
GINDEX	0.5232	0.5000	0.1570	1.0000	0.0667	29.7970***
GOV-MNG	0.6818	0.6829	0.1166	0.9512	0.3158	16.6220***
GOV-SH	0.7119	0.7273	0.1174	1.0000	0.3000	23.8340***
PARS	0.7433	0.8000	0.1566	1.0000	0.2000	24.6160***

Variables with ***, **, or * are significant at 1%, 5%, and 10% level, respectively.

The Pearson's and Spearman's rank correlation matrix between the governance scores is reported in Table 12. While Pearson's correlation coefficients capture linear relationships between the scores, Spearman's coefficients measure monotonic relationships. This can lead to different results as in a monotonic relationship, variables move in the same or opposite direction but not necessarily at a constant rate, whereas in a linear relationship, such rate is constant. Nevertheless, the Pearson's and Spearman's rank correlation results do not show notable differences for the governance scores.

A look at the individual correlation coefficients indicates significant differences in the relationships between the scores. While, e.g., the Pearson's (Spearman's) correlation coefficient between ENTRM and GOV-SH shows a significant positive correlation with a value of 0.8161 (0.8118), the correlation coefficient between GINDEX and GOV-MNG has a negative value of -0.0352 (-0.0331).

Consequentially, it can be assumed that the different scores do not measure the same construct of corporate governance quality and might likely capture different dimensions of corporate governance. Low and negative correlations are mainly between scores that include internal and those which include external

governance provisions, while there are positive and high coefficients in between the group of internal and external governance scores themselves.

Table 12: Pearson and Spearman's rank correlation coefficients of the governance variables

Pearson correlation coefficients:							
	EIKON -MNG	EIKON -SH	ENTRM	GINDEX	GOV-MNG	GOV-SH	PARS
EIKON-MNG	1.0000						
EIKON-SH	0.1129*	1.0000					
ENTRM	0.0828*	0.3306*	1.0000				
GINDEX	-0.0110	0.3320*	0.5455*	1.0000			
GOV-MNG	0.6119*	0.1143*	0.2206*	-0.0352	1.0000		
GOV-SH	0.1073*	0.5078*	0.8161*	0.6170*	0.2875*	1.0000	
PARS	0.1593*	0.2231*	0.6210*	0.3714*	0.3266*	0.5787*	1.0000

Spearman's rank correlation coefficients:							
	EIKON -MNG	EIKON -SH	ENTRM	GINDEX	GOV-MNG	GOV-SH	PARS
EIKON-MNG	1.0000						
EIKON-SH	0.1127*	1.0000					
ENTRM	0.0753*	0.3069*	1.0000				
GINDEX	-0.0097	0.3325*	0.5733*	1.0000			
GOV-MNG	0.5935*	0.0996*	0.2299*	-0.0331	1.0000		
GOV-SH	0.0854*	0.4892*	0.8118*	0.6417*	0.2872*	1.0000	
PARS	0.1438*	0.2140*	0.6133*	0.3699*	0.3203*	0.5852*	1.0000

Variables with * are significant at the 5% level.

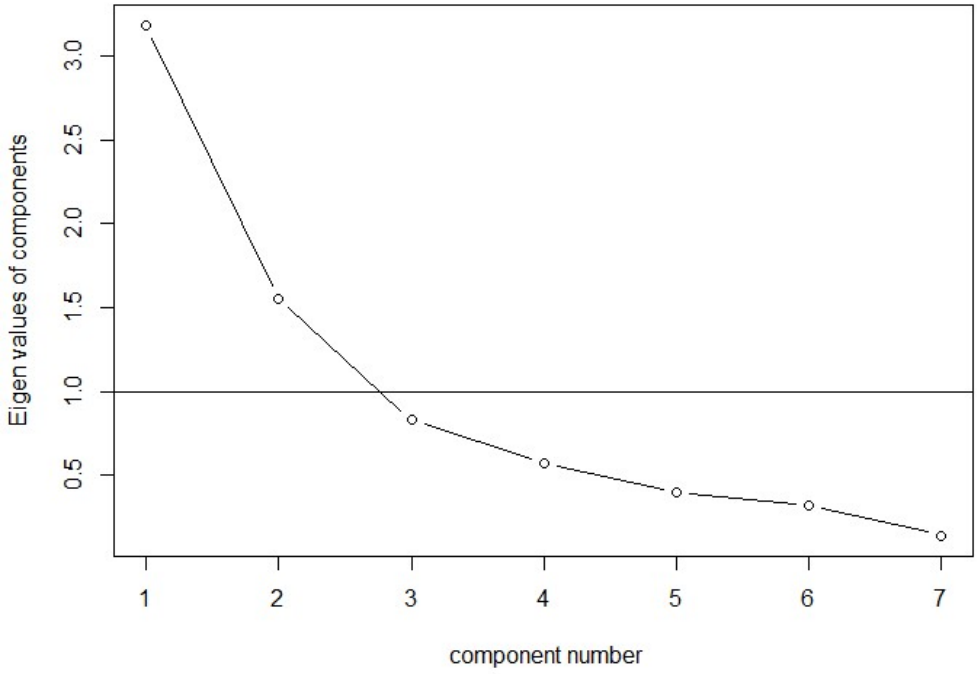
4.1.2.2 Principal component analysis (PCA)

To further analyze the preliminary findings on the relation between the governance scores as provided by the Pearson and Spearman's rank correlation, a

Principal Component Analysis is conducted. The PCA can identify common factors and loadings between the scores to measure different dimensions of corporate governance quality. Such a concept has already been implemented by Larcker et al. (2007), Dey (2008), and Louizi and Kammoun (2016) who analyze corporate governance on a governance provisions level. While Larcker et al. (2007) identify 14 factors from 39 governance provisions, Dey (2008) distills seven factors from 22 provisions. A more recent study by Louizi and Kammoun (2016) uses a set of 50 governance provisions and shows that these provisions load on only two main factors. They conclude that these two factors represent "shareholders' rights and board of directors" as well as "interests of different parties" (Louizi & Kammoun, 2016, p. 380).

Before performing the PCA on governance score level, pre-conditions are tested through the Kaiser-Mayer-Olkin criterion as well as the Bartlett test. With a value of 0.7035, the KMO is well above the critical value of 0.5 and the Bartlett test is statistically significant at the 95% confidence interval level. The PCA can therefore be pursued further (Maddala, 2008, pp. 292–296). The number of relevant factors is extracted using the Very Simple Structure criterion, in short VSS criterion. The calculation of the VSS criterion is based on a varimax rotation and suggests a two-factor model which accounts for 67.69% of the total variance. The number of factors is determined by the so-called "elbow" approach based on a VSS scree plot of the eigenvalues of the factors as shown in Figure 10. This means that the set of governance scores in general loads on two factors, i.e., they have two principal components.

Figure 10: VSS scree plot for the set of governance scores
[Source: scree plot extracted from statistics tool "R"]



Results of the PCA as reported in Table 13 support the findings of the correlation coefficient analyses. Scores loading on factor 1 are mainly those scores in which the number of external governance provisions, i.e., shareholder rights provisions, prevail. Scores loading on factor 2 are those related to internal governance quality. The PCA results are generally in line with the results by Louizi and Kammoun (2016, pp. 378–382) who identify a shareholder and stakeholder factor in their PCA analysis of governance provisions. This outcome shows that corporate governance cannot be generalized or measured as a single construct and therefore needs to be reviewed on a more differentiated basis.

Table 13: Principal component analysis results

Governance score	Factor 1	Factor 2	Uniqueness
EIKON-MNG		0.873	0.237
EIKON-SH	0.569		0.672
ENTRM	0.874		0.225
GINDEX	0.773		0.371
GOV-MNG		0.893	0.179
GOV-SH	0.917		0.140
PARS	0.693		0.438
Proportional Variance	0.433	0.244	
Cumulative Variance	0.433	0.677	

Subsequently, results of the PCA are used to construct two composite measures of governance quality which correspond to factor 1 and factor 2 of the PCA. For this purpose, all governance scores are z-standardized first. Scores that load on factor 1 (factor 2), i.e., external (internal) corporate governance quality, are then summed up for each firm and year and divided by the number of addends comprised. As a result, two composite governance measures are created: One represents external governance quality (EXT), and one represents internal governance quality (INT). Summary statistics on EXT and INT are presented in Table 14.

Table 14: Descriptive statistics on the composite governance measures

Composite governance score	Mean	Median	sd	Max	Min	Shapiro-Wilk test
EXT	0.0021	0.0085	0.7683	2.0768	-2.2428	3.8100***
INT	0.0075	0.1265	1.3621	3.0831	-4.0256	18.3290***

Variables with ***, **, or * are significant at 1%, 5%, and 10% level, respectively.

4.1.3 DEPENDENT VARIABLE AND CONTROLLING VARIABLES

Dependent variables. Historically, research on the governance firm value and performance relation has used a large set of performance measures and firm value KPIs as dependent variables which have been explained and discussed in section 3.2 of this thesis. Based on the advantages and disadvantages of the individual indicators for organizational performance, Tobin's Q is selected as the dependent variable and shall reflect a firm value KPI that includes earnings, growth, and corporate risk. For the empirical analysis, it is denoted as Q and calculated as the market value of equity and total assets less common equity and deferred taxes divided by total assets. Therefore, it can be regarded as a ratio of the market value of a firm to its assets' replacement cost.

Unlike accounting-based performance indicators, Tobin's Q is regarded as a reliable measure of firm value and performance, as it minimizes distortions caused by strategic accounting decisions and balance sheet management. Tobin's Q is an often-used dependent variable in the research area and has been applied, besides others, by Chhaochharia and Laeven (2009), Gupta et al. (2009), and Zagorchev and Gao (2015). From the overview of empirical studies on corporate governance and organizational performance in Table 8, it can also be seen that Tobin's Q is, by a large margin, the most frequently applied dependent variable in academic research.

Panel A of Table 15 provides descriptive statistics on Q. If corporate governance influences organizational performance and firm value, significant differences of Q between well and poorly governed firms should be expected. The minimum value for Q is 0.5285, while the maximum is 5.3731. This means that the sample includes firms with a Q value of less than one which are traded below their assets' replacement cost while other firms are traded at almost five times their assets' replacement cost. On average, Q is 1.6918 and the median value of the sample is 1.4727. Q does not follow a normal distribution which is indicated by the rejected Shapiro-Wilk test. For the empirical analysis, the dependent variable Q is not transformed as there are no economic reasons for a transformation. Further, the impact of governance on Q is assumed to be linear and not quadratic or square rooted. An untransformed dependent variable, therefore, allows better interpretation of the research results. Possible non-linear relationships between corporate governance and Q are addressed in the robustness checks in section 4.4.2.

Controlling variables. To analyze the influence of internal and external corporate governance on Q, several controlling variables are included to control for the specification bias (Hsiao, 2015, p. 313). This shall ensure that results of the regression-based analysis are not biased from relevant but omitted variables. The selection of controlling variables is derived from prior research studies on corporate governance which focus on similar research questions and hypotheses. In the following, the controlling variables are described in detail:

- *CAPEX.* As an indicator for growth opportunities and investment intensity and consistent with Aggarwal et al. (2010) and Cheung et al. (2011), CAPEX, i.e., the capital expenditures to total assets, is included as a controlling variable. As firms usually take investments to achieve future growth, a positive influence on firm value is expected. However, on the negative side, a high CAPEX also bears the risk of mis-investments.
- *CASH.* The ratio of cash and short-term investments to total assets is included to represent a firm's cash holdings. Such an approach has been applied by Flammer (2015) and Ahmed, Qi, Ullah, and Kimani (2018). On the one hand, cash holdings do not deliver high returns and may create an incentive to carry out rash investment decisions or open opportunities for managers to increase compensation and perquisites. For this reason, CASH might have a negative influence on firm value. On the other hand, cash holdings allow firms to withstand financial distress and provide flexibility to react to market changes and investment opportunities which will likely increase the overall firm value.
- *DEBT.* The ratio of total debt to total assets, i.e., DEBT, is included as a controlling variable to account for risk. This follows the approach by Chhaochharia and Laeven (2009) as well as Singh et al. (2018).
  Based on the monitoring effect of DEBT, e.g., through increased attention from funders as well as better handling of scarce resources, a positive impact on firm value is expected (Dhaliwal, Hogan, Trezevant, & Wilkins, 2011, p. 1131).
- *INTANGIBLES.* Following Khanchel (2007) and Surroca, Tribó, and Waddock (2010), INTANGIBLES, i.e., the ratio of intangible assets to total assets, are included to represent potential market entry barriers and information asymmetries. In industries with a high ratio of intangible assets, market entry barriers are expected to be lower than in industries

where the ratio of intangible assets is low. Further, a high value of intangible assets generally makes it more difficult for analysts to evaluate a firm properly. Therefore, a negative influence on firm value is expected.

- *RESVOL.* Similar to Krishnaswami and Subramaniam (1999) and Rogers and Securato (2009), the study includes residual volatility as an additional variable to account for corporate risk. The residual volatility is calculated as the volatility, which remains when predicting a firm's stock returns by a well-diversified market portfolio. For this thesis, the market portfolio is reflected by the underlying STOXX® EUROPE 600 index. Consequently, residual volatility is calculated as a firm's volatility minus the product from the volatility of the STOXX® EUROPE 600 index and a firm's beta factor. The calculation is based on a firm's average annual price movements. A negative impact on firm value is assumed.
- *ROA.* Following Bebchuk et al. (2009) and Garcia et al. (2017), the return on assets, calculated as the gross income to total assets, is included as a controlling variable. A positive relationship is expected. It is assumed that financial performance positively affects firm value.
- *SIZE.* Similar to Drobetz et al. (2004) and Bhagat and Bolton (2019), the value of a firm's total asset is used as a proxy for firm size. In general, a positive effect of SIZE on Q is expected as larger firms should have better access to external funding, benefit from lower transaction costs, and can compete more efficiently than smaller firms (Rizqia & Sumiati, 2013, p. 122).

Table 15: Descriptive statistics on the dependent variables and the controlling variables

Variables	Mean	Median	sd	Max	Min	Shapiro-Wilk test
Panel A:						
Q	1.6918	1.4727	0.7595	5.3731	0.5285	183.3300***
Panel B:						
CAPEX	0.0424	0.0338	0.0347	0.3703	0.0000	231.0170***
CASH	0.0787	0.0602	0.0676	0.5017	0.0001	205.8140***
DEBT	0.3954	0.3873	0.2143	1.8676	0.0000	40.0510***
INTANGIBLES	0.2818	0.2412	0.2090	0.8961	0.0000	75.2870***
RESVOL	0.1291	0.1083	0.0740	0.8792	0.0269	306.0970***
ROA	0.0574	0.0555	0.0594	0.5102	-0.3200	116.2780***
SIZE (in k EUR)	22,400,000	7,338,006	41,300,000	412,000,000	322,350	650.2170***

Variables with ***, **, or * are significant at 1%, 5%, and 10% level, respectively.

Panel B of Table 15 provides insights on the controlling variables used for the following regression analyses. The ratio of capital expenditures to total assets (CAPEX) varies between zero and 37.03%. On average, firms invest about 4.24% of their total assets into capital expenditures with 3.38% being the median value. The average value of cash holdings (CASH) is 7.87% of the total assets and the median value of CASH is 6.02%. However, it shows that the range of cash holdings is wide. While the minimum value is only 0.01%, the maximum value of cash holding in the sample is 50.17%, i.e., more than half of a firm's total assets. Firms finance their assets with an average ratio of total debt to total assets (DEBT) of 39.54% which is close to the median value of 38.73%. The minimum and maximum values show that the sample ranges from fully equity to fully debt-financed firms. The intangible assets to total assets ratio (INTABGIBLES) averages 28.18% with a median of 24.12%. The sample provides a large range of INTANGIBLES with firms having a ratio from 0% to 89.61% of their assets classified as intangible assets. Residual volatility (RESVOL) waffles between 0.0269 and 0.8792, has its average value at 0.1291, and its median value at 0.1083. Values for the return on assets (ROA) range

between firms with high positive returns on their assets (51.02%) but also include firms with negative returns of up to -32.00%. However, on average, firms have positive returns of 5.74% and a value of 5.55% as the median. As the sample's starting point are the 600 largest European firms by market capitalization, firm size is generally high. The average firm has a total assets value of 22.4 billion Euros with a median value of 7.338 billion Euros. The smallest firm in the sample has a size of 322.35 million Euros and belongs to the technology sector and the largest firm in the sample is the automobile firm Volkswagen AG with a size of 412 billion Euros in the year 2017.

For all controlling variables, the Shapiro-Wilk normality test is rejected. For RESVOL, variable transformation is applied to mitigate adverse effects of non-normally distributed variables. As RESVOL shows a positive skewness of 2.6673 which indicates that the distribution is highly right-skewed, RESVOL is transformed using the natural logarithm procedure. This leads to a reduced skewness of only 0.6345. It needs to be mentioned that the transformation of RESVOL does not change the direction of its impact on firm value, as analyzed in the following empirical research sections.

For SIZE, the natural logarithm is used to transform the values as this procedure is a common standard in empirical research. For the other variables, transformation with the square root or lateral logarithm could not improve skewness, kurtosis, nor normal distribution results. For interpretation purposes, these variables are not transformed. In the following, this thesis refers to the transformed variables as ln(RESVOL) and ln(SIZE).

The panel data regression analysis is performed to test for hypothesis 1a and 1b while controlling for variables as set out above. Q_{it} is modeled as a linear function of the firm-specific controlling variables and the two composite internal and external governance quality measures. The model can be summarized by the following equation:

$$Q_{it} = \beta_{con} \sum_{j=1}^{L} \beta_j \times x_{jit} + \beta_9 \times EXT_{it} + \beta_{10} \times INT_{it} + d_t + n_i + u_{it} \qquad (1)$$

where:

Q_{it}	=	reflects Q,
β_{con}	=	constant regression coefficients,
x_{jit}	=	firm-specific control variables CAPEX, CASH, DEBT, INTANGIBLES, ln(RESVOL), ROA, and ln(SIZE) of firm *i* at time *t*,
EXT_{it}	=	composite measure for external governance,
INT_{it}	=	composite measure for internal governance,
d_t	=	unobservable time effects,
n_i	=	unobservable individual effects, and
u_{it}	=	stochastic disturbance term of firm *i* at time *t*.

4.2 EMPIRICAL METHODOLOGY

4.2.1. REGRESSION DIAGNOSTICS

Prior to carrying out the panel data regression analysis, several regression diagnostics need to be tested to ensure that regression coefficients, standard errors, and significance levels are reported correctly. These regression diagnostics are based on the best linear unbiased estimators (BLUE) criteria and include tests for multicollinearity, heteroscedasticity, serial correlation, and cross-sectional dependence. An explanation of the respective test procedures is given below:

- *Multicollinearity.* Multicollinearity occurs when there is a linear intercorrelation between explanatory variables in a multiple regression model. A high level of multicollinearity can cause issues to fit the model or interpret its results. However, the predictive power and reliability of the model are not negatively impacted by multicollinearity. The test for multicollinearity used in this thesis is based on calculating variance inflation factors, also known as VIF values. In cases where a VIF exceeds a value of ten, multicollinearity is likely to be present (Kim, 2019, p. 558).
- *Heteroscedasticity.* Heteroskedasticity occurs when the variance of the error term is non-constant. Heteroskedasticity constitutes a breach of the BLUE criteria under which homoskedasticity is assumed. As a result of

heteroskedasticity, the standard errors of the estimates are biased, and usual t-statistics or F-statistic cannot be used. Heteroskedasticity can be identified using the Breusch-Pagan / Cook-Weisberg test introduced by Breusch and Pagan (1979). The test is derived from the Lagrange multiplier test principles.

In addition, the modified Wald test for groupwise heteroskedasticity can be applied. The null of both tests is homoskedasticity. A common instrument to respond to the presence of heteroskedasticity is the application of robust standard errors such as the Huber-White or Driscoll-Kraay standard errors (Hoechle, 2007, p. 283). Prior to carrying out the Breusch-Pagan / Cook-Weisberg test for heteroskedasticity, an assessment of the normality of the residuals needs to be conducted, as the Breusch-Pagan / Cook-Weisberg test assumes a normal distribution of the residuals.

- *Serial correlation.* Serial correlation describes a correlation between successive values of a variable and is also referred to as autocorrelation. For panel regressions, this can lead to scenarios where the error terms of the regression are serially correlated with each other over time. Serial correlation can invalidate significance tests and lead to an underestimation of standard errors (Drukker, 2003, p. 168). Serial correlation is more likely to be an issue in macro panels with long time series, while it is less of an issue for micro panels with few years of observation as present in this thesis (Torres-Reyna, 2010, p. 21). However, the presence of serial correlation can be tested by applying the Wooldridge test for autocorrelation in panel data which is based on the idea of the Lagrange multiplier test. The null hypothesis of such test is that no serial correlation exists. In cases where the null is rejected and serial correlation is an issue, robust standard errors such as the Huber-White or Driscoll-Kraay standard errors should be applied (Hoechle, 2007, p. 283).
- *Cross-sectional dependence.* Panel data can be subject to cross-sectional dependence which is also called contemporaneous correlation. It describes a case where the cross-sectional units are mutually interdependent (Xu, Cai, & Fang, 2016, p. 127). Cross-sectional dependence is usually attributable to common but unobserved factors which affect each of the individual units. Such factors can have different sources, e.g., the development of the world

economy, risk-free interest rates, or other external factors. When these common factors are omitted from the model but would be correlated with the independent variables, the estimators obtained by the panel regression might be inconsistent (Henningsen & Henningsen, 2019, p. 357).

To test for cross-sectional dependence, the Pesaran CD test can be performed. The null hypothesis of such test is cross-sectional independence so that when the null is rejected, cross-sectional dependence is an issue. In such cases, the literature proposes to estimate the panel regression by using Driscoll–Kraay standard errors (Hoechle, 2007, p. 309).

4.2.2. RANDOM VERSUS FIXED EFFECTS REGRESSION MODELS

For the analysis of longitudinal or panel data, empirical methodologies such as the random effects model, the fixed effects model, or simple pooled regression models can be applied. As each of these models follows different underlying assumptions, it is crucial to understand differences between the models and verify their requirements before applying the methodologies (Clark & Linzer, 2015, p. 402).

Estimating a standard ordinary least squares model always bears the risk of delivering biased results when variables that have a significant effect on the dependent variable are omitted. Therefore, one major task of researchers is to make sure that all variables that possibly impact the dependent variable are included in the empirical model.

In contrast, fixed effects models can mitigate an existing omitted variable bias for models which are not fully specified. However, such omitted variable needs to be time-invariant, i.e., the impact at one specific point in time does not change and remains the same over time. This is possible as a fixed effects model uses panel data in which subjects like individuals, firms, countries, or others are repeatedly measured over a period of time (Morgan, 2013, pp. 114–116). By including subject-specific as well as periodic-specific fixed effects, the impact of time-invariant causes of omitted variables can be removed regardless of if such variables are included in the model or not. In this way, fixed effects models allow to measure the net effects of the independent variables on the dependent variable and are less affected by biases from omitted or unmeasured causes (Morgan, 2013, p. 116).

However, there are limitations to the fixed effects model. In cases where subject or time-invariant characteristics are not unique to a specific subject but correlate with characteristics from other subjects, a fixed effects model cannot be applied. This results from a violation of the assumption that each subject is different as its error term and the constant term would correlate with other subjects (Morgan, 2013, pp. 116–118).

A random effects model, in contrast, can be used when the variation across the subject is assumed to be random and not correlated with the independent variables. While in the fixed effects model, the subject-specific effect is treated as fixed for each subject, the random effects model treats the subject-specific term as randomly varying (Wooldridge, 2010, p. 251). Therefore, Greene (2012, pp. 293–295) describes random effects models as a regression with a random constant term for subject-specific intercepts. Hence, if it is likely that differences across the subjects may influence the dependent variable, then a random effects model should be preferred over a fixed effects methodology. However, for random effects models to produce consistent and unbiased estimates, the independent variables in the model must not correlate with the random variable (Allison, 2009, pp. 8–10). If this assumption is breached, then the estimated effect of the independent variables will not be consistent (Morgan, 2013, p. 117).

To decide which model should be applied, researchers often rely on the Hausman test of specification as well as the Breusch-Pagan Lagrange multiplier test, often referred to as the LM test. First, the Breusch-Pagan LM test can decide if a random effects model or a simple OLS regression model should be applied. The null hypothesis of the Breusch-Pagan LM test assumes that variances across entities are zero, i.e., there are no panel effects. When the null of the LM test is rejected, the preferred model is the random effects model, however, if it is not rejected, there are no differences across entities and a simple OLS regression can be used. As a second step, the Hausman test can further differentiate between fixed and random effects for panel data, as it is designed to recognize violations of the random effects assumption. Consequentially, it tests if the unique errors (u_i) are correlated with the independent variables. When there is a correlation, the null hypothesis of the Hausman test is rejected and the preferred regression model is a fixed effects model. If the null hypothesis of the Hausman test cannot be rejected, then the preferred model is the random effects model (Clark & Linzer, 2015, pp. 402–405).

4.2.3. MITIGATING ENDOGENEITY

As set out in section 3.2.3 of this thesis, the influence of corporate governance on organizational performance and specifically firm value might likely be affected by endogeneity as firms purposely choose their governance structures (Iyengar & Zampelli, 2009, p. 1094). Consequently, the firm-specific choice of a governance structure could be strategic and not random so that the independent variable (X_i), i.e., internal and external corporate governance quality, might be endogenous.

There are various empirical methodologies to mitigate endogeneity and estimate consistent and unbiased research results (Iyengar & Zampelli, 2009, p. 1092). Among others, one commonly used technique to overcome endogeneity problems are fixed-effects panel regressions which control for unobserved heterogeneity by including time-fixed and subject or firm-fixed-effects (Ebbes, Papies, & van Heerde, 2017, pp. 31–34). The so-called "within" transformation of the fixed-effects panel regression wipes out individual effects. As the unobservable individual effects are constant over time, the fixed-effects panel regression produces consistent parameter estimates (Petersen, 2009, p. 464). However, fixed-effects panel models can only produce consistent estimates under the assumption of strict exogeneity (Schultz et al., 2010, p. 148). Therefore, the fixed-effects methodology is not optimal to overcome other forms of endogeneity issues, e.g., when the data is affected by a self-selection bias (Secchi, Tamagni, & Tomasi, 2016). In this regard, instrumental variable techniques are a measure that is frequently applied in research to address endogeneity caused by self-selection problems (Antonakis, Bendahan, Jacquart, & Lalive, 2014, p. 32).

IV models can be applied in cases where an endogenous independent variable (X_i) is systemically related to unobserved causes of the dependent variable (Y_i) (Clougherty et al., 2016, p. 296). The idea behind this approach is to include an instrumental variable (Z_i) into the regression which can account for the unexpected effects between variables. In the case of corporate governance, this would be a variable that influences corporate governance quality but would influence firm value only indirectly through its association with corporate governance quality. From this general description, three conditions to identify strong instrumental variables can be derived:

First, the instrumental variable (Z_i) must fulfill the orthogonality condition, i.e., being uncorrelated with the error term ($\underline{u_i}$). Second, the instrument (Z_i) must correlate with the endogenous independent variable (X_i). Third, the instrument (Z_i) must be excluded from the model so that its effect on the dependent variable is only indirect (Wooldridge, 2010, pp. 83–85).

However, one major issue with IV methods in practice is that it might prove extremely difficult to determine an appropriate instrumental variable in theory and derive the required data in practice. Therefore, in empirical research, researchers often include instrumental variables which are generated from lagged values of the endogenous independent variable (Wooldridge, 2010, p. 303). A lagged instrumental variable thereby is a variable that measures the value of the independent variable at a previous point in time, e.g., corporate governance quality at "t-1" or "t-2". Although lagged variables may not be exogenous and therefore are no instrumental variables in the narrow sense, multiple research results reveal that lagged instrumental variable methods can mitigate the endogeneity problems and serve as reliable instruments (Wang & Bellemare, 2020, p. 2). Nevertheless, researchers need to make compelling theoretical arguments when applying a lagged IV methodology (Sovey & Green, 2011, p. 194).

In practice, IV methods are usually applied with a two-stage least squares (2SLS) model. Thereby, a 2SLS estimation removes the potion of variance from the independent variable (X_i) which correlates with the error term ($\underline{u_i}$). The 2SLS model can be divided into two stages: In the first stage, the instrumental variables are used to "obtain predicted values of the endogenous variable" (Antonakis et al., 2014, p. 33) which will be uncorrelated with the error term ($\underline{u_i}$). In the second stage, these predicted values can then be used to predict the dependent variable.

In summary, 2SLS models use instruments to purge the endogenous independent variable from its common variance with the error term (Antonakis et al., 2014, p. 33). In this way, only the "clean" variance of the independent variable which is uncorrelated with the error term is used to predict the dependent variable. When estimating a 2SLS model, most statistic software programs provide F-tests for joint significance of the instruments. In this way, weak instruments can be detected as they fall below the critical F-test value of ten according to Stock and Yogo (2005, pp. 94–96).

4.3 BASIC REGRESSION RESULTS

4.3.1 REGRESSION DIAGNOSTICS RESULTS

In the first step, regression diagnostics as for the basic panel data regression model according to equation (1) from section 4.1.3 are conducted and summarized in Table 16 below.

Starting with multicollinearity, all reported VIF values are in a range between 1.09 and 1.39 with an average VIF of 1.25. This is well below the critical value of ten. Consequently, regression results are not impacted by multicollinearity between the independent variables. Regarding heteroskedasticity, both the Wald test as well as the Breusch-Pagan or Cook-Weisberg test are rejected at the 5% level. This indicates the presence of heteroskedasticity and needs to be considered when choosing the standard error methodology. By using the "qnorm" command in Stata, the assumption of normality of the residuals can be supported as the qnorm plot shows an overall symmetry of the distribution of residuals with only slight deviations near the tails. The Wooldridge test for autocorrelation is also rejected so that serial correlation needs to be addressed accordingly. Results of the Pesaran's CD test for cross-sectional dependence indicate that the residuals are correlated, and cross-sectional dependence is an issue as well.

Table 16: Test of model assumptions for a panel regression

Model Assumption	Testing method	Result
Multicollinearity	Test of variance inflation factors (VIF)	VIFs do not indicate critical multicollinearity; all VIF values below critical value of 10
Heteroskedasticity	(i) Wald test; (ii) Breusch-Pagan or Cook-Weisberg test	Both tests rejected at 5% level; presence of heteroskedasticity
Normality of the residuals	"qnorm" plot in Stata	overall symmetry of distribution of residuals; only slight deviations near the tails.
Autocorrelation/ serial correlation	Wooldridge test for serial correlation in panel models	Test rejected; serial correlation is present
Cross-sectional dependence	Pesaran's CD test for cross-sectional dependence	residuals are correlated; cross-sectional dependence is present
Time fixed effects	F-test for time individual effects.	coefficients for all years are not jointly equal to zero; time fixed effects need to be included in the model

As some of the BLUE requirements are violated by the presence of heteroskedasticity, serial correlation, and cross-sectional dependence, the panel data regression needs to be estimated with appropriate standard errors. Following Driscoll and Kraay (1998, 556ff.) as well as Hoechle (2007, p. 285) the significance tests of the regression coefficients need to rely on the Driscoll and Kraay robust standard errors. These standard errors are robust to disturbances that are heteroskedastic, serial correlated, and cross-sectionally dependent. The often-used Huber-White standard errors cannot be used in this case, as they only work for samples with heteroskedastic and autocorrelated disturbances but not for cross-sectionally dependent samples (Hoechle, 2007, p. 283).

As the sample is based on panel data between 2012 and 2017, the error term is expected to be driven by unobservable time and individual effects. To decide between a pooled OLS, a fixed effects model, or a random effects model, the Breusch-Pagan LM test of random effects is carried out first. The rejection of the null hypothesis that variances across entities are zero shows that the random effects model is preferred over the pooled OLS. Further, the rejection of the null hypothesis of the Hausmann test indicates a significant interdependence between the individual effects and the remainder error term. Consequently, the fixed effects model is preferred over the random effects model and the regressions can be consistently estimated through a fixed effects panel regression with firm fixed effects by using the so-called "within" estimator.

When running a fixed effects regression model, it needs to be checked if time fixed effects need to be included as well. To test if the fixed effects panel regression requires time fixed effects, the Stata post estimation command "testparm" is used. The testparm command is a joint test to check if the dummies for all years are equal to zero. In case the null hypothesis is not rejected, no time fixed effects are needed. In case the null is rejected, then the coefficients for all years are not jointly equal to zero so that time fixed effects need to be included in addition to firm fixed effects. The test results for time fixed effects show that the null hypothesis that coefficients for all years are jointly equal to zero is rejected. Therefore, time fixed effects need to be included in the fixed effects model.

4.3.2 FIXED EFFECTS PANEL REGRESSION RESULTS

The fixed effects panel regression includes dependent, independent, and controlling variables as outlined in sections 4.1.2 and 4.1.3 accordingly and follows the equation (1) as set forth herein. Table 17 reports the fixed effects panel regression results for the influence of internal and external governance on firm value measured by Q. The overall variance which the regression model accounts for is indicated by the R-squared overall value which is 0.2657.

Regarding the controlling variables, regression results are mostly in line with expectations and prior findings from literature. CAPEX shows a positive but non-significant influence on firm value, while the influence of CASH on Q is positive and significant at the 5% level. This shows that CASH can increase firm value by

providing flexibility and security rather than decreasing value through generating low returns. For DEBT, a positive and significant impact on Q is reported. It is likely that this effect is due to the utilization of interest tax shields as well as its monitoring function from outside creditors which contributes to avoiding overinvestments and improving the handling of scarce resources. INTANGIBLES show a negative but non-significant impact on Q. This leads to the conclusion that higher levels of residual volatility, i.e., corporate risk, lead to a decrease in firm value. In contrast, the regression results indicate that ROA positively affects Q. Consequently, accounting performance measured by the return on assets positively impacts firm valuation.

Last, ln(SIZE), i.e., the natural logarithm of firm size, shows negative and highly significant estimates for its influence on *Q*. This is a surprising result, as prior studies have reported a positive impact of size on firm value. Rizqia and Sumiati (2013, p. 126), for example, report a positive impact of firm size on Q by arguing that larger firms have easier access to external funding, lower transaction cost, and more spotlight from investors. However, other studies in the area of corporate governance research from Brown and Caylor (2006), Chen, Chung, Hsu, and Wu (2010), and Jayachandran, Kalaignanam, and Eilert (2013) also report negative estimates for firm size. Following Stender and Rojahn (2020, p. 158) who use a similar sample and period, they assume that the negative impact of ln(SIZE) is driven by specific characteristics connected with the sample, i.e., the STOXX® Europe 600 index. While firms with a high number of total assets from industry sectors like industrials, basic materials, or energy constitute a large fraction of the sample, sectors like the technology sector, where high valuations and financial performance can be reached, are underrepresented.

Table 17: Results of the fixed effects panel regression model

Variables	Dependent Variable: Q
EXT	0.125 (0.026)***
INT	-0.016 (0.007)*
CAPEX	0.260 (0.357)
CASH	0.829 (0.284)**
DEBT	0.091 (0.023)**
INTANGIBLES	-0.417 (0.324)
ln(RESVOL)	-0.157 (0.027)***
ROA	1.898 (0.265)***
ln(SIZE)	-0.295 (0.051)***
Firm Fixed Effects	Yes
Year Fixed Effects	Yes
Observations	2,282
R-squared within	0.1873
R-squared between	0.2887
R-squared overall	0.2657

This table reports the results of the fixed effects panel regression model. The governance measures EXT and INT are regressed on the firm value variable Q. The controlling variables include CAPEX, CASH, DEBT, INTANGIBLES, ln(RESVOL), ROA, and ln(SIZE). Significance tests of the regression coefficients rely on robust Driscoll-Kraay standard errors which are reported in parentheses. Variables with ***, **, or * are significant at 1%, 5%, and 10% level, respectively.

Regarding the independent variables *INT* and *EXT*, the regression results show mixed evidence. While there is a negative and significant impact of INT on Q with a coefficient of -0.016, the impact of EXT on Q is positive and significant with a coefficient of 0.125. Therefore, it can be summarized that firm value measured by Q increases through better external governance quality (EXT) while it decreases with better internal governance (INT).

The positive influence of EXT on Q might be explained through several causes. Consistent with the agency theory, better external governance strengthens

shareholder rights which, in turn, decreases management's the leeway to pursue actions that do not maximize shareholder value. Consequently, firms with strong shareholder rights are less impacted from agency costs created by the separation of ownership and control (Jiraporn, Kim, Davidson, & Singh, 2006, pp. 948–950). This is because shareholders should have the right to participate in the annual meetings, ask questions to the management, elect board members, and execute their voting rights on fundamental corporate decisions so that decision-making is not at the sole discretion of the management. These and other governance provisions addressing shareholder rights shall align the management to act in the best interest of the shareholders. Management decisions that potentially destroy firm value can be prevented which ultimately curbs the resulting agency costs. Therefore, it seems logical that good external governance leads to a direct increase in firm value.

As a second aspect, Q, as an indicator for organizational performance, is highly influenced by the firm's market value. As share prices on the stock market are a direct result out of the demand for a stock, it can be assumed that firms with good external governance quality might be regarded as a preferred investment opportunity over firms that do not provide sufficient shareholder rights. In addition, many institutional investors nowadays follow investment strategies that exclusively focus on firms with good governance rankings (Tseng et al., 2019, p. 2108). Therefore, the increased demand for investments in well-governed firms could lead to a direct increase in trading volume, demand, and stock pricing which consequentially results in an increase of market and firm value.

The internal governance quality (INT) might not play an important role for shareholders as it focuses more on internal factors, such as board characteristics, board structure, board meetings, board remuneration, board committees, as well as audit activities that do not directly affect shareholder rights. Furthermore, several studies have already shown similar research results which reveal a negative influence of specific internal governance provisions on firm value. Yermack (1996, pp. 185–190), for example, uses the internal governance provision of board size and argues that smaller boards of directors are more efficient than larger boards and can work at a lower cost. In addition, Atty, Moustafasoliman, and Youssef (2018, p. 14) reveal a significant negative influence of board size on Tobin's Q which supports the assumption that certain internal governance regulations might have an inverse impact on firm value.

Durden and Pech (2006, p. 84) criticize increasing opportunity costs created by corporate governance regulations which slow down businesses and decrease their flexibility. Although they acknowledge that implementing governance mechanisms may ultimately achieve the intended goal of lessening opportunities for corporate mismanagement and providing better protection for shareholders and other stakeholders, Durden and Pech (2006, p. 84) argue that governance requirements may have unforeseen negative consequences for businesses. These negative consequences are expressed, e.g., through increased operational complexities in terms of compliance with stricter firm policies or approval processes and a pre-occupation of the managers' and employees' time for regular governance activities.

The extensive focus on compliance with regulations may also lead to a more hesitant decision-making culture and create a fear to take calculated risks as these might contravene with internal governance regulations (Durden & Pech, 2006, p. 93). A management that is burdened with extensive governance regulations might lose its agility and speed to respond to external pressures or events. In the worst case, this might hinder managers from focusing on creating value for the firm as the more relevant target for them is regulatory compliance (Durden & Pech, 2006, p. 87). Therefore, internal governance regulations might have a potential negative impact on firm value. This could especially be the case for firms that operate in rapidly changing and competitive markets or compete in an international environment with competitors that do not have to follow the same level of standards. In such cases, internal governance can constitute a competitive disadvantage (Durden & Pech, 2006, p. 84).

4.4 ROBUSTNESS CHECKS

This section covers a total of three robustness checks to further substantiate the results of the basic fixed effects panel data regression from section 4.3.2. The first robustness check includes an instrumental variables regression to test and account for a possible endogeneity bias on the governance-firm value relation. As a second check, a test for a non-linear relationship between corporate governance and firm value is carried out. The third test uses alternative firm value measures to check if the influence of EXT and INT on Q shows similar results when other KPIs which reflect firm value are applied as the dependent variable.

4.4.1 INSTRUMENTAL VARIABLES REGRESSIONS

As a mitigation for the previously described endogeneity concerns caused by a potential self-selection bias, a two-stage least-squares IV regression model similar to Chung and Zhang (2011, pp. 258–260) is conducted. The previously applied fixed effects model can only control unobserved time-invariant effects (constant over time) through the so-called de-meaning approach. However, it does not deliver a reliable outcome when unobserved effects are time-variant, i.e., these effects are not constant and change over time (Petersen, 2009, p. 464). Consequently, an IV regression approach needs to be conducted.

A major obstacle of the IV regression model is to identify valid instrumental variables for such an approach. However, firm size as a possible instrumental variable used by Black et al. (2006, p. 385) and Coles, Meschke, and Lemmon (2003, pp. 160–163) is already considered in the empirical model as a controlling variable. Further, other common instruments extracted from literature cannot be included due to the nature of the sample selection process, e.g., index membership as used by Drobetz et al. (2004, pp. 287–288), because all firms in the sample are part of the same STOXX® Europe 600 index, or due to unavailability of data, e.g., the comprehensiveness of a country's corporate governance recommendations as used by Renders et al. (2010, p. 92).

Based on Durnev and Kim (2005, p. 1487), lagged values of the endogenous independent variables INT and EXT are used as instrumental variables. This approach follows a large number of other scholars like Christensen, Kent, Routledge, and Stewart (2015, p. 156), Durnev and Kim (2005, p. 1487), as well as Renders et al. (2010, p. 92) who also apply lagged values of the independent variables as instruments, stating that "endogeneity does not persist over time" (Christensen et al., 2015, p. 156). INT and EXT lagged by one year will further be strongly correlated with the endogenous regressor, thereby fulfilling one major condition for instrumental variables. In the following regression, the instrumental variables are denoted with EXT_{t-1} and INT_{t-1}.

Similar to the fixed effects regression in section 4.3.2, the IV regression model includes firm and year fixed effects. The model is based on a 2SLS regression consisting of two separate stages: The first stage of the IV regression tests the relation between the instrumental variables and the endogenous independent

variables. The instrumental variable must be correlated with the related endogenous variables to prove the overall consistency of the instrument. When an instrument is not correlated with the endogenous variable, it cannot demonstrate its relevance and consequently is too weak (Ebbes et al., 2017, p. 15). Results of the first-stage regressions reported in Table 18 show that EXT is positively correlated with EXT_{t-1} and INT is positively correlated with INT_{t-1}, both at the 1% significance level. Further, the Sanderson and Windmeijer (2016) F-statistic values from the tests of under-identification and weak identification from the first-stage IV regressions are well above the critical value of ten according to Stock and Yogo (2005, pp. 94–96).

Table 18: First-stage IV regression results (2SLS)

Variables	Q	
	EXT	INT
EXT_{t-1}	0.243 (0.076)***	0.028 (0.014)**
INT_{t-1}	0.015 (0.008)*	0.378 (0.127)***
CAPEX	-0.457 (0.059)***	-0.238 (0.339)
CASH	0.307 (0.020)***	0.291 (0.305)
DEBT	-0.107 (0.301)***	-0.274 (0.072)***
INTANGIBLES	0.130 (0.050)***	0.400 (0.109)***
ln(RESVOL)	-0.017 (0.010)*	0.000 (0.031)
ROA	-0.103 (0.078)	0.150 (0.152)
ln(SIZE)	0.084 (0.043)**	0.186 (0.046)***
Firm Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Observations	1,847	1,847
F-test of excluded instruments (Sanderson-Windmeijer)	25.290***	78.190***

This table reports the results of the first-stage IV regression including fixed effects. The controlling variables CAPEX, CASH, DEBT, INTANGIBLES, ln(RESVOL), ROA, and ln(SIZE) as well as the instrumental variables EXTt-1 and INTt-1 are regressed on the governance measures EXT and INT. Significance tests of the regression coefficients rely on robust Driscoll-Kraay standard errors which are reported in parentheses. Variables with ***, **, or * are significant at 1%, 5%, and 10% level, respectively.

Both the first- and second-stage IV regressions use robust Driscoll-Kraay standard errors similar to the fixed effects regression from section 4.3.2. The choice of bandwidth follows the default Bartlett kernel rule-of-thumb approach and is set to a value of "3" (Newey & West, 1994, p. 633). The applied Driscoll-Kraay standard errors are robust to heteroskedasticity, autocorrelation, and disturbance through cross-sectional dependence (Hoechle, 2007, p. 285).

For the second-stage IV regressions, the test for strong instruments is carried out first. The Cragg-Donald and Kleibergen-Paap Wald F-statistics show that EXT_{t-1} and INT_{t-1} are again identified as valid and strong instruments for EXT and INT. All F-statistics are well above the critical threshold defined by the Stock-Yogo weak ID test result (Bhagat & Bolton, 2019, p. 149).

One major output of the second-stage regression is the result of the endogeneity test. The endogeneity test has the null hypothesis that the specified endogenous independent variables can be treated as exogenous. The test is distributed as chi-squared with degrees of freedom equal to the number of independent variables. It is defined as the difference of two Sargan-Hansen statistics, one for the regression where the independent variables are treated as endogenous and one for the regression where the independent variables are treated as exogenous (Baum & Schaffer, 2020). When the null hypothesis of exogeneity is rejected, this consequently indicates endogeneity. As reported in Table 19, the endogeneity test is be rejected for Q as the dependent variable so that endogeneity is a true concern for the influence of INT and EXT on Q. This also indicates that the IV regression results from Table 19 are more consistent than the fixed effects regression results reported in Table 17 as these are very likely biased by endogeneity.

Table 19: Second stage IV regression results and postestimations

Variables	Q
EXT	0.356 (0.089)***
INT	-0.141 (0.036)***
CAPEX	-0.025 (0.392)
CASH	0.431 (0.184)**
DEBT	0.064 (0.037)*
INTANGIBLES	-0.586 (0.186)***
ln(RESVOL)	-0.171 (0.023)***
ROA	1.654 (0.198)***
ln(SIZE)	-0.404 (0.018)***
Firm Fixed Effects	Yes
Year Fixed Effects	Yes
Observations	1,847
R-squared (centered)	0.1164
Cragg-Donald Wald F statistic	57.791
Kleibergen-Paap Wald F statistic	25.411
Stock-Yogo Critical Value (10% rejection)	7.03
Endogeneity test of endogenous regressors	Chi-squared p-value = 0.0010

This table reports the results of the second stage IV regression including fixed effects. The governance measures EXT and INT are regressed on the firm value variable Q by including lagged values of EXT and INT as instrumental variables. The controlling variables include CAPEX, CASH, DEBT, INTANGIBLES, ln(RESVOL), ROA, and ln(SIZE). Significance tests of the regression coefficients rely on robust Driscoll-Kraay standard errors which are reported in parentheses. Variables with ***, **, or * are significant at 1%, 5%, and 10% level, respectively.

For the IV regression of INT and EXT on Q, signs of the coefficients, as well as the significances of the controlling variables, are almost unchanged compared to the fixed effects regression from Table 17. However, one change is that for CAPEX, the IV regression returns a negative but not significant influence on Q, while it is positive and not significant in the fixed effects regression.

Regarding the independent variables, similar results can be reported for the IV regression as well. The influence of EXT on Q remains significant at the 1% level and of positive nature. In this way, the results of the IV regression further substantiate the positive impact on Q and support the theory that shareholders appreciate good external governance quality which then reflects in the valuation of the firm. For the relation between INT and Q, the influence remains negative but is significant at the 1% level for the IV regression compared to the 10% level significance in the fixed effects regression. This overall supports the previous findings from section 4.3.2 that internal governance has a negative influence on firm value. However, it can only be assumed that such negative influence may result from a distraction of the management from core business activities, the creation of decision speed bumps, and decreased flexibility created by internal governance mechanisms (Durden & Pech, 2006, p. 92).

4.4.2 NON-LINEAR RELATIONSHIPS

As a second robustness check, the influence of EXT and INT on Q is tested for non-linear relationships. As set out in the introduction of this thesis, several scholars like, e.g., Durden and Pech (2006, pp. 92–94), argue that the development of corporate governance has led to an over-regulation so that it does not support a firm's organizational performance, but, instead, has an increased focus on compliance and controls so that governance might slow down businesses and reduce their flexibility.

For these reasons, it can be assumed that EXT and INT have a non-linear influence on Q. For example, when EXT or INT have low or moderate values, there could be a positive influence on firm value, while this influence turns negative for high values of EXT and INT due to an over-regulation issue. The basic fixed effects panel data model is consequently extended and squared values of EXT and INT, denoted as EXT^2 and INT^2, are included.

However, regression results of the fixed effects panel regression model with included squared terms of the independent variables show that the influence of INT^2 on Q remains significantly negative and the influence of EXT^2 on Q remains significantly positive. For both INT^2 and EXT^2, the signs of the regression coefficients are not inverted but identical to the signs of the influence of INT and EXT on Q. As a consequence, no indication for a non-monotonic relationship between INT or EXT on Q can be found. With higher values of EXT, Q increases monotonously, and with higher values of INT, Q decreases monotonously. This also means that no optimal level of corporate governance for INT and EXT can be determined.

The overall accuracy of the regression model with squared values of the dependent variables changes only marginally compared to the basic regression model. While there is an increase in the r-squared "within" from 0.1873 to 0.1890, both the r-squared "between" and the r-squared "overall" slightly reduce from 0.2887 to 0.2839 and from 0.2657 to 0.2612.

As the change in the model's overall accuracy is only marginal and no non-linear relationship between the independent and dependent variables could be found, the empirical analysis continues with the assumption of a linear relation between INT and EXT on Q. Regression results of the robustness check for non-linear relationships are summarized in Appendix 5.

4.4.3 ALTERNATIVE FIRM VALUE MEASURES

As a first robustness check, alternative firm value measures are used as dependent variables. While Tobin's Q is by far the most used performance indicator in research on the governance-firm value relation, there are other indicators that can also serve as reliable estimators of a firm's organizational performance. Like Q, these are not only based on accounting figures but also include forward-looking and risk-based factors. Following the discussion on measuring organizational performance in section 3.2.1 of this thesis, the market-to-book value (MTBV), the price cash flow ratio (PCR), as well as the price-earnings ratio (PER) are selected. Thereby, MTBV is measured by dividing the market capitalization with the value of total assets minus total liabilities, PCR is measured as the ratio of market value

per share to cash flow per share, and PER is calculated as the relation between the market value per share and earnings per share.

For all three alternative firm value measures, the null hypothesis of the Shapiro–Wilk test for normal distribution is rejected at the 1% level. However, there are no economic reasons to transform the dependent variables even though they do not follow a normal distribution. MTBV, PCR, and PER are therefore included in the model with their un-transformed values. Regression results with alternative firm values are reported in Table 20 below.

Table 20: Results of the fixed effects panel regressions for alternative firm value measures

Variables	MTBV	PCR	PER
EXT	0.2725 (0.1089)*	0.9185 (0.3223)**	1.0098 (0.8315)
INT	-0.1429 (0.0746)	-0.0334 (0.1058)	-0.0572 (0.3691)
CAPEX	-3.5895 (5.0596)	-13.9757 (10.7537)	0.3974 (40.5364)
CASH	4.6788 (2.2352)*	14.1966 (2.9413)***	10.4018 (9.8850)
DEBT	-5.1518 (0.8332)***	-3.4380 (0.6076)***	-6.9667 (1.4537)***
INTANGIBLES	6.1742 (1.8745)**	12.2847 (3.8609)**	-3.1843 (8.9596)
ln(RESVOL)	-0.2986 (0.1717)	-0.4288 (0.6625)	-1.9820 (1.0090)
ROA	-3.2281 (2.5510)	-8.5592 (5.6579)	-60.8404 (4.3720)***
ln(SIZE)	-0.4227 (0.5739)	1.8325 (0.6041)**	4.9241 (2.2872)*
Firm Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Observations	2,282	2,282	2,282
R-squared within	0.0271	0.0217	0.0149
R-squared between	0.0153	0.0093	0.0001
R-squared overall	0.0195	0.0087	0.0011
F-Statistics	10.34***	92.08***	372.97***

This table reports the results of the fixed effects panel regression model with alternative firm value measures. The governance measures EXT and INT are regressed on MTBV, PCR, and PER. The controlling variables include CAPEX, CASH, DEBT, INTANGIBLES, ln(RESVOL), ROA, and ln(SIZE). Significance tests of the regression coefficients rely on robust Driscoll-Kraay standard errors which are reported in parentheses. Variables with ***, **, or * are significant at 1%, 5%, and 10% level, respectively.

Fixed effects panel regression results with alternative firm value measures reveal an overall comparable result to the regression on Q. The influence of EXT is positive and significant for regressions on MTBV and PCR, and positive but not significant for the regression on PER. This supports the results gained from the influence of EXT on Q and the assumption that good external governance leads to higher firm values.

The influence of INT on the alternative firm value measures is negative but not significant for all three measures of MTBV, PCR, and PER. Even though the measured influences of INT on the dependent variables are not significant, the negative direction of their influence on firm value is consistent with the results from the regression with Q as the dependent variable.

Regarding the controlling variables, a few changes in directions and significances can be observed. While the influence of CAPEX on Q was positive but not significant, CAPEX is negative and not significant for MTBV and PCR. The influence of CASH remains positive and significant for MTBV and PCR, but is not significant for PER. DEBT shows a significant negative influence on the alternative firm value measures, however, it was positive and significant for Q. For INTANGIBLES, a positive and significant effect on MTBV and PCR is measured. This is in contrast to the negative and non-significant effect from the regression with Q. Concerning ln(RESVOL), the influence remains negative but is not significant for all three alternative measures. For ROA, a general negative impact on all three firm value measures is reported which is significant for PER. Last, ln(SIZE) on PCR and PER is positive and significant, while the results of MTBV show a similar negative direction like ln(SIZE) on Q.

4.5 MODERATING AND MEDIATING EFFECTS IN THE GOVERNANCE-FIRM VALUE RELATION

4.5.1 MODERATION ANALYSIS - INTERACTION EFFECTS WITH MARKET COMPETITION

This section focuses on the question of why there are differences in the influence of internal and external governance on firm value measures. The mixed evidence of the different governance dimensions on Q and alternative measures may lead to the assumptions that, in some industries or sectors, pursuing

governance principles is not valuated by shareholders. More specifically, in the case of internal governance, it even seems to destroy firm value.

Recent literature by Mishra and Mohanty (2018), Giroud and Mueller (2010), Ammann, Oesch, and Schmid (2013), and Giroud and Mueller (2011) try to explain similar findings by arguing that differences in the influence of governance quality on Q might stem from the level of competition within different industries or markets. According to Giroud and Mueller (2011, pp. 563–565), firms that operate in non-competitive markets benefit more from compliance with corporate governance compared to firms in competitive markets. Based on a statement by Smith (1776) saying that "Monopoly ... is a great enemy to good management" (Smith, 1776, p. 120), firms in competitive markets face constant competitive pressure which inevitably forces them to increase efficiency and make the best use of resources to survive the competition.

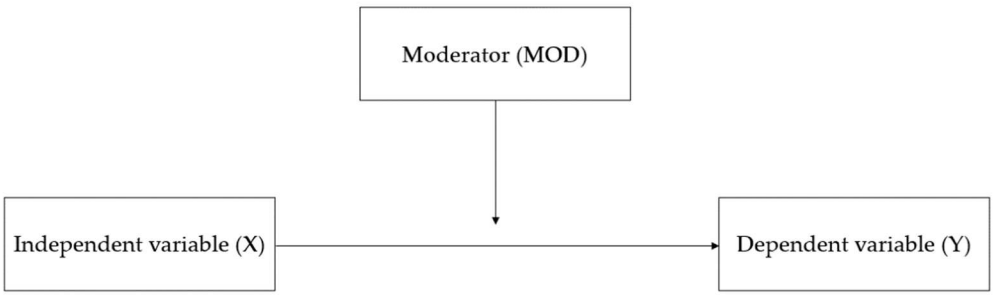
In addition, Guadalupe and Perez-Gonzalez (2010, p. 26) state that competitive pressure leads to a significant reduction and curbing of private benefit consumption by managers. Firms which do not efficiently use their resources in competitive markets will consequently be unable to compete and disappear from these markets. Therefore, a high level of market competition enforces discipline on managers and affects a natural alignment of their incentives with the shareholder's interest to maximize firm value. Under these circumstances, market competition might become a form of substitute for corporate governance principles so that a requirement to comply with governance regulations, especially in highly competitive markets, might become redundant (Ammann et al., 2013, pp. 452–453).

Moreover, external cost and internal resources used for governance activities in such markets might even lead to a negative impact on financial performance and eventually the value of a firm (Durden & Pech, 2006, p. 92). In addition, Giroud and Mueller (2011, p. 594) also show that in certain non-competitive industries, the effect of governance has a strong and significant positive influence on firm value. Consequently, they claim that the governance-firm value relation is generally positive but decreases with the degree of market competition (Ammann et al., 2013, p. 454).

From a statistics point of view, the influence of a variable, e.g., market competition, which affects the direction or strength of the relation between the independent and dependent variable, can be described as an interaction or

moderating effect. As visualized in Figure 11, moderating effect exists whenever the relation between an independent variable and a dependent variable is contingent upon the values of a third variable, the moderator or moderating variable (Aguinis & Gottfredson, 2010, p. 776).

Figure 11: Simple moderation model
[Source: own representation]



In the case of corporate governance, the influence of internal and external governance (X) on firm value and performance (Y) might be moderated by market competition as the moderator (MOD). With different values of MOD, the influence of X on Y might change. To produce consistent research results when a moderating effect is present, the regression analysis needs to include so-called interaction terms (*X*MOD) between the moderator variable and the independent variable or variables (Giroud & Mueller, 2011, p. 566).

To create a consistent moderator variable, the measurement of the degree of market competition follows a similar approach as applied by Rojahn and Zechser (2019, p. 2686) and Mishra and Mohanty (2018, p. 468). Both studies construct a so-called revenue-based Herfindahl-Hirschman Index which can measure market competition in a specific industry sector. To calculate the HHI, all firms included in the sample are divided into industry sectors according to the ICB super sector classification in a first step. For each super sector, the total market volume per year, i.e., the sum of all revenues generated in the sector, is determined. In this way, a revenue-based classification of the European market built on the firms included in the STOXX® Europe 600 index and their respective ICB super sectors is conducted.

In a second step, each firm is given a market share based on the relation of its annual revenue to the respective market volume of the entire ICB super sector. Summing up the squared market shares per each firm within each sector finally leads to a revenue-based HHI per each super sector. Changes of a firm's ICB super sector classification during the sample period are considered accordingly.

The values of the HHI theoretically lies between zero and one. Thereby, zero reflects the highest possible degree of competition and one reflects a strict monopoly. Table 21 provides an overview of the HHI values per each ICB super sector and year for the sample. A lower level of market competition can be observed especially in the Automobile & Parts, Retailers, and Energy sectors. In contrast, high levels of competition are calculated for the Telecommunications, Health Care, Consumer Products & Services, Media, Construction & Materials, Industrial Goods & Services, and the Utilities sector.

Table 21: Herfindahl-Hirschman Index per ICB Super Sector and year

ICB Code	ICB Super Sector	2012	2013	2014	2015	2016	2017
1010	Technology	0.0992	0.1112	0.1027	0.1116	0.1166	0.1109
1510	Telecommunications	0.0859	0.0906	0.0947	0.0969	0.1053	0.1096
2010	Health Care	0.0835	0.0892	0.0810	0.0796	0.0826	0.0826
4010	Automobiles & Parts	0.1618	0.1637	0.1642	0.1627	0.1607	0.1583
4020	Cons. Products & Services	0.0892	0.0893	0.0900	0.0922	0.0927	0.1030
4030	Media	0.1025	0.0860	0.0719	0.0764	0.0769	0.0837
4040	Retailers	0.2652	0.2474	0.2249	0.2037	0.1425	0.1441
4050	Travel and Leisure	0.1120	0.1124	0.1234	0.1252	0.1243	0.1313
4510	Food, Beverage & Tobacco	0.1069	0.1018	0.0992	0.1009	0.1063	0.1044
4520	Pers. Care, Drug & Grocery	0.1061	0.1044	0.1124	0.1016	0.1088	0.1089
5010	Construction & Materials	0.0771	0.0787	0.0877	0.0797	0.0795	0.0825
5020	Ind. Goods & Services	0.0343	0.0332	0.0343	0.0335	0.0352	0.0363
5510	Basic Resources	0.1331	0.1497	0.1431	0.1353	0.1238	0.1437
5520	Chemicals	0.1466	0.1575	0.1412	0.1273	0.1093	0.1274
6010	Energy	0.1723	0.1704	0.1721	0.1720	0.1766	0.1977
6510	Utilities	0.0963	0.0949	0.0914	0.0917	0.0837	0.0828

To be used for the empirical analysis, the HHI variable is transformed into a binary value. Thereby, a value of "0" is given when the HHI value is below 0.150 and a value of "1" is given whenever the HHI is equal or exceeds a value of 0.150. This binary classification follows the guidelines published by the US Department of Justice which considers an HHI of less than 0.150 to reflect a competitive marketplace, while an HHI of more than 0.150 can be considered as a moderately or even highly concentrated marketplace with a low level of competition (The United States Department of Justice, 2018). A total of 230 firm observations are categorized to operate in markets with low or moderate market competition, while the majority of firm observations are categorized to operate in markets with high market competition.

To control for interactions between market competition and internal and external corporate governance, the interaction terms between EXT*HHI and INT*HHI are included in the IV regression with year and firm fixed effects. This model is selected over a simple fixed effects regression to mitigate potential biases caused by endogeneity. Results of the regression are stated in Table 22.

Table 22: Regression results with included interaction terms with market competition

Variables	Q
EXT	0.349 (0.092)***
EXT*HHI	0.106 (0.042)**
INT	-0.141 (0.035)***
INT*HHI	0.092 (0.046)**
CAPEX	0.163 (0.401)
CASH	0.430 (0.192)**
DEBT	0.068 (0.039)*
HHI	0.009 (0.046)
INTANGIBLES	-0.589 (0.176)***
ln(RESVOL)	-0.161 (0.019)***
ROA	1.623 (0.203)***
ln(SIZE)	-0.408 (0.019)***
Firm Fixed Effects	Yes
Year Fixed Effects	Yes
Instruments included	Yes (EXT_{t-1} and INT_{t-1})
Observations	1,847
R-squared (centered)	0.1191

This table reports the results of the fixed effects regressions including the interaction terms between EXT and INT with HHI. These are denoted as INT*HHI and EXT*HHI. For the regression of INT and EXT on Q, a fixed effects IV regression with EXT_{t-1} and INT_{t-1} as instruments is used to account for endogeneity. The controlling variables include CAPEX, CASH, DEBT, HHI, INTANGIBLES, ln(RESVOL), ROA, and ln(SIZE). Significance tests of the regression coefficients rely on robust Driscoll-Kraay standard errors which are reported in parentheses. Variables with ***, **, or * are significant at 1%, 5%, and 10% level, respectively.

Theoretically, the influence of corporate governance on firm value and performance should be positive in those sectors where the HHI has a binary value of "1", while for sectors where the HHI takes a binary value of "0", corporate governance should be less relevant.

For the controlling variables, the regression results with included interaction terms show neither a change of signs nor a change of the significance levels compared to the IV regression results in Table 19. Only the result for CAPEX is an exception as it reveals a positive but not significant instead of the negative but not significant influence before. Further, the isolated moderating variable HHI has a positive but not significant impact on firm value.

However, regression results for the interaction terms and independent variables provide interesting changes. Previous fixed effects and IV regressions revealed a positive impact of EXT on Q as well as a negative impact of INT on Q. When including the interaction terms, the effect of EXT on Q does not change and the estimate for EXT*HHI on Q remains positive but not significant. The influence of INT on Q also remains negative and significant, as shown before. However, INT*HHI on Q shows a positive influence in the moderation model which is also significant at the 5% significance level. This means that for firms in industries with low market competition, i.e., for which the HHI is "1", internal governance (INT) now has a positive influence on Q and therefore increases firm valuation.

This supports the previous assumption that a positive influence of internal governance on firm value may be limited to firms operating in non-competitive markets. For internal governance, it may also be the case that market competition serves as a substitute for corporate governance as already described by Giroud and Mueller (2011, p. 564). While for the total sample, INT on Q has a negative impact, the interaction INT*HHI, i.e., internal governance in low market competition, has a positive influence on Q. Therefore, for industries with low market competition, internal corporate governance can provide value to shareholders and increase a firm's value.

4.5.2 MODERATION ANALYSIS - INTERACTION EFFECTS WITH CONTROLLING VARIABLES

Besides a moderating effect by market competition, previous studies have indicated other possible interacting effects between corporate governance and other variables which potentially influence the governance-firm value relation. In the following, justification for interactions between CAPEX, CASH, DEBT, and INTANGIBLES are provided and a moderation analysis is conducted accordingly.

The selection of these moderating variables is based on theoretical assumptions from section 2.1.2. These state a high risk of information asymmetries and agency cost when a firm's ratio of investments into assets (CAPEX) is high, when cash reserves (CASH) are high, when the ratio of debt is low (DEBT), or when a firm has a high ratio of intangible assets (INTABGIBLES).

CAPEX. Assuming that firms invest in assets and business opportunities to create shareholder value, high CAPEX should generally be perceived as a positive indicator sustaining a firm's future competitiveness (Bauer, Braun, & Clark, 2007, p. 445). This conclusion might be true as long as the management acts in accordance with the shareholders' interests. However, high capital expenditures especially bear the risk of over- or mis-investments and create simplified opportunities to hide transactions that divert capital for personal benefits. High CAPEX firms, therefore, require effective control mechanisms to reinforce a disciplining influence on investment decisions and constrain potentials for empire-building and cash diversion (Bauer et al., 2007, p. 442). In this regard, academic literature by Dittmar and Mahrt-Smith (2007, p. 627) find that corporate governance can positively impact investment decisions, Harford et al. (2008, p. 554) interpret that poorly-governed firms invest suboptimally, and Durnev and Kim (2005, p. 1488) argue that firms with large investment opportunities need better corporate governance structures to invest in the right opportunities. Including interactions between EXT (INT) and CAPEX will therefore provide additional insights if CAPEX has a mediating effect on the governance-firm value relation.

CASH. Dittmar and Mahrt-Smith (2007, p. 627) also show that the positive impact of corporate governance on firm value is caused by an improvement in the use of cash holdings. They show that the interaction terms between EXT (INT) and CASH should positively impact firm value since corporate governance policies are

supposed to reduce the danger of misallocated funds in the presence of high cash reserves (Dittmar & Mahrt-Smith, 2007, p. 599). Harford et al. (2008, p. 554) support these results by showing that low governance quality leads to dissipative spending actions such as increasing management compensation or overpaying for acquisition targets. When cash is channeled into non-profitable investments and private benefits, these expenditures do not create future value but reduce operating performance and firm value in the long run. Firms with high cash holdings consequently need effective governance measures.

DEBT. A firm's capital structure may protect an efficient value creation process as DEBT generally serves as a disciplinary instrument that decreases agency problems between managers and shareholders (La Rocca, 2007, p. 319). As interest and repayments of debt are not at the management's discretion, creditors have the power to declare a firm bankrupt, whereby they exercise a certain pressure on the management to ensure future profitability and cash flows.

However, when DEBT is low, the control function through shareholders, banks, and other outside creditors is not given so that the risk of agency cost increases. When a firm's DEBT ratio is low, it requires effective corporate governance mechanisms to compensate for the missing disciplinary effect. In addition, firms with external financing needs are generally incentivized to achieve higher corporate governance quality as outside creditors are more likely to provide capital to well-governed debtors and at a lower cost (Chen et al., 2010, p. 239). As a result, effective corporate governance can work as a disciplinary instrument, facilitate outside financing, and lead to lower financing costs, thereby increasing firm valuation. The interaction term between internal and external corporate governance and DEBT should, therefore, have a positive impact on firm value.

INTANGIBLES. Last, an interaction between corporate governance and INTABNIBLES is tested. Following Surroca et al. (2010, p. 464), INTANGIBLES might represent the level of potential information asymmetries. In industries with a high intangible assets ratio, it is difficult for analysts and shareholders to determine a fair firm value as large parts of the assets are intangibles. Such uncertainty caused by incomplete information can result in valuation discounts and lower firm values. Consequentially, INTANGIBLES might moderate the governance-firm value relation as they increase information asymmetries.

Regression results stated in Table 23 include interaction terms between EXT (INT) and the controlling variables CAPEX, CASH, DEBT, and INTANGIBLES. As a basis, an IV regression with fixed effects for firms and years is used to mitigate the potential of an endogeneity bias.

The interaction terms with external and internal governance and CAPEX, EXT*CAPEX shows a negative and significant influence on firm value measured by Q and INT*CAPEX reveals a negative but not significant influence. For INT*CAPEX, these results are in line with expectations, as it could have been expected that the negative individual effects of INT and CAPEX on Q do not change directions when they interact. For the interaction of EXT*CAPEX, however, it shows that external governance cannot mitigate the negative influence of CAPEX on Q. One possible explanation could be that capital intensive firms from high CAPEX industries are generally less preferred by investors and consequently have a lower firm valuation even though their external governance is on a good level.

Regarding cash holdings, EXT*CASH is positive and significant while INT*CASH is positive but not significant. This supports that internal and external governance and CASH have a positive influence on Q. This result corresponds with the theoretical implications as it was expected that high cash holdings and good governance positively influence firm value as effective governance limits opportunistic behavior of managers. Consequently, high cash reserves will not be exploited or allocated into unprofitable investments. As the stand-alone influence of INT on Q was negative, it shows that in interaction with high cash holdings, INT can provide value and the negative influence turns into a positive one.

For the interaction of corporate governance and DEBT, the influence of EXT*DEBT has a negative sign, while INT*DEBT has a positive one, with both effects being highly significant at the 1% level. This reveals that high DEBT, together with strong internal governance mechanisms, can increase a firm's valuation. Also, it needs to be mentioned that the influence of the standalone variable INT has a positive and significant influence on Q when INT*DEBT is included in the regression. For EXT*DEBT, it seems like the positive influence of EXT on Q in turns negative interaction with DEBT. In accordance with the theoretical assumptions, this result indicates a substitutive relationship between EXT and DEBT so that the monitoring effect of DEBT creates a redundancy of external governance mechanisms.

Table 23: Regression results with included interaction terms from controlling variables

Variables	Q	Q	Q	Q
Moderator	CAPEX	CASH	DEBT	INTANGIBLES
EXT	0.425 (0.079)***	0.325 (0.103)***	0.492 (0.108)***	0.089 (0.058)
EXT*CAPEX	-2.078 (0.403)***			
EXT*CASH		0.352 (0.201)*		
EXT*DEBT			-0.333 (0.069)***	
EXT*INTANGIBLES				0.942 (0.327)***
INT	-0.136 (0.035)***	-0.148 (0.043)***	0.195 (0.028)***	0.012 (0.036)
INT*CAPEX	-0.100 (0.437)			
INT*CASH		0.091 (0.099)		
INT*DEBT			0.139 (0.049)***	
INT*INTANGIBLES				-0.581 (0.132)***
CAPEX	-0.023 (0.340)	-0.039 (0.387)	-0.010 (0.404)	0.012 (0.332)
CASH	0.449 (0.174)***	0.449 (0.174)***	0.421 (0.196)**	0.467 (0.173)***
DEBT	0.044 (0.032)	0.058 (0.035)*	0.098 (0.057)*	-0.006 (0.050)
INTANGIBLES	-0.619 (0.186)***	-0.560 (0.187)***	-0.546 (0.184)***	-0.431 (0.181)**
ln(RESVOL)	-0.177 (0.024)***	-0.171 (0.023)***	-0.166 (0.021)***	-0.167 (0.020)***
ROA	1.621 (0.203)***	1.640 (0.198)***	1.648 (0.202)***	1.542 (0.207)***
ln(SIZE)	-0.397 (0.024)***	-0.405 (0.018)***	-0.409 (0.018)***	-0.374 (0.025)***
Firm Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Instruments	EXT_{t-1} & INT_{t-1}	EXT_{t-1} & INT_{t-1}	EXT_{t-1} & INT_{t-1}	EXT_{t-1} & INT_{t-1}
Observations	1,847	1,847	1,847	1,847
R-squared (centered)	0.1295	0.1207	0.1240	0.0721

This table reports the results of the fixed effects regressions including the interaction terms between EXT and INT with the controlling variables CAPEX, CASH, DEBT, and INTANGIBLES. These are denoted as EXT*CAPEX, EXT*CASH, EXT*DEBT, EXT*INTANGIBLES, INT*CAPEX, INT*CASH, INT*DEBT, and INT*INTANGIBLES. For the regression of INT and EXT on Q, a fixed effects IV regression with EXT_{t-1} and INT_{t-1} as instruments is used to account for endogeneity. The controlling variables include CAPEX, CASH, DEBT, INTANGIBLES, ln(RESVOL), ROA, and ln(SIZE). Significance tests of the regression coefficients rely on robust Driscoll-Kraay standard errors which are reported in parentheses. Variables with ***, **, or * are significant at 1%, 5%, and 10% level, respectively.

Regarding interactions with INTANGIBLES, results provide mixed evidence. EXT*INTABGIBLES is positive and significant, showing that firms with good external governance and high INTANGIBLES have a higher Q. This aligns with the agency theory as external governance can provide value to shareholders in cases where INTABGIBLES, i.e., information asymmetries, are high. However, INT*INTANGIBLES shows a negative and significant impact. Such result is not in accordance with the expected outcome. Nevertheless, it might indicate that high-intangibles firms require a certain level of flexibility which is not supported by internal governance regulations and then creates a negative influence of firm value.

Results of the controlling variables show no major differences to the previously reported results from Table 19.

4.5.3 MEDIATION ANALYSIS – INFORMATION ASYMMETRIES AS A MEDIATOR

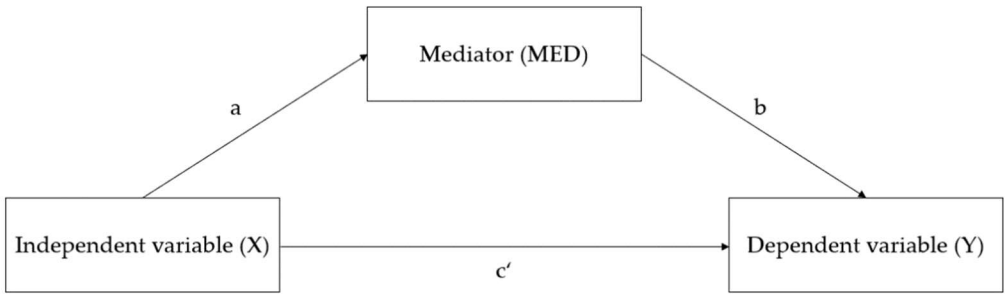
The analysis of the governance-firm value relation as reported in Table 17, Table 20, and Table 19 of this thesis have focused on a direct influence of corporate governance quality on the dependent variable. However, it is often seen in research that the influence of an independent variable (*X*) on the dependent variable (*Y*) works through an intervening or mediating variable (*MED*) (Baron & Kenny, 1986, p. 1173). In a mediation model, a third variable, the mediator, is added to the regression model based on the assumption that X causes the mediator ($X \rightarrow MED$) and the mediator causes the dependent variable ($MED \rightarrow Y$). The overall mediation model can be described with ($X \rightarrow MED \rightarrow Y$).

Adding a mediator variable to a regression model can provide additional insights and interpretations about the relation between X and Y, even if a standard regression model does not find an association between X and Y (Zhao, Lynch, & Chen, 2010, p. 198). For this thesis, the mediation model is used to have a closer look at why governance influences firm value and if this effect is executed directly or is the result of an indirect effect through a mediator variable. An overview of a standard "1-1-1" mediation model is provided in Figure 12. Relations between these variables are marked with arrows whereby *a* represents the relation of *X* on MED, *b* represents the relation of MED on Y adjusted for *X*, and *c'* represents the relation of *X* on *Y* adjusted for the mediator variable (MED). The total effect of *X*

on Y can be stated as the sum of its direct and indirect effect on Y, i.e., the direct effect c' plus its indirect effect $a*b$ (MacKinnon, Fairchild, & Fritz, 2007, pp. 595–596).

Figure 12: Simple "1-1-1" mediation model

[Source: own representation]



Baron and Kenny (1986) have defined the most widely applied empirical approach to carry out mediation analyses. This approach is based on a three-step model which uses a sequential estimation of the relationships between the independent, dependent, and mediating variables. The following equations can summarize the three-step mediation model:

$$MED = i_3 + aX + \varepsilon_3 \quad (2)$$

$$Y = i_1 + cX + \varepsilon_1 \quad (3)$$

$$Y = i_2 + c'X + bMED + \varepsilon_2 \quad (4)$$

where:

X	=	independent variable,
Y	=	dependent variable,
MED	=	mediating variable,
i_1, i_2, i_3	=	intercepts,
c	=	coefficient relating the independent (X) and dependent variable (Y),

c'	=	coefficient relating the independent (X) and dependent variable (Y) adjusted for the effect of the mediating variable (MED),
b	=	coefficient relating the mediating variable and dependent variable (Y) adjusted for the effect of (X), and
a	=	coefficient relating the independent (X) and mediating variable (MED).

Thereby, it is assumed that the test for a mediating effect on the relation between an independent and dependent variable can only be established in case that in the first equation, the independent variable (X) has a significant influence on the mediating variable (MED), in the second equation, the independent variable (X) has a significant influence on the dependent variable (Y), and in the third equation, the mediating variable (MED) has a significant influence on the dependent variable (Y), while the effect of the independent variable (X) on the dependent variable (Y) needs to be less strong than in the second equation (Baron & Kenny, 1986, p. 1177).

Although the causal steps approach by Baron and Kenny (1986) is widely used in theory and research, it has been criticized, besides many, by Preacher and Hayes (2008, p. 880) or Zhao et al. (2010, pp. 197–202) for various reasons: One is that more recent literature by Zhao et al. (2010, p. 199) has shown that there is no strict necessity of a significant zero-order effect for mediation. All that matters is that the indirect effect is significant, while the direct effect of X on Y may not be. Based on this, mediation models can show two types of mediation: (i) a full mediation, where only an indirect effect of X on Y can be measured, but the direct effect of X on Y cannot be discovered, or (ii) a partial mediation in which there is both a direct and indirect effect of X on Y (Zhao et al., 2010, p. 198). Further, the causal steps approach uses Sobel (1982) and Sobel (1986) "z-test" to test the significance of the indirect effect $a*b$ (Zhao et al., 2010, p. 202).

As the indirect effect results from a product of two parameters, the sampling distribution is not normally distributed and tends to be positively skewed with a shorter, fatter tail to the left (Zhao et al., 2010, p. 202). Consequently, the results of

the z-test might lead to an inaccurate estimation of the standard error for the mediated effect. As an alternative approach to the z-test, Preacher and Hayes (2004, pp. 721–722) have provided a "bootstrap" test that is more powerful than the z-test as it generates an empirically derived bootstrapped sampling distribution of $a*b$. As bootstrapping makes no assumptions about the shape of the distribution, it can estimate reliable values when the number of bootstrap resamples is sufficiently large (Zhao et al., 2010, p. 202). The following mediation analyses use a value of 5,000 bootstrap resamples following Rojahn and Zechser (2019, p. 2699).

For the estimation of the mediation model, a structural equation model (SEM) approach fitted by "maximum likelihood" and the "gsem" command in the data science software Stata is used.

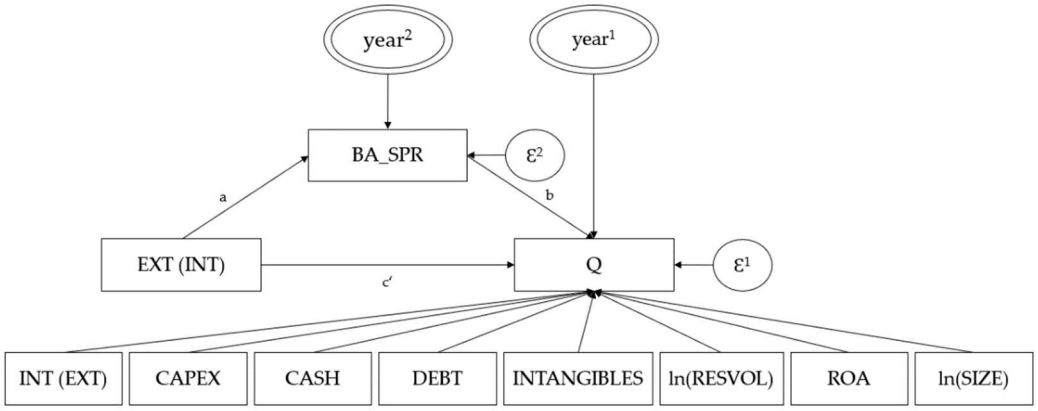
The selection of a mediating variable is based on the theoretical assumptions from section 2.4 of this thesis, in which it is identified that one reason why governance has a positive theoretical influence on firm value is the reduction of information asymmetries when governance quality is high. The level of information asymmetries could therefore act as a mediator for the governance firm value relation. The basis regression model already includes controlling variables like the intangible asset ratio (INTANGIBLES) and residual volatility (ln(RESVOL)) which can be used to reflect information asymmetries as well (Khanchel, 2007, pp. 740–742; Krishnaswami, Spindt, & Subramaniam, 1999, p. 416). Therefore, this thesis follows Callahan et al. (1997, p. 51) who use the relative bid-ask spread (BASPR) as a variable to represent information asymmetries instead. Thereby, BASPR represents the difference between the bid and ask price of a share relative to the ask price, i.e., a spread which is set by dealers so that the "expected gains from uninformed traders cover the expected losses to informed traders" (Callahan et al., 1997, p. 51). Consequently, the bid-ask spread will be larger when a dealer lacks information or trades with better-informed traders. A high relative bid-ask spread indicates a high level of information asymmetry while a lower relative bid-ask spread indicates a low level.

The hypothesis of a mediating effect of the bid-ask spread is supported by research results from Latif et al. (2017, p. 273) and Kang and Kim (2011, p. 64). Their studies show that corporate governance increases the reliability and relevancy of financial reporting so that information asymmetry and systematic risk can be reduced. They report a positive direct effect on firm value as well as an indirect

effect through the channel of various attributes that reduce information asymmetries (Latif et al., 2017, p. 273).

The setup of the 1-1-1 multilevel mediation model is displayed in Figure 13. It uses EXT (INT) as the independent variable, BASPR as the mediating variable, and Q as the dependent variable. Controlling variables as per the previous regression analyses are added. Year effects are added to the mediating and dependent variable. However, a mediation model does not allow for the inclusion of firm fixed effects.

Figure 13: SEM Mediation model with year effects based on Zhao et al. (2010)
[Source: own representation]



Results of the mediation analysis with information asymmetries as a mediating variable are summarized in Table 24. For the equation with EXT as the independent variable and INT as a controlling variable, results indicate that neither the direct nor the indirect effect of EXT on Q is significant. Overall, this results in a negative but non-significant total effect of EXT on Q. The assumption that information asymmetries mediate the relation between external governance and firm value, therefore, cannot be supported for the sample so that mediation results are reported but not further discussed below.

Table 24: Mediating effects of information asymmetries on the governance-firm value relation

Path coefficient	EXT	INT
Direct effect (c′)	-0.0029 (0.0142)	0.0299 (0.0080)***
Indirect effect (a*b)	0.0004 (0.0008)	0.0028 (0.0010)***
Total effect (c′+ a*b)	-0.0025 (0.0142)	0.0327 (0.0079)***
Path a: BASPR ← EXT (INT)	-0.0000 (0.0001)	-0.0002 (0.0001)***
Path b: Q ← BASPR	-11.2061 (5.4381)**	-11.2067 (5.3504)**
Control variables: Q_{it} ← X_{it}		
EXT	n.a.	-0.0029 (0.0106)
INT	0.0299 (0.0041)***	n.a.
CAPEX	1.9855 (0.2044)***	1.9855 (0.2047)***
CASH	2.1918 (0.2379)***	2.1918 (0.2378)***
DEBT	-0.1374 (0.0400)***	-0.1374 (0.0401)***
INTANGIBLES	0.6261 (0.0408)***	0.6261 (0.0409)***
ln(RESVOL)	-0.1889 (0.0538)***	-0.1889 (0.0541)***
ROA	5.9703 (0.3507)***	5.9703 (0.3502)***
ln(SIZE)	-0.1823 (0.0135)***	-0.1823 (0.0134)***

This table reports the results of the multilevel mediation models (1-1-1) with BASPR as the mediator variable for the relation of EXT and INT on Q. The models have been fitted by 'maximum likelihood' applying the "gsem" command in Stata. The controlling variables include CAPEX, CASH, DEBT, INTANGIBLES, ln(RESVOL), ROA, and ln(SIZE). Bootstrap results for indirect effects are based on 5,000 resamples. Bootstrap standard errors are in parentheses. Variables with ***, **, or * are significant at 1%, 5%, and 10% level, respectively.

With regard to the control variables, results of the multilevel mediation model show a stronger influence of the controlling variables CASH, ln(RESVOL), ROA, and ln(SIZE) compared to the fixed effects regression results in Table 17. While CAPEX already showed a positive influence in the fixed effects regression, this influence is now positive and significant in the SEM. For DEBT and INTANGIBLES, however, influences as per the SEM have opposite signs with DEBT. Such differences could be explained with differences in the estimation

procedures, i.e., the "1-1-1 SEM" versus the "within estimator", as well as by the inclusion of BASPR as an additional variable.

Results of the SEM analysis with INT as the independent variable and EXT as a controlling variable reveal significant positive effects for the direct-, indirect-, and total path, all three at the 1% significance level. This indicates a partial mediation by BASPR on the internal governance-firm value relation. Also, it shows that, according to the SEM model, INT shows a positive and significant effect on Q when including BASPR as a mediator variable.

In contrast to the earlier conducted fixed effects and IV regression models, where INT had a negative influence on Q, this finding relativizes the negative influence of INT on Q. Internal governance can reduce information asymmetries measured by BASPR in a first step. BASPR then shows a negative and significant influence on Q at the 5% level. This means that INT reduces BASPR and BASPR consequently increases firm value. This supports the assumption that lower information asymmetries, i.e., lower bid-ask spreads, lead to a higher firm value and vice versa. This also supports the selection of ln(RESVOL) and INTANGIBLES as controlling variables which, in literature, are often used to represent information asymmetries as well. Although this shows that under specific circumstances of high information asymmetries, INT can increase firm value, it needs to be mentioned that the underlying empirical methodology of a SEM model is different to these of the fixed effects or IV regression models, also because the SEM model cannot account for firm fixed effects.

5. CONCLUSION

5.1 SUMMARY

Despite a large basis of research activities and publications on the topic of corporate governance and its influence on firm value measures, this thesis could identify specific areas in research where it can contribute to extend current academic literature and potentially close certain research gaps. Thereby, it uses various empirical methodologies and focuses specifically on the European market, with a sample consisting of non-financial firms included in the STOXX® Europe 600 index over a period from 2012 through 2017. The practical relevance can be summarized into the following three major contributions:

First, this thesis has developed a novel approach to measure governance quality on firm level. In contrast to existing measurement approaches, this new approach considers that corporate governance quality may not be one overall construct but exist of several different underlying dimensions. As different dimensions of corporate governance may have different influences on firm value, new insights on the governance-firm value relation are expected.

The measurement approach is based on a set of several frequently cited corporate governance scores from literature as well as additional commercial governance ratings. For this purpose, the Gompers et al. (2003) G-Index, the Bebchuk et al. (2009) Entrenchment Index, as well as the Brown and Caylor (2006) GOV-Score and Parsimonious Index are recreated on a common database by using the originally applied methodologies. To this set of five governance scores[5], the Refinitiv Eikon management and shareholder scores are added to represent commercial governance ratings from a globally leading financial data provider. To identify similarities between the seven scores, a PCA approach is used to identify common factors on which the scores load, i.e., different dimensions of corporate governance quality. In line with prior results from Louizi and Kammoun (2016, pp. 378–382), the PCA reveals that the set of governance scores loads on two general factors. Based on the governance provisions included in the specific scores, the factors are identified to represent internal and external governance quality.

[5] For the GOV-Score, two scores were recreated, one based on Eikon management, and one based on Eikon shareholder provisions.

Results from the PCA are then used to create two composite measures of governance quality, INT for internal governance and EXT for external governance.

As a second contribution, an empirical analysis on how the identified internal and external dimensions of corporate governance influence firm value has been carried out. For this purpose, the two composite measures for internal and external governance quality are regressed on firm value which is represented by Tobin's Q and denoted as Q. As the sample is based on panel data, a fixed effects panel data regression model is applied. Controlling variables are derived from related empirical studies on similar research questions. Results of the fixed effects regression show that there is a positive and significant impact of EXT on Q. However, the influence of INT on Q is significant and negative, so that it seems that the internal and external dimensions of corporate governance have contradictory effects on firm value.

It is assumed that the positive effect of EXT on Q may stem from the direct impact of external governance on shareholder rights. As good protection of shareholder rights might be perceived as a positive signal for investors. This should increase the demand for shares and consequently increase the firm and market value. The negative effect of INT on Q is assumed to result from costs for the implementation of internal governance measures as well as the increase of operational complexities connected to internal governance (Durden & Pech, 2006, p. 84). The creation of board committees, large boards of directors, frequent board meetings, and the occupation of management resources for governance topics are just some examples.

Robustness checks include a repetition of the fixed effects regression with alternative firm value measures, an analysis of non-linear relationships, and an IV regression to control for a possible endogeneity bias. The alternative firm value measures include the market-to-book value (MTBV), the price cash flow ratio (PCR), and the price-earnings ratio (PER). Regression results show a similar positive influence of EXT on firm value and a negative but non-significant influence of INT on firm value. As previous studies from Schultz et al. (2010), Iyengar and Zampelli (2009), or Renders et al. (2010) have raised concerns about a potential impact of self-selection endogeneity on the research results, a 2SLS instrumental variables regression is conducted. This regression includes lagged values of the independent variables INT and EXT as instruments. Results show that the fixed

effects regression results are indeed impacted by endogeneity and should be interpreted with care. However, the IV regression results do not report a change of INT's and EXT's influence on the dependent variable Q. Moreover, the significance of the negative influence of INT on Q even increases. Consequently, both the positive influence of external governance and the negative influence of internal governance on firm value could be substantiated.

As a third contribution, further analyses of the influence of corporate governance on firm value and if it is impacted by certain moderating and mediating effects are conducted.

Giroud and Mueller (2011, p. 594) as well as Ammann et al. (2013, p. 454) have already shown that corporate governance in highly competitive markets might be redundant, as market competition already forces firms to manage resources efficiently and managers to act in the best interest of the firm. It is therefore expected that a moderation analysis can provide additional insights. For this purpose, interaction terms between a binary dummy variable for market competition (HHI) and the independent variables INT and EXT are created and included in the regressions. Thereby, the market competition dummy is a binary variable that separates the sample into a "low and moderate" market competition and "high" market competition group. While previous regression results revealed a negative influence of internal governance on firm value, the moderation analysis shows that the interaction term INT*HHI has a positive and significant impact on firm value. This result indicates that under certain market conditions, internal governance can have a positive influence on firm value. However, this positive influence is only valid for industries with low market competition. When market competition is high, there are other effects which substitute the positive impact of internal governance on firm value.

In addition, interactions with the controlling variables CAPEX, CASH, DEBT, and INTABGIBLES are analyzed. For external governance, a significant negative impact of EXT*CAPEX and EXT*DEBT is found, while EXT*CASH and EXT*INTANGIBLES reveal a positive influence on firm value. Especially interesting is the negative impact of EXT*DEBT which indicates that the often-quoted monitoring effect of DEBT might be a substitute for external governance mechanisms as the interaction terms reveals a negative impact on Q. Further, the positive influence of EXT*CASH on Q shows that external governance potentially

protects firms with high CASH holdings against value-destroying expenditures, opportunistic management behavior, and overinvestments. The positive influence of EXT*INTANGIBLES indicates that external governance can provide value when INTABGIBLES, i.e., information asymmetries, are high. This result also aligns with the assumption of agency cost.

Moderating effects with internal governance can be found for INT*DEBT, which positively influences Q, and INT*INTANGIBLES, which has a negative influence. For INT*DEBT this shows that internal governance can provide value in addition to the monitoring effect of DEBT and consequently contributes to an increase in firm value. The negative impact of INT*INTANGIBLES is not as expected but might indicate that firms with high intangibles need a certain level of flexibility which does not align with internal governance regulations.

A subsequent mediator analysis focuses on information asymmetries, measured by the relative bid-ask spread (BASPR), as a mediator for the governance-firm value relation. Thereby, indirect effects on firm value through information asymmetries measured by the relative bid-ask spread (BASPR) are analyzed as such a relationship seems likely when interpreting corporate governance from an agency theory point of view. It shows that for EXT, no such effect is found. The positive influence of EXT on Q is therefore executed as a direct effect that is not moderated by information asymmetries. However, regarding INT, a partial mediation of the internal governance-firm value relation by BASPR can be reported. This indicates that the influence of INT on Q can be separated into a direct effect as well as into an indirect effect. For the indirect effect, INT leads to reductions of information asymmetries as a mediator variable in a first step. In a second step, the mediator variable executes a negative impact on firm value, i.e., the reduction of information asymmetries leads to higher firm values. These findings contrast with the negative influence of INT as reported in the fixed effects and IV regression models. However, they show that, under a mediation assumption, internal governance can have a positive contribution to firm value.

Overall, the findings of this thesis show that one possible reason for the mixed evidence of governance quality on firm value and performance might stem from the disregard of the different internal and external dimensions of corporate governance and the lack of controlling for endogeneity. On the influence of internal and external governance on firm value, an overall positive influence of external

governance can be reported, supported by results of the robustness checks. However, in certain scenarios, e.g., when the debt ratio is high, external governance mechanisms might be redundant.

For internal governance, an overall negative influence is found which is supported by the robustness checks. From results of the moderation analysis, it can be derived that in certain circumstances, e.g., when the level of market competition is low or when firms have high debt ratios, internal governance can positively contribute to an increase in a firm's value. Further, internal governance increases firm value through an indirect effect with information asymmetries as a moderator.

5.2 LIMITATIONS

As the conclusions of this study are based on an individual empirical research design, it is important to mention some limitations that need to be considered when interpreting the results. These limitations primarily relate to the sample data used, the appropriateness of the dependent variable, the empirical models that were applied, and the measurement approach of the independent variables.

First, due to the availability constraints of detailed corporate governance data on a firm-level basis, the empirical study focuses on large and mid-size firms from a developed market such as the European one, namely all non-financial firms included in the STOXX® EUROPE 600 index. Small and other medium-size firms could not be included as there is no publicly available information about their governance quality. Although this leads to the issue that the sample is intentionally chosen but not randomly selected, it needs to be mentioned that comprehensive corporate governance studies for the European market are rare, so that this study is already a considerable contribution to the existing research of corporate governance in Europe. Further, due to the nature of the sample selection process, financial firms are excluded so that no statement about the governance-firm value relation for these firms can be made. With a very likely improvement of corporate governance databases in the next years, it might be able to gain additional insights and produce datasets that include small, medium, and large-sized firms.

Second, as per the analysis of different firm value measures in section 3.2.1 of this thesis, the selection of Tobin's Q as the dependent variable was assessed. Tobin's Q is acknowledged as a commonly used measure in empirical research to

reflect firm value. Similar studies by Chhaochharia and Laeven (2009), Gupta et al. (2009), and Zagorchev and Gao (2015) have also applied Tobin's Q as the dependent variable of their studies. However, it is also clear that Tobin's Q is not the only way to measure firm value and there are other variables and indicators which could be used as well. It might even be possible that the use of different variables for firm value would come to different empirical conclusions. The robustness checks in section 4.4.3 have tried to cover this topic by using alternative firm value measures with similar empirical results. Ongoing future research that uses different firm value variables is highly appreciated and will further contribute to support or challenge the findings of this thesis.

Third, there are certain empirical analyses that could be carried out in future research. For example, when it comes to the mediator analysis, one interesting approach would have been to use a variable like institutional ownership as a mediator variable and see if the percentage to which a firm is owned by institutional investors does have a mediating effect on the governance-firm value relation. In theory, next to a direct influence of governance on firm value, good external governance, i.e., large shareholder rights, might also lead to an increase of institutional ownership which then could have a positive indirect influence on firm value. The same applies to variables like accounting accuracy which was used in some recent studies as a mediator (Latif et al., 2017, p. 255). However, these additional mediation analyses could not be conducted in this thesis due to the lack data availability for the European sample.

Fourth, although the approach to measure and determine the firm-specific level of corporate governance in this thesis is promoted as a more comprehensive approach compared to other studies, the author is aware that there is no definite measure or set of measures that captures all aspects of corporate governance. There might be room for improving and extending the applied measurement approach in further studies and include other scoring techniques, such as the weighting of certain governance provisions, to improve measurement results. Furthermore, it would be interesting to see future studies using the newly created composite measurement approach or rerun prior empirical research on the governance-firm value relation based on it.

5.3 OUTLOOK AND IMPLICATIONS FOR RESEARCH

This thesis focuses on the influence of internal and external governance on firm value. As an implication for research and practice, it suggests that both the principles of internal as well as external corporate governance are factors for responsible management of a firm and should be complied with. This is supported by the global importance of corporate governance as well as the increasing recognition of governance criteria for investment decisions and strategies (Tseng et al., 2019, p. 2108).

Based on the research results, it is suggested that the identified dimensions of corporate governance, i.e., internal and external governance, should be separately captured when analyzing their influence on firm value. This is of particular importance as the empirical results of this thesis show that different governance dimensions can have opposite effects on firm value. Researchers who do not account for different governance dimensions take the risk of reporting distorted estimates.

It has also shown that endogeneity can impact research results and lead to biased conclusions. Since certain governance measures might be purposely selected and are not random, a research methodology that adequately addresses endogeneity concerns caused by self-selection needs to be a mandatory part of the empirical methodology when analyzing the influence of corporate governance on firm value.

One of the major takeaways of this thesis is that corporate governance's contribution to firm value is dependent on a market's competitiveness. Especially the influence of internal governance quality on firm value matters in non-competitive markets where there are only few competitive pressures, while it might even destroy firm value in competitive markets. Consequently, the influence of corporate governance on firm value can be different depending on the market environment in which a firm is operating. Due to this interacting effect, a moderation analysis should be carried out before generalizing research results for all industries and markets.

This thesis has demonstrated that databases like the Refinitiv Eikon ESG database can serve as an underlying database to produce governance scores. However, while this thesis makes use of the data related to governance quality

only, Eikon also provides environmental and social quality data. As the importance of environmental and social information has significantly increased over the last years and ESG information became a material criterion to carry out investment decisions, it might have additional practical value to use the full ESG information for further research (van Duuren, Plantinga, & Scholtens, 2016, p. 531). A recent study carried out by Amel-Zadeh and Serafeim (2017) for the Harvard Business School supports this research implication. By asking a large group of asset managers who manage about 43 percent of the global institutional assets under management, it showed that the majority of 82 percent of the managers use ESG information for investment decisions (Amel-Zadeh & Serafeim, 2017, p. 4). Findings on the governance-firm value relation could consequently be enlarged by analyzing how environmental, social, and governance information as a whole influence firm value.

As a final outlook to future research on corporate governance, recent publications, e.g., by Mackey, Barney, and Dotson (2017), use a new empirical methodology called the hierarchical Bayesian modeling approach. While the empirical research methodology of this thesis analyses the average influence of corporate governance on firm value, the hierarchical Bayesian modeling approach is able to estimate the governance-firm value relationship at the individual firm level. This can prove especially valuable for panel data analyses, where usually there aren't many observations on a single firm so that firm-specific coefficients can only be estimated with weak confidence (Mackey et al., 2017, p. 326). However, the hierarchical Bayesian models can estimate probability distributions for each firm-specific parameter other than calculating only point estimates. This allows statements about the influence of an independent variable on a dependent variable at the firm level rather than the average influence. By using this methodology, a re-examination of the governance-firm value relation could be conducted and provide additional insights.

APPENDIX

Appendix 1: Description of Eikon management governance provisions
[Source: own representation based on original descriptions out of the Refinitiv Eikon ESG module]

No.	Provision name	Description
1.01	Board Functions Policy	Does the firm have a policy for maintaining effective board functions?
1.02	Corporate Governance Board Committee	Does the firm have a CG board committee?
1.03	Nomination Board Committee	Does the firm have a nomination board committee?
1.04	Audit Board Committee	Does the firm have an audit board committee?
1.05	Compensation Board Committee	Does the firm have a compensation board committee?
1.06	Board Structure Policy	Does the firm have a policy for maintaining a well-balanced membership of the board?
1.07	Policy Board Size	Does the firm have a policy regarding the size of its board?
1.08	Policy Board Independence	Does the firm have a policy regarding the independence of its board?
1.09	Policy Board Diversity	Does the firm have a policy regarding the gender diversity of its board?
1.10	Policy Board Experience	Does the firm have a policy regarding the adequate experience on its board?
1.11	Policy Executive Compensation Performance	Does the firm have a performance-oriented compensation policy?
1.12	Policy Executive Compensation ESG Performance	Does the firm have an extra-financial performance-oriented compensation policy?
1.13	Policy Executive Retention	Does the firm have a general, all-purpose policy regarding compensation to attract and retain executives?
1.14	Compensation Improvement Tools	Does the firm have the necessary internal improvement and information tools for the board members to develop appropriate compensation/renumeration to attract and retain key executives?
1.15	Internal Audit Department Reporting	Does the internal audit department report to the audit committee of the board?
1.16	Succession Plan	Does the firm have a succession plan for executive management (key board members) in the event of unforeseen circumstances?
1.17	External Consultants	Do the board or board committees have the authority to hire external advisers or consultants without management's approval?

No.	Provision name	Description
1.18	Audit Committee Independence	Percentage of independent board members on the audit committee as stipulated by the firm.
1.19	Audit Committee Independence	Does the firm report that all audit committee members are non-executives?
1.20	Audit Committee Expertise	Does the firm have an audit committee with at least three members and at least one "financial expert" within the meaning of Sarbanes-Oxley?
1.21	Audit Committee NonExecutive Members	Percentage of non-executive board members on the audit committee as stipulated by the firm.
1.22	Compensation Committee Independence	Percentage of independent board members on the compensation committee as stipulated by the firm.
1.23	Compensation Committee Independence	Does the firm report that all compensation committee members are non-executives?
1.24	Compensation Committee NonExecutive Members	Percentage of non-executive board members on the compensation committee as stipulated by the firm.
1.25	Nomination Committee Independence	Percentage of independent board members on the nomination committee.
1.26	Nomination Committee Independence	Are the majority of the nomination committee members non-executives?
1.27	Nomination Committee NonExecutive Members	Percentage of non-executive board members on the nomination committee as stipulated by the firm.
1.28	Board Attendance	Does the firm publish information about the attendance of the individual board members at the board meetings?
1.29	Number of Board Meetings	The number of board meetings during the year.
1.30	Board Meeting Attendance Average	The average overall attendance percentage of board meetings as reported by the firm.
1.31	Board Structure Type	The firm has unitary board structure, a classical two-tier board structure with a supervisory board or a mixed two-tier board structure with a board of directors and a supervisory board.
1.32	Board Size More Ten Less Eight	Total number of board members which are in excess of ten or below eight.
1.33	Board Size	The total number of board members at the end of the fiscal year.
1.34	Board Background and Skills	Does the firm describe the professional experience or skills or the age of every board member?

No.	Provision name	Description
1.35	Board Gender Diversity, Percent	Percentage of females on the board.
1.36	Board Specific Skills, Percent	Percentage of board members who have either an industry specific background or a strong financial background.
1.37	Average Board Tenure	Average number of years each board member has been on the board.
1.38	Non-Executive Board Members	Percentage of non-executive board members.
1.39	Independent Board Members	Percentage of independent board members as reported by the firm.
1.40	CEO-Chairman Separation	Does the CEO simultaneously chair the board or has the chairman of the board been the CEO of the firm before?
1.41	CEO Board Member	The CEO is a board member.
1.42	Chairman is ex-CEO	Has the chairman (Aufsichtsratvorsitzender) held the CEO (Vorstandsvorsitzender) position in the firm prior to becoming the chairman?
1.43	Board Member Affiliations	Average number of other corporate affiliations for the board member.
1.44	Board Individual Re-election	Are all board members individually subject to re-election (no classified or stagged board structure)?
1.45	Board Member Membership Limits	The maximum number of years a board member can be on the board as stipulated by the firm.
1.46	Board Member Term Duration	The smallest interval of ten years in which the board members are subject to re-election.
1.47	Executive Compensation Policy	Does the firm have a policy for the performance-oriented compensation that attracts and retain the senior executives and board members?
1.48	Executive Individual Compensation	Does the firm provide information about the total individual compensation of all executives and board members?
1.49	Total Senior Executives Compensation	The total compensation paid to all senior executives as reported by the firm.
1.50	Highest Remuneration Package	Highest remuneration package within the firm is US dollars.
1.51	CEO Compensation Link to TSR	Is the CEO's compensation linked to total shareholder return (TSR)?
1.52	Executive Compensation LT Objectives	Is the management and board members remuneration partly linked to objectives or targets which are more than two years forward looking?
1.53	Sustainability Compensation Incentives	Is the senior executive's compensation linked to CSR/H*S/sustainability targets?

No.	Provision name	Description
1.54	Shareholder's Approval Stock Compensation Plan	Does the firm require that shareholder approval is obtained prior to the adoption of any stock-based compensation plans?
1.55	Board Member Compensation	Total compensation of the board members in US dollars.
1.56	Board Member LT Compensation Incentives	The maximum time horizon of the board member's targets to reach full compensation.
1.57	Executive Compensation Controversies	Is the firm under the spotlight of the media because of a controversy linked to high executive or board compensation?
1.58	Board Cultural Diversity, Percent	Percentage of board members that have a cultural background different from the location of the corporate headquarters.
1.59	Executive Members Gender Diversity, Percent	Percentage of female executive members.

Appendix 2: Description of Eikon shareholder governance provisions
[Source: own representation based on original descriptions out of the Refinitiv Eikon ESG module]

No.	Provision name	Description
2.01	Shareholder Rights Policy	Does the firm have a policy for ensuring equal treatment of minority shareholders, facilitating shareholder engagement, or limiting the use of anti-takeover devices?
2.02	Policy Equal Voting Right	Does the firm have policy to apply the one-share = one-vote principle?
2.03	Policy Shareholder Engagement	Does the firm have a policy to facilitate shareholder engagement, resolutions, or proposals?
2.04	Dual Class Stock	Does the firm have dual-class stocks (class A/B, registered/bearer shares)?
2.05	Equal Voting Rights	Are all shares of the firm providing equal voting rights?
2.06	Voting Cap	Does the firm have shares with a voting cap (ceiling) clause, ownership ceilings or control share acquisition provision?
2.07	Voting Cap Percentage	The percentage of maximum voting rights allowed or ownership rights.
2.08	Minimum Number of Shares to Vote	Has the firm set requirements for a minimum number of shares to vote?
2.09	Director Election Majority Requirement	Are the firm's board members generally elected with a majority vote?

No.	Provision name	Description
2.10	Shareholders Vote on Executive Pay	Do the firm's shareholders have the right to vote on executive compensation?
2.11	Public Availability Corporate Statutes	Are the firm's articles of association, statutes, or bylaws publicly available?
2.12	Veto Power or Golden share	Does the biggest owner (by voting power) hold the veto power or own golden shares?
2.13	State Owned Enterprise SOE	Is the firm a State-Owned Enterprise (SOE)?
2.14	Anti-Takeover Devices Above Two	The number of anti-takeover devices in place in excess of two.
2.15	Poison Pill	Does the firm have a poison pill in force during the annual period under review?
2.16	Unlimited Authorized Capital or Blank Check	Does the firm have unlimited authorized capital or a blank check? The board of directors is authorized to issue an unlimited amount of new stocks shares or to create new classes of preferred stock without shareholder meeting approval. These measures act as anti-takeover devices since they dilute the existing share base and the potential acquirer will have to purchase more shares in order to gain control of the reporting organisation.
2.17	Classified Board Structure	Does the firm have a classified board structure? Classified board structure is one in which different classes of directors serve for different term lengths. Board terms are often classified in order to thwart unfriendly takeover attempts, since potential acquirers would have to wait longer before they could take control of a firm's board through the normal voting procedure.
2.18	Staggered Board Structure	Does the firm have a staggered board structure? Staggered board structure is one where only a portion of directors is elected during a year. Board terms are often staggered or classified in order to thwart unfriendly takeover attempts, since potential acquirers would have to wait longer before they could take control of a firm's board through the normal voting procedure.
2.19	Supermajority Vote Requirement	Does the firm have a supermajority vote requirement or qualified majority (for amendments of charters and bylaws or lock-in provisions)? The amendment of the reporting organisation's charter (bylaws, articles of association, certificate of incorporation) may require a supermajority of votes (anywhere between 67-90%). By requiring a supermajority or absolute majority vote from shareholders in order to amend or restate its charters, a firm can prevent easy modification or elimination of its takeover defence provision.

No.	Provision name	Description
2.20	Golden Parachute	Does the firm have a golden parachute or other restrictive clauses related to changes of control (compensation plan for accelerated pay-out)? Golden parachute refers to lucrative benefits given to top executives in the event that a firm is taken over by another firm, resulting in the loss of the office of these executives. This also includes accelerated vesting of share-based compensation in the event of a change in control. Severance payments resulted in the wake of a takeover, makes business combination transactions more expensive, thus discouraging potential acquisition of a firm.
2.21	Limited Shareholder Rights to Call Meetings	Has the firm limited the rights of shareholders to call special meetings? There is limitation for shareholders to call special meetings when only directors and officers can call them and/or shareholders need at least 10% of shares in order to request a special meeting. Limitation for shareholders to call meetings reduce their ability to pass special business (such as removing a hostile director to the takeover proposal or amending specific anti-takeover provisions in the firm charter) that can facilitate a takeover transaction to happen without the firm or the board to be prepared for it. The purpose of such measure is hence to eliminate or restrict the right of shareholders to take action other than at an annual meeting.
2.22	Elimination of Cumulative Voting Rights	Has the firm reduced or eliminated cumulative voting in regard to the election of board members? Cumulative voting is a type of voting process that helps strengthen the ability of minority shareholders to elect a director. This method allows shareholders to cast all of their votes for a single nominee for the board of directors when the firm has multiple openings on its board. Hence, it is easier for any shareholder to elect a particular director to the board. In the context of a takeover, this will be someone who is more favourable to this transaction. The elimination of cumulative voting rights for shareholders hence make it more difficult for such takeover friendly directors to get elected.
2.23	Pre-emptive Rights	Does the firm grant pre-emptive rights to existing shareholders? Pre-emptive right is the right belonging to existing shareholders of a corporation to avoid involuntary dilution of their ownership by giving them the chance to buy a proportional interest of any future issuance of common stock. This is also been called the subscription right or subscription privilege. When shareholders, usually a majority shareholder or a shareholder committing large amounts of capital to a start-up firm, purchase shares, they want to ensure they have as much voting power in the future as they did when they initially invested in the firm. By getting pre-emptive rights in its shareholder's agreement, the shareholder can ensure that any seasoned offerings will not dilute his/her

No.	Provision name	Description
		ownership percentage, thereby making any takeover attempt more difficult.
2.24	Company Cross Shareholding	Does the firm have significant cross shareholding that can prevent takeovers? Cross shareholding refers to the holding of shares between two or more publicly listed companies that give each firm involved an equity stake in the other. Cross shareholding means that a potential acquirer will have to negotiate with two companies in order to gain controlling share interest over one of them (the target firm). This may give rise to special negotiated price for the shares where eventually the acquisition becomes more expensive than previously planned.
2.25	Confidential Voting Policy	Does the firm have a confidential voting policy (i.e., management cannot view the result of shareholder votes)? Confidential voting policy means when all ballots, proxies and voting tabulations are kept confidential (by the vote tabulations, independent inspectors and returning officers) and only the vote totals are announced. When voting procedure is not confidential, management can easily influence the outcome of the votes through pressure or intimidation, which in return may result in the rejection of a takeover proposal.
2.26	Limitation of Director Liability	Does the firm have a limitation of director liability? Limitation of director liability refers to indemnification provisions to firm directors and officers. Such provisions can be in form of a liability insurance (D&O insurance) payable to the directors and officers, to cover damages or defense costs in the event they suffer such losses as a result of a lawsuit for alleged wrongful acts.

No.	Provision name	Description
2.27	Shareholder Approval Significant Transactions	Are there limitations to the shareholders right to approve significant firm transitions such as M&As (no rights to vote or supermajority required)? Shareholders' right to approve significant firm transitions such as M&As (no rights to vote or supermajority required) is limited when such approval requires a supermajority voting. Moreover, certain law provisions may also further impose restrictions with regards to the approval of business combination transactions. One way to reduce the power of the two-tier bid is to make the second stage take-out merger more difficult to achieve at a price lower than the cash tender offer price. The simplest way to amend the corporate charter to provide that a bidder cannot accomplish a take-out merger without approval of a supermajority vote of shareholders. This either requires the bidder to purchase even more of the stock in the tender offer at a higher price, to assure approval, or to offer a cash-out at a high enough price to persuade the remaining public shareholders to approve the merger.
2.28	Limitations on Removal of Directors	Are there limitations to the shareholders' right to remove board members (i.e., only for cause, supermajority vote required, etc.)? Limitations on removal of directors refers to removal of directors only for a cause and/or removal of directors through a supermajority voting requirement. Removal of directors for cause or through a supermajority vote requirement, makes it more difficult for a potential acquirer to dismiss some or all directors before their term expires. This hampers the potential acquirer's ability to easily gain control over a board which has been hostile to its takeover attempt.
2.29	Advance Notice for Shareholder Proposals	Does the firm have deadlines relating to shareholder proposals? Advance notice for shareholder proposals refers to the deadline periods, which is a window interval within which shareholders must submit their proposals or nomination before the general meeting. Ideally this should allow shareholders to submit proposals as close to the meeting date as reasonably possible and within the broadest window possible. When the deadline date is further away from the next general meeting, and the interval window is smaller, the board and management have more time to review the nominations and proposals. Thus, they can prevent or mitigate the occurrence of any last minute surprises such an undesirable takeover proposal, anti-takeover amendment in the bylaws or any director nominee who may be in favor for such proposals.
2.30	Earnings Restatement	Is the firm in the process of a material earnings restatement?
2.31	Profit Warnings	Has the firm issued a profit warning during this year?
2.32	Non-audit to Audit Fees Ratio	All non-audit fees divided by the audit and audit-related fees paid to the group auditor.

No.	Provision name	Description
2.33	Insider Dealings Controversies	Is the firm under the spotlight of the media because of a controversy linked to insider dealings and other share price manipulations?
2.34	Accounting Controversies	Is the firm under the spotlight of the media because of a controversy linked to aggressive or non-transparent accounting issues?

Appendix 3: Mapping of Eikon management governance provisions with ISS governance methodology and assessment
[Source: own representation based on Institutional Shareholder Service (2003) and Institutional Shareholder Service (2020)]

No.	Provision name	Description
1.01	Board Functions Policy	Should be in place and published to document standards on issues regarding the board functions.
1.02	Corporate Governance Board Committee	The functions of a governance committee should be handled by a separate committee of the board.
1.03	Nomination Board Committee	The nominating committee is responsible for identifying and approving nominees for vacant positions on the board of directors.
1.04	Audit Board Committee	The audit committee reviews the adequacy and effectiveness of internal auditing, accounting, and financial controls of the firm.
1.05	Compensation Board Committee	The compensation committee makes recommendations and sets guidelines for the compensation of executives of the firm.
1.07	Policy Board Size	Fixing the size of the board prevents a reduction in the board size as a means to oust independent directors or those who cause friction within an otherwise homogenous board.
1.08	Policy Board Independence	The firm should publicly disclose a set of board guidelines and annually publish them in its proxy.
1.09	Policy Board Diversity	Positive to have a policy regarding gender diversity.
1.10	Policy Board Experience	Should be in place and published to document standards on director selection and experience.
1.11	Policy Executive Compensation Performance	Director compensation packages should be designed to provide value to directors for value received. Studies indicate that tying directors' compensation to the performance of the firm generally serves shareholders better than providing directors with cash compensation.

No.	Provision name	Description
1.13	Policy Executive Retention	A compensation package must be designed to attract and retain competent directors who are willing to risk becoming a defendant in a lawsuit and suffer potentially adverse publicity if the firm runs into financial difficulties or is mismanaged.
1.14	Compensation Improvement Tools	Necessary to develop compensation plans.
1.15	Internal Audit Department Reporting	The internal audit department directly reports to the audit committee of the board which then reviews the results of internal auditing.
1.16	Succession Plan	A board-approved CEO succession plan should be in place and evaluated by the directors periodically.
1.17	External Consultants	Strict reliance on management reports for information on corporate performance may skew directors' perceptions. Directors should develop a comprehensive corporate outlook by combining information from managers with that of outside consultants and equity analysts.
1.18	Audit Committee Independence	This key committee of the board should be composed solely of independent directors. (100%)
1.20	Audit Committee Expertise	Audit committee should be composed of at least one financial expert.
1.21	Audit Committee NonExecutive Members	This key committee of the board should be composed solely of non-executive members. (100%)
1.22	Compensation Committee Independence	This key committee of the board should be composed solely of independent directors. (100%)
1.24	Compensation Committee NonExecutive Members	This key committee of the board should be composed solely of non-executive members. (100%)
1.25	Nomination Committee Independence	This key committee of the board should be composed solely of independent directors. (100%)
1.27	Nomination Committee NonExecutive Members	This key committee of the board should be composed of a majority of non-executive members. (50%)
1.28	Board Attendance	Necessary to make judgment on board meeting's attendance. Creates transparency.
1.29	Number of Board Meetings	Board meetings should take place at least once a quarter.
1.30	Board Meeting Attendance Average	Directors should attend at least 75% of board meetings. Any member who accepts a nomination to serve as a director should be prepared to make attendance at scheduled meetings a top priority.

No.	Provision name	Description
1.33	Board Size	A board of between 9 and 12 board members is considered ideal. Generally, boards should not have less than 6 and more than 15 members.
1.34	Board Background and Skills	Necessary to make judgements and increases transparency.
1.37	Average Board Tenure	should not be more than 10yrs
1.38	Non-Executive Board Members	should be at least 75%
1.39	Independent Board Members	The current minimum standard is that at least two-thirds of the directors on the board should be independent.
1.40	CEO-Chairman Separation	The positions of chairman and CEO should be separated or a lead director should be specified.
1.43	Board Member Affiliations	Outside directorships should be limited to service on the boards of five or fewer public companies. A service limit of four or fewer public firm boards is considered even better.
1.44	Board Individual Reelection	Directors should be accountable to shareholders on an annual basis.
1.47	Executive Compensation Policy	A compensation package must be designed to attract and retain competent directors who are willing to risk becoming a defendant in a lawsuit and suffer potentially adverse publicity if the firm runs into financial difficulties or is mismanaged. Director compensation packages should be designed to provide value to directors for value received. Studies indicate that tying directors' compensation to the performance of the firm generally serves shareholders better than providing directors with cash compensation.
1.48	Executive Individual Compensation	Increases transparency.
1.51	CEO Compensation Link to TSR	Directors should receive a portion of their compensation in the form of stock.
1.52	Executive Compensation LT Objectives	Useful to not only put focus on short time success but setting having strategic targets to ensure successful performance in the future.
1.53	Sustainability Compensation Incentives	Positive to link targets to CSR/H*S/Sustainability targets.
1.54	Shareholders' Approval Stock Compensation Plan	All stock-based incentive plans should be submitted to shareholders for approval.
1.57	Executive Compensation Controversies	Firm should not be under the spotlight of the media because of a controversy linked to high executive or board compensation.

No.	Provision name	Description
1.59	Executive Members Gender Diversity, Percent	Should at least e 10% women. (this is one third of the recommended value of 30% according to best practice policy in Germany)

Appendix 4: Mapping of Eikon shareholder governance provisions with ISS governance methodology and assessment
[Source: own representation based on Institutional Shareholder Service (2003) and Institutional Shareholder Service (2020)]

No.	Provision name	Description
2.01	Shareholder Rights Policy	An equal treatment of shareholder rights (especially minority shareholder) is viewed as favorably.
2.02	Policy Equal Voting Right	Common stock entitled to one vote per share and declawed preferred stock are viewed favorably.
2.03	Policy Shareholder Engagement	Having a policy to facilitate shareholder engagement, resolutions or proposals is viewed as favorably.
2.04	Dual Class Stock	Common stock entitled to one vote per share and declawed preferred stock are viewed favorably.
2.05	Equal Voting Rights	Equal voting rights are viewed favorably.
2.06	Voting Cap	Limits the voting power of the shareholders.
2.08	Minimum Number of Shares to Vote	A requirement would limit shareholder rights (especially minority shareholder) and is not viewed as favorably.
2.09	Director Election Majority Requirement	Positive when board members are generally elected with a majority vote.
2.10	Shareholders Vote on Executive Pay	Shareholder approval should be sought prior to repricing underwater stock options. Plan documents should be written to expressively prohibit repricing without prior shareholder approval.
2.11	Public Availability Corporate Statutes	Board guidelines should be published in the proxy on an annual basis.
2.12	Veto Power or Golden share	A veto right would limit rights and power of remaining shareholders (especially minority shareholder) and is not viewed as favorably.
2.14	Anti-Takeover Devices Above Two	Incorporation in a state without anti-takeover provisions or opting out of such protections is viewed favorably.

No.	Provision name	Description
2.16	Unlimited Authorized Capital or Blank Check	In most instances, blank check preferred stock is used responsibly. Private placements of preferred stock are often used by companies that are experiencing a cash shortage and cannot afford to go through the months-long process of registering securities for sale through the SEC. Nevertheless, blank check preferred stock is also suited for use as an entrenchment device.
2.17	Classified Board Structure	A firm that has a classified, or staggered, board is one in which directors are typically divided into three classes, with each class serving three-year terms; each class's re-election occurs in different years. In contrast, all directors of an annually elected board serve one-year terms and the entire board stands for election each year. Directors should be accountable to shareholders on an annual basis.
2.18	Staggered Board Structure	A firm that has a classified, or staggered, board is one in which directors are typically divided into three classes, with each class serving three-year terms; each class's re-election occurs in different years. In contrast, all directors of an annually elected board serve one-year terms and the entire board stands for election each year. Directors should be accountable to shareholders on an annual basis.
2.19	Supermajority Vote Requirement	A simple majority vote should be required to amend the charter/bylaws and to approve mergers or business combinations. Supermajority provisions violate the principle that a simple majority of voting shares should be all that is necessary to effect change regarding a firm and its corporate governance provisions. Requiring more than this may permit managements to entrench themselves by blocking amendments that are in the best interests of shareholders.
2.20	Golden Parachute	Negative for shareholders; in case of taking over, they are facing additional cost.
2.21	Limited Shareholder Rights to Call Meetings	Shareholders should be permitted to call a special meeting when they want to take action on certain matters that arise between regularly scheduled annual meetings.
2.22	Elimination of Cumulative Voting Rights	Shareholders should have the right to cumulate their votes for directors. Cumulative voting permits a shareholder to amass (cumulate) all his or her votes for directors and apportion these votes among one, a few, or all of the directors on a multi-candidate slate.
2.23	Pre-emptive Rights	Should not provide pre-emptive rights to Shareholders.
2.25	Confidential Voting Policy	Management should not influence the outcome of the votes through pressure or intimidation. Every Shareholder has the right to vote independent.
2.26	Limitation of Director Liability	Directors should act responsible. Their liability for mismanagement should not be reduced by a security.

No.	Provision name	Description
2.29	Advance Notice for Shareholder Proposals	Reduces Shareholder rights to make proposals topics that show up surprisingly/ are related to latest news, etc. Further, board and management have more time to prepare for answers and mitigations.
2.33	Insider Dealings Controversies	Firms should not be under the spotlight of the media because of a controversy linked to insider dealings and other share price manipulations.
2.34	Accounting Controversies	Firms should not be under the spotlight of the media because of a controversy linked to aggressive or non-transparent accounting issues.

Appendix 5: Results of the robustness check for non-linear relationships

Variables	Dependent Variable: Q
EXT	0.125 (0.026)***
EXT^2	0.030 (0.011)**
INT	-0.017 (0.005)**
INT^2	-0.004 (0.003)
CAPEX	0.260 (0.370)
CASH	0.826 (0.287)**
DEBT	0.094 (0.022)***
INTANGIBLES	-0.428 (0.320)
ln(RESVOL)	-0.158 (0.028)***
ROA	1.889 (0.267)***
ln(SIZE)	-0.298 (0.051)***
Firm Fixed Effects	Yes
Year Fixed Effects	Yes
Observations	2,282
R-squared within	0.1890
R-squared between	0.2839
R-squared overall	0.2612

This table reports the results of the fixed effects panel regression model with included squared terms of the independent variables. The governance measures EXT and INT as well as their squared values EXT^2 and INT^2 are regressed on the firm value variable Q. The controlling variables include CAPEX, CASH, DEBT, INTANGIBLES, ln(RESVOL), ROA, and ln(SIZE). Significance tests of the regression coefficients rely on robust Driscoll-Kraay standard errors which are reported in parentheses. Variables with ***, **, or * are significant at 1%, 5%, and 10% level, respectively.

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