



## Master Thesis

# The Effects of Introducing Mandatory ESG Reporting on Company Strategic Decision-Making

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## **Abstract**

Companies are increasingly pressured to integrate Environmental, Social and Governance (ESG) aspects into their corporate decision-making. Mandatory ESG reporting, a central tool in attempting to shift companies' focus towards ESG, is gaining in importance. Therefore, it is imperative to understand how far mandatory ESG reporting impacts corporate decision-making and strategic considerations.

This thesis aims to investigate the effects of mandatory ESG reporting on business strategy. For this purpose, the following research question is posed: 'Does mandatory ESG reporting influence the business strategy?' Supporting research questions are stated to analyse the relationship in more detail, considering the categories of ESG and potential differences among company clusters, as well as to make predictions for the upcoming Corporate Sustainability Reporting Directive (CSRD).

To answer the research questions, a quantitative content analysis was conducted based on the introduction of the CSR-Richtlinie-Umsetzungsgesetz (CSR-RUG) in Germany in 2017. Concretely, the business strategies of German DAX companies were analysed between 2016 and 2019 concerning the existence and frequency of ESG-related content employing a predefined word list.

The results of the investigation show that ESG-related content in business strategies has grown by 22.4% between 2016 and 2019. Besides general ESG terms, especially social aspects were increasingly incorporated in business strategies due to the CSR-RUG. Moreover, the study finds that the effects of mandatory ESG reporting vary largely between industries. Overall, this work proves that mandatory ESG reporting significantly affects the integration of ESG into business strategies.

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## List of Abbreviations

abs.	absolute
CO2	carbon dioxide
CSR	corporate social responsibility
CSRD	Corporate Sustainability Reporting Directive
CSR-RUG	CSR-Richtlinie-Umsetzungsgesetz
ESG	Environmental, Social and Governance
ESRS	European Sustainability Reporting Standards
EU	European Union
HGB	Handelsgesetzbuch
KWH	Key Word Hits
NFRD	Non-Financial Reporting Directive
rel.	relative
SME	small and medium-sized enterprises

# 1. Introduction

In a world of progressing climate change and unprecedented challenges, companies see themselves confronted with the fact that maximising profits is not sufficient anymore. The pressure to integrate Environmental, Social and Governance (ESG) principles into corporate decision-making is rising rapidly. Governments, regulatory bodies, and stakeholders call for greater transparency and responsibility of companies, and mandatory ESG reporting is on the rise.

## 1.1 Motivation and Objective

Considering this development, researchers and practitioners argue and discuss the effectiveness of ESG reporting regulations. Proponents view ESG reporting as crucial for making companies act more sustainably and, therefore, as an essential component in the response to climate change. Critics regard it as an ineffective bureaucratic act without any implications for corporate behaviour. Can mandatory ESG reporting truly drive companies to make more sustainable and socially responsible decisions, or is it just a bureaucratic exercise?

The discussion is more relevant than ever in light of the upcoming Corporate Sustainability Reporting Directive (CSRD), which became effective on January 1, 2024. It is crucial to study the implications of mandatory ESG reporting in general and, specifically, the impact on corporate decision-making. Therefore, this thesis aims to contribute to the field of research by closely analysing the relationship between mandatory ESG reporting and business strategy. The following main research question is formulated:

*RQ1: Does mandatory ESG reporting influence the business strategy?*

Additionally, three sub-questions are formulated, further specifying the main research question. The thesis analyses how business strategy is influenced in terms of which category of ESG, if any, most often and most prominently enters the business strategy following the introduction of mandatory ESG reporting.

*RQ1.1: How is the business strategy influenced regarding the categories of ESG?*

Another goal of this work is to determine if and how this influence varies between company clusters. It shall be determined whether characteristics such as company size, industry, or media presence are decisive for the impact of mandatory ESG reporting on business strategy.

*RQ1.2: How does the influence vary between different company clusters?*

RQ1.1 and RQ1.2 are to be answered based on the introduction of the Non-Financial Reporting Directive (NFRD) in 2017. However, it is also a goal of the thesis to derive conclusions for the future, which is formulated in the last research question:

*RQ1.3: What can be concluded for the introduction of future ESG reporting regulations (specifically the CSRD) regarding their influence on business strategy?*

In answering these questions, the thesis aims to work out the relationship between mandatory ESG reporting and business strategy from different perspectives. Furthermore, it shall enable a better assessment of future ESG reporting regulations, like the soon-to-be-applied CSRD, regarding their effectiveness in driving more sustainable and socially responsible strategic decisions.

## **1.2 Methodology and Structure**

The thesis applies a quantitative empirical approach to answer the research questions. A quantitative content analysis is conducted based on the introduction of the CSR-Richtlinie-Umsetzungsgesetz (CSR-RUG) in Germany in 2017. The CSR-RUG is the implementation of the European NFRD into national law and constitutes an important milestone in the development of mandatory ESG reporting in Germany. It is, therefore, well suited to study the relationship between ESG reporting and business strategy. To assess this relationship, the period of 2016 to 2019 is selected, which covers the introduction of the CSR-RUG well. Throughout this period, annual reports of the German DAX companies, specifically those parts describing the business strategy, are analysed for a list of key words which signal the existence of ESG-related content. This way, it can be determined if and how ESG-related content has been incorporated into business strategies.

Chapter 2 sets the theoretical foundation of the thesis. ESG reporting both in the European Union (EU) and Germany is introduced by outlining the importance and the historical development of ESG reporting. Furthermore, the CSR-RUG is presented and compared to the CSRD concerning content, scope, and applicability.

Chapter 3 develops the connection between mandatory ESG reporting and business strategy from a theoretical perspective. After defining factors influencing the integration of sustainability into business strategy in general, a literature-based argumentation works out the influence of ESG reporting on corporate ESG performance. For the direct influence of ESG reporting on business strategy, a research gap is identified. Tackling this research gap and following the research questions, hypotheses are developed.

Chapter 4 illustrates the methodology of the empirical study, including a description of the scope, sample, and data collection process, as well as the methodological description of the quantitative analysis. Chapter 5 presents the findings and discusses the results. The discussion is structured based on the research questions and, hence, addresses the general influence of ESG reporting on business strategy, potential variations among ESG categories as well as company clusters, and conclusions for the introduction of the CSRD. Chapter 6 summarises the arguments throughout the thesis by providing a conclusion accompanied by a description of limitations and possibilities for further research.



## **2. Theoretical Background: ESG Reporting in the European Union and Germany**

The following chapter focuses on ESG reporting in the EU and Germany and provides the relevant theoretical foundation for the investigation to follow. It includes a description of the importance and development of ESG reporting. Following, the CSR-RUG is introduced and compared to the CSRD since these two ESG reporting regulations build the basis for the empirical study.

### **2.1 Definition and Importance of ESG Reporting**

To study the relationship between ESG reporting and business strategy, it is crucial to understand the foundations of ESG reporting itself. The term “ESG”, referring to Environmental, Social and Governance, was first prominently used in a report called “Who Cares Wins” in 2004, a joint initiative of several financial institutions backed by the United Nations. This report used the term to describe possibilities of integrating ESG aspects in the capital market (Helfaya et al., 2023, p. 3; Swiss Federal Department, United Nations of Foreign Affairs & United Nations, 2004, p. 1).

Some authors understand ESG as a synonym for corporate social responsibility (CSR) (Gaggl, 2021, p. 330), while others differentiate more precisely and describe ESG as a more recent concept that encompasses CSR and socially responsible investment (Helfaya et al., 2023, p. 3; Câmara & Morais, 2022, p. vii). For this thesis, ESG shall be defined as a concept that “relates to the influence of environmental, social and governance criteria in organisational decision-making at any level” (Câmara, 2022, p. 4).

Also, the term “non-financial information” is found in literature, primarily in legal text (Gaggl, 2021, p. 330), and its meaning appears similar to ESG’s. For simplicity’s sake, no strict separation of the concepts above shall be adopted throughout the thesis. If different terms are used, this is solely to improve the reading flow and not to distinguish between the concepts specifically.

The general importance of ESG reporting seems beyond doubt in the literature. While the overall goal of ESG reporting is to “create a long-term solution to the needs of society and protect the ecosystem” (Helfaya et al., 2023, p. 4), the importance of ESG reporting can also be analysed more directly from different perspectives.

From an investor's perspective, ESG reporting enables the channelling of capital towards truly sustainable investment opportunities. It makes capital markets more efficient due to better informed decision-making of investors regarding capital allocations (Frade & Froumouth, 2022, pp. 231–232). This point is proven by the investors' increasing demand for ESG-related data (Helfaya et al., 2023, p. 4).

However, it is not only the investors that exert pressure on companies to disclose ESG information. Other stakeholders, like customers, employees, and the general public, are also increasingly holding companies responsible for their impact on society and the environment (Helfaya et al., 2023, p. 3). This might affect purchasing decisions, decisions on the acceptance of job offerings, and general brand reputation (Kotsantonis & Serafeim, 2019, p. 50). Regarding reputation and brand image, also the company's perspective on the importance of ESG reporting enters the discussion since ESG reporting indeed has a substantial impact on brand reputation (Helfaya et al., 2023, p. 4).

After having outlined the importance of ESG reporting in general, the question arises as to why standardised, or mandatory, ESG reporting has recently gained such strong momentum. Kotsantonis and Serafeim highlight the poor quality of ESG data and the resulting inconsistency in how companies report ESG data regarding metrics, terminology, and units of measurement. Comparing the ESG performance of different companies is, therefore, a significant challenge (Kotsantonis & Serafeim, 2019, p. 51). Standardised ESG reporting is inevitable to ensure comparability, transparency, compliance, and proper supervision and to prevent greenwashing (Frade & Froumouth, 2022, p. 233). The following chapter elaborates on how ESG reporting has increasingly shifted from a voluntary to a mandatory approach within the EU.

## **2.2 Development of ESG Reporting in the European Union**

After having explained the importance of ESG reporting, this chapter outlines how ESG reporting has evolved and advanced within the EU and which frameworks are currently the most relevant ones. The discussion on how ESG matters should be considered in business operations has been going on for long; however, it has amplified since the turn of the century (Garcia Rolo, 2022, p. 191). At the beginning of the 21st century, CSR started being more actively discussed by EU lawmakers, but its incorporation into business practices remained entirely voluntary (Helfaya et al., 2023, p. 4). Several non-binding policies have been published throughout the 2000s, including the Green Paper Promoting a European Framework for Corporate Social Responsibility in 2001 and the Communication on Corporate Social Responsibility in 2002 (Garcia Rolo, 2022, pp. 191–192).

The voluntary approach to ESG disclosure was relatively ineffective since motivation and incentives for companies to follow the recommendation for increased ESG disclosure were limited. Furthermore, information was barely comparable between companies and countries, and rating agencies applied different weighting systems, leading to inconsistent ESG ratings (Helfaya et al., 2023, pp. 4–5).

The need for more harmonised ESG disclosure first led to some national initiatives. For example, the Danish Financial Statements Act Amendment in 2008 called for the communication of non-financial information to external stakeholders, and UK companies have been required to report greenhouse gas emissions-related information since 2013. Nevertheless, comparability between EU countries was still missing (Doni et al., 2020, p. 3).

In the EU Commission's Communication on a Renewed Strategy for CSR, published in 2011, the idea of a legal framework regarding the integration of ESG topics into business matters was introduced, and the concept of mandatory systems superseded the voluntary character. The 2012 Action Plan on European Company Law established the fact that ESG integration into business practices could only be achieved through increased transparency, which, in turn, relied heavily on mandatory ESG disclosure frameworks (Garcia Rolo, 2022, pp. 192–193).

The various EU action plans and reflection papers, so far non-binding, resulted in a tangible legal framework consisting of three legislative acts, referred to as the “mandatory disclosure trinity” by Garcia Rolo (2022, p. 193). The first essential framework for mandatory ESG disclosure was the Non-Financial Reporting Directive (NFRD) in 2014, officially called Directive 2014/95/EU (Garcia Rolo, 2022, p. 194). For the first time, a legislative act imposed mandatory reporting requirements on the EU level (Helfaya et al., 2023, p. 5).

The NFRD applies to all large listed European companies and requires the disclosure of non-financial information, such as environmental and social issues or diversity policies, starting in fiscal year 2017 (Helfaya et al., 2023, p. 5; Doni et al., 2020, p. 3). Specific issues depend on the transposition into national law, which each member state had to enforce. In Germany, the NFRD was transposed into the CSR-RUG, which is addressed in detail afterwards.

Another important legal framework is the Regulation (EU) 2019/2088, also called Sustainable Finance Disclosure Regulation (SFDR), published in 2019 and applicable since 2021, which targets the financial services sector (Cremasco & Boni, 2022, pp. 2–3; Garcia Rolo, 2022, p. 200). The SFDR aims to increase transparency on how sustainability risks are considered in investment decisions and reduce sustainability information asymmetries and greenwashing (Garcia Rolo, 2022, p. 200).

The third framework completing the “mandatory disclosure trinity” (Garcia Rolo, 2022, p. 193) is the Regulation (EU) 2020/852, also referred to as Taxonomy Regulation, established in 2020. It intends to provide criteria for identifying certain economic activities as environmentally sustainable, ensuring harmonised standards among EU member states and mitigating greenwashing. Consequently, the Taxonomy is not directly focused on ESG disclosure but rather complements NFRD and SFDR (Garcia Rolo, 2022, p. 204).

Together, NFRD, SFDR, and the Taxonomy Regulation build the current basis of ESG reporting in the EU. For the empirical investigation of the relationship between ESG reporting and business strategy, the NFRD is considered the most suitable framework, which is why its German equivalent, the CSR-RUG, is discussed in further detail in the following chapter.

## **2.3 CSR-Richtlinie-Umsetzungsgesetz (CSR-RUG)**

The implementation of the NFRD into German law resulted in the “Act to Strengthen the Non-financial Reporting by Corporations in their Management and Group Management Reports” (CSR-Richtlinie-Umsetzungsgesetz, CSR-RUG) (Schröder, 2020, p. 62; Uwer & Schramm, 2018, p. 197). After having been adopted in March 2017, the CSR-RUG was published in the Bundesgesetzblatt (Federal Law Gazette) on April 18, 2017. It came into effect on April 19, 2017, and applied to fiscal years starting from January 1, 2017 (Schröder, 2020, pp. 63–64).

### **2.3.1 Purpose and Scope**

The CSR-RUG aims to transpose the contents and goals of the NFRD as closely as possible into German national law. It requires the creation of a non-financial statement or a separate non-financial report as well as an extended disclosure of the diversity policy (Kajüter, 2017, p. 137). Like the NFRD, the CSR-RUG aims to increase transparency regarding environmental and social aspects through more relevant, consistent, and comparable reporting. Furthermore, the German legislator seeks to raise reporting entities’ awareness of sustainability issues and motivate them to prioritise non-financial aspects (Schröder, 2020, p. 63).

The CSR-RUG applies to all corporations (§ 289b Abs. 1 HGB), cooperatives (§ 336 HGB), and limited liability commercial partnerships (§ 264a HGB), which cumulatively fulfil the following criteria (Schröder, 2020, p. 64; Uwer & Schramm, 2018, pp. 199–200):

- Qualify as large (§ 267 Abs. 3 S. 1 HGB)
- Are capital market oriented (§ 264d HGB)
- Employ more than 500 people per year on average.

A company qualifies as large if it “fulfil[s] at least two of the following criteria: balance-sheet sum of € 20,000,000, annual sales of € 40,000,000, [...] annual average 250 employees” (Uwer & Schramm, 2018, p. 200). Capital market oriented are companies that use an organised market to trade their own securities (Schröder, 2020, p. 65).

According to § 341a Abs. 1a HGB, credit institutions and insurance companies fall within the CSR-RUG scope, whether capital market oriented or not, as long as the other two criteria are fulfilled. Small and medium-sized enterprises (SMEs) are explicitly not included in the scope to spare these organisations the additional administrative burden (Schröder, 2020, pp. 64–65).

As for groups, a parent company is obliged to create a non-financial group statement if it is a corporation (§ 315b Abs. 1 HGB) or a limited liability commercial partnership (§ 264a HGB) and cumulatively fulfils the following criteria (Schröder, 2020, pp. 65–66; Uwer & Schramm, 2018, p. 200):

- Is capital market oriented (§ 264d HGB)
- The related group fulfils at least two of the following criteria (net method, based on consolidated numbers): balance-sheet sum of € 20 million, annual sales of € 40 million, annual average 250 employees (§ 293 Abs. 1 S. 1 Nr. 1 HGB)
- The related group employs more than 500 people per year on average on a consolidated basis.

Subsidiaries are exempt from the reporting duty if they are already included in a non-financial group statement of their parent company (Schröder, 2020, p. 67).

Literature is in agreement that the number of companies affected by the CSR-RUG is relatively small, although the precise number stated (during the first years of implementation) varies between 315 (Humbert, 2019, p. 281) and 550 companies (Kajüter, 2017, p. 137), out of which approximately 50% are credit institutions and insurance companies (Uwer & Schramm, 2018, p. 200; Kajüter, 2017, p. 137).

### **2.3.2 Publication Options and Application of Reporting Frameworks**

The CSR-RUG allows for two forms of publication: a non-financial statement or a non-financial report. The non-financial statement (§ 289b Abs. 1 HGB) is published as part of the management report, where it can either be scattered across the report based on topics or be dedicated a separate section. In either case, the publication naturally occurs with the management report (Schröder, 2020, pp. 68–69; Uwer & Schramm, 2018, p. 201; Kajüter, 2017, p. 138).

However, the legislator also allows the creation of a separate non-financial report (§ 289b Abs. 3 HGB), which, in turn, can take the form of an independent report or be integrated into others, such as sustainability reports. The form of a non-financial report requires that it contains at least the same legally required information as the non-financial statement would contain. If the form of a non-financial report is chosen, it must be published either together with the management report in the Federal Gazette or on the website of the company latest four months after the balance-sheet date, whereas in the latter case, the management report must refer to it (Schröder, 2020, pp. 69–71; Uwer & Schramm, 2018, p. 201; Kajüter, 2017, p. 138).<sup>1</sup>

Since the period for the publication of management reports for capital market oriented companies is also four months, the legislator tries to harmonise the publication dates despite different reporting formats (Schröder, 2020, p. 69). By offering the choice between non-financial statement and report, the CSR-RUG aims to unburden companies which have already published separate sustainability reports (Schröder, 2020, p. 72).

Based on § 289d HGB, companies may use existing frameworks to create the non-financial statement, which can originate from the national, EU, or international level (Schröder, 2020, p. 72). Possible frameworks include but are not limited to Deutscher Nachhaltigkeitskodex, the European Environmental Management and Audit System EMAS, the Global Reporting Initiative GRI, or the OECD Guidelines for Multinational Enterprises (Boecker & Zwirner, 2019, pp. 234–235; Uwer & Schramm, 2018, p. 202). The CSR-RUG does not prescribe any specific framework or the application of any framework at all. If a framework is applied, it must be named, and it is recommended to be used long-term. It must be reasoned if no framework is applied (Schröder, 2020, pp. 72–73). Overall, the legislator grants various options regarding publication and application of reporting frameworks.

### **2.3.3 Contents and Audit**

In § 289c HGB, the CSR-RUG defines which information is to be disclosed in the non-financial statement, whereas this is not to be understood as a comprehensive list but as minimum disclosure requirements (Schröder, 2020, p. 74). First, a brief business model description is to be provided (§ 289c Abs. 1 HGB). Furthermore, the non-financial statement must report on the following five aspects, according to § 289c Abs. 2 HGB: environmental, employee, and social matters, respect for human rights, and the fight against corruption issues (Uwer & Schramm, 2018, p. 201). The legislators explicitly name examples, which are presented in **Table 1**.

---

<sup>1</sup> For simplicity, throughout this thesis, only the non-financial statement is referred to. However, if not explicitly stated otherwise, this shall include both forms of publication, i.e., also the separate non-financial report.

**Table 1:** Reporting aspects of the non-financial statement based on the CSR-RUG (Source: Author's own, following Schröder, 2020, p. 73–74).

<b>Reporting Aspect</b>	<b>Examples</b>
<i>Environmental matters</i>	Greenhouse gas emissions, water usage, air pollution, use of renewable and non-renewable energy, protection of biological diversity
<i>Employee matters</i>	Actions for gender equality, working conditions, respect for employee rights and trade union rights, workplace safety
<i>Social matters</i>	Dialogue on communal or regional level, actions for protection and development of local communities
<i>Respect for human rights</i>	Prevention of human rights violations
<i>Fight against corruption issues</i>	Existing instruments for the fight against corruption and bribery

The information to be disclosed on these five aspects is determined with § 289c Abs. 3 HGB, which states that information must be reported if it fulfils a two-tier relevance criterion. This criterion requires information to be necessary to understand the course of business, the business result, and the current situation of the business, as well as the impact on the respective non-financial aspect (Uwer & Schramm, 2018, p. 201).

More specifically, § 289c Abs. 3 HGB mentions the following six disclosure requirements for each of the aspects, which are to be understood as non-exhaustive (Schröder, 2020, pp. 75–77):

- Description of concepts pursued by the company, including due diligence processes
- Overview of the results of these concepts
- Relevant risks related to the business activities of the company
- Relevant risks related to business relations, products and services of the company
- Demonstration of the most critical non-financial performance indicators
- Indications and explanations on amounts accounted for in the annual financial statements.

An exemption clause (§ 289e HGB) exists for certain negative aspects related to future developments or matters under negotiation. Such aspects may be omitted if their disclosure is objectively capable of causing substantial damage to the company and if their omission does not prevent a realistic representation of the business development, business results and the situation of the company (Schröder, 2020, pp. 77–80; Uwer & Schramm, 2018, p. 204).

The CSR-RUG also requires, apart from the non-financial statement, the extended disclosure of the diversity policy. Hence, according to § 289f HGB, companies must describe their diversity concept, including aspects like age, gender, and educational and professional background, in a separate section within their management report or publish it on their website. Specifically, measures to increase the diversity of the company's management, goals, and results shall be presented (Schröder, 2020, p. 84).

Concerning the external audit of the non-financial statement, the requirements given by the CSR-RUG are relatively limited. Mandatory is only the confirmation of the formally correct existence of the non-financial statement by the auditor (§ 317 Abs. 2 S. 4 HGB). A substantial audit of the contents of the non-financial statement is not required but can be done voluntarily. Companies are free to decide whether they conduct a substantial audit, to what extent it is conducted and by whom (annual auditor or independent auditor) (Kajüter, 2017, p. 138). In any case, due to its supervising function, the Supervisory Board must audit the content of the non-financial statement (Schröder, 2020, pp. 80–81). Theoreticians deem it likely that companies commonly conduct voluntary substantial audits (Uwer & Schramm, 2018, p. 205), given the high sanctions in case of non-compliance with statutory provisions. Administrative penalties can range between € 2 million and € 10 million (Boecker & Zwirner, 2019, p. 235).

#### **2.3.4 Criticism and Assessment**

The introduction of the CSR-RUG, increasing the focus on non-financial aspects and being a milestone in non-financial reporting practice, was generally applauded by scholars (Kajüter, 2017, p. 138; Schröder, 2020, p. 88). However, various aspects of the CSR-RUG evoked massive criticism and discussion in the literature (Schröder, 2020, p. 88). The most significant arguments are presented in this chapter.

Generally, the idea of making non-financial reporting mandatory is critically discussed. Strict regulation is claimed to undermine the motivation for existing voluntary sustainability reporting, the competitive advantage of which is now void (Schweren & Brink, 2016, p. 181).

An extension of the scope generally (Humbert, 2019, p. 281), and specifically to include partnerships and non-capital market oriented firms, has been demanded to include large German family businesses, such as Aldi, Lidl, Würth, or Dr. Oetker (Schröder, 2020, p. 93; Kajüter, 2017, p. 137). Also, the NFRD leaves the member states the option to extend the scope of application to SMEs. This right of choice has aroused criticism since it reduces comparability on a European level (Schröder, 2020, p. 93; Eufinger, 2015, p. 426). Furthermore, the indirect inclusion of SMEs is critically assessed. Although officially, the burden of reporting may not be passed on to suppliers and partners, it can be expected that



companies exert pressure on their suppliers and partner companies to provide data (Schröder, 2020, p. 95). Concurrently, gathering the data can be challenging for the reporting entity, especially for deeper levels of the supply chain (Boecker & Zwirner, 2019, p. 234). However, it can also represent a chance for smaller companies since the increased involvement with CSR can generate a competitive advantage (Schröder, 2020, p. 95; Meeh-Bunse et al., 2016, p. 2772).

The different publication options are criticised for reducing comparability (Humbert, 2019, p. 283; Kajüter, 2017, p. 138). The separate non-financial report inhibits the equal valuation of financial and non-financial information and the description of connections between the two reporting fields. Nevertheless, it provides higher flexibility for firms and benefits those with established sustainability reporting. The option to integrate the non-financial statement throughout the management report at different positions allows for a better description of connections but is problematic regarding clarity and audit (Schröder, 2020, p. 96).

Comparability within Germany and the EU is also problematic because the substantial design of the non-financial statement relies on mere principles backed with examples, which leaves great freedom for implementation. The introduction of the two-tier relevance criterion might provide orientation in that regard; however, it is also seen with scepticism because risks for ESG aspects are often not directly relevant to the course of business and, hence, are not required to be reported according to the relevance criterion (Germanwatch, 2016, pp. 3–4; Schröder, 2020, pp. 97–99). Other reasons that inhibit comparability between companies and EU member states are the freedom of choice for the application of reporting frameworks (Schröder, 2020, p. 97), the possibility to omit certain negative aspects (Schröder, 2020, pp. 99–100), and the voluntariness of the substantial audit (Schröder, 2020, p. 100).

Overall, the CSR-RUG is a compromise that leaves much room for interpretation and discretion and calls for reassessment and further development. Nonetheless, the CSR-RUG adds a new perspective to reporting practices (Kajüter, 2017, p. 138). It implies a chance for companies to start dealing with CSR topics more actively. The comply-or-explain mechanism, especially, may result in critical reflection on certain aspects and lead to more CSR initiatives and measures (Schröder, 2020, p. 102).

Indeed, the need for further development due to various inaccuracies and points of criticism resulted in the creation of the CSRD, which will become applicable for the 2024 fiscal year. The following chapter explains how the CSRD goes beyond the CSR-RUG and compares both legislations.

## **2.4 Comparison CSR-RUG and CSRD**

As outlined in the previous chapter, there is an urgent need to improve the existing framework. In response to this need, the European Commission drafted a first proposal to revise the existing NFRD in April 2021. After intense debates, in June 2022, a political compromise was achieved by the European Commission, the European Parliament and the Council of the European Union. Finally, the Corporate Sustainability Reporting Directive (CSRD) was published on December 16, 2022, and became effective on January 5, 2023. All member states must transfer the CSRD into national law by July 6, 2024 (Fink & Schmidt, 2023, p. 105).

### **2.4.1 Fundamental Reforms of the CSRD**

Essentially, the CSRD replaces the NFRD and brings reforms in scope, form of publication, audit, and applicable reporting frameworks. Additionally, the CSRD calls for applying the EU Taxonomy, that is, identifying taxonomy-conform business activities (Heichl et al., 2022, p. 523). Contents to be reported and the understanding of the relevance criterion are now specified in one uniform reporting framework, the European Sustainability Reporting Standards (ESRS) (Fink & Schmidt, 2023, p. 105).

While the NFRD solely applies to large, capital market oriented companies (for details, see Chapter 2.3.1), the CSRD will gradually extend the scope also to large (§ 267 Abs. 3 S. 1 HGB), non-capital market oriented companies, that is, limited liability companies, credit institutions and insurance companies, as well as SMEs that are capital market oriented (Bannier, 2023, p. 160; Lanfermann & Baumüller, 2023, p. 90; Lerner, 2023, p. 62). Companies which already fall under the scope of the NFRD will have to comply with the CSRD starting from the fiscal year 2024. One year later, also large, non-capital market oriented companies will be required to report according to the CSRD, and from fiscal year 2026 on, also SMEs will come within the ambit of the CSRD. Consequently, the scope of ESG reporting will be increased massively throughout the years to come (Lerner, 2023, p. 63). DNK estimates the total number of affected German companies to rise from 550 to 15,000 (Deutscher Nachhaltigkeitskodex, 2023).

The CSRD stipulates that the non-financial statement must be integrated into the management report as a separate section. The options under the NFRD to scatter the information across the management report in the sense of an integrated reporting or to publish a separate non-financial report will, therefore, cease to exist (Fink & Schmidt, 2023, p. 107). Furthermore, the management report, including the non-financial statement, shall be provided in an electronic format according to the ESEF (European Single Electronic Format) and contain electronic

tagging, allowing for the data to be integrated into the European Single Access Point (ESAP) (Lerner, 2023, p. 64).

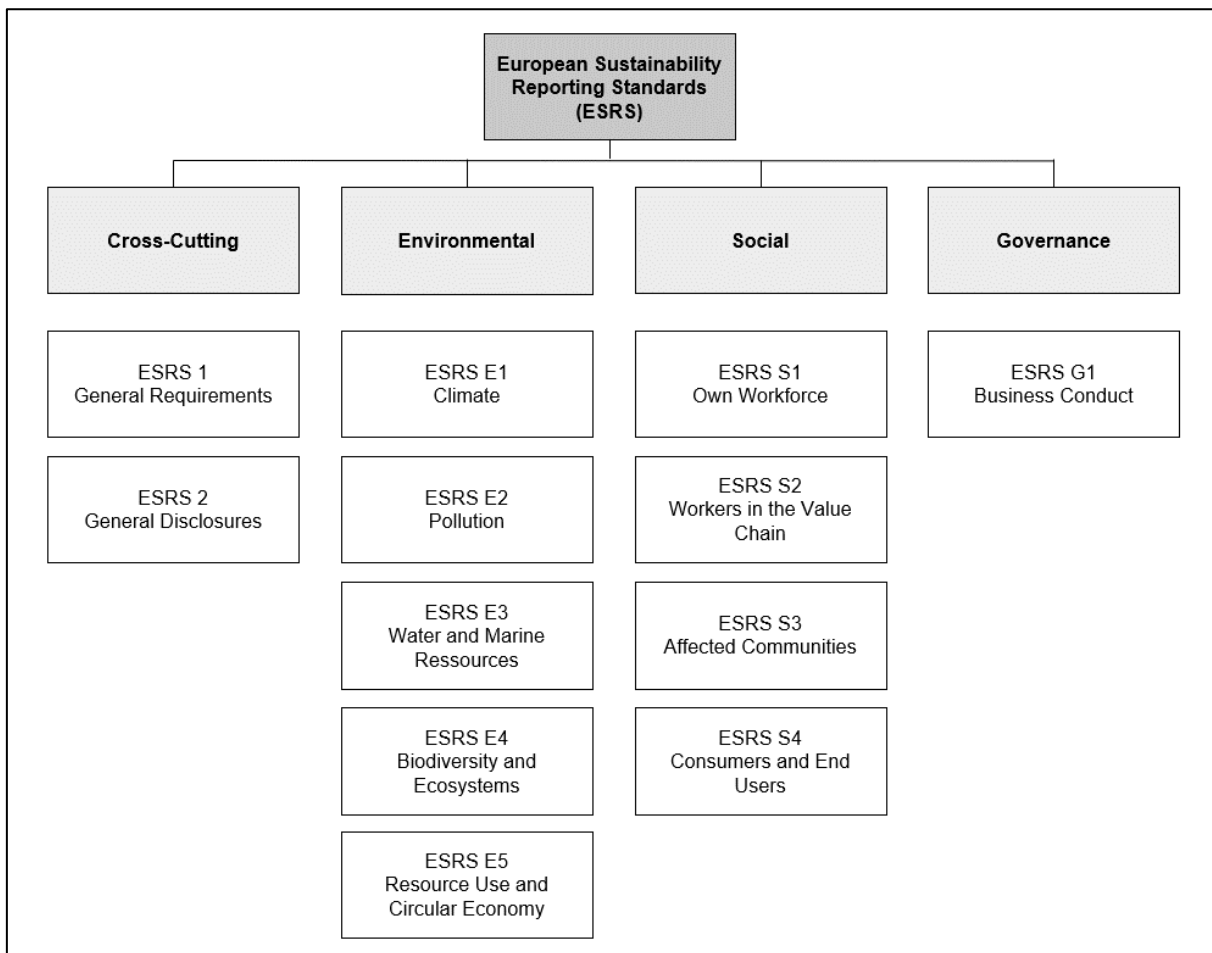
The CSRD introduces mandatory substantial audits of the non-financial statement to increase credibility and trust in non-financial information. These audits can be conducted by either the auditor of the financial statements or an independent auditor (Baumüller & Grbenic, 2021, p. 376). An audit with “limited assurance” is sufficient for the first three years. Afterwards, the requirement for an audit with “reasonable assurance” is intended to be introduced (Baumüller & Grbenic, 2021, p. 376), provided an assessment will deem it feasible (Rössel et al., 2023, p. 23). “Limited assurance” means the auditor did not encounter any facts that made him believe misrepresentation occurred. “Reasonable assurance”, in turn, means that the auditor confirms directly that the information was presented following the applicable regulations (Fink & Schmidt, 2023, p. 115).

Compared to the NFRD, the CSRD requires more detailed information on specific topics, including the sustainability strategy, sustainability goals, the role of corporate bodies and authorities concerning sustainability matters, sustainability policies, sustainability-related incentive systems, or sustainability risks (Fink & Schmidt, 2023, pp. 109–110). While the NFRD granted absolute flexibility regarding the application of reporting frameworks, the EU did not consider this appropriate anymore and mandated the EFRAG with the development of a uniform reporting framework, namely the ESRS (Fink & Schmidt, 2023, p. 113), an overview of which shall be provided with the following chapter.

#### **2.4.2 The Role of the ESRS**

The first set of ESRS was adopted as a Delegated Act by the European Commission on July 31, 2023 (European Commission, 2023). Additional sets with more specific guidelines, such as industry-specific standards and lighter standards for capital market oriented SMEs, are on their way (Fink & Schmidt, 2023, p. 114).

The ESRS consist of two cross-cutting standards, that is, ESRS 1 General Requirements and ESRS 2 General Disclosures, and ten topic-specific standards within the fields of Environment, Social, and Governance, as can be seen in **Figure 1** (Lerner, 2023, pp. 65–66). The ten specific standards must be fulfilled independently of the industry a reporting company belongs to (Fink & Schmidt, 2023, p. 114).



**Figure 1:** Overview of ESRS (Source: Following Lerner, 2023, p. 66).

However, reporting duties are decisively dependent on the concept of double materiality (Fink & Schmidt, 2023, p. 114). The concept already exists in the NFRD in the form of the relevance criterion but has been applied only restrictively due to difficulties in its understanding (Baumüller & Grbenic, 2021, p. 374; Fink & Schmidt, 2023, p. 112; Heichl et al., 2022, p. 526). To assess whether a sustainability aspect is material and, hence, necessary to be reported, companies shall apply both the inside-out and the outside-in perspective. The inside-out perspective, also called impact materiality, analyses the implication of business activities on the environment. If a sustainability aspect has or is expected to have real or potential, positive or negative implications on humans or the environment over a short-, medium-, or long-term horizon, it must be considered impact material (Fink & Schmidt, 2023, p. 113; Heichl et al., 2022, p. 526).

The outside-in perspective also referred to as financial materiality, analyses the implications of sustainability aspects on the company's financial position. If a sustainability aspect has or is expected to have financial consequences on the company over a short-, medium-, or long-term horizon, it must be considered financially material. A sustainability aspect must also be

reported if only one of the materiality analyses detects materiality, which is the core difference from the NFRD (Fink & Schmidt, 2023, pp. 112–113; Heichl et al., 2022, p. 526).

The ESRS aim to incorporate existing standards to facilitate the switch for companies that already report on sustainability issues (Lerner, 2023, p. 65). Hence, the ESRS are closely related to the GRI Standards, which, for example, also follow, in principle, the logic of double materiality (Heichl et al., 2022, p. 526).

### **2.4.3 Criticism and Assessment**

Although there is no doubt that transparency, credibility, and comparability of sustainability reporting will massively increase with the CSRD compared to the NFRD, it still attracts criticism in literature, which comes as no surprise given the vastly increased scope of content to be reported. Adapting to and fulfilling the new Directive will incur high efforts and costs for affected companies. Especially for international companies, an increased financial burden is expected due to the transition from previous standards and the application of yet another reporting system. Also, SMEs are likely to experience severe challenges, for example, in the gathering and processing of data (Fink & Schmidt, 2023, p. 116; Lerner, 2023, p. 67). Generally, also the obligation to publish the sustainability report as a separate section in the management report and in ESEF format, requiring a rearrangement for many companies, the materiality analysis, and the substantial audit could potentially pose grave challenges for companies (Fink & Schmidt, 2023, p. 116).

The CSRD does not directly dictate a particular way of doing business or a specific strategic orientation. Nevertheless, it indirectly influences corporate decision-making since the various disclosure requirements let companies be confronted with public criticism and reactions from stakeholders. Public disclosure of sustainability information will likely impact financing decisions. Critics warn that this might result in good strategies, investments, or innovative ideas not being pursued or done because they do not positively impact CSRD metrics (Lerner, 2023, p. 68). Consequently, scholars justifiably ask “in how far a political body like the European Commission has the legitimacy to act in such a prescriptive way” (Baumüller & Grbenic, 2021, p. 377); the answer to which is not found in literature yet.

Sceptics of the CSRD also argue that with the changing demands of consumers, the market would become more sustainable anyway. However, information asymmetries prevent informed decision-making of consumers and investors. A harmonised and transparent sustainability reporting framework is inevitable to reduce these information asymmetries (Lerner, 2023, pp. 68–69). A uniform sustainability reporting system is also urgently needed to effectively implement the EU Taxonomy (Lerner, 2023, p. 67).

Overall, with the CSRD, European sustainability reporting is becoming more complete, comparable, and reliable, and the weaknesses of current European regulations are being tackled. Hence, scholars consider the CSRD a significant step forward (Baumüller & Grbenic, 2021, p. 379). If the application of the CSRD is carefully prepared and the materiality analysis is done properly, the results can directly be applied to business strategies, risk management and governance. Ultimately, this opens the chance for thoroughly sustainable business success (Bannier, 2023, p. 168).

### **3. Literature-Based Argumentation and Development of Hypotheses: ESG Reporting and Business Strategy**

The previous chapter has built the necessary theoretical background on ESG reporting. After having discussed the foundations and recent developments in (mandatory) ESG reporting, the next chapter aims to create a connection between ESG reporting and business strategy or company strategic decision-making to approach the formulated research questions of this thesis. Hypotheses are developed within this chapter based on current findings in the literature.

#### **3.1 Factors Influencing the Integration of Sustainability into Business Strategy**

Evidently, the introduction of mandatory ESG reporting regulations is not the only factor that can lead to the integration of sustainability into business strategy. To study the mentioned relationship and correctly evaluate the findings of this study, it is crucial to be aware of any additional factors that can lead to the increased integration of sustainability into business strategy.

Fundamental management theories have been developed to describe how business strategy is formed and influenced generally. One of the most common tools to describe impact factors on strategy is SWOT analysis. SWOT considers internal and external factors that can affect corporate performance positively and negatively, while internal factors are referred to as strengths and weaknesses and external factors are defined as opportunities and threats (Leigh, 2009, p. 1089). Factors in the external environment affecting business strategy are also described with the PESTEL model. Those factors are part of the macroeconomic environment, which managers can only influence to a limited extent. PESTEL includes political, economic, sociocultural, technological, ecological, and legal factors (Rothaermel, 2019, p. 67). Furthermore, business strategy is strongly influenced by the industry structure, which can be assessed and defined with industry analysis. The most prominent tool for this is the Five Forces Model by Michael Porter, which describes the five competitive forces: threat of entry, power of suppliers, power of buyers, threat of substitutes, and rivalry among existing firms (Rothaermel, 2019, p. 74).

Elaborating on these concepts further would not serve the goal of this work. Nevertheless, it is important to mention them since they build the foundation of any business strategy and, consequently, of the integration of sustainability into business strategy. In other words, each factor identified as leading to increased sustainability in business strategy has its roots in at

least one of these fundamental concepts. Literature has discussed internal and external factors influencing the integration of sustainability into business strategy. This stream of literature is not related to mandatory ESG reporting but is still considered valuable for this work.

Internal factors include company size and structure. Scholars have differing views on whether or not company size matters in the integration process. While some scholars claim that sustainability integration strongly relates to company size, others cannot find any relationship between the two variables (Engert et al., 2016, pp. 2838–2839). Zharfpeykan and Akroyd (2022) found that larger companies tend to include more sustainability indicators in their performance management systems. Literature, however, agrees that an organisational structure adapted to sustainability promotes sustainability integration (Engert et al., 2016, p. 2839).

The design of management control systems is mentioned as another internal factor. Effective management control systems can have a positive impact on sustainability integration into strategy; however, it is a challenge to integrate sustainability indicators into existing management tools (Engert et al., 2016, pp. 2841–2842). Also, manager attitude and behaviour are crucial factors for sustainability integration. If management perceives corporate sustainability as necessary and beneficial for the company, the integration into business strategy is much stronger (Engert et al., 2016, pp. 2841–2842). Some scholars even consider management attitude the most influential factor for sustainability integration (Zharfpeykan & Akroyd, 2022). Organisational learning and knowledge management positively influence the integration of sustainability into business strategy as well. Knowledge management refers to making implicit knowledge explicit and fostering discussion and learning. It can enhance a company's competitive advantage and certainly facilitate sustainability integration (Engert et al., 2016, p. 2841). Furthermore, organisational culture plays a significant role in integrating sustainability into business strategy. Since organisational culture refers to beliefs, values, and behavioural patterns shared by all members of the organisation, it is essential that this culture is sustainability-oriented and sustainability initiatives and strategies, in turn, are embedded in and supported by organisational culture (Engert et al., 2016, p. 2842).

Other drivers of sustainability integration are transparency and communication. Increased transparency can be achieved through internal and external communication, which is why communication is seen as a driver of sustainability integration. While external communication mainly refers to sustainability reporting, internal communication is also important. Only if objectives and measures are communicated clearly employees can understand and trust a sustainability mission statement and strategy (Engert et al., 2016, p. 2841).



This list of factors may not be exhaustive, but it shows that internal organisational drivers are diverse, and their impact may not be underestimated (Engert et al., 2016, p. 2843). Of course, external, market-driven factors also strongly influence the integration of sustainability into business strategy, an example being industry. It is found that companies in low-impact environmental industries show a higher integration of sustainability into their performance management systems than companies in high-impact environmental industries (Zharfpeykan & Akroyd, 2022). Among the many external factors is mandatory ESG reporting (Zharfpeykan & Akroyd, 2022), which is discussed in greater detail in the following chapter.

## **3.2 The Influence of Mandatory ESG Reporting on Company ESG Performance**

After having pictured the variety of factors that can influence the integration of sustainability into business strategy, this chapter aims explicitly to elaborate on the influence of mandatory ESG reporting. Previous studies have mainly focused on the influence of mandatory ESG reporting on company ESG performance rather than business strategy, which is why precisely the impact on ESG performance is discussed in the following.

### **3.2.1 Literature Review**

A growing body of literature is exploring the influence of ESG reporting regulations (Aluchna et al., 2022; Baboukardos et al., 2023; Chen et al., 2018; Christensen et al., 2017; Cicchiello et al., 2023; Cuomo et al., 2022; Downar et al., 2021; Fiechter et al., 2022; Grewal et al., 2019; Ioannou & Serafeim, 2017; Jackson et al., 2020; Lu & Abeysekera, 2021; Ren et al., 2023; She, 2022; Tomar, 2023). Within this stream of literature, different directions can be observed. A large part of the studies focuses on the influence on financial performance and firm valuations (Grewal et al., 2019; Ioannou & Serafeim, 2017; Lu & Abeysekera, 2021), showing that increased ESG disclosure due to imposed regulation positively affects firm valuation (Ioannou & Serafeim, 2017). However, since effects on financial performance do not constitute the research focus of this thesis, this literature stream shall not be further elaborated.

On the contrary, the literature focusing on the 'real effects' of mandatory ESG reporting, meaning resulting changes within companies and in their societal and natural environment (Baboukardos et al., 2023, p. 154), that is, companies' ESG performance, is reviewed more closely for this thesis. As mentioned before, studies concerning the effects of mandatory ESG reporting on business strategy itself are scarce. Nevertheless, business strategy can be seen as the root cause for changes in business performance, hence also ESG performance, and

both aspects are closely related. Therefore, the literature concerning ESG performance is deemed relevant for developing hypotheses.

While many studies specifically focus on the NFRD in the EU (Aluchna et al., 2022; Cicchiello et al., 2023; Cuomo et al., 2022), much of the existing literature also considers other ESG reporting regulations (Baboukardos et al., 2023; Chen et al., 2018; Ren et al., 2023). To broaden the scope of the literature reviewed and include evidence from different regions, literature not explicitly related to the NFRD is also reviewed.

Different streams are observed when considering the studies related to the effects of mandatory ESG reporting on ESG performance. Scholars assess how companies subject to new ESG reporting regulations have commenced social and environmentally oriented activities (Baboukardos et al., 2023, p. 154), specifically concerning green innovation (Ren et al., 2023), the level of CO<sub>2</sub> emissions (Chen et al., 2018; Downar et al., 2021; Tomar, 2023), human rights performance and supply chain due diligence (She, 2022), and employee safety (Chen et al., 2018; Christensen et al., 2017). Other studies investigate how CSR activities have increased overall employing rating agency scores (Cuomo et al., 2022; Fiechter et al., 2022).

Jackson et al. (2020) investigate the effects of the introduction of the NFRD in 24 OECD countries and find an increase in CSR activities of affected companies while levels of corporate social irresponsibility did not decrease. Other studies confirm the observation of increased CSR activities as an effect of the NFRD (Cuomo et al., 2022; Fiechter et al., 2022) and add that also CSR transparency (Cuomo et al., 2022) and CSR infrastructure (Fiechter et al., 2022) have improved. Fiechter et al. (2022, p. 1542) also highlight that this is especially true for companies with previously low levels of CSR engagement. Aluchna et al. (2022) and Cicchiello et al. (2023) come to similar conclusions but apply a different approach. Both studies assess ESG performance in terms of ESG scores and find that ESG performance has increased due to the introduction of the NFRD.

Chen et al. (2018) explore the effects of the introduction of the CSR disclosure legislation in China in 2008. They find that industrial wastewater and CO<sub>2</sub> emissions have decreased in cities where companies affected by the regulation were based. They also detect that, at the same time, companies' profitability has dropped and conclude that the regulation has resulted in positive externalities for society at the cost of firm profitability. Another Chinese study implies that the 2008 CSR disclosure policy has increased green innovation performance (Ren et al., 2023).

Downar et al. (2021) assess the impact of the 2013 carbon disclosure mandate targeting all UK-incorporated listed firms. They find that greenhouse gas emissions were reduced by about 8% compared to a control group of companies unaffected by the law, while gross margins were

unchanged. Tomar (2023) conducts a similar study in the United States based on the 2010 U.S. Greenhouse Gas Reporting Program and confirms the findings by Downar et al. (2021). Tomar detects a reduction in greenhouse gas emissions by 7.9% and finds that benchmarking plays a vital role in emission reduction. However, some studies find that mandatory ESG reporting fails to improve ESG performance. Another UK-based research on the effectiveness of mandatory carbon reporting does not find evidence that the introduction of the regulation has significantly improved emission reduction performance (Tang & Demeritt, 2018).

A study by Christensen et al. (2017) is based on the Dodd-Frank Act in the U.S. mining industry, which requires companies to include mine-safety records in their financial reports. Companies affected by the Act showed a reduced number of injuries but also lower labour productivity. Targeting the social aspect as well, She (2022) detects increased supply chain due diligence regarding suppliers' human rights abuses and improved human rights performance of suppliers after the introduction of a disclosure regulation in California targeting supply chain due diligence. The author further elaborates on the critical role of stakeholder pressure.

The body of literature is growing, but the topic is far from being settled; specifically, literature on the real effects of the NFRD "is still in its infancy" (Cuomo et al., 2022, p. 4). Previous studies investigate the real effects in various areas and show positive as well as negative effects, whereas studies finding positive effects prevail (Cuomo et al., 2022, p. 4). Studies mainly focus on internal firm-level effects; hence, more research is needed regarding impacts on society as a whole (Baboukardos et al., 2023, p. 155).

This thesis aims to contribute to the fragmented body of literature and targets multiple research gaps. The first evident research gap consists in assessing the effects of mandatory ESG reporting on business strategy. The literature so far is only focused on ESG performance. However, improved short-term ESG performance does not necessarily entail a long-term strategic focus on ESG aspects. Hence, an investigation on the integration into business strategy is necessary to properly assess whether the observed improvements in ESG imply a long-term strategic focus on ESG.

Furthermore, existing literature usually takes the NFRD as a basis for investigation. Some studies also focus on specific single-country regulations (Chen et al., 2018; Downar et al., 2021; She, 2022). However, the particular effects of the German CSR-RUG on ESG performance or business strategy based on samples of German companies have yet to be studied sufficiently. This thesis intends to contribute to this research gap. Finally, more specific investigations regarding differences between the ESG categories, potential impact factors and predictions for the CSRD are scarce and call for further study, which is why this thesis also

focuses on these topics. Targeting the identified research gaps, hypotheses are developed in the following chapter.

### **3.2.2 Hypothesis Development**

In light of the presented literature, it becomes evident that the introduction of mandatory ESG reporting has largely induced the question of the effectiveness of such regulation (Cicchello et al., 2023, p. 1124; Cuomo et al., 2022, p. 3). Most studies note a positive relationship between mandatory ESG reporting and ESG performance (Cuomo et al., 2022, p. 4). Much empirical evidence has been developed on that, as was described in the previous chapter (Chen et al., 2018; Downar et al., 2021; She, 2022).

The reasoning behind that is as follows. Since the disclosure regulation results in more information being shared with corporate stakeholders regarding CSR activities, stakeholders are better able to assess corporate commitment to CSR and may base decisions on this (Aluchna et al., 2022, p. 6; Cuomo et al., 2022, p. 4). This may lead to companies being pressured to increase their CSR activities “to signal their stakeholders that they are good performers” (Cuomo et al., 2022, p. 5). Increased CSR activities can also become more attractive to firms since they can use it to improve their positioning among competitors (Cuomo et al., 2022, p. 5).

Considering the first research question of whether mandatory ESG reporting influences business strategy, it is expected that the effects are in line with the effects on ESG performance. If performance in ESG-related activities is significantly improved, it can be assumed that this has been formulated as a strategic goal or at least entered the description of the business strategy in any form. In line with this reasoning, the following first hypothesis is proposed:

*H1: Mandatory ESG reporting leads to increased integration of ESG aspects into business strategy.*

To the best of the author’s knowledge, little literature exists on the particular impact of each ESG category, except for one study that investigates the differences between ESG categories based on Polish companies subject to the NFRD. The authors note a significant impact of mandatory ESG reporting on environmental and social performance, while no significant correlation is detected for governance performance (Aluchna et al., 2022, p. 18).

While this might indicate a similar tendency for the integration of ESG categories into business strategy, the specific circumstances of the study deviate from those of the study of this thesis. Aluchna et al. (2022) focus solely on Polish companies and highlight that they lagged in terms of environmental and social activities compared to other European companies before the

introduction of the NFRD. At the same time, governance aspects were already well-regulated in Poland, leading to lower increases in governance performance compared to environmental and social performance (Aluchna et al., 2022, p. 18).

The study findings are not likely to be reproduced in exactly the same way but generally suggest differences between the categories of ESG. Based on specific circumstances, some categories may increase their appearance in business strategies more heavily than others. Hence, the hypothesis concerning the ESG categories is formulated as follows:

*H1.1: The categories of ESG are integrated into business strategy due to mandatory ESG reporting with varying intensity.*

Many authors analyse how certain internal and external factors or characteristics influence the positive effect of mandatory ESG reporting on ESG performance. Cicchiello et al. (2023), for example, find that ESG rating is positively correlated with Return on Assets (ROA) as a means of profitability, meaning the increase in ESG rating scores due to the NFRD was more significant for firms with higher ROA. At the same time, the effect was stronger for firms with low leverage levels (Cicchiello et al., 2023, p. 1125). Cuomo et al. (2022) argue that large companies possess more resources and can, therefore, better engage with CSR activities. They are, consequently, expected to have conducted such activities already before the implementation of the NFRD. Hence, the effect of the NFRD on ESG performance is stronger for smaller companies (Cuomo et al., 2022, p. 7). The effect is also stronger the higher the level of R&D expenses (Cuomo et al., 2022, p. 10).

Ren et al. (2023) detect that the positive impact of mandatory CSR reporting on green innovation was enhanced by the environmental enforcement intensity, meaning companies located in areas with high government monitoring and enforcement efforts in environmental issues (Ren et al., 2023, p. 580) experienced a more significant effect on green innovation. Furthermore, the effect was stronger for state-owned companies and companies with high media coverage intensity, regardless of whether the tone was positive or negative (Ren et al., 2023, p. 589). She (2022) determines that the increase in supply chain due diligence following the introduction of a respective disclosure regulation was positively affected by pressure from non-governmental organisations, socially conscious shareholders, and customer incentives to use the newly disclosed information (She, 2022, p. 399).

For this thesis, the factors of company size, industry, and media presence are selected for closer analysis of potential impact, representing a mixture of company-specific and external characteristics and being considered relevant and suitable for the study. Since the impact of company size on ESG performance increase due to the NFRD introduction is found to be

negative (Cuomo et al., 2022, p. 7), a similar effect on business strategy can be expected. Consequently, the following hypothesis is formulated:

*H1.2a: The integration of ESG aspects into business strategy due to mandatory ESG reporting is stronger for smaller companies.*

To the best of the author's knowledge, prior studies do not investigate the impacts of industry. Hence, expectations on which industry types enhance the effect cannot be developed. The respective hypothesis is, therefore, formulated openly:

*H1.2b: The integration of ESG aspects into business strategy due to mandatory ESG reporting depends on the industry a company operates in.*

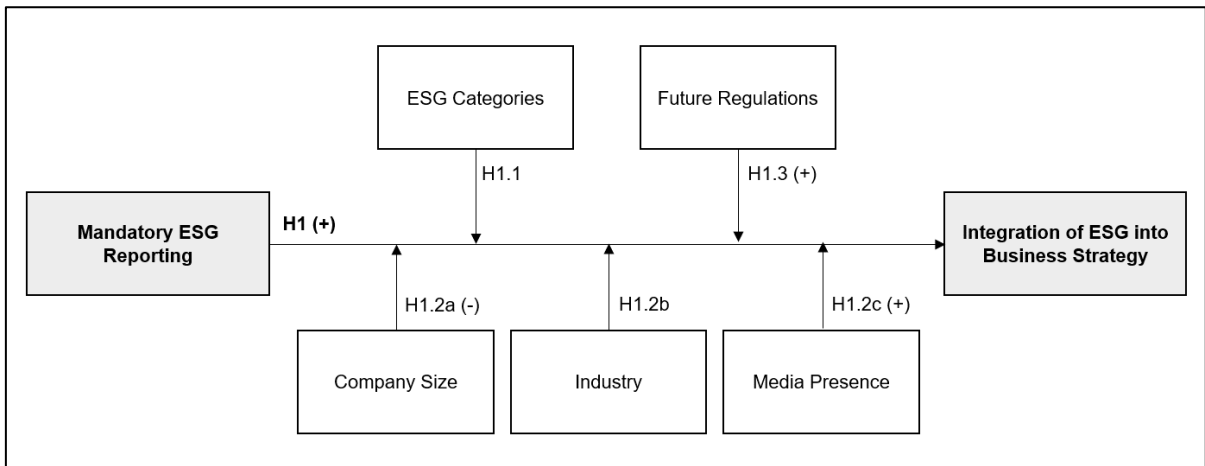
While company size and industry are tangible characteristics, media presence is a rather fuzzy concept. Following the argument that stakeholder pressure may lead to enhanced CSR activities (Cuomo et al., 2022, p. 5), a metric for determining stakeholder pressure should be found. It can be assumed that stakeholder pressure is greater the more present a company is in the media, which is why media presence is deemed a suitable metric. In line with Ren et al. (2023), who suggest that mandatory CSR reporting especially fostered green innovation in companies with high media coverage intensity, the following hypothesis can be proposed:

*H1.2c: The integration of ESG aspects into business strategy due to mandatory ESG reporting is stronger for companies with higher levels of media presence.*

The last research question elaborates on what can be concluded for the introduction of future ESG reporting regulations (specifically the CSRD) regarding their influence on business strategy. Since integration effects are expected to be especially strong for smaller firms, as formulated in H1.2a, Cuomo et al. (2022) argue that the upcoming CSRD regulation, mandating also listed SMEs, will extend the effect on ESG performance. Drawing on this argumentation, a stronger influence on business strategy regarding ESG integration can be expected as well. The following hypothesis is proposed:

*H1.3: The integration of ESG aspects into business strategy will intensify with future ESG reporting regulations (specifically the CSRD).*

Unlike the other hypotheses, H1.3 is not tested with the empirical study, which solely draws on historical data and cannot predict future regulations. H1.3 is instead either confirmed or rejected based on arguments presented in the literature and based on the comparison between both regulations, NFRD (CSR-RUG) and CSRD, done in Chapter 2.4. An overview of the conceptual model, including all hypotheses, is provided in **Figure 2**.



**Figure 2:** Conceptual model with hypotheses (Source: Author's own).

## 4. Methodology

The following chapter explains the research design of the empirical study, which targets the research gaps identified in the previous chapter. The study's overarching aim is to determine how the introduction of an ESG disclosure regulation affects the existence and frequency of ESG-related content in business strategies. In the following, it is explained how the study is designed to achieve this aim. The study employs a quantitative content analysis to answer the research questions.

### 4.1 Scope, Sample and Data Collection

The scope of the study is based on the enactment of the CSR-RUG. As previous chapters have shown, this legislation constitutes an important milestone in the development of mandatory ESG reporting in Germany. Consequently, it serves as a suitable framework for the intended investigation. To study the effects of this framework, the period from 2016 to 2019 is analysed. With the CSR-RUG coming into effect in fiscal year 2017, the period includes one year without the impact of the regulation (2016), one year during which the regulation came into effect (2017), and two years after the enactment (2018-2019). This allows for comparisons between the regulated and unregulated environment, and slightly delayed effects are also represented.

The sample consists of German companies that were members of German DAX from 2016 to 2019 (Qontigo, 2024). During that period, German DAX consisted of 30 companies, which are considered the largest and most important publicly traded companies in Germany. For better comparability, however, only permanent members of German DAX between 2016 and 2019 are considered, reducing the sample size to 27 companies.

Next, only companies subject to the CSR-RUG can be considered for the study, which is why an applicability check is conducted. To determine which companies fall under the scope of the CSR-RUG (as was described in Chapter 2.3.1), the relevant data, that is, number of employees, balance-sheet sum, and annual sales, is collected from the companies' annual reports. Since all companies published their business strategy as part of the combined management report, meaning on the group level, and published non-financial group statements or reports, the data is collected for the groups instead of the single companies. All 27 companies, being listed in the German DAX, are naturally capital market oriented. Furthermore, all groups employed on average more than 500 employees per year, had annual sales higher than € 40 million and a balance-sheet sum higher than € 20 million within the



considered timeframe. Hence, all 27 companies (groups) fall under the scope of the CSR-RUG. A summary of this applicability check is provided in Appendix 2.

Most companies define their fiscal year starting on January 1 and ending on December 31. However, Infineon Technology and Siemens have fiscal years starting on October 1 and ending on September 30. Consequently, the CSR-RUG only applied to these companies from fiscal year 2018. Shifting the analysis timeframe to 2017 to 2020 would mitigate the differences; however, comparability with the other companies would still be limited since the existence of the CSR-RUG and the resulting new practices of competitors might have impacted the two companies already in 2017. To avoid this uncertainty in terms of comparability, Infineon Technology and Siemens are excluded from the sample, reducing the sample size to 25 companies.

Some companies adopted strategies with a fixed timeframe. Assuming that major adjustments in business strategy would only be made in conjunction with the presentation of the new strategy, this is accounted for by adjusting the analysed timeframe. The timeframe is not modified in case the change of strategy took place between 2016 and 2019 since the strategic changes are represented in the regular timeframe. However, four companies (Adidas, BMW, Fresenius Medical Care, and Henkel) adopted business strategies in 2016 or earlier, which were applicable until 2020, meaning the new strategy was only presented in 2020. To include the potentially large changes, the year 2020 is additionally analysed for the four companies. These companies are hereinafter called “5y companies”, whereas companies with a regular analysis timeframe are named “4y companies”. Deutsche Post and Volkswagen had a similar timeframe but replaced their strategies early or made major adjustments already before 2020, which is why the regular analysis timeframe of 2016 to 2019 is not extended in these cases.

With four years to be analysed for 21 companies and five years to be analysed for four companies, the number of reports to be analysed, that is, the number of observations, sums up to 104 reports. The sample selection process is summarised in **Table 2**.

**Table 2:** Sample selection for quantitative analysis (Source: Author's own).

<b>Step</b>	<b>Sample Size*</b>	<b>Observations**</b>
All firm-years of DAX 30 companies over 2016-2019	30	120
After excluding non-permanent DAX 30 companies	27	108
After excluding companies not subject to CSR-RUG	27	108
After excluding companies with differing fiscal year	25	100
After accounting for fixed strategic timeframes	<b>25</b>	<b>104</b>
	<i>*Number of companies included</i>	
	<i>**Number of reports to be analyzed</i>	

The data collection process consists of the collection of the annual reports containing the description of the business strategy. All companies described their strategy as part of the combined management report, except for BMW, which disclosed the business strategy exclusively in the CSR report. Münchener Rück did not disclose their business strategy explicitly as an identifiable chapter; hence, the chapter “Group Structure” is analysed instead, being closest to a description of business strategy. Similarly, Linde did not disclose its business strategy in 2018 and 2019. Since strategic aspects were, however, mentioned in the Letter to Shareholders, this Letter is analysed instead.

The standardised process of retrieving and preparing the text corpuses includes the following steps. First, the respective annual reports (containing the combined management report and descriptions of business strategies) are downloaded as PDF files from the corporate websites. For simplicity, the sources are summarised in Appendix 1 and not cited throughout the text. Next, the relevant parts describing the business strategy are identified, extracted and copied into a separate Word file. The Word files are checked for line breaks, and if necessary, line breaks are manually removed because otherwise, the analysis software would not be able to identify the respective word. Finally, a corpus containing all 104 Word files is created in the analysis software.

## **4.2 Quantitative Content Analysis**

Drawing on existing literature on quantitative content analysis (Baier et al., 2020; ESMA, 2022), a word list is created based on which the existence and frequency of ESG-related content can be determined. In a sophisticated process incorporating various steps, Baier et al. (2020) developed an exhaustive ESG word list containing 491 words. Being used as a basis for other studies (ESMA, 2022), the word list is considered a meaningful and reliable source. To match the list with the intended research design, the original word list by Baier et al. is collated with the sample at hand, creating an extract of 197 words which actually occur in the sample.

Subsequently, the words are structured in three separate, category-based lists. Baier et al. (2020) already provide this categorisation into environmental, social, and governance. Each category word list is manually adjusted, meaning “duplicates” are deleted as a first step. For example, the list contained both words “environment” and “environmental”, which can later be combined with the search term “environment\*”. Hence, the term “environmental” was erased from the list, allowing for a wider variety of final key words. Further adjustments include the removal of words like “sustainability” and “responsibility” since they are to be understood in a general ESG context and are therefore assigned to a separate, superordinate category called “X”. Words that do not exclusively indicate ESG context (“control”, “review”, “independent”) and

might even be related to the core business of single companies (“coal”, “health”, “medicine”), are removed as well. To further increase the variety of final key words, words that are usually used conjunctly (e.g., “carbon” and “footprint”) are also removed. More precisely, the word occurring less frequently in the sample is eliminated. The remaining words are finally ranked according to their frequency within the sample, and for each category (E, S and G), the ten most frequent words are selected as key words. The general “X” category consists of three key words.

**Table 3:** Final word list for quantitative analysis (Source: Author's own).

<b>Category</b>	<b>Search Term</b>	<b>Key Word</b>	<b>Related Words</b>
<b>X</b>	<i>sustainab*</i> <i>responsib*</i> <i>ESG</i>	<b>sustainability</b> <b>responsibility</b> <b>ESG</b>	sustainable, sustainably responsible, responsibly
<b>E</b>	<i>climate</i> <i>emission*</i> <i>environment*</i> <i>renewabl*</i> <i>wind</i> <i>footprint</i> <i>resource*</i> <i>solar</i> <i>waste*</i> <i>water</i>	<b>climate</b> <b>emissions</b> <b>environment</b> <b>renewable</b> <b>wind</b> <b>footprint</b> <b>resource</b> <b>solar</b> <b>waste</b> <b>water</b>	emission, emission-free environmental, environmentally renewables  resources  wasted, wastewater
<b>S</b>	<i>people</i> <i>societ*</i> <i>social*</i> <i>safe*</i> <i>diversity</i> <i>human*</i> <i>communit*</i> <i>women</i> <i>training*</i> <i>labour AND labor</i>	<b>people</b> <b>society</b> <b>social</b> <b>safety</b> <b>diversity</b> <b>human</b> <b>communities</b> <b>women</b> <b>training</b> <b>labor</b>	societal, societies socially safe, safer, safely, safeguard, safeguarding  humanity, humanitarian, humans community trainings labour
<b>G</b>	<i>leadership</i> <i>cultur*</i> <i>stakeholder*</i> <i>integrity</i> <i>complan*</i> <i>governance</i> <i>talent*</i> <i>engage*</i> <i>skill*</i> <i>conduct</i>	<b>leadership</b> <b>culture</b> <b>stakeholders</b> <b>integrity</b> <b>compliance</b> <b>governance</b> <b>talent</b> <b>engagement</b> <b>skills</b> <b>conduct</b>	cultures, cultural stakeholder  compliant  talents, talented engage, engaged skilled

The described approach results in a final word list of 33 key words, presented in **Table 3**, which also shows how the key words are translated into search terms to include related words. For example, the key word “human” is translated into the search term “human\*” to include “humans”, “humanity”, and “humanitarian”.

After screening the existing tool landscape, Anthony's tool, “AntConc”, proved suitable for conducting the quantitative content analysis (Anthony, 2023). As described before, AntConc is first used to generate a corpus of all text excerpts containing strategy descriptions. Having loaded this corpus into AntConc, the function “Plot” is used to run analyses for each predefined search term. The analysis is conducted case-insensitive, meaning capitalisation does not impact the results. AntConc provides the absolute frequency of each search term per file contained in the corpus and the total number of tokens (i.e., words) per file. This data is extracted from AntConc and collated in an Excel spreadsheet. Based on this spreadsheet, the data is further analysed, evaluated, and interpreted.

**Table 4:** Industry and sector assignment of sample companies (Source: Author's own based on Boerse.de, 2023).

Industry	Sector	Companies
Chemicals, Pharmaceuticals, Bio- and Medical Engineering	Chemicals	BAS, BAY
	Pharmaceuticals	ME
	Healthcare	FRM, FR
Finances	Insurance	MR, ALL
	Financial Services	DBO
	Banking	DB
Other	Automotive and Other Motor Vehicles	BMW, DAI, VW
	Construction and Construction Supplier	HEI
	Automotive Supplier	CO
	Engineering	LIN
Supply, Environment and Infrastructure	Energy	RWE, EON
	Traffic, Transport and Logistics	DP, LH
	Real Estate	VO
Technology	Software	SAP
	Telecommunication	DTK
Trade and Consumer Goods	Consumer Goods	ADI, HE, BEI

For testing hypotheses H1.2a, H1.2b, and H1.2c relating to differences between company size, industry, and media presence, the sample companies must be clustered. For determining company size, the data collected during the applicability check for CSR-RUG, that is, data on employees, annual sales, and balance-sheet sum, is used. Averages of the years 2016 to 2019 are taken, and each metric of size is tested separately for correlation with ESG integration through a regression analysis. To determine potential differences between industries, each

sample company is assigned an industry and a more specific sector (Boerse.de, 2023), as shown in **Table 4**.<sup>2</sup>

To analyse the correlation between media coverage and ESG integration into business strategy, a study conducted by “Brandwatch” in 2017 is used. This study investigates the online and social media presence of the DAX 30 companies by analysing the number of online and social media posts mentioning the company name between April 1 and May 15, 2017 (Grün & Engelland, 2017). Once again, the correlation is tested with a regression analysis. For all statistical tests, a significance level of 5% is assumed.

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<sup>2</sup> Abbreviations are used for company names. The assignment of the abbreviations to the full company names can be understood with Appendix 2.

## 5. Findings and Discussion

In the following chapter, the results of the quantitative content analysis are presented with reference to the research questions and hypotheses. The results are directly interpreted, discussed, and related to the findings from the literature.

### 5.1 General Influence of Mandatory ESG Reporting on Corporate Strategy

Before presenting the results concerning the first research question, a descriptive overview of the generated dataset is provided. The key metric used throughout the analysis is “Key Word Hits” (hereinafter called KWH), which states how often the predefined key words from the word list (as in **Table 3**) appear in a text. Usually, KWH is presented as a share of total tokens, that is, the number of words identified by AntConc, to account for the varying length of the strategy descriptions. Hence, the relative frequency of ESG-related words is used, called relative KWH.

*Table 5: Absolute and relative KWH per company and category (Source: Author's own).*

Company	Total Tokens	Key Word Hits (KWH)				Abs. KWH	Rel. KWH
		X	E	S	G		
<b>BMW</b>	9,030	162	79	73	34	<b>348</b>	0.0385
<b>BAS</b>	8,704	102	58	90	66	<b>316</b>	0.0363
<b>ADI</b>	18,101	43	26	93	122	<b>284</b>	0.0157
<b>RWE</b>	16,442	36	207	15	14	<b>272</b>	0.0165
<b>HE</b>	6,857	89	73	38	46	<b>246</b>	0.0359
<b>DAI</b>	19,682	39	40	84	74	<b>237</b>	0.0120
<b>VW</b>	6,830	44	47	42	69	<b>202</b>	0.0296
<b>SAP</b>	7,408	29	51	70	42	<b>192</b>	0.0259
<b>ME</b>	15,480	33	30	70	57	<b>190</b>	0.0123
<b>MR</b>	9,955	65	30	41	24	<b>160</b>	0.0161
<b>BAY</b>	6,669	53	44	47	5	<b>149</b>	0.0223
<b>BEI</b>	9,823	57	16	22	42	<b>137</b>	0.0139
<b>HEI</b>	4,176	40	19	30	35	<b>124</b>	0.0297
<b>EON</b>	5,527	32	57	17	7	<b>113</b>	0.0204
<b>DTK</b>	11,584	25	17	25	19	<b>86</b>	0.0074
<b>DBO</b>	5,385	46	12	12	10	<b>80</b>	0.0149
<b>DB</b>	8,865	11	39	5	9	<b>64</b>	0.0072
<b>DP</b>	5,010	15	9	19	21	<b>64</b>	0.0128
<b>LH</b>	7,248	24	18	10	4	<b>56</b>	0.0077
<b>CO</b>	6,724	17	6	8	22	<b>53</b>	0.0079
<b>FRM</b>	4,273	25	4	5	12	<b>46</b>	0.0108
<b>ALL</b>	1,788	5	3	6	20	<b>34</b>	0.0190
<b>VO</b>	7,210	8	13	1	0	<b>22</b>	0.0031
<b>LIN</b>	2,088	3	7	3	5	<b>18</b>	0.0086
<b>FR</b>	2,650	2	0	12	0	<b>14</b>	0.0053
<b>SUM</b>	<b>207,509</b>	<b>1005</b>	<b>905</b>	<b>838</b>	<b>759</b>	<b>3,507</b>	<b>0.0169</b>

Without analysing the development over time, **Table 5** summarises KWH in absolute and relative terms per company and category between 2016 and 2019 (2020 for the special cases, see Chapter 4.1). It shows that the top-performing companies in terms of absolute frequency of KWH are BMW, BASF, and Adidas. The absolute frequency of KWH per company varies between 348 (BMW) and 14 KWH (Fresenius), while the relative frequency lies between 0.0385 (BMW) and 0.0031 (Vonovia). Words from Category X appeared most prominently, followed by Category E.

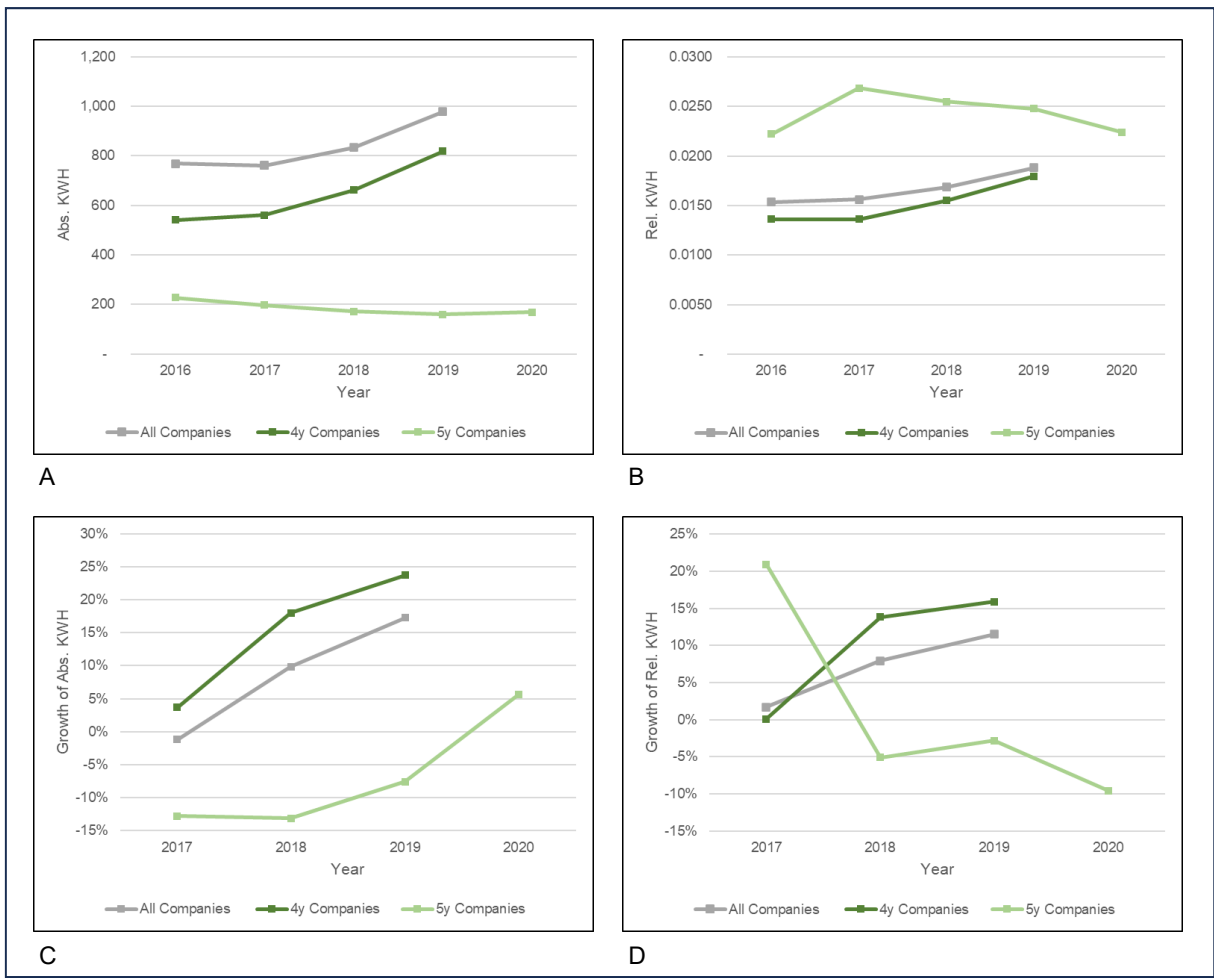
The main research question, RQ1, asks whether mandatory ESG reporting influences business strategy. More specifically, the question is whether introducing ESG reporting regulation leads to increased ESG-related content in the business strategy. To investigate this general relationship, H1 is formulated, which suggests a positive relationship between mandatory ESG reporting and ESG integration into business strategy.

Indeed, the study shows that the relative frequency of KWH, considering all companies together, has grown from 0.0154 in 2016 by 22.4% up to 0.0188 in 2019 (see **Figure 3-B**). This finding indicates that the hypothesis might be true. Interestingly, the growth only really started in 2018. While the relative frequency had almost stagnated in 2017 compared to 2016, it grew by almost 8% in 2018 and roughly 11.5% in 2019 (see **Figure 3-D**).

With the CSR-RUG becoming effective in 2017, major growth could have been expected in 2017. Apparently, the adjustments in business strategies were delayed by one year. Companies were probably occupied with complying with the newly introduced reporting regulation first and did not have the capacity to integrate the newly reported topics into business strategy right away. Another reason might be that companies preferred first to gain some experience in reporting under the CSR-RUG and to develop an understanding of which aspects of ESG were of particular relevance to them. Apart from that, literature confirms that there are various tensions in strategic ESG integration (Siltaloppi et al., 2021, p. 509).

When comparing 4y and 5y companies, large differences become apparent. Considering only companies with the regular timeframe from 2016 to 2019 (4y companies), the relative frequency of KWH has even grown by 32% and, similarly to the numbers for all companies together, growth started in 2018 only (see **Figure 3-B, 3-D**).

However, 5y companies differ largely: While their relative frequency of KWH is generally higher, it has almost stagnated when comparing 2016 (0.0222) and 2020 (0.0224) (see **Figure 3-B**). In fact, the relative frequency of KWH has grown by almost 21% in 2017, followed by negative growth from 2018 to 2020 (see **Figure 3-D**). The high growth in 2017 is mainly related to a substantial decrease in total tokens, meaning the strategy descriptions have been shortened drastically in 2017.

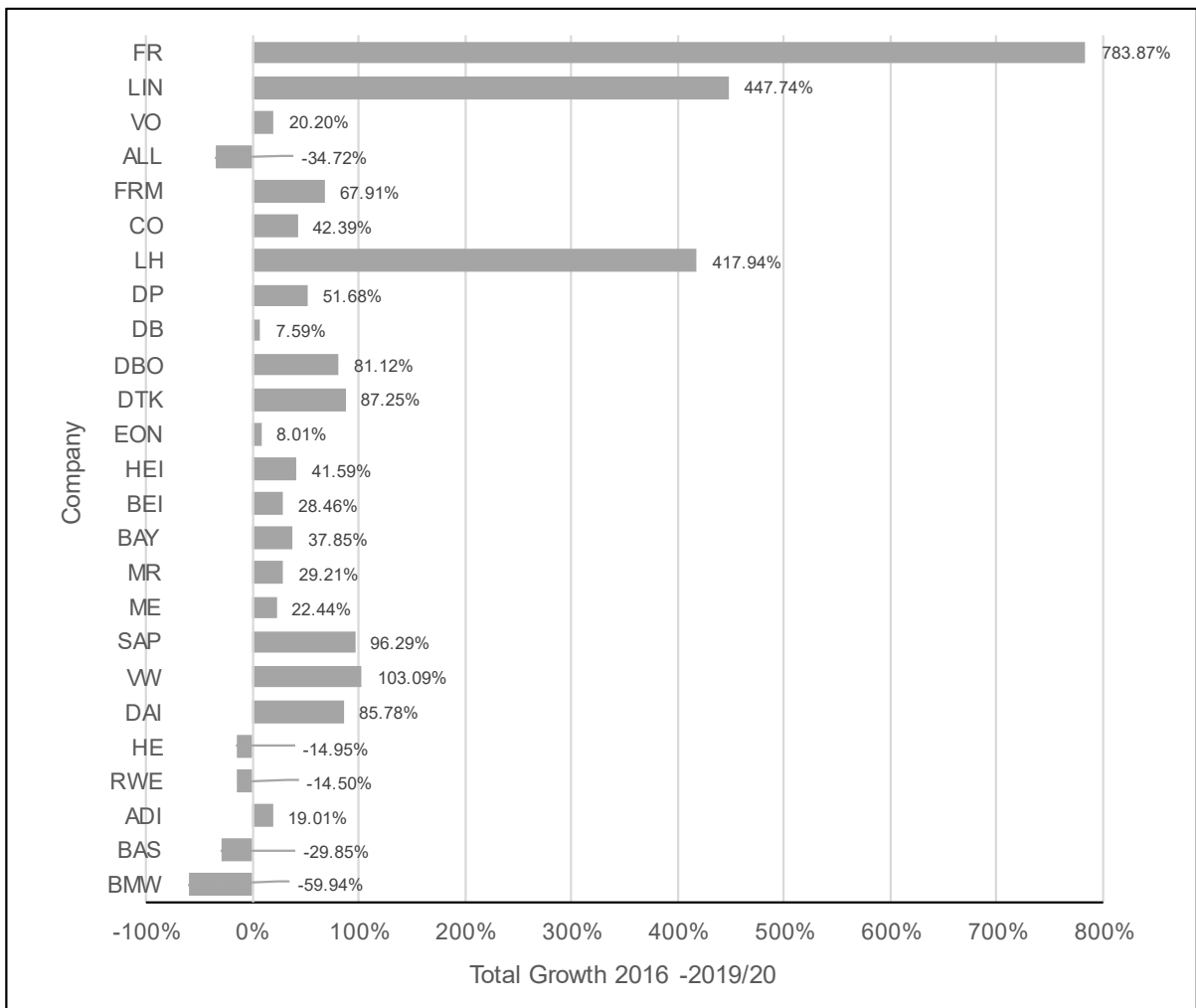


**Figure 3:** A: Absolute development of KWH. B: Relative development of KWH. C: Growth of absolute KWH. D: Growth of relative KWH. (Source: Author's own).

The general decreasing trend in 5y companies can be explained by analysing the included companies more closely. Two of the four 5y companies are BMW and Henkel, which have decreased their relative frequency of KWH from 2016 to 2020 by about 60% and 15%, respectively and therefore greatly influence the overall development of 5y companies. Both companies belong to the top performers in terms of relative frequency of KWH. Naturally, companies with high ESG integration levels have a lower growth potential than companies with weaker ESG integration.

The expected increase in KWH for 5y companies in 2020, due to the new strategy presentations, is only visible in absolute frequencies, with KWH growing from 159 in 2019 by 5.66% to 168 in 2020 (see **Figure 3-A, 3-C**). Considering the length of the strategy descriptions, no growth in relative KWH can be detected. Concluding that companies with fixed strategic programmes generally differ in ESG integration would be a wrong generalisation since the sample of 5y companies is too small.





**Figure 4:** Growth of relative KWH per company (Source: Author's own).

**Figure 4** displays the growth of relative KWH per company. The calculation of these growth rates can be reviewed in Appendix 3. The largest increase is seen for Fresenius, Linde, and Lufthansa. It must, however, be considered that these companies presented the overall lowest absolute KWH of 2, 1, and 3, respectively, in 2016. Therefore, the abnormally high growth rates were achieved easily and cannot be interpreted as a strong performance increase. These companies are treated cautiously in further analyses and even eliminated as outliers, where necessary. On the other hand, the weakest growth rates are detected for BMW, Allianz, and BASF, with decreases of 59.94%, 34.72%, and 29.85%, respectively. Apart from them, only Henkel and RWE show negative growth rates of about 15%.

The presented data provides evidence for the acceptance of hypothesis H1, proving that mandatory ESG reporting regulation leads to increased integration of ESG aspects into business strategy. Although it does not hold for all companies, the general relationship is evident since relative KWH grew by 22.4% from 2016 to 2019, considering the total sample.

Looking only at 4y companies, relative KWH increased even by 32%. Consequently, hypothesis H1 is accepted.

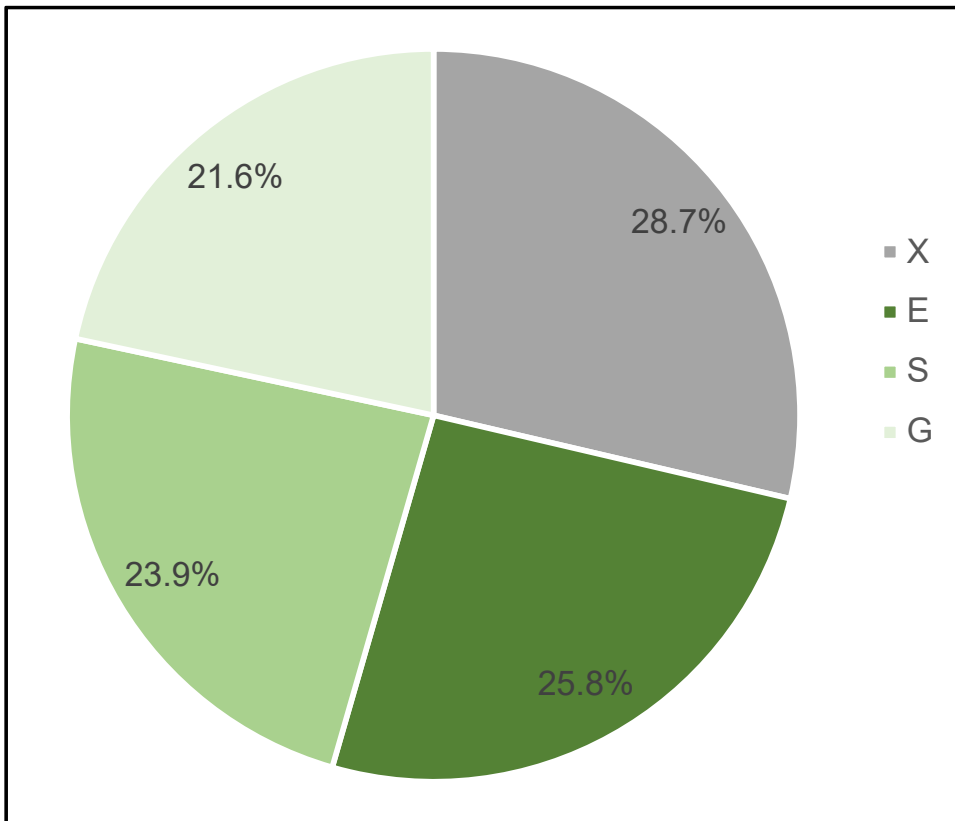
It goes in line with the existing literature, which finds that ESG performance in terms of CSR activities has improved due to the introduction of the NFRD (Cuomo et al., 2022, p. 4; Fiechter et al., 2022, pp. 1541–1542; Jackson et al., 2020, p. 24). Also, the literature stream discussing ESG performance in terms of ESG scores and its increase following the introduction of the NFRD (Aluchna et al., 2022; Cicchiello et al., 2023) is in line with the results. The study also confirms Fiechter et al.'s (2022, p. 1542) findings, which state that the NFRD has particularly impacted companies with previously low levels of CSR engagement.

It can be questioned whether solely the introduction of the CSR-RUG has caused the increase in ESG integration, especially since the increase was somewhat delayed. Other factors have likely contributed to the increase as well, as discussed in Chapter 3.1. External sociocultural factors like growing societal awareness for ESG topics and the general trend towards more corporate CSR have presumably impacted the result (Helfaya et al., 2023, p. 1). Internal factors like changed manager attitude or organisational culture might have also affected ESG integration, as Engert et al. (2016, pp. 2841-2842) have discussed. A more comprehensive study accounting for additional impact factors would be needed to determine reliably how much the introduction of the CSR-RUG has contributed to the growth of ESG aspects in business strategy.

## 5.2 Differences Among ESG Categories

RQ1.1 asks how the influence on business strategy varies between the different ESG categories. In other words, which categories are predominantly increasing in business strategy descriptions with the introduction of ESG reporting regulation? The respective hypothesis H1.1 is formulated neutrally and solely suggests varying integration intensity between ESG categories.

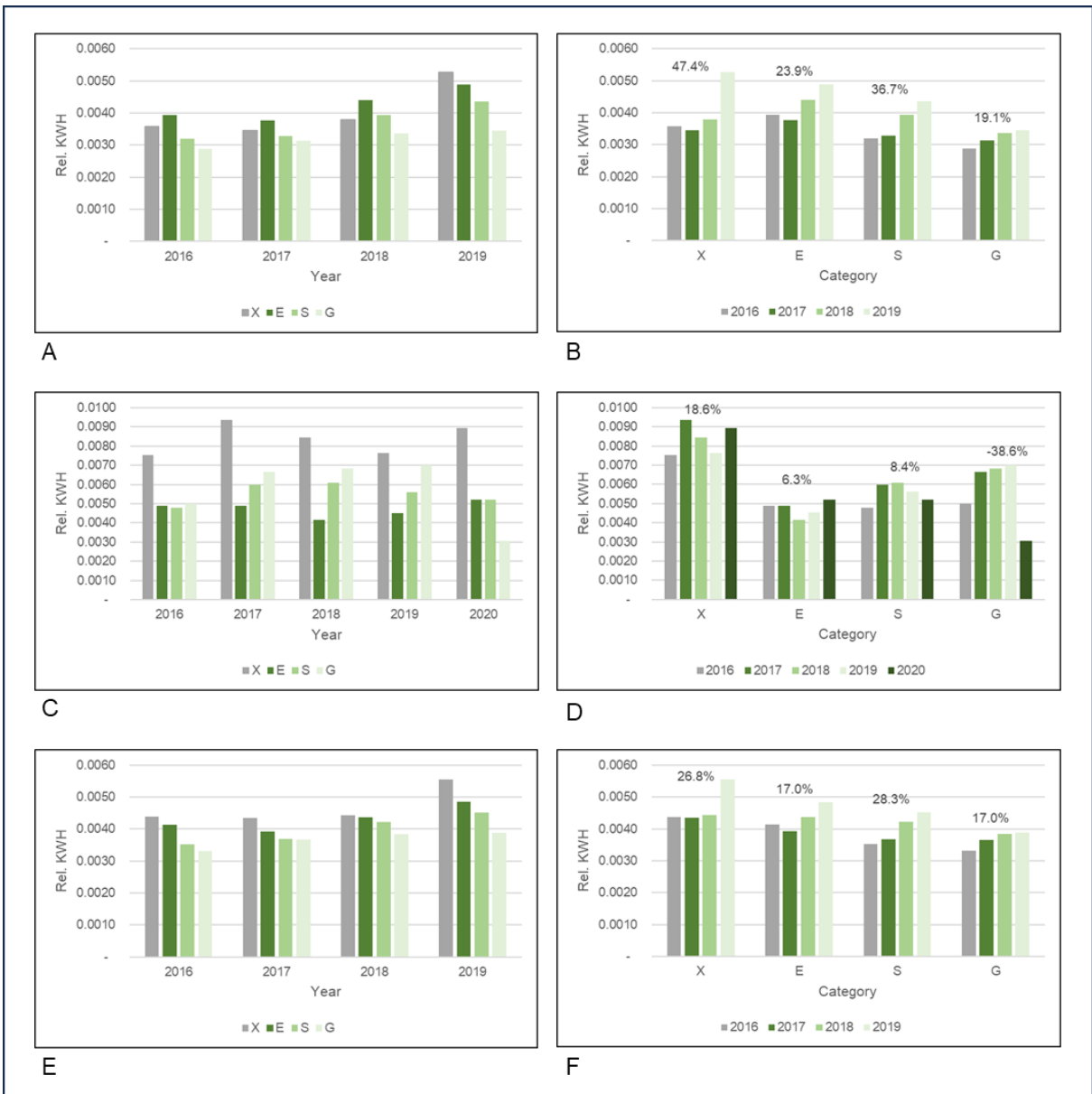
Indeed, the quantitative analysis reveals differences between the ESG categories. Without considering the development over time yet, each category's absolute frequency is depicted in **Figure 5**. It shows that categories X (General, 28.7%) and E (Environmental, 25.8%) are addressed slightly more frequently in strategy descriptions, followed by S (Social, 23.9%) and G (Governance, 21.6%).



**Figure 5:** Absolute distribution of ESG categories. (Source: Author's own).

However, to answer RQ1.1, the development over time is of interest, and here, more significant differences manifest. **Figure 6-A to 6-F** show how the different categories of ESG have developed within the considered timeframe. Again, the data is presented for 4y companies, 5y companies, and combined. As **Figure 6-A** shows, for 4y companies, category E was prevalent until 2018, showing that environmental topics were addressed more often than others. In 2019, category X became the most frequently mentioned category, while the other categories had still grown, signalling an increasing focus of business strategy on ESG generally.

For 5y companies, category X was by far the most relevant category, category E was comparably weak, and category G was relatively strong (**Figure 6-C**). This could imply that the 5y companies did address ESG rather generally without discussing specific topics in detail. 5y companies seem to have put more weight on governance and, interestingly, less on environmental topics. Taking all companies together, category X was the most frequently used category as well; however, the other categories did not lag much, and category E was the second-most used category. The difference in frequency between the categories seems to increase from 2018 to 2019 (**Figure 6-E**).



**Figure 6:** A: Development of relative KWH per year for 4y companies. B: Development of relative KWH per category for 4y companies. C: Development of relative KWH per year for 5y companies. D: Development of relative KWH per category for 5y companies. E: Development of relative KWH per year for all companies together. F: Development of relative KWH per category for all companies together. Values in % represent growth rates. (Source: Author's own).

This is interesting, considering that the CSR-RUG was applicable from 2017, and major changes in patterns could have been expected in that year. It is likely that it took one or two years for the effects to appear in the business strategies. As already mentioned in Chapter 5.1, when discussing the delay in growth of relative KWH, reasons for this could be that companies did not have the capacity to integrate the newly reported topics into business strategy right away or that companies preferred first to develop an understanding on which aspects of ESG were of particular relevance for them. Tensions in ESG integration are manifold, as is also discussed in the literature (Siltaloppi et al., 2021, p. 509).

Looking at the development per category, for 4y companies, the most significant growth can be seen for category X (47.4%), mainly from 2018 to 2019, as seen in **Figure 6-B**. This is followed by category S, which grew by 36.7% but seemingly more steadily throughout the years. The lowest growth was visible for category G (19.1%).

As presented in **Figure 6-D**, 5y companies show the same ranking of categories, with X having the largest growth (18.6%) and G the lowest (-38.6%). Compared to 4y companies, the growth rates are generally lower, and the growth of category X deviates more significantly from the other categories.

For all companies combined (**Figure 6-F**), it can be seen that although X was the most frequently used category, S showed the highest growth between 2016 and 2019 (28.3%), closely followed by category X with 26.8% growth. Categories E and G had a lower growth of 17% each. Hence, social topics were increased especially, while environmental and governance topics did increase less. Also, the general mentioning of ESG in business strategies increased.

In answer to the research question, it can be summarised that especially the social category has grown largely during the analysed timeframe, meaning the CSR-RUG has led companies to focus particularly on social topics. In contrast, the environmental and governance categories seemed less affected by the introduction of the CSR-RUG. The general category X also showed significant growth, especially when looking at 4y and 5y companies separately. This signals that ESG generally became more relevant in strategy descriptions with a particular focus on social aspects. Hypothesis H1.1, suggesting differences between the ESG categories, can, therefore, be accepted.

## 5.3 Differences Among Company Clusters

To further analyse the relationship between ESG integration into business strategy and the introduction of the CSR-RUG, RQ1.2 is posed, which asks how the influence varies between different company clusters. The characteristics of company size, industry, and media presence are investigated as potential factors influencing the relationship.

### 5.3.1 Company Size

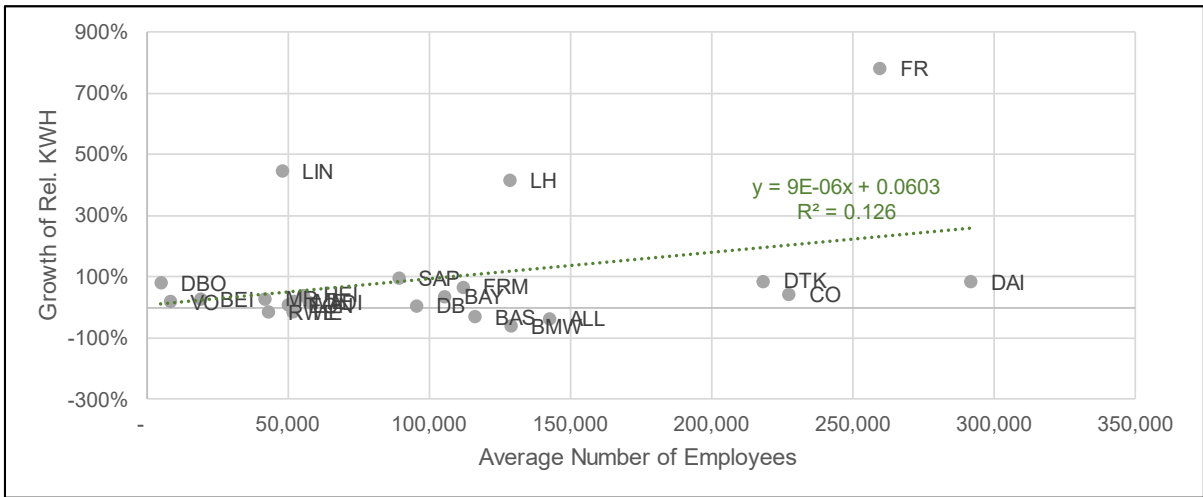
Regarding company size, hypothesis H1.2a suggests that the integration of ESG aspects into business strategy due to mandatory ESG reporting is stronger for smaller companies. To test this hypothesis, three regressions are conducted. As dependent variable, the growth of relative KWH per company (see **Figure 4**) is used for all three tests. The dependent variable is

regressed separately against three variables indicating company size. Test 1 investigates the relationship between the growth of relative KWH and the average number of employees, Test 2 between growth of relative KWH and average annual sales, and Test 3 between growth of relative KWH and average balance-sheet sum. As described in Chapter 4.2, the data on employees, annual sales and balance-sheet sum from 2016 to 2019 is averaged for each company and then used as independent variables.

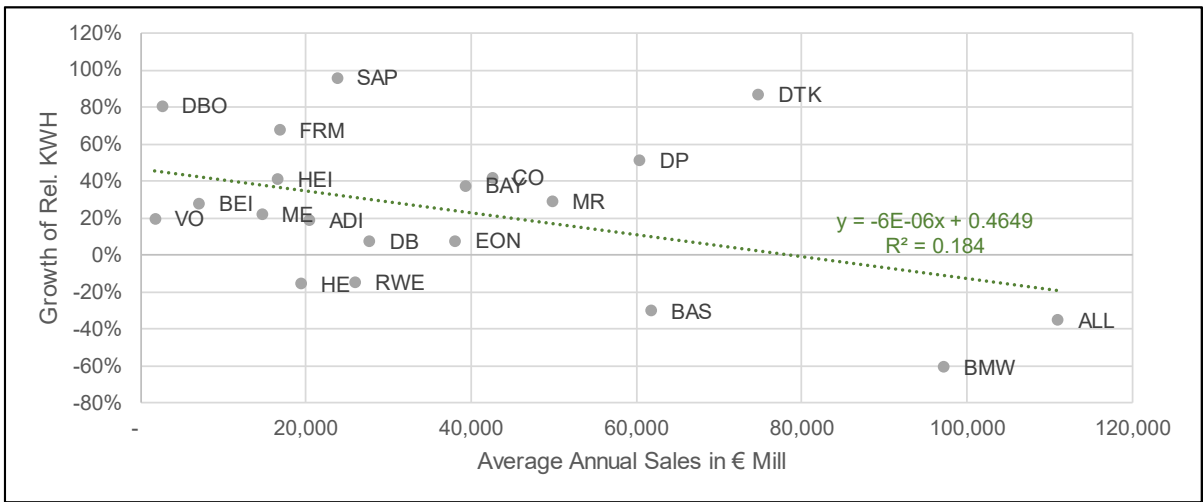
The summary statistics for Tests 1 to 3 are shown in Appendix 4, and the corresponding scatter plots are displayed in **Figure 7, Figure 8 and Figure 9**. In fact, none of these tests show strong results. To better display the relationships, values that greatly deviate (i.e., outliers) are removed from the sample. For Test 1, this concerns Deutsche Post and Volkswagen, which employed significantly more people than the other sample companies. For Test 2, Daimler and Volkswagen are eliminated, interestingly, both from the automotive industry, since their average annual sales are much higher than those of the other companies. For Test 3, Deutsche Bank and Allianz are removed from the sample, showing significantly larger balance-sheet sums, which makes sense considering their affiliation with the financial industry and the fact that the corresponding business models naturally result in large balance-sheet sums (Kapan & Minoiu, 2018, p. 2). Apparently, industry-specific characteristics play a major role, which are discussed in the following chapter.

Additional outliers eliminated in Tests 2 and 3 are Lufthansa, Linde, and Fresenius. These companies do not deviate in terms of company size but in terms of growth of relative KWH. As discussed in Chapter 5.1, the growth rates of more than 400% are abnormal and not comparable with the other companies since the absolute KWH are very low (below 10). Consequently, these companies are identified as outliers and eliminated.

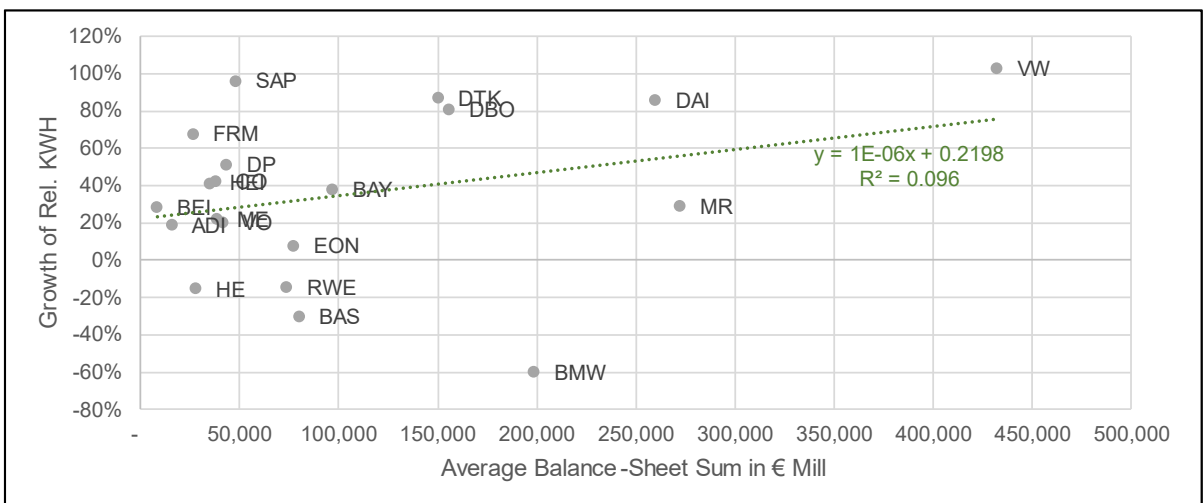
Even after eliminating outliers, the results are insignificant on the pre-determined 5% significance level. Tests 1, 2, and 3 produce p-values of 0.096, 0.059, and 0.184 respectively. Since the sample size is very small ( $n=23$  for Test 1 and  $n=20$  for Test 2 and Test 3), it could be argued that a 10% significance level may be appropriate, which would result in Tests 1 and 2 being significant. However, this comes with a higher probability of errors, which is why the significance level is not lifted and remains at 5%. Consequently, all three tests can theoretically not be further analysed since significance is crucial for further analysis. Nevertheless, a brief analysis of the most significant test is conducted.



**Figure 7:** Test 1 - Growth of relative KWH vs. average number of employees (Source: Author's own).



**Figure 8:** Test 2 - Growth of relative KWH vs. average annual sales (Source: Author's own).



**Figure 9:** Test 3 - Growth of relative KWH vs. average balance-sheet sum (Source: Author's own).

The test with the lowest p-value (0.059, marginally exceeding the 5% significance level) is Test 2, which analyses the relationship between growth of relative KWH and average annual sales (**Figure 8**). Hence, annual sales seems to be the metric influencing ESG integration into business strategy the most. If Test 2 would be considered significant, the  $R^2$  (coefficient of determination) of 0.184 suggests that annual sales explain 18.4% of the variation in growth of relative KWH.

This is a relatively low percentage, which is not surprising since, clearly, other factors influence both annual sales and ESG integration into business strategy (Engert et al., 2016), as discussed in Chapter 5.1. This is especially true given the diversity of the sample companies in terms of business model, structure, and industry. The correlation in Test 2 is negative, which suggests that H1.2a is true, and especially smaller companies, in terms of annual sales, experience higher growth of relative KWH, that is, higher growth in ESG integration into business strategy due to ESG reporting regulations.

This would go in line with existing literature, which argues that the effects of ESG reporting regulations on ESG performance are stronger for smaller companies because larger companies possess more resources and are, therefore, expected to have conducted such activities already before the implementation of the regulation (Cuomo et al., 2022, p. 7). As argued in Chapter 3.2.2, ESG performance can, to some extent, be expected to translate into ESG integration into business strategy. Consequently, the result of Test 2, if considered significant, would confirm the evidence from the literature.

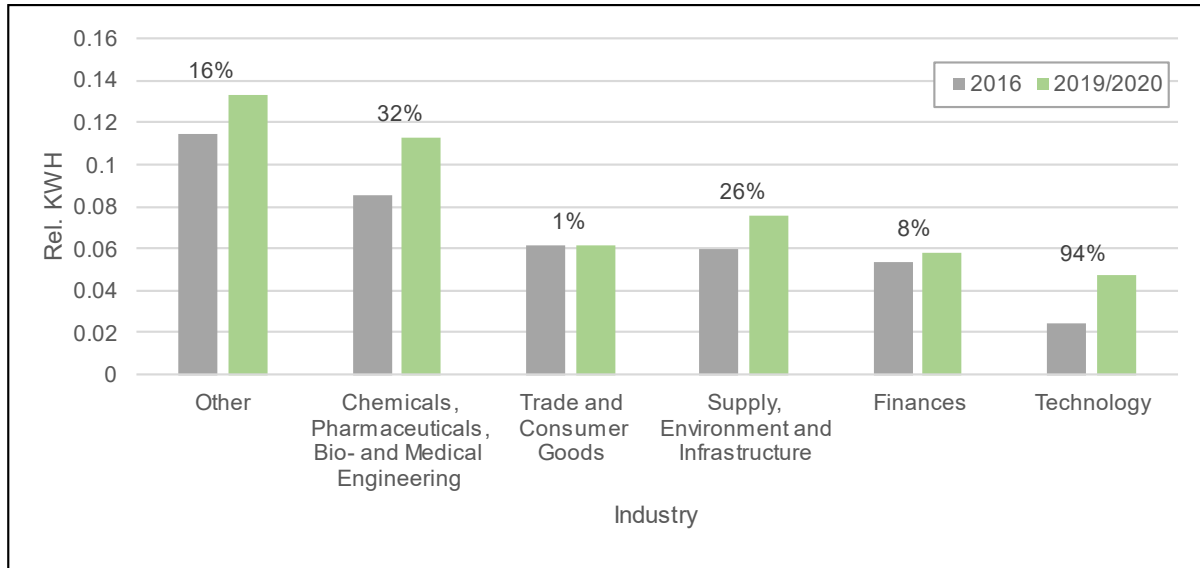
On the contrary, Tests 1 and 3 imply a positive correlation between growth of relative KWH and company size, as seen in **Figure 7 and Figure 9**. A thorough interpretation of this inconsistency is impossible since the results of Tests 1 and 3 are clearly insignificant. At most, it can be argued that the three variables used as metrics for company size behave very differently, especially within the selected sample. Companies showing large numbers for one variable do not necessarily show the same for the remaining two variables, as can be seen in Appendix 2.

Overall, the result of Test 2, which is the only test that could be argued to be significant, if any, suggests that, indeed, there is a negative correlation between company size and ESG integration into business strategy, as was formulated with hypothesis H1.2a. However, following proper scientific methodology, H1.2a must be rejected since also Test 2 is not significant within the 5% significance level. The fact that Test 2 only marginally fails to be significant indicates that there might indeed be a correlation. A study with a larger sample and timeframe might prove this assumption.



### 5.3.2 Industry

Hypothesis H1.2b states that the integration of ESG aspects into business strategy due to mandatory ESG reporting depends on the company's industry. Indeed, the analysis reveals large differences between industries and sectors.



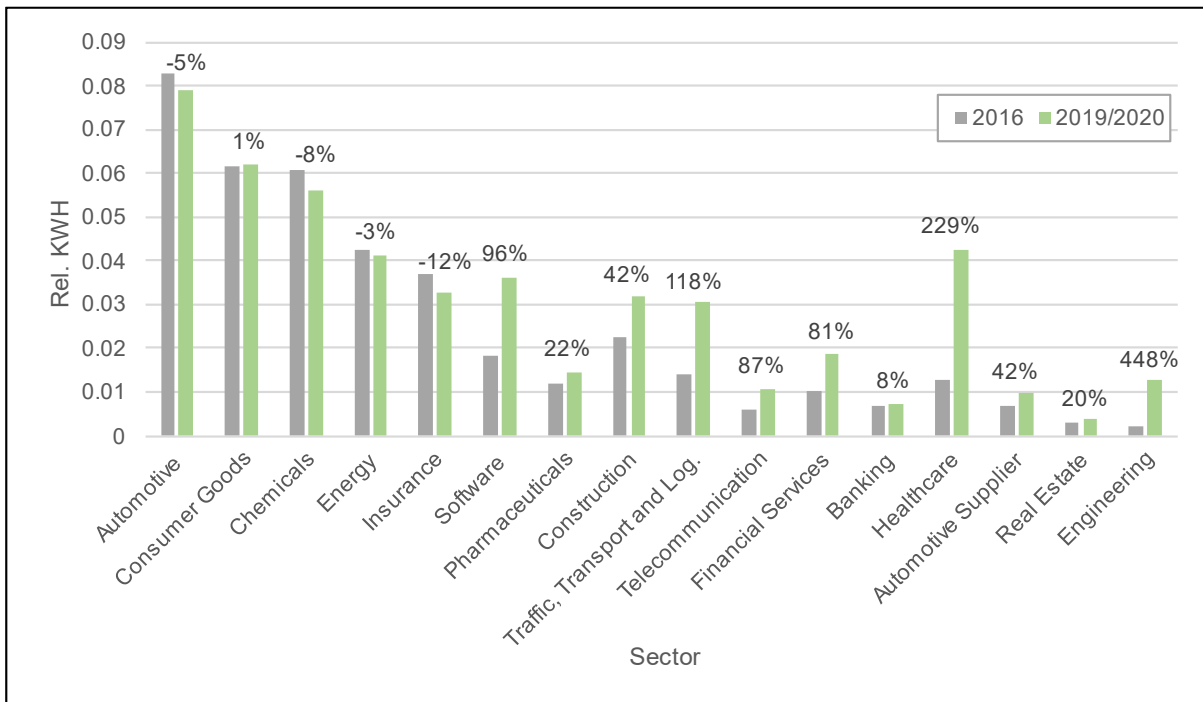
**Figure 10:** Development of relative KWH per industry between 2016 and 2019/2020. Values in % represent growth rates. (Source: Author's own).

As visible in Appendix 5, the industry integrating ESG content most frequently into their strategies, displayed as absolute KWH, is “Other”, which includes automotive, construction, and engineering companies. This is followed by Chemicals and Pharmaceuticals and Trade and Consumer Goods. The lowest absolute KWH is detected for the Technology industry. However, Technology has the highest growth in relative KWH (94%, see **Figure 10**). More interestingly, Chemicals and Pharmaceuticals showed significant growth of 32% as well, although being already among the top performers in absolute terms. Supply, Environment and Infrastructure also increased relative KWH by 26%. Trade and Consumer Goods stagnated within the analysed timeframe.

Looking at the more specific sectors in **Figure 11** and the mapping of industries, sectors, and companies in **Table 4**, the industry growth rates can be explained in more detail. For example, the 16% growth of the “Other” industry is mainly driven by Engineering, consisting only of Linde, which shows abnormal growth due to generally low KWH numbers. On the other hand, the Automotive sector, including BMW, Daimler, and Volkswagen, reveals even negative growth, reducing the overall growth of the “Other” industry.

The 32% growth of the Chemicals and Pharmaceuticals industry is mainly driven by the 229% growth in the Healthcare sector, which in turn is caused by the abnormal growth of Fresenius

(783%). Again, as described above, this is due to generally low KWH numbers. The sector Pharmaceuticals (solely consisting of Merck) has grown by 22% while Chemicals, consisting of BASF and Bayer, has decreased by 8%. It is evident that even within an industry, large differences exist between companies. Furthermore, the small sample size leads to some sectors only comprising one or two companies, in which case results are based on company-specific impacts rather than industry-specific ones.



**Figure 11:** Development of relative KWH per sector between 2016 and 2019/2020. Values in % represent growth rates. (Source: Author's own).

Even the 1% growth in Trade and Consumer Goods does not result from stagnation within the industry. It includes Beiersdorf, which has grown by 28% and Henkel, which has decreased by 15%. Only the companies included in the Technology industry, namely SAP (Software) and Deutsche Telekom (Telecommunication), show coherent and strong growth, with 96% and 87%, respectively.

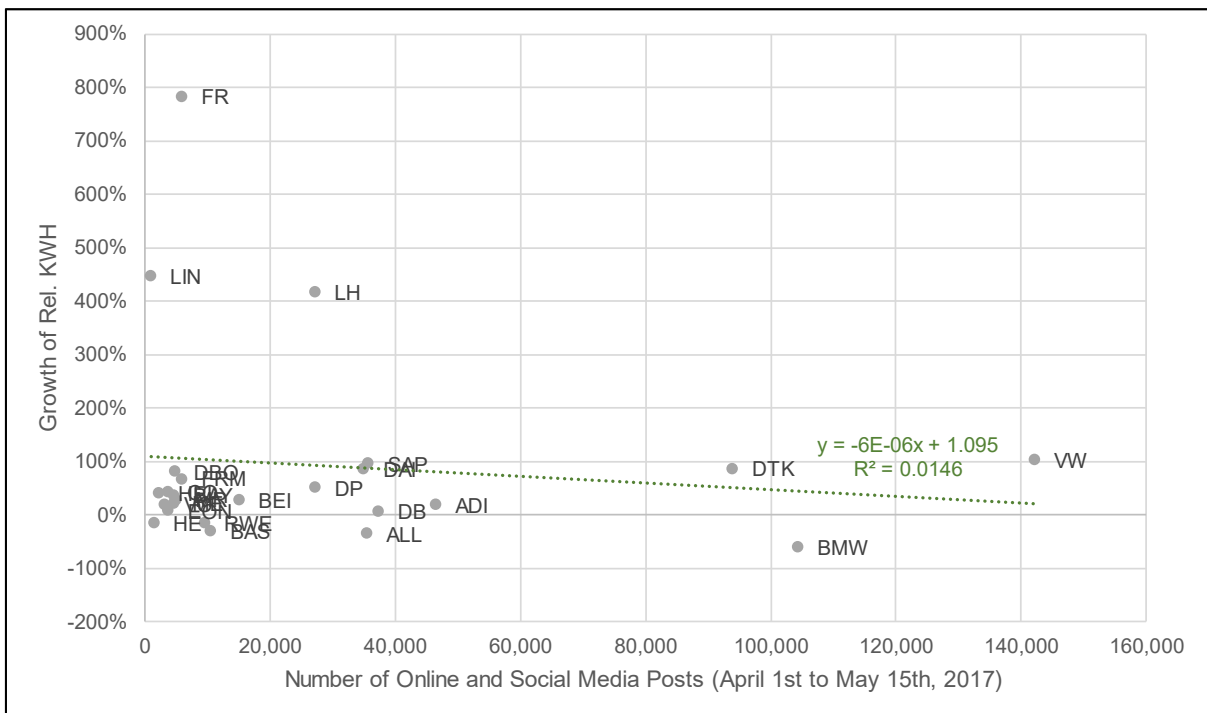
Ignoring the companies with abnormal growth rates (Linde, Lufthansa, and Fresenius) and their respective sectors (Engineering, Traffic, and Healthcare), the sectors with the highest growth rates are Software, Telecommunications, and Financial Services. The reasons for the differences among sectors and industries can only be speculated. The differences might, for example, originate from industry-specific legislation passed during the considered timeframe or political influences. An additional analysis of the industry environments and remarkable developments within each industry might have provided more insights.

Overall, with KWH growth rates ranging from 1% to 94%, it can be concluded that the industry does indeed affect the integration of ESG into business strategy due to mandatory ESG reporting. A more detailed split into sectors reveals further differences. Hence, the hypothesis H1.2b is accepted.

### 5.3.3 Media Presence

With hypothesis H1.2c, it is expected that the integration of ESG aspects into business strategy due to mandatory ESG reporting is stronger for companies with higher levels of media presence. To test this hypothesis, a regression is done with the growth of relative KWH as the dependent variable and the number of online and social media posts mentioning the company name between April 1 and May 15, 2017 (Grün & Engelland, 2017) as the independent variable. The used dataset for media presence can be reviewed in Appendix 6.

As the scatter plot in **Figure 12** and the summary statistics in Appendix 6 show, the regression is clearly not significant. The p-value of 0.57 is decidedly too high; hence, an analysis of the regression is not possible. **Figure 12** illustrates once more the abnormal growth rates of Fresenius, Linde, and Lufthansa, as discussed previously. Technically, these values could again have been removed from the sample; however, this would barely improve the regression results. In fact, the data points are scattered, and no trend is recognisable. Only Deutsche Telekom, Volkswagen, and BMW show a significantly higher media presence. For Volkswagen, this might be related to the emissions scandal in 2015 (Jung & Sharon, 2019).



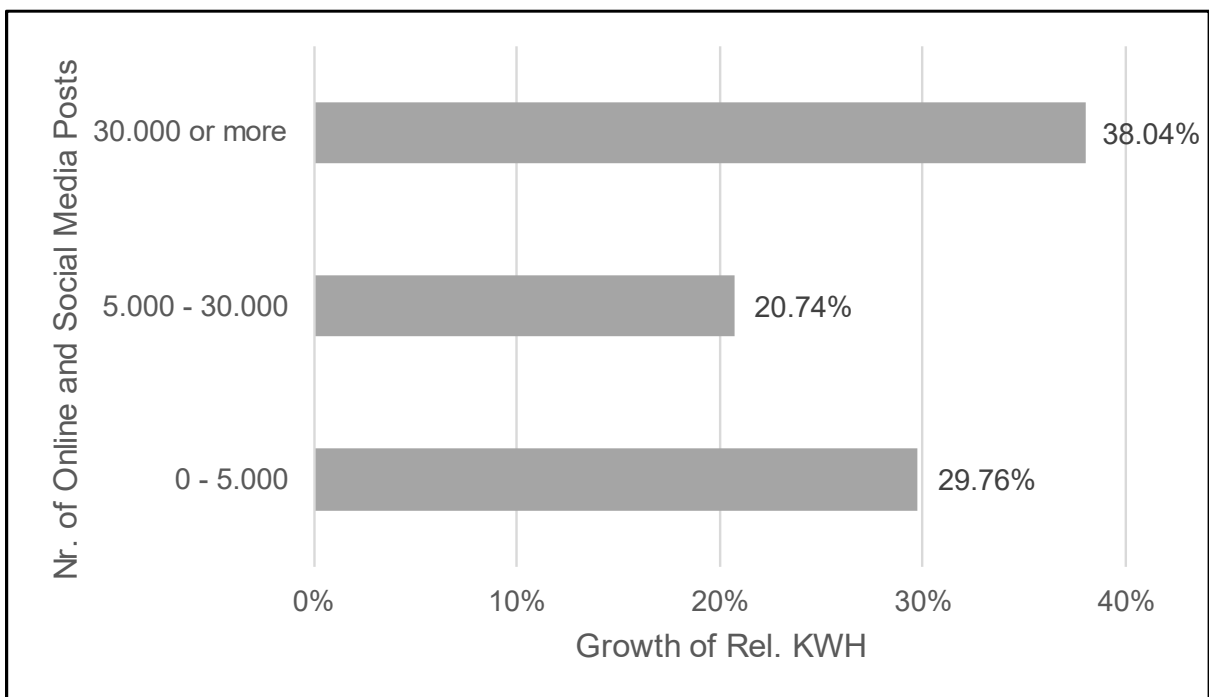
**Figure 12:** Growth of relative KWH vs. media presence in terms of number of online and social media posts between April 1 and May 15, 2017. (Source: Author's own).

The regression is limited in many ways. First, the data on media presence is limited. The timeframe considered is suitable for the present study but relatively short. Extending the timeframe to six or twelve months might likely have produced more realistic results.

Furthermore, the analysis only includes online and social media posts that mention the company name, while brand names are not considered directly. For example, posts were scanned for Daimler, Henkel, and Beiersdorf but not for Mercedes, Perwoll, and Nivea. Consequently, companies with strong independent brand strategies score comparably low in this analysis. This undoubtedly affects the results greatly.

However, it is not considered a major limitation for the scope of this analysis since the present analysis also focuses on the business strategies of the companies without taking into account the independent brand strategies. For example, if Nivea customers exert increased pressure for more CSR, Beiersdorf will likely integrate ESG-related content into the Nivea brand strategy instead of the Beiersdorf corporate strategy. Hence, the growth of relative KWH as designed in the present study would likely not be affected.

Against the expectation expressed in the hypothesis, companies with weak media presence, such as SAP and Deutsche Post, also greatly increased ESG content in business strategies. On the contrary, companies with strong media presence apparently were not always pressured enough to increase their ESG integration; a prime example is BMW, which even decreased absolute and relative KWH.



**Figure 13:** Growth of relative KWH per category of media presence. (Source: Author's own).

However, when developing categories of media presence, as in **Figure 13**, it becomes evident that there seems to be a trend for companies with higher media presence to have higher ESG integration growth due to mandatory ESG reporting. Companies mentioned in at least 30,000 online and social media posts in the respective timeframe showed an average growth in relative KWH of 38%. This evidence supports the hypothesis and the reasoning that media coverage is a metric for stakeholder pressure, and increased stakeholder pressure leads to enhanced CSR activities (Cuomo et al., 2022, p. 5) and ESG integration into business strategy. Nevertheless, companies with less than 5,000 online and social media posts in the respective timeframe also had an average growth in relative KWH of 30%. One might speculate that this observation represents those companies that deliberately use ESG topics to improve media presence and customer awareness and sharpen the positioning of their brand(s) and products. To conclude, the data presented provides evidence for a general trend for companies with stronger media presence to have higher ESG integration growth due to mandatory ESG reporting, as shown in **Figure 13**. Nonetheless, with the insignificant regression (p-value of 0.57), the evidence is insufficient to accept the formulated hypothesis. The hypothesis H1.2c must be rejected. It is, however, anticipated that a study with a larger sample, a larger timeframe, and more suitable data on media presence and stakeholder engagement would provide evidence for a positive correlation between media presence and ESG integration.

## 5.4 Introduction of the CSRD

The hypotheses discussed so far are all based on the introduction of the CSR-RUG. While analysing historical data is valuable, applying the findings and formulating predictions for the future is most relevant. In this case, this refers to the research question RQ1.3, asking what can be concluded for the introduction of future ESG reporting regulations (specifically the CSRD) regarding their influence on business strategy. Based on existing literature, the respective hypothesis H1.3 states that the integration of ESG aspects into business strategy is expected to intensify with future ESG reporting regulations (specifically the CSRD).

The present study proves that there is indeed a positive impact of ESG reporting regulations on the integration of ESG aspects into business strategy. Having confirmed this positive relationship, it can be expected with some certainty that the upcoming CSRD might also positively impact ESG integration into business strategy. It is rather a question of whether this positive impact will be intensified with the CSRD. For several reasons, this is quite likely.

First, the CSRD applies to an extended scope of companies, including capital market oriented SMEs and non-capital market oriented large companies (Banner, 2023, p. 160). Considering

the argument stated in the literature that smaller companies especially benefit from ESG reporting regulations in terms of ESG performance, the extension of the scope to include also smaller companies seems reasonable (Cuomo et al., 2022, p. 8). The results of the present analysis, although not largely significant, suggest that smaller firms also tend to experience more significant effects in terms of ESG integration into business strategy (see Chapter 5.3.1). Considering this, much stronger effects of the CSRD on ESG integration into business strategy can be expected.

Since under the CSRD, the non-financial statement must be published as part of the management report (Fink & Schmidt, 2023, p. 107), it receives the same weight and importance as the financial statements. This may lead to a change of thinking and greater integration of ESG aspects into business strategy.

The CSRD also demands more detailed information on specific topics, such as sustainability strategy and goals (Fink & Schmidt, 2023, p. 109). This means that under the CSRD, companies will have to develop a sustainability strategy, if not done already, or report on their existing one. They will have to deal with the strategic perspective on ESG topics; hence, it is very likely that ESG topics will increasingly be integrated into existing business strategies.

More importantly, with one uniform set of standards (ESRS), the reporting requirements are defined more precisely (Fink & Schmidt, 2023, p. 113). Looking at the results of the quantitative analysis regarding the differences among ESG categories, it becomes clear that general ESG terms not referring to a specific field of ESG (defined as category X) were frequently used in business strategies (see Chapter 5.2). This reveals a lack of particular contents or goals. It seems as if companies felt the need to address ESG in their business strategies; however, due to the flexible character of the CSR-RUG, they could not identify concrete, relevant topics. The CSRD promises improvements in that regard.

Lastly, the concept of double materiality is improved with the CSRD, meaning also aspects that impact the environment without direct financial consequences for the companies must be reported (Fink & Schmidt, 2023, pp. 112–113). This will result in companies dealing with and discussing more ESG aspects than before. With more ESG aspects being discussed and considered, the likelihood of being integrated into business strategy increases.

Consequently, it appears the CSRD will foster more sustainable and socially responsible decisions and the long-term integration of ESG aspects into business strategy and business model. With the fundamental changes identified between the CSR-RUG and the CSRD and the findings from the quantitative analysis, it can be said that the integration of ESG aspects into business strategy is likely to intensify with the CSRD. Therefore, hypothesis H1.3 is accepted.

## **6. Limitations, Further Research and Conclusion**

This final chapter summarises the findings from the literature review and the quantitative content analysis. Furthermore, it describes the methodological limitations of the empirical analysis and outlines suggestions for further research.

### **6.1 Limitations and Further Research**

The applied methodology of quantitative content analysis has proven useful for investigating the impact of ESG reporting regulations on the integration of ESG aspects into business strategy. The impact could be well analysed and described. Especially the developed key metric, growth of relative KWH, was meaningful in describing the development of ESG integration.

However, the study is limited mainly concerning scope and timeframe. The sample size of 25 companies is very small, which is why specific characteristics and developments of single firms largely affect the results. All sample companies are represented in the German DAX. On the one hand, this ensures diversity in industries and business models and a simple, unbiased selection of the sample. On the other hand, this results in all sample companies being comparably large. Smaller companies would likely produce different results. Further research could, hence, be based on a larger and more diverse sample regarding company size.

Furthermore, the analysed timeframe of four years, or five years in special cases, is relatively short. A larger timeframe would more precisely depict whether introducing the CSR-RUG has indeed led to a spike in relative KWH. Therefore, further research could focus on a longer timeframe.

The most severe limitation of the methodology is the existence of various additional impact factors that could not be included in the model. For example, due to the noise of other factors not considered, the direct impact of company size could not be described well. To receive reliable and more precise results, many other variables would need to be included, as was discussed in Chapter 3.1. Potential variables would be external factors like industry-specific regulatory developments, investors' pressure, stock development, overall economic development, brand reputation, or customer engagement, as well as internal factors like sustainability of core products or services, organisational culture, or manager attitude. The study attempted to include some of the most relevant factors, such as industry-specific developments or brand reputation and customer engagement. However, the available data was very limited and did not precisely represent the impact intended to be included, an

example of this being the data on media presence as a metric for stakeholder pressure. Gathering suitable and reliable data is the key challenge that future research could tackle. The study is limited to a quantitative content analysis. A supporting qualitative content analysis would enhance results and provide detailed background on various additional factors and is, hence, recommended for further research.

Regardless of the study's limitations, future research should focus on the introduction of the CSRD. Starting with fiscal year 2024, annual reports will show the impacts of the CSRD, which are expected to be even stronger, as described in Chapter 5.4. Consequently, it is worth studying these impacts and comparing them to the results of existing literature and the present study.

## **6.2 Conclusion**

This thesis aimed to investigate the effects of introducing mandatory ESG reporting on company strategic decision-making. More specifically, the impact of mandatory ESG reporting on business strategy was to be analysed. The overarching question was whether an impact generally exists, and several sub-questions aimed at delivering a more detailed description of this impact considering various influencing factors.

An exhaustive theoretical literature review revealed the importance of mandatory ESG reporting and presented the CSR-RUG with its core characteristics. In a comparison, substantial weaknesses of the CSR-RUG were identified, while the CSRD promises major improvements. Furthermore, ESG integration into business strategy and the role of mandatory ESG reporting were analysed from a theoretical perspective, which revealed a general positive impact of mandatory ESG reporting on ESG integration. This was followed by a quantitative content analysis based on the introduction of the CSR-RUG in 2017.

As a result of the literature review and the quantitative analysis, it can be confirmed that mandatory ESG reporting regulations affect business strategies. The introduction of such regulations leads to increased integration of ESG aspects into business strategies. The quantitative analysis found that between 2016 and 2019, ESG aspects were increasingly mentioned in the business strategies of German DAX companies.

The categories of ESG that grew the most due to the introduction of the CSR-RUG were X, referring to general ESG terms, and S, referring to social aspects, while general ESG terms and environmental aspects were the most frequently mentioned overall. The impact of mandatory ESG reporting on business strategy has been found to vary largely between company clusters. The most significant cluster is found to be industries (and sectors). While



ESG integration into business strategy has significantly grown in some industries, for example, Technology or Chemicals and Pharmaceuticals, other industries seemed more reluctant to the impact of mandatory ESG reporting on business strategy, for example, Trade and Consumer Goods or Finances.

Other clusters analysed are company size and media presence. Both clusters did not show strong, significant results; nevertheless, trends were identified. Regarding company size, the analysis revealed a tendency for smaller companies, in terms of annual sales, to experience a more significant impact of mandatory ESG reporting on business strategy. Concerning media presence, a trend could be detected that the business strategies of companies with a stronger media presence were impacted heavier by mandatory ESG reporting regulations. The identified trends and tendencies for these two clusters do, however, require confirmatory studies.

The empirical analysis, in combination with the existing body of literature, allows for conclusions and predictions concerning the upcoming CSRD. In fact, it can be expected that the identified positive impact of mandatory ESG reporting regulations on ESG integration into business strategy will be amplified with introducing the CSRD. The study finds that various new characteristics of the CSRD will lead to this intensified ESG integration, such as the extended scope and the uniform reporting framework.

The findings are valuable in describing the relationship between mandatory ESG reporting and business strategy. By extensively defining and explaining this relationship, this thesis contributes to the field of research and fills two major research gaps: First, it analyses the concrete impacts on business strategy, while the existing body of literature focuses on the effects on ESG performance. Secondly, it analyses the particular impact of the German legislation CSR-RUG, while the majority of existing studies are either focused on the European-level NFRD or legislations of other countries.

This thesis proves that mandatory ESG reporting can indeed be effective in reorientating businesses towards more sustainable strategies and driving more sustainable and socially responsible decision-making. Consequently, ESG reporting is a critical element in the response to climate change.

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## Appendix 1: List of Annual Reports<sup>3</sup>

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<sup>3</sup> All websites last accessed on January 5, 2024



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## Appendix 2: Applicability Check CSR-RUG Company Size

Company Name	Short	Number of employees (min 500) as of December 31					Annual Sales in € million (min. € 40 million) as of December 31					Average
		2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	
Adidas AG	ADI	55,555	58,902	56,888	57,016	59,533	16,915	18,483	21,218	21,915	23,640	20,434
Allianz SE	ALL	142,459	140,253	140,553	142,460	147,268	110,836	110,649	109,590	107,442	116,469	110,997
BASF SE	BAS	112,435	113,830	115,490	122,404	117,628	70,449	57,550	61,223	60,220	59,316	61,752
BMW AG	BMW	122,244	124,729	129,932	134,682	133,778	92,175	94,163	98,282	96,855	104,210	97,137
Bayer AG	BAY	116,600	99,592	99,820	107,894	103,824	46,085	34,943	35,015	36,742	43,545	39,266
Beiersdorf AG	BEI	17,659	17,934	18,934	20,059	20,654	6,686	6,752	7,056	7,233	7,653	7,076
Continental AG	CO	204,700	216,000	230,700	242,800	244,100	39,232	40,550	44,010	44,404	44,478	42,535
Daimler AG	DAI	284,562	284,957	289,530	298,465	301,839	149,467	153,261	164,154	167,362	172,745	161,398
Deutsche Bank AG	DB	101,104	99,744	97,535	91,737	87,597	33,525	30,014	26,447	25,316	23,165	27,693
Deutsche Börse AG	DBO	4,460	4,731	5,183	5,397	5,835	2,220	2,389	2,462	2,780	2,936	2,557
Deutsche Post AG	DP	450,508	459,262	472,208	499,018	499,250	59,230	57,334	60,444	61,550	63,341	60,380
Deutsche Telekom AG	DTK	226,332	220,582	216,454	216,369	212,846	69,228	73,095	74,947	75,656	80,531	74,691
E.ON SE	EON	43,162	43,138	42,699	43,302	78,948	42,656	38,173	37,965	30,084	41,484	38,072
Fresenius Medical Care AG	FRM	104,033	109,319	114,000	112,658	120,659	15,455	16,570	17,784	16,547	17,477	16,767
Fresenius SE & Co. KGaA	FR	222,305	232,873	273,249	276,750	294,134	27,995	29,471	33,886	33,530	35,524	32,081
HeidelbergCement AG	HEI	45,453	60,424	59,054	57,939	55,047	13,465	15,166	17,266	18,075	18,851	16,565
Henkel AG & Co. KGaA	HE	49,450	51,350	53,700	53,000	52,450	18,089	18,714	20,029	19,899	20,114	19,369
Linde AG	LIN	26,657	26,498	26,461	80,820	79,886	10,710	10,469	11,358	14,836	28,228	15,120
Lufthansa AG	LH	119,559	123,287	128,856	134,330	137,784	32,056	31,660	35,579	35,542	36,424	34,252
Merck KGaA	ME	49,613	50,348	52,880	51,713	57,036	12,845	15,024	14,517	14,836	16,152	14,675
Münchener Rück AG	MR	43,554	43,428	42,410	41,410	39,662	50,374	48,851	49,115	49,064	51,457	49,772
RWE AG	RWE	59,762	58,652	59,547	17,748	19,792	45,848	43,590	13,822	13,406	13,125	25,958
SAP SE	SAP	76,986	84,183	88,543	96,498	100,330	20,793	22,062	23,461	24,708	27,553	23,715
Volkswagen AG	VW	604,000	619,000	634,000	656,000	671,000	213,292	217,267	229,550	235,849	252,632	229,718
Vonovia SE	VO	6,368	7,437	8,448	9,923	10,345	1,415	1,538	1,668	1,894	2,075	1,718

## Appendix 2: Applicability Check CSR-RUG Company Size (cont'd)

Company Name	Short	Balance-sheet sum in € million (min. € 20 million) as of December 31					Average
		2015	2016	2017	2018	2019	
Adidas AG	ADI	13,343	15,176	14,019	15,612	20,680	15,766
Allianz SE	ALL	848,942	883,809	901,300	897,567	1,011,185	908,561
BASF SE	BAS	70,836	76,496	78,768	86,556	86,950	79,921
BMW AG	BMW	172,174	188,545	195,506	208,938	228,034	198,639
Bayer AG	BAY	73,917	82,238	75,087	126,732	126,258	96,846
Beiersdorf AG	BEI	6,873	7,573	8,205	8,871	10,065	8,317
Continental AG	CO	32,836	36,175	37,441	40,445	42,568	37,893
Daimler AG	DAI	217,166	242,988	255,345	281,619	302,438	259,911
Deutsche Bank AG	DB	1,629,130	1,590,546	1,474,732	1,348,137	1,297,674	1,468,044
Deutsche Börse AG	DBO	180,076	163,843	135,141	161,899	137,165	155,625
Deutsche Post AG	DP	37,870	38,295	38,672	50,470	52,169	43,495
Deutsche Telekom AG	DTK	143,920	148,485	141,334	145,375	170,672	149,957
E.ON SE	EON	113,693	63,699	55,950	54,324	98,566	77,246
Fresenius Medical Care AG	FRM	23,246	25,504	24,025	26,242	32,935	26,390
Fresenius SE & Co. KGaA	FR	43,233	46,697	53,133	56,703	61,237	52,201
HeidelbergCement AG	HEI	28,374	37,120	34,558	35,783	38,589	34,885
Henkel AG & Co. KGaA	HE	22,323	27,951	28,339	29,562	31,403	27,916
Linde AG	LIN	18,319	19,332	20,436	93,386	86,612	47,617
Lufthansa AG	LH	32,462	34,697	35,778	38,213	42,659	36,762
Merck KGaA	ME	38,081	38,258	35,621	36,888	43,811	38,532
Münchener Rück AG	MR	268,868	267,805	265,722	270,168	287,553	272,023
RWE AG	RWE	79,334	76,402	69,059	80,108	64,192	73,819
SAP SE	SAP	41,390	44,277	42,484	51,502	60,215	47,974
Volkswagen AG	VW	381,935	409,732	422,193	458,156	488,071	432,017
Vonovia SE	VO	30,959	32,522	37,516	49,388	56,498	41,377

## Appendix 3: Calculation of Growth of Relative KWH per Company

Company	2016			2017			2018			2019			2020			Growth of Rel. KWH
	Tokens	Abs. KWH	Rel. KWH	Tokens	Abs. KWH	Rel. KWH	Tokens	Abs. KWH	Rel. KWH	Tokens	Abs. KWH	Rel. KWH	Tokens	Abs. KWH	Rel. KWH	
BMW	1390	75	0.0540	2172	94	0.0433	1474	68	0.0461	1542	58	0.0376	2452	53	0.0216	-59.94%
BAS	1836	76	0.0414	1883	72	0.0382	1920	79	0.0411	3065	89	0.0290				-29.85%
ADI	5087	68	0.0134	3599	60	0.0167	3779	63	0.0167	3436	58	0.0169	2200	35	0.0159	19.01%
RWE	3241	68	0.0210	5377	73	0.0136	4089	64	0.0157	3735	67	0.0179				-14.50%
HE	1755	64	0.0365	953	36	0.0378	986	37	0.0375	906	39	0.0430	2257	70	0.0310	-14.95%
DAI	5363	52	0.0097	5188	44	0.0085	5245	71	0.0135	3886	70	0.0180				85.78%
VW	2320	45	0.0194	1350	43	0.0319	1383	44	0.0318	1777	70	0.0394				103.09%
SAP	1518	28	0.0184	1424	17	0.0119	2505	76	0.0303	1961	71	0.0362				96.29%
ME	3151	37	0.0117	4056	43	0.0106	4378	54	0.0123	3895	56	0.0144				22.44%
MR	2568	34	0.0132	2355	42	0.0178	2460	40	0.0163	2572	44	0.0171				29.21%
BAY	1687	33	0.0196	1159	28	0.0242	1635	29	0.0177	2188	59	0.0270				37.85%
BEI	2146	25	0.0116	2641	38	0.0144	2430	35	0.0144	2606	39	0.0150				28.46%
HEI	926	21	0.0227	1152	37	0.0321	1226	38	0.0310	872	28	0.0321				41.59%
EON	1381	30	0.0217	1518	30	0.0198	1392	24	0.0172	1236	29	0.0235				8.01%
DTK	2419	14	0.0058	2610	15	0.0057	2864	17	0.0059	3691	40	0.0108				87.25%
DBO	1754	18	0.0103	1396	22	0.0158	1159	20	0.0173	1076	20	0.0186				81.12%
DB	1953	13	0.0067	1271	5	0.0039	1871	19	0.0102	3770	27	0.0072				7.59%
DP	1221	14	0.0115	1308	13	0.0099	986	11	0.0112	1495	26	0.0174				51.68%
LH	1188	3	0.0025	1498	5	0.0033	1886	13	0.0069	2676	35	0.0131				417.94%
CO	2016	14	0.0069	1568	12	0.0077	1623	12	0.0074	1517	15	0.0099				42.39%
FRM	1988	20	0.0101	649	8	0.0123	509	4	0.0079	535	4	0.0075	592	10	0.0169	67.91%
ALL	336	8	0.0238	334	11	0.0329	539	6	0.0111	579	9	0.0155				-34.72%
VO	1615	5	0.0031	1815	5	0.0028	1899	5	0.0026	1881	7	0.0037				20.20%
LIN	436	1	0.0023	499	4	0.0080	357	3	0.0084	796	10	0.0126				447.74%
FR	685	2	0.0029	795	2	0.0025	860	2	0.0023	310	8	0.0258				783.87%

## Appendix 4: Summary Statistics of Regression Analyses for Company Size

**TEST 1**  
**SUMMARY OUTPUT - Number of Employees**

Regression Statistics	
Multiple R	0.35498453
R Square	0.12601402
Adjusted R Square	0.08439564
Standard Error	1.86339523
Observations	23

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	10.51341108	10.51341108	3.027845327	0.096482907
Residual	21	72.9170776	3.472241791		
Total	22	83.43048868			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.06026227	0.639354781	0.094254817	0.925800286	-1.269348787	1.389873323	-1.269348787	1.389873323
X Variable 1	8.6439E-06	4.96758E-06	1.740070495	0.096482907	-1.68671E-06	1.89746E-05	-1.68671E-06	1.89746E-05

Removed Outliers: VW, DP

**TEST 2**  
**SUMMARY OUTPUT - Annual Sales**

Regression Statistics	
Multiple R	0.428957676
R Square	0.184004688
Adjusted R Square	0.138671615
Standard Error	0.38693712
Observations	20

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	0.607707392	0.607707392	4.058950258	0.0591259
Residual	18	2.694966027	0.149720335		
Total	19	3.302673419			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.464912201	0.139862917	3.324056241	0.003775324	0.171071117	0.758753285	0.171071117	0.758753285
X Variable 1	-5.8949E-06	2.92597E-06	-2.014683662	0.0591259	-1.20421E-05	2.52331E-07	-1.20421E-05	2.52331E-07

Removed Outliers: LH, LIN, FR, DAI, VW

**TEST 3**  
**SUMMARY OUTPUT - Balance-Sheet Sum**

Regression Statistics	
Multiple R	0.309779082
R Square	0.095963079
Adjusted R Square	0.045738806
Standard Error	0.430480685
Observations	20

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	0.354077112	0.354077112	1.910691245	0.183799513
Residual	18	3.335645171	0.185313621		
Total	19	3.689722283			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.219788281	0.13545241	1.622623626	0.122053546	-0.064786673	0.504363236	-0.064786673	0.504363236
X Variable 1	1.24357E-06	8.99651E-07	1.382277557	0.183799513	-6.46529E-07	3.13366E-06	-6.46529E-07	3.13366E-06

Removed Outliers: LH, LIN, FR, DB, ALL

## Appendix 5: Calculations of Growth of Relative KWH per Industry and Sector

Industry	Abs. KWH	Rel. KWH 2016	Rel. KWH 2019/2020	Growth of Rel. KWH
<i>Other</i>	982	0.1150	0.1336	16%
<i>Chemicals, Pharmaceuticals, Bio- and Medical Engineering</i>	715	0.0857	0.1131	32%
<i>Trade and Consumer Goods</i>	667	0.0615	0.0619	1%
<i>Supply, Environment and Infrastructure</i>	527	0.0598	0.0756	26%
<i>Finances</i>	338	0.0540	0.0584	8%
<i>Technology</i>	278	0.0242	0.0470	94%

Sector	Abs. KWH	Rel. KWH 2016	Rel. KWH 2019/2020	Growth of Rel. KWH
<i>Automotive</i>	787	0.0830	0.0790	-5%
<i>Consumer Goods</i>	667	0.0615	0.0619	1%
<i>Chemicals</i>	465	0.0610	0.0560	-8%
<i>Energy</i>	385	0.0427	0.0414	-3%
<i>Insurance</i>	194	0.0370	0.0327	-12%
<i>Software</i>	192	0.0184	0.0362	96%
<i>Pharmaceuticals</i>	190	0.0117	0.0144	22%
<i>Construction</i>	124	0.0227	0.0321	42%
<i>Traffic, Transport and Log.</i>	120	0.0140	0.0305	118%
<i>Telecommunication</i>	86	0.0058	0.0108	87%
<i>Financial Services</i>	80	0.0103	0.0186	81%
<i>Banking</i>	64	0.0067	0.0072	8%
<i>Healthcare</i>	60	0.0130	0.0427	229%
<i>Automotive Supplier</i>	53	0.0069	0.0099	42%
<i>Real Estate</i>	22	0.0031	0.0037	20%
<i>Engineering</i>	18	0.0023	0.0126	448%

## Appendix 6: Data on Media Presence and Summary Statistics of Regression Analysis for Media Presence

Company	Growth of Rel. KWH	Number of Online and Social Media Posts (April 1st to May 15th, 2017)*
BMW	-59.94%	104,239
BAS	-29.85%	10,497
ADI	19.01%	46,406
RWE	-14.50%	9,513
HE	-14.95%	1,316
DAI	85.78%	34,905
VW	103.09%	142,093
SAP	96.29%	35,601
ME	22.44%	4,448
MR	29.21%	4,865
BAY	37.85%	4,607
BEI	28.46%	14,989
HEI	41.59%	2,120
EON	8.01%	3,678
DTK	87.25%	93,840
DBO	81.12%	4,661
DB	7.59%	37,227
DP	51.68%	27,119
LH	417.94%	27,104
CO	42.39%	3,607
FRM	67.91%	5,884
ALL	-34.72%	35,438
VO	20.20%	3,108
LIN	447.74%	863
FR	783.87%	5,884

\* Source: (Grün & Engelland, 2017)

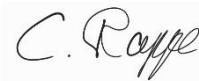
SUMMARY OUTPUT - Media Presence								
Regression Statistics								
Multiple R	0.120636767							
R Square	0.014553229							
Adjusted R Square	-0.028292282							
Standard Error	1.892765541							
Observations	25							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	1	1.216879804	1.2168798	0.33966754	0.565692036			
Residual	23	82.39891201	3.58256139					
Total	24	83.61579181						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	1.095002771	0.47252473	2.3173449	0.02973719	0.117510892	2.072494651	0.117510892	2.072494651
X Variable 1	-6.20546E-06	1.06475E-05	-0.58281	0.56569204	-2.82315E-05	1.58205E-05	-2.82315E-05	1.58205E-05

# Statutory Declaration

## Sworn declaration

I hereby formally declare that I have written the submitted Master Thesis entirely by myself without anyone else's assistance. Wherever I have drawn on literature or other sources, either in direct quotes, or in paraphrasing such material, I have given the reference to the original author or authors and to the source where it appeared. I am aware that the use of quotations, or of close paraphrasing, from books, magazines, newspapers, the internet or other sources, which are not marked as such, will be considered as an attempt at deception, and that the thesis will be graded with a fail. I have informed the examiners and the board of examiners in the case that I have submitted the dissertation, entirely or partly, for other purposes of examination.

Berlin, 19.01.2024



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place, date

signature