



**TURUN
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WHAT IF FIRMS FAKE THEIR ACCOUNTING FIGURES?

Three Essays about Financial
Misrepresentations

Ingolf Kloppenburg



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ABSTRACT

The topic of this dissertation is the deliberate violation of accounting standards. This phenomenon is called “misrepresentation”, which by definition refers to a deliberate action by a person. This individual could be a member of top management, such as the CEO or CFO, or a lower-level manager. This dissertation comprises of an introductory chapter and three essays. It thereby employs various approaches to obtain an enhanced understanding of the phenomenon, especially in the field of accounting characteristics of misrepresenting firms and the capital market’s perspective on these firms. These approaches are developed from a theoretical perspective based on positive accounting theory, fraud triangle, and the efficient market hypothesis. In the first of three essays, both the reasons for misrepresentation and the accounting characteristics of firms that misrepresent are the central issues. In the second essay, one aspect of the phenomenon is examined, namely the firm’s value. It is approached by observing how much the misrepresenting firm gains (or loses) in market value and what happens to this gain (or loss) once the misrepresentation is revealed to the public. Lastly, the third essay uses misrepresentation as a proxy for low earnings quality, and the main topic is how sell-side financial analysts are impacted by low earnings quality.

The first essay starts with a broad perspective on the topic before the second essay zooms into a specific aspect, while the third essay examines the use of misrepresentation as a proxy. This sequence of essays provides a glimpse in the diverse possibilities to utilise the phenomenon “misrepresentation” for research purposes. The dissertation is based on a special and partly unique dataset of misrepresenting firms between 1976 and 2014. The misrepresenting firms and the misrepresented annual reports were identified by the US authorities. As the misrepresentation has been determined this way, the dataset is highly reliable. Moreover, while the applied methods differ for each essay, the methodological focus lies in quantitative methods such as regression analysis.

The results indicate that, from an accounting perspective, differences exist between the characteristics of misrepresenting firms depending on the reason for their misrepresentation. These differences include the reason for the misrepresentation, the tool used, and the outcome. Moreover, firms’ fundamental value substantially increases as a result of misrepresentation, and no evidence is found for a link between firm value and the market reaction to the misrepresentation.

In addition, sell-side financial analysts are unaware of the misrepresentation or even misled by it.

This dissertation contributes to positive accounting theory and the fraud triangle by demonstrating how the different reasons for a misrepresentation are aligned with different firm's accounting characteristics. It also offers insights into market behaviour by elucidating the reactions of the capital market and analysts to financial misrepresentations. This dissertation provides insights for practitioners especially from the field of capital market actors as well as the government bodies by expanding knowledge about how misrepresentations are handled by the capital market and, consequently, have both managerial and legislative importance.

KEYWORDS: Financial Misrepresentation, Accounting Fraud, Accounting and Auditing Enforcement Releases (AAER), Earnings Quality, Efficient Market Hypothesis, Financial Statement Analysis, Financial Analysts

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TIIVISTELMÄ

Väitöskirjassa tutkitaan kirjanpitosstandardien tuottamuksellista rikkomista eli vääristelyä. Vääristely on nimenomaisesti tarkoituksellista toimintaa. Vääristelyyn voi syyllistyä ylimmän johdon edustaja, kuten toimitusjohtaja tai talousjohtaja, tai alemman tason johtaja. Väitöskirja koostuu johdannosta ja kolmesta aihetta käsittelevästä esseestä. Väitöskirjan tavoite on erilaisia lähestymistapoja soveltamalla tuottaa lisää tietoa vääristelystä ja etenkin vääristelyyn syyllistyvien yritysten taloudellisista erityispiirteistä laskentatoimen näkökulmasta sekä pääomamarkkinoiden suhtautumisesta kyseisiin yrityksiin. Lähestymistapoja on kehitetty positiivisen laskentatoimen teorian, petoskolmion ja tehokkaiden markkinoiden hypoteesin pohjalta. Ensimmäisen esseen keskeisiä teemoja ovat syyt vääristelyyn sekä vääristelyyn syyllistyvien yritysten taloudelliset erityispiirteet. Toisessa esseessä tarkastellaan vääristelyä yrityksen markkina-arvon näkökulmasta: kuinka paljon vääristelyyn syyllistynyt yritys lisää (tai menettää) markkina-arvoaan ja miten vääristelyn julkitulo vaikuttaa vääristelyn seurauksena syntyneeseen arvon lisäykseen (tai menetykseen). Kolmannessa esseessä tarkastellaan vääristelyä yrityksen taloudellisen raportoinnin laadun mittarina ja kuinka raportoinnin laatu vaikuttaa rahoitusanalyttikoiden antamiin suosituksiin.

Ensimmäisessä esseessä vääristelyä tarkastellaan yleisellä tasolla, toisessa keskitytään sen tiettyyn käytännön ulottuvuuteen ja kolmannessa tarkastellaan vääristelyä korvikemuuttujana. Esheet kuvastavat, millaisia akateemisen tutkimuksen mahdollisuuksia vääristely ilmiönä tarjoaa. Väitöskirja perustuu erityiseen ja osittain ainutlaatuisen aineistoon yrityksistä, joiden taloudellisessa raportoinnissa Yhdysvaltain viranomaiset ovat havainneet vääristelyä vuosina 1976–2014. Koska aineisto sisältää vain viranomaisten havaitsemia vääristelytapauksia, se on erittäin luotettava. Vaikka esseen menetelmälliset valinnat poikkeavat toisistaan, on painopiste kvantitatiivisissa menetelmissä, kuten regressioanalyysissä.

Tulokset osoittavat, että vääristelyyn syyllistyvien yritysten taloudelliset erityispiirteet eroavat toisistaan sen mukaan, mikä vääristelyn taustalla oleva syy on. Näitä eroja ovat muun muassa vääristelyn syy, vääristelyn toteutustapa ja lopputulos. Vääristelyyn syyllistyneen yrityksen arvon havaittiin nousevan merkittävästi vääristelyn seurauksena, eikä yrityksen arvon ja markkinareaktion välillä havaittu yhteyttä vääristelyn paljastuttua. Lisäksi rahoitusanalyttikot eivät tulosten valossa ole tietoisia vääristelystä, tai se saattaa jopa ohjata heitä harhaan.

Väitöskirja täydentää positiivista laskentatoimen teoriaa ja petoskolmiota koskevaa kirjallisuutta osoittamalla, kuinka vääristelyn syyt kytkeytyvät yritysten taloudellisiin erityispiirteisiin. Lisäksi väitöskirja valottaa markkinoiden toimintaa havainnollistamalla pääomamarkkinoiden ja analyytikoiden reaktioita vääristelyyn. Väitöskirja tarjoaa tietoa pääomamarkkinoiden toimijoille ja viranomaisille siitä, miten pääomamarkkinat käsittelevät vääristelyä. Tiedolla voi olla merkitystä niin yritysjohdolle kuin lainsäätäjälle.

ASIASANAT: Taloudellinen vääristely, kirjanpitorikos, Accounting and Auditing Enforcement Releases (AAER), tuloksen laatu, tehokkaiden markkinoiden hypoteesi, tilinpäätösanalyysi, rahoitusanalyytikot

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“In research everyone loves each other!” - This quote came from a senior researcher in my first semester as PhD student. I was not believing the statement but I was wrong. I experienced in my time so far a lot of help and support from colleagues. Most surprising to me was that nobody seemed to have a problem with sacrificing their free time for me without receiving an adequate or even any form of remuneration. Naming now all of these friendly people will be impossible for me. However, please be assured that I will never forget them.

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INGOLF KLOPPENBURG

Table of Contents

Abbreviations	13
List of Original Essays.....	14
1 Introduction and Motivation	15
1.1 Research Questions.....	17
1.2 Main Results and Practical Implications	19
1.3 Structure of the Dissertation.....	20
2 Theoretical Background.....	22
2.1 Positive Accounting Theory.....	22
2.2 The Fraud Triangle.....	24
2.3 Efficient Market Hypothesis.....	26
2.4 Relevance of the Theoretical Background to Answering the Research Questions.....	30
3 Financial Misrepresentation	31
3.1 SEC Investigations and Their Legal Framework.....	31
3.2 Private Securities Litigation	33
3.3 Relevant Institutional Framework Regarding Misrepresentations	34
3.3.1 Annual General Meeting.....	34
3.3.2 Compensation Committee	35
3.3.3 Audit Committee.....	35
3.3.4 Independent Auditor.....	36
3.3.5 The Role of the Institutional Framework in Fighting Misrepresentations.....	38
3.3.6 Changes in the Institutional Framework and the SEC Investigations as a result of the Sarbanes– Oxley Act.....	38
3.4 Financial Misrepresentations and Related Low Earnings Quality Measures	40
3.4.1 Earnings Management	41
3.4.2 Earnings Restatement.....	42
3.4.3 Relationship Between Earnings Management, Earnings Restatements, and Financial Misrepresentations.....	43
3.4.4 Advantages and Disadvantages of Using Data Based on Earnings Management, Earnings Restatements, or Misrepresentations	45

4	Prior Literature About Misrepresentations and Selected Related Areas	48
4.1	Prior Literature: Drivers For and Against the Likelihood of a Misrepresentation	48
4.2	Characteristics of Misrepresenting Firms/Misrepresentation Detection	51
4.2.1	Characterisation of Misrepresenting Firms by Beneish (1999a, b)	51
4.2.2	Characterization of Misrepresenting Firms and Prediction Model Development by Dechow et al. (2011)	52
4.2.3	Tax Characteristics of Misrepresenting Firms	54
4.3	Consequences of Misrepresentations	55
4.4	Reasons for Misrepresentations and Earnings Management	56
5	Data Selection	71
6	Research Papers	75
6.1	Summary of Research Paper 1: Firms' Accounting Misrepresentations - Reasons, Tools, and Outcomes	76
6.2	Summary of Research Paper 2: Does the Capital Market Recognize Financial Misrepresentations? – Fundamental Value and Market Analysis	77
6.3	Summary of Research Paper 3: To Rely, or Not to Rely? Sell-Side Financial Analysts and Low Earnings Quality	79
7	Conclusion	81
	List of References	84
	Original Publications	91

Tables

Table 1	Overview of the Literature About the Reasons for Earnings Management and for Misrepresentations.	60
Table 2	Distribution of Misrepresented Firm Years Between 1976 and 2014.	72
Table 3	Frequency of Misrepresented Firm Years per Firm.	73

Figures

Figure 1	Fraud triangle following Cressey (1953).	25
Figure 2	Fraud pentagon following Marks (2012).	26
Figure 3	Timeline of a typical SEC investigation as depicted in Karpoff et al. (2008a).	32
Figure 4	Time sequence for earnings management, earnings restatements, and misrepresentations/fraud.	44
Figure 5	Frequencies and overlap among earnings management, earnings restatements, and misrepresentations/fraud.	45

Abbreviations

AAER	Accounting and Auditing Enforcement Release
ASC	Accounting Standard Codification
DoJ	Department of Justice
GAAP	Generally Accepted Accounting Principles
GAO	Government Accountability Office
PCAOB	Public Company Accounting Oversight Board
PSLRA	Private Securities Litigation Reform Act of 1995
SEC	United States Securities and Exchange Commission
SOX	Sarbanes–Oxley Act

List of Original Essays

This dissertation is based on the following original essays, which are referred to in the text by their Roman numerals:

- I Kloppenburg, I. (2024) Firms' Accounting Misrepresentations - Reasons, Tools and Outcomes
- II Kloppenburg, I. (2024) Does the Capital Market Recognize Financial Misrepresentations? – Fundamental Value and Market Analysis
- III Kloppenburg, I., and Schadewitz, H. (2024) To Rely, or not to Rely? Sell-Side Financial Analysts and Low Earnings Quality

1 Introduction and Motivation

Financial misrepresentations (hereinafter “misrepresentation”) are rare events that cause enormous financial damage (Palmrose et al. 2004). The term misrepresentation refers to a deliberate violation of generally accepted accounting principles (GAAP) by a company’s top management or lower-level employees. The “deliberate” aspect is important here since it excludes errors by definition. Chapter 3 provides a detailed definition of misrepresentation.

The financial damage that can be caused by misrepresentation can be illustrated by the case of Wirecard AG, a company with its headquarters near Munich, Germany. The company had a market value of 28 billion € shortly before its collapse in 2020 (Schuetze and O’Donnell 2020). Its main business segment was to provide financial services, especially in electronic payment processing (Dias et al. 2021).

The first open allegations of balance sheet irregularities date back to 2008 (McCrum 2020) when the German shareholder association expressed doubts about the company’s balance sheet. This resulted in a special audit by the large auditing firm EY. As the audit report did not support the doubts, the case was closed. EY also became Wirecard’s standard auditing firm. In 2016, an anonymous source again raised doubts about Wirecard’s practices, but no action was taken in response to the anonymous allegation. In 2019, the *Financial Times* published a report that raised doubts about the existence of approximately half of Wirecard’s business. This was followed by a second report in the *Financial Times* that directly accused Wirecard of accounting fraud through fraudulently inflating its profits. Wirecard reacted by appointing the company KPMG to conduct a special audit, but the resulting report was unable to clarify all of the allegations.

In June 2020, Wirecard’s auditors EY, who were busy auditing the company’s 2019 annual report, found strong evidence that a substantial amount of money, supposedly held by an escrow account, did not exist (Dias et al. 2021). It ultimately transpired that the money did not, in fact, exist and that the figures in the books were the result of a series of fraudulent accounting practices. A full overview of all accounting malpractices is currently outstanding. Because of the fraud, the CEO and CFO of Wirecard left the board, and a few days later, Wirecard filed for bankruptcy (McCrum 2020). The CFO became a fugitive while the CEO was prosecuted in a

German court. The bankruptcy of Wirecard led to a loss of billions of euros for debt and equity holders (Schuetze and O'Donnell 2020, McCrum 2020). The exact value is dependent on the ongoing bankruptcy process. Moreover, it led to a lawsuit filed by the shareholders against the auditing firm EY with an as-yet unknown outcome (Gries 2021, Rasch 2023).

More cases like that of Wirecard have occurred in the past. That of the US company Enron, which was caught misrepresenting in 2001, is probably known to many people (Curwen 2021). Other examples of large companies caught misrepresenting include WorldCom in 2002 (Tran 2002), the American International Group in 2005 (Ivanova 2017), Toshiba in 2015 (Farrell 2015), and Luckin Coffee in 2020 (Stempel 2021). As this list of high-profile cases suggests, the phenomenon is not only a German problem. Enron, WorldCom, American International Group, and Luckin Coffee were listed in the United States (US) at the time of their misrepresentation, while Toshiba was listed in Japan.

The aim of this dissertation is to increase the knowledge that exists on the phenomenon of misrepresentation. Therefore, the phenomenon is approached from three different directions in three separate essays. The first objective (Essay 1) is to increase an understanding of the phenomenon itself by analysing the reason for, tools used in, and outcome of misrepresentation; thus, an overview of the phenomenon is provided. The major novelty here compared with previous research is that the reason for the specific firm to employ misrepresentation is identified from governmental investigation reports. This not only allows for the identification of the reasons and the frequency of a set of reasons but also for a characterization of the type of firms susceptible given a certain set of reasons. Essay 1 also draws conclusions about the tool used to identify misrepresentations as well as the outcomes. Consequently, it is possible to conduct a finer analysis of the phenomenon compared with previous research.

The second objective (Essay 2) is to delve deeper into one aspect of the phenomenon. Essay 2 examines shareholders and the effect of misrepresentation on the firm's value from a shareholder perspective. In addition, the value created (or lost) during the misrepresentation period is compared with the market reaction once the misrepresentation is revealed to the public. The unique aspect here is that the firm's value is calculated based on fundamental information from a group of misrepresenting firms to mirror shareholders' valuation of the firms.

Lastly, the third objective (Essay 3) is to go beyond misrepresentations as a phenomenon. A misrepresented annual report is known to have low earnings quality since the financial figures are (with a very high likelihood) incorrect. Therefore, Essay 3 takes advantage of the knowledge and tests how sell-side financial analysts (as proxy for well-informed, professional users of financial statements) react to low earnings quality. Misrepresentations are consequently only a proxy for low earnings

quality. Moreover, access to analyst reports and thus analyst forecasts favours the use of material originating from analysts.

The dissertation bases on a dataset of investigation reports of the Securities and Exchange Commission of the USA about (alleged) misrepresentations. More details about the definition of the dataset can be found in chapter 3 and of the dataset itself in chapter 5. Using the investigation reports in the US leads to a coherent institutional setting as well as a consistent framework of how these misrepresentations are uncovered.

Since misrepresentations are inseparably related to the correctness of financial statement information, multiple theories connected with financial statement information are affected by the phenomenon. However, to avoid a long discussion of these theories and to enhance the understanding of the main points, the focus is only placed on the most important theories, although the fact that there are also other theories affected by the research is acknowledged. The main theories on which the dissertation is based are positive accounting theory, fraud triangle, and the efficient market hypothesis, all three of which are introduced in Chapter 2.

1.1 Research Questions

This dissertation centres around the phenomenon of misrepresentation. It relies on a sample of firms apprehended for misrepresentation by a government agency and disclosed in an enforcement report (such reports are described in Section 3.1). The firms in the dataset are all traded in the US, where almost all of them are headquartered (the dataset is described further in Chapters 3 and 5). This dissertation adopts three different directions to research the phenomenon. First, in Essay 1, observations are made about the misrepresenting firms themselves, including an analysis of the misrepresenting firms, the reason for the misrepresentation, the tool used for the misrepresentation, and the outcome. The underlying theories are positive accounting theory and the fraud triangle (an explanation of the theories follows in Sections 2.1 and 2.2). The specific research questions (RQs) for Essay 1 are as follows:

RESEARCH QUESTION 1: What reasons for a misrepresentation can be empirically detected in enforcement reports?

RESEARCH QUESTION 2: Is there a link between the manager's reason for the misrepresentation and the tool for the misrepresentation?

RESEARCH QUESTION 3: Is there a link between the manager's reason for the misrepresentation and the profile (approximated by accounting ratios) of a misrepresenting firm?

Second, Essay 2 examines one aspect of the phenomenon more deeply, namely the artificial value that the firm gains from the misrepresentation. This gain in firm value is then compared with the loss in market value once the misrepresentation is revealed to the public. The underlying theory here is the efficient market hypothesis. The specific research questions for this part of the investigation are as follows:

RESEARCH QUESTION 4: How much is the firm's (artificial) value gain (or loss) due to a misrepresentation computed using fundamental information?

RESEARCH QUESTION 5: Is there an association between the (artificial) value gain (or loss) of a misrepresenting firm, which has been computed using fundamental information, and the market reaction once the misrepresentation is revealed to the public?

Third, Essay 3 examines one specific feature of misrepresentations, namely that perpetrating firms have low earnings quality since their financial figures are alleged to be incorrect. The objective of this third direction is to demonstrate how the feature of low earnings quality is exploited, which concerns how low earnings quality impacts analysts. The specific research question is as follows:

RESEARCH QUESTION 6: How are sell-side financial analysts affected by low earnings quality when creating their earnings forecasts?

While the phenomenon of misrepresentation forms the common thread throughout the dissertation, as the research questions indicate, the phenomenon is examined differently in each of the three essays. While it is at the centre of the work in Essay 1, only one particular aspect of the phenomenon, namely the value difference, is examined in Essay 2, while in Essay 3, the phenomenon serves as a proxy for low earnings quality. This diversity suggests the possibilities that this phenomenon offers for research, which is also one reason for choosing such a variety of different approaches to the phenomenon. Additional reasons are the clear gap in the literature as well as the availability of data.

1.2 Main Results and Practical Implications

In the first essay, the main aim is to identify the reason for the misrepresentations in the enforcement reports. Moreover, depending on the reason identified, a search is conducted for the tool used for the misrepresentation as well as an (accounting) profile of the misrepresenting firm. The results indicate three main categories of reasons for firms to misrepresent their financial figures, which are listed as follows:

Category 1: Misrepresentation for the manager's direct personal gain in wealth (greed);

Category 2: Misrepresentation to avoid negative contractual or institutional consequences (flee);

Category 3: Misrepresentation due to capital market pressure (fear).

Furthermore, the results indicate that both common and different tools are used depending on the reason for the misrepresentation. Misrepresenting firms in category 1 mainly use methods that increase earnings, total assets, and sales. Misrepresenting firms in category 2 mainly use methods that increase receivables, sales, earnings, and total assets and decrease current liabilities. Misrepresenting firms in category 3 mainly use methods that increase earnings and current assets and decrease total assets, inventory, and current liabilities.

In addition, the accounting profile differs depending on the category. Misrepresenting firms in category 1 are comparatively small and typically highly profitable. Moreover, their riskiness is as high as that of other peer firms. Misrepresenting firms in category 2 are also comparatively small but appear to take more risks. Their profitability does not appear to differ compared with their peers. Misrepresenting firms in category 3 are comparatively large, and they typically take as many or even more risks than their peers while also (on average) being as profitable as their peers. Wirecard, the case introduced at the start of Chapter 1, belongs to category 1 since the misrepresentation was mainly aimed at increasing the wealth of the CEO and CFO as well as their power.

A wider knowledge of misrepresentations as well as the connection between misrepresentation and the reason for its occurrence might be helpful for multiple groups. A straightforward example is auditors. Their task is to "perform the audit to obtain reasonable assurance about whether the financial statements are free of material misrepresentation, whether caused by error or fraud" (AS 1001.02; more about auditors is provided in Section 3.3.4). Consequently, it is in the interest of auditors to enhance their understanding of misrepresentation. In particular, the results of this research might help auditors (given a certain accounting profile and a

specific reason for suspicion) to focus on a specific tool. Other examples of the practical implications of this research include that capital market actors, such as financial analysts, might become more aware of a potential problem at a firm, or that banks might perform tighter checks or require special debt covenants for firms suspected of misrepresenting.

The second essay deals with the question of the artificial gain (or loss) in fundamental firm value during the misrepresentation period. Moreover, the gain (or loss) is compared with the change in market value once the misrepresentation is revealed to the public. The results indicate that a positive difference exists in the fundamental firm value when the same firm year is compared, once as misrepresented and once as restated, of between 7.7% and 29.6% on average and a median difference of between 1.6% and 17.6%. This increase in the fundamental firm value is unrelated to the drop in market value once the misrepresentation is revealed to the public. As such, the results have a practical implication for multiple groups, especially those affected by the movement of the share price. For example, a shareholder might be interested in the results for developing a trading strategy. In addition, financial analysts might be interested because the results could help them to estimate the level of impact of the revelation that a misrepresentation has occurred.

The third essay examines the effect of the misrepresentation on sell-side analysts, especially their earnings-per-share forecasts. Here, the misrepresentation is a proxy for low earnings quality. The results suggest that the number of analysts who follow a misrepresenting firm increases due to the misrepresentation. Additionally, the consensus forecast is positively affected while the standard deviation remains unchanged. The results suggest that the analysts were not aware of the misrepresentation and were rather misled by it. Moreover, there was no change in the dispersion among the analysts measurable. This indicates that the analysts make their forecasts in a uniform manner with or without the misrepresentation.

The results of this research are, first and foremost, of interest to analysts since they provide knowledge about what is happening in their field and how they can differentiate themselves from their competitors. Furthermore, the results are of special interest to the users of analyst reports – most notably shareholders. Using these results, shareholders can identify the level of trust they can place in analyst reports when examining low earnings quality. Additionally, shareholders might wish to adjust their trading strategy after considering the implications of the results regarding the efficient market hypothesis.

1.3 Structure of the Dissertation

The remainder of the dissertation is structured as follows: First, the theoretical background is discussed in Chapter 2. The emphasis here is on the three most

relevant theories: that of Positive Accounting Theory, Fraud Triangle, and Efficient Market Hypothesis.

Next, the concept “financial misrepresentation” is defined in Chapter 3, as are the lines of defence used to avoid misrepresentations before they exist or at least to detect them once they do. The roles of the annual general meeting, compensation committee, audit committee, and auditors, among others, are also presented in more detail. Additionally, an explanation is provided of how these lines of defence are helpful in avoiding misrepresentations *ex ante* or detecting them *ex post*. Other concepts included in the topic of low earnings quality are also introduced, especially in regard to any emphasis involved in the concepts’ relationship with misrepresentations (Section 3.4). This most notably concerns the concepts “earnings management” and “restatement”.

Then, in Chapter 4, prior literature is presented with a special focus on a characterization of misrepresenting firms. This incorporates the reasons provided for misrepresentations in the relevant literature regarding misrepresentations or related areas. Subsequently, the data and data collection are described in Chapter 5, while Chapter 6 summarises the essays.

Lastly, Chapter 7 provides the overall conclusion to the dissertation. It focuses on the basic idea as well as the main results, implications, and limitations of the essays. Following the conclusion chapter, the three original essays are attached to the dissertation.

2 Theoretical Background

The phenomenon of a misrepresentation targets the heart of accounting: the financial figures. Consequently, multiple different accounting or accounting-related theories are affected by this phenomenon. However, the studies in this dissertation only focus on three theories. Therefore, these three theories are discussed in the following sections (2.1–2.3), while other theories affected by misrepresentation are also acknowledged. Lastly, the chapter discusses the relevance of the theoretical background to answering the research questions.

2.1 Positive Accounting Theory

The history of positive accounting theory dates back to 1978 (Watts and Zimmerman 1986 and 1990). The starting point for the theory was the question of how accounting standards should be formulated given the different interests of various stakeholders in a firm (Watts and Zimmerman 1978), such as the managers of firms having their remuneration tied to certain financial figures (e.g., earnings). Thus, these managers have an interest in accounting standards that lead to financial figures that are favourable to their remuneration, such as accelerated earnings. Another example is banks and other lenders who are interested in the repayment of a loan, including interest. Hence, they are less interested in, for example, the management's remuneration as long as the firm is able to pay back the loan, including interest. As these examples demonstrate, conflicts of interest can exist among stakeholder groups regarding the optimal accounting standards and their use.

Since its development, positive accounting theory has been modified and extended (Scott 2015). Currently, it is also known as contracting theory, which has now left the field of optimal accounting standards to take a broader perspective. Presently, it also includes accounting choices within the existing accounting standards. However, the main message of the theory remains the same: Accounting is not used to present a truthful and accurate picture of the firm to outsiders but rather to present the firm as close to the desired state as possible. According to Scott (2015), the term “desired” depends on the perspective. To explain the term, it is necessary to take a step back.

A firm has multiple contracts with internal or external parties (Coase 1937, Scott 2015). The internal parties include the firm's managers but also its employees. An external party is, for example, a bank or a supplier. A contract does not necessarily have to be a written contract signed by both parties. It can also be an implicit contract, an example of which would be related to the shareholder. A shareholder does not sign a contract with the firm; nevertheless, shareholders would want the firm to work reasonably and properly with their money. Moreover, shareholders are interested in accurate reports from the firm that allow them to evaluate it. Another example of an implicit contract is related to the government. Although nothing is written and signed by government officials and the representatives of a firm, the government expects the firm to act according to a certain set of rules, including paying taxes. In return, the firm and its employees are provided with governmental services and protection. It must be added that the theory – and this all contracts – rely on rationality among the parties.

Prior literature has identified three main hypotheses for accounting following positive accounting theory (Watts and Zimmerman 1983, 1990, Scott 2015). The first hypothesis is related to management compensation contracts. Often, the remuneration of management is bound to certain accounting figures (Healy 1985). Reaching these figures or exceeding a certain threshold leads to higher remuneration for the management. Consequently, the management would want to meet or exceed these accounting figures to maximise their own personal wealth.

The second hypothesis is related to debt contracts. Typically, in debt contracts, certain accounting figures are included (debt covenants). In cases where the accounting figures are not met (i.e., a covenant is broken), these contracts define the punishments. Such punishments could include an increase in the interest rate or the termination of the debt contract. Avoiding a breach of such a contractual covenant or improving the negotiation position in the case of a new debt contract could be the aim of management – one that can be achieved by the means of accounting.

The third hypothesis is related to political contracts (Watts and Zimmerman 1983, 1990). The claim is that large, profitable firms attract the attention of the government, as governments are interested in avoiding monopolies. Thus, they tend to punish large firms that are highly successful and consequently highly profitable. To avoid these punishments, such firms are interested in exhibiting lower profitability than they actually have. These three main hypotheses provide some reasons for why there is an interest among firms in not reporting earnings truthfully and accurately. However, they do not cover all of the possible reasons. A complete list of reasons cannot be provided due to the number of different interests of various stakeholders in firms.

To answer the aforementioned question of what the term “desired” means, one must look at the reason for not truthfully and accurately reporting earnings. One

example is that, in consideration of the management contract hypothesis, a firm might deviate from truthful reporting to increase the manager's personal wealth. By contrast, in consideration of the political contract hypothesis, a firm might deviate to avoid attention from the government and any resulting regulations. Which hypothesis and hence which of the "desired" accounting figures dominate depends on the particular case and cannot be generalized.

2.2 The Fraud Triangle

Donald C. Cressey was an American criminologist who conducted a series of interviews aimed at identifying why people commit fraud (Cressey 1950 and 1953). He was particularly interested in individuals who (1) accepted a position of trust in good faith and then (2) violated such trust by committing fraud. The position of a CEO is an example of a position of trust since a CEO receives the trust of various stakeholders (e.g., shareholders, employees, and suppliers) to manage the firm in an appropriate way. However, other managers in a firm, such as lower-tier managers, can be considered similar to the CEO in that they hold a position of trust, since they also experience the trust of various stakeholders. Whether a misrepresentation is fraud and, thus, whether the individuals found to have caused the misrepresentation are responsible for committing a fraudulent act, can also be discussed. From a legal point of view, 75% of the cases of firms caught misrepresenting charges also lead to an accusation against an individual of fraud (Amiram et al. 2018). Hence, legally, although there is a large overlap, not all misrepresentations are deemed fraud cases. However, a misrepresentation that does not lead to charges against individuals for fraud is also illegal. Moreover, from a moral perspective, whoever is negatively affected by the misrepresentation might be the target of fraud, even though there is no criminal charge. Consequently, prior literature has sometimes considered all misrepresentations as fraud (e.g., Miller 2006, Bao et al. 2020, Blanco et al. 2022, Lennox and Pittman 2010). However, this is not always the case (e.g., Dechow et al. 2011, Bertomeu et al. 2021, Burns and Kedia 2006).

The original fraud triangle consists of the following three elements: pressure, opportunity, and rationalization. Pressure, sometimes called perceived pressure, refers to the reason/motivation for an individual to commit fraud (Abdullahi and Mansor 2015). Pressure is differentiated here into three groups: (1) personal pressure, (2) employment stress, and (3) external pressure (Lister 2007). Personal pressure (1) refers to pressure that originates from the need to pay for an individual's lifestyle and vices. Employment stress (2) refers to pressure that originates from contingent compensation structures or the management's financial interests. External pressure (3) refers to threats to the financial stability of the business, financiers' covenants, and market expectations. Murdoch (2008) sees a further group

comprising political and social pressure. He mainly denotes, by using these terms, an individual's status in society and their reputation. However, one can also argue that personal pressure also covers this aspect.

Opportunity means that the individual must also have the possibility to commit fraud (Cressey 1953). This includes access to the necessary tools as well as a weak internal control system that does not hinder the individual from committing the fraud.

Rationalization refers to the phenomenon of individuals being aware of their illegal behaviour but attempting to find justifications for their behaviour (Schuchter and Levi 2019). One such justification could be a CEO claiming that he was only trying to save jobs. Thus, individuals try to find a way to justify their actions as morally acceptable (Tsang 2002). Since the justification still leads to illegal and (probably also) immoral actions, one can argue that such individuals lack moral reasoning (Rae and Subramian 2008). Figure 1 provides an overview of the fraud triangle.

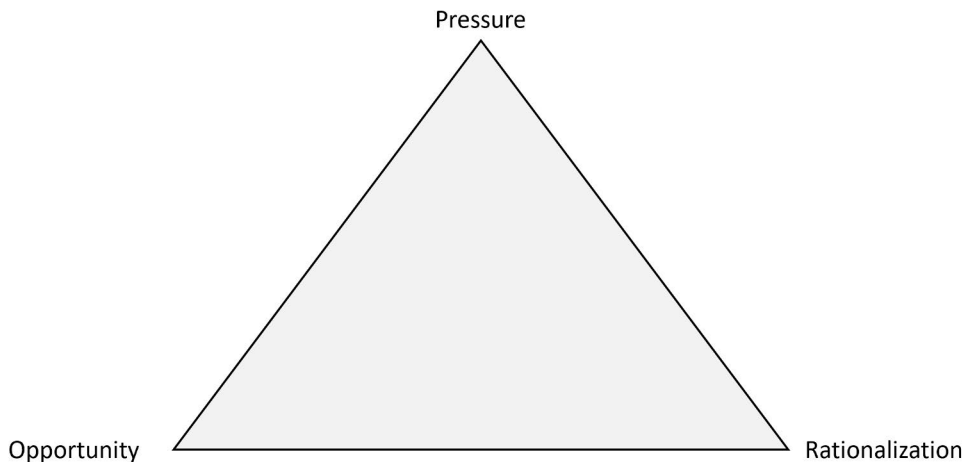


Figure 1: Fraud triangle following Cressey (1953).

The fraud triangle has experienced multiple extensions (Huber 2017, Bekiaris and Papachristou 2017, Christian et al. 2019). One relevant extension is the introduction of the capability dimension by Wolf and Hermanson (2004). Here, capability refers to the ability of the individual to commit the fraud, which could be sufficient knowledge or skill. Moreover, the individual must have a personality that can enhance the act of fraud as well as the ability to convince others to support their fraudulent behaviour (if necessary).

Another extension of the fraud triangle is from Marks (2012), who has a background as a practitioner. Originating from his own experience, Marks introduces the dimension of arrogance to the triangle, which here refers to the individual's belief that they are superior to others as well as that they are above internal controls. The combined extensions of the fraud triangle suggested by Wolf and Hermanson (2004) and Marks (2012) lead to the fraud pentagon, which is depicted in Figure 2:

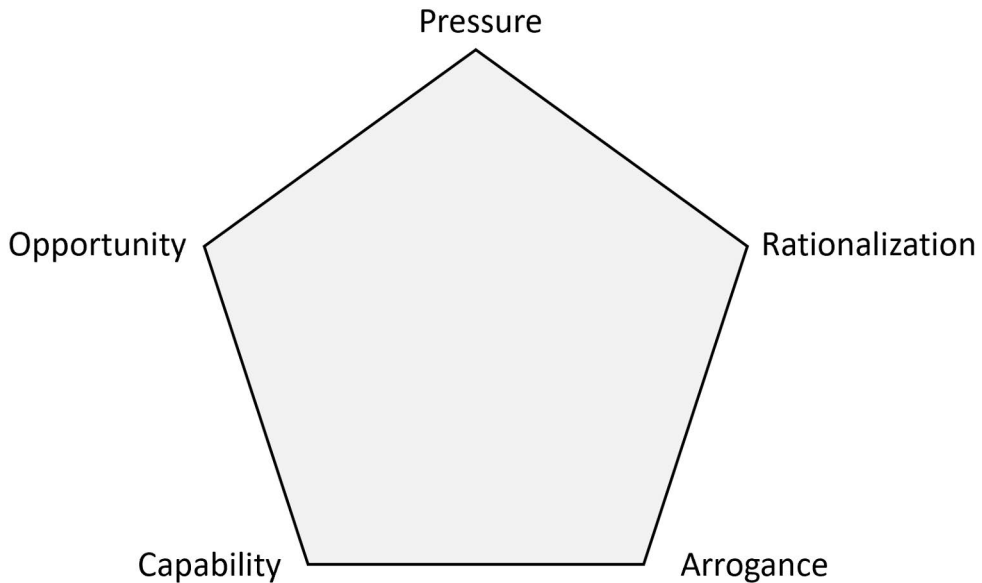


Figure 2: Fraud pentagon following Marks (2012).

The main focus of this dissertation is on the pressure dimension (why a firm misrepresents) and the opportunity dimension (how a firm misrepresents). Both dimensions can be found in the fraud triangle as well as in the fraud pentagon. Therefore, it is not the focal point whether the fraud triangle or the pentagon is used. However, since it is longer and better established in the literature, I focus on the fraud triangle while acknowledging that the fraud pentagon might lead to the same implications.

2.3 Efficient Market Hypothesis

Market efficiency is a major topic in the economics literature (e.g., Marshall 2009, Mankiw 2014). The term refers, in general, to the optimal allocation of resources without any loss of welfare. In the case of the capital market, the relevant resource is capital. Fama (1970) defines an efficient capital market as a market where the

prices provide an accurate signal in terms of resource allocation. Hence, the price of the securities always fully reflects the available information.

A major question therefore arises as to what “fully reflects” means. What information is “fully reflected” by the price of a security? Consequently, Fama (1970 and 1991) classifies efficient markets into three forms: a weak form, a semi-strong form, and a strong form. In each form, the term “fully reflects” is defined slightly differently. First, in the weak form of the efficient market hypothesis, the claim is that all past prices are included in the current price of a security. It is subsequently not possible to conclude future development from a past development or trend. Hence, the term “fully reflects” here contains past prices but not current information. Second, the semi-strong form of the efficient market hypothesis, the current price of securities contains past prices as well as all relevant public information. It is important to note that only public information is included, and non-public information, such as private information about the management, is not included since it is not known to (potential) actors on the capital market. Consequently, it is not possible to compare past prices to current prices. Moreover, it is not possible to achieve a difference in the share prices by using a fundamental value analysis. Accordingly, the term “fully reflects” covers past prices as well as current public information. Lastly, in the strong form of the efficient market hypothesis, all (available) information is included in the current price. This includes past prices, public information, and private information from individuals. For example, the privileged private information known to the management that has not yet been communicated to the outside is included in the price of the security. Consequently, the term “fully reflects” means that all information is included in the price of a security.

The efficient market hypothesis is thus based on the following three main assumptions (Fama 1970): (1) there are no transaction costs; (2) information is costless, free, and available to everyone; and (3) all market participants draw the same conclusion from the given information about the price of a security. Fama (1970) acknowledges that these assumptions are unrealistic in reality. However, he remarks that these assumptions do not need to be met perfectly for market efficiency. In fact, he considers all of these conditions “unrealistic in practice”, arguing that high transaction costs do not hinder a market from being efficient as long as all available information is taken into account by a sufficient number of transactors. In addition, it is enough if a sufficient number of investors have access to all available information. It is not necessary for all investors to have access for an efficient market to exist. Similarly, it is not necessary for the investors to agree on the same implication of the information on the price of a security. It is only required for there to be no single investor or group of investors that consistently outperforms the others

in their evaluation of the information. In more recent literature, the rationality of the investors is also explicitly mentioned as a crucial assumption (Scott 2015).

Whether the efficient market hypothesis in each of its forms holds true is a much debated question in the literature (Degustis and Novickyte 2014, Malkiel 2003 and 2005, Borges 2010). Doubts about the strong form of the hypothesis were already raised by Fama in the 1970s (1970). Thus, the strong form is highly likely not to be feasible in reality and is consequently disregarded in the following. However, the literature is uncertain about the feasibility of the weak and semi-strong forms. While they were widely accepted by researchers as accurate in the early period of the efficient market hypothesis, doubts have been raised in the 21st century (Malkiel 2003). According to Naseer and Tariq (2015), the emergence of behavioural finance research caused this change in the minds of researchers.

Furthermore, the weak form of the efficient market hypothesis has been tested multiple times over the last decades. Fama (1965) and Fisher (1966) were the first to find supportive evidence for the hypothesis. Both authors are able to demonstrate a certain stability in the share prices and interpret their findings as indicators that past prices should be included in current prices. However, Fama (1991) remarks that these two studies, similar to many other early studies, lack statistical power. He argues that the results are valid despite the lack of statistical power since the variation in the outcomes of the models is small.

In later years and with more data, Lo and MacKinlay (1988) as well as Conrad and Kaul (1988) demonstrated a positive autocorrelation in daily and weekly returns. This is interpreted as a clear indicator of the weak form of the efficient market hypothesis. However, doubts about the hypothesis have also been raised with an increase in the amount of data. For example, French and Roll (1986) demonstrate that stock prices are more variable during the trading hours of the stock exchange (e.g., weekdays) compared with non-trading hours (e.g., weekends). Specifically, stock prices change more often when the stock exchange is open compared with when it is closed. The authors interpret this finding as a potential signal against market efficiency in its weak form. However, Fama (1991) highlights that it could be caused by the noise trading of uninformed investors.

Moreover, Jethwani and Ramchandani (2017) analyse 49 papers that have tested the efficient market hypothesis in its weak form. Thirty-five of the 49 papers conclude that the weak form of the hypothesis does not hold true. However, this also means that 14 papers either support the hypothesis or at least obtain mixed results. The authors claim that the results of the 49 papers depend on the time period and statistical tools used by the researcher. Thus, whether the efficient market hypothesis, in its weak form, holds true can also be discussed based on more recent literature.

The efficient market hypothesis in its semi-strong form is typically tested with an event study design (Fama 1991). In such a design, a certain event and the corresponding date when the event becomes public knowledge are determined (Binder 1998). A hurdle here is the determination of the exact event date. Binder (1998) illustrates the difficulty using several examples. According to the author, it is comparatively easy to determine the date of a corporate announcement. Although there might be some leakage of information in the days before, event studies that rely on the official announcement date have proven to be rather accurate. However, determining the exact event date is even more difficult in cases such as a change in regulations that requires congressional (or other parliamentary) approval. Such congress decisions are normally previously discussed among the members of Congress as well as among non-members like lobbyists. Thus, measuring the reaction of the capital market once the new regulation has passed Congress only covers the change in expectations of the capital market and is likely inaccurate. In the following step and for all events studies, the reaction of the capital market measured on or around the event date is then compared with a hypothetical market reaction as if the event had not happened (Binder 1998). The market reaction in the hypothetical case is calculated either with a cross-sectional or a time-series approach.

The results of various event studies have provided mixed evidence about whether the efficient market hypothesis holds true in its semi-strong form. However, the opinion expressed in the literature to date is that, in general, the hypothesis holds true, although exceptions (i.e., anomalies) exist (e.g., Fama 1991, Malkiel 2011, Degutis and Novickyte 2014). An example of research that confirms the efficient market hypothesis is that of Fama et al. (1969). The authors demonstrate that the news of a stock split and the consequent adjustment of the dividend policy typically result in a market value increase for the firm. They also demonstrate that the market reaction is a full and immediate indication that the efficient market hypothesis holds true in its semi-strong form. An example of an anomaly is the hypothesis of Ball and Brown (1968), who investigate the market reaction after the disclosure of an annual report. They demonstrate that the market also reacts multiple days after the disclosure of the new information. Since a time lapse of one or two days until the information is included in the price of a security cannot be called “immediate”, one could argue that the post-announcement drift indicates an anomaly. Moreover, conducting the same analysis again in recent times does not change the results in general (Ball and Brown 2019). An in-depth analysis of the findings in 1968 and the impact in subsequent years is provided by Kothari and Wasley (2019).

Similar to the two aforementioned examples, multiple further event studies have been published. The results either indicate that the efficient market hypothesis holds true or that there is an anomaly. As providing an overview of all these case studies would go beyond the scope of this dissertation, I refer interested readers to literature

reviews about the efficient market hypothesis by Degustis and Novickyte (2014), Rossi (2015), or Naseer and Bin Tariq (2015).

2.4 Relevance of the Theoretical Background to Answering the Research Questions

Each of the three theories plays its own major role in answering the research questions of this dissertation. First, positive accounting theory provides explanations as to why annual reports or financial figures in general might be altered. The explanations might be of interest in all three essays. However, the first essay is probably closest to the theory since it discusses the reason for a misrepresentation (altering the annual report). Consequently, positive accounting theory plays a major role in the supporting construct of the first essay.

Second, the fraud triangle helps to explain those elements that drive the decision of an individual to initiate a misrepresentation. This topic is of the most relevance in the first essay, where the reason and tools for causing a misrepresentation are analysed. Thus, the fraud triangle is also used as a supporting construct in the first essay.

Third, the efficient market hypothesis explains how the capital market acts and reacts to (new) information. In the case of Essay 2, a central part of the research involves measuring and understanding the reaction of the market to a misrepresentation. In more detail, the aim is to understand the market's reaction when given a firm's value difference based on fundamental information. Here, the efficient market hypothesis is helpful in understanding and interpreting how the capital market deals with the (potentially) unknown information of a misrepresentation and how it reacts once the information becomes (definitely) known to the capital market.

The connection between the efficient market hypothesis and low earnings quality is not explicitly mentioned in Essay 3. However, the hypothesis is present in the background when asking how capital market participants can allocate capital efficiently when sell-side analysts, as the relevant group for overcoming the information asymmetry between firms and shareholders, are faced with low earnings quality.

3 Financial Misrepresentation

There is no fixed term in the literature for the phenomenon of “financial misrepresentation”, or “misrepresentation” for short. Various authors have also called the phenomenon “misstatement” (Dechow et al. 2011), “misreporting” (Burns and Kedia 2006), and “accounting fraud” (Miller 2006, Palmrose et al. 2004). I use the term “financial misrepresentation” following Amiram et al. (2018). Common to all of these terms is that the underlying dataset consists of US firms that are subject to or mentioned in the accounting and auditing enforcement releases (AAERs) of the US Securities and Exchange (SEC). In the following sections, the background of AAERs is explained. This includes the legal perspective, the institutional perspective, and the position of misrepresentations in the field of low earnings quality.

3.1 SEC Investigations and Their Legal Framework

AAERs are the result of an investigation by the SEC. Of special interest is a violation of Section 13(b)(2) of the Securities and Exchange Act of 1934. This section requires listed firms to “make and keep books, records, and accounts, which, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the issuer” (Securities and Exchange Act of 1934 Sec. 13(b)(2)(A)). Moreover, the section requires listed firms to “devise and maintain a system of internal accounting controls sufficient to provide reasonable assurances that—

- (i) transactions are executed in accordance with the management’s general or specific authorization;
- (ii) transactions are recorded as necessary (I) to permit preparation of financial statements in conformity with generally accepted accounting principles or any other criteria applicable to such statements, and (II) to maintain accountability for assets;
- (iii) access to assets is permitted only in accordance with management’s general or specific authorization; and
- (iv) the recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action is taken with respect to any differences” (Securities and Exchange Act of 1934 Sec. 13(b)(2)(B)).

Essentially, the section requires listed firms to report their earnings truthfully and within the GAAP. Furthermore, the firms are required to implement an internal control system that ensures that there will be no GAAP violations. Since the SEC operates in the US, GAAP specifically refers to the US-GAAP.

Individuals are typically punished because of a violation of Section 10(B) of the Securities and Exchange Act of 1934. This section states that “it shall be unlawful for any person, directly or indirectly, by the use of any means or instrumentality of interstate commerce or of the mails, or of any facility of any national securities exchange to use or employ, in connection with the purchase or sale of any security registered on a national securities exchange or any security not so registered, or any securities-based swap agreement any manipulative or deceptive device or contrivance in contravention of such rules and regulations as the Commission may prescribe as necessary or appropriate in the public interest or for the protection of investors” (Securities and Exchange Act of 1934 Sec. 10(B)).

In sum, Section 10(B) disallows any manipulative behaviour by anyone towards a range of items traded on the stock market. This also covers shares and hence share price manipulations through, for example, a deliberate misrepresentation. Whether the manipulator obtains a personal advantage from the manipulation is not mentioned in the section and is consequently irrelevant. Thus, any deliberate misrepresentation, irrespective of the reason, is a violation of Section 10(B).

The SEC investigates (among others) potential violations against these two sections (13(b)(2) and 10(B)) and prosecutes violations against these sections. A typical time sequence for such an SEC investigation is depicted in Figure 3:

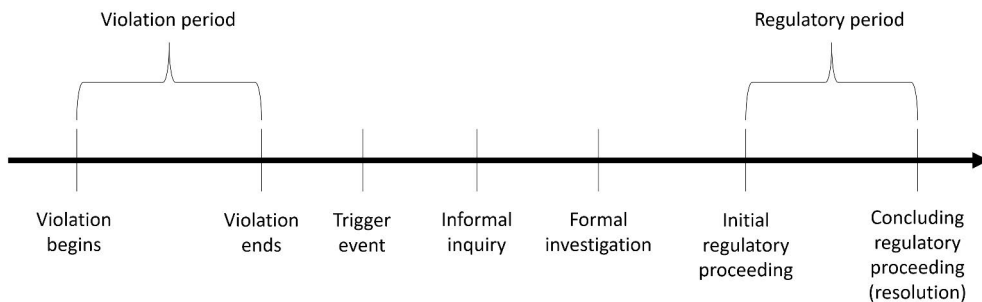


Figure 3: Timeline of a typical SEC investigation as depicted in Karpoff et al. (2008a).

Initially, there is a time period in which the firms misrepresent, which is the violation period. Subsequently, a trigger event occurs that draws the attention of the SEC. Examples of such an event are the self-disclosure of malfeasance by the firm, restatements, auditor departure, unusual trading, investigations by other federal agencies (e.g., the Department of Defense and the Environmental Protection Agency), delayed SEC filings, management departures, whistle-blower charges, and

routine reviews of the SEC (Karpoff et al. 2008a). After the trigger event, the SEC starts its investigation with an informal inquiry.¹ If the informal inquiry delivers sufficient indications of a violation of the law, then the SEC starts a formal investigation (Karpoff et al. 2008a).

A formal investigation can have two possible outcomes. First, the SEC cannot find any items of evidence that indicate law violations, with the result being that such cases are dropped and no further actions are pursued or public notifications disclosed. Second, the SEC finds sufficient evidence of a violation of the law, and it then prosecutes the cases (Files 2012). In both cases, the public is informed about the results of the investigation through releases about the findings. The entire process between the end of the violation period and the disclosure of the findings to the public normally takes several years. The earlier provision of information to the public may only occur through voluntary disclosure by the firms (Karpoff et al. 2008a).

Consequently, the SEC is only interested in firms that are subject to the Securities and Exchange Act. This covers all firms listed in the US or, more precisely, those whose securities are listed in the US at a stock exchange or on an over-the-counter market, as well as those in the process of being listed (initial public offerings [IPOs]; Securities and Exchange Act 1934 Sec. 2). Hence, the SEC considers itself also responsible for firms headquartered in a foreign country whose shares are traded in the US, such as on a US stock exchange. The SEC does not consider itself responsible for firms whose securities are not listed or delisted, for example, as part of a bankruptcy.

To be listed, whether firms are headquartered in foreign countries or not, they must fulfil the institutional standards of the US. These are holding an annual general meeting, having a compensation committee and an audit committee, and employing independent auditors. In Chapter 3.3, each of the four institutional standards is explained with a special focus on misrepresentation detection and prevention. Before, in Chapter 3.2, the impact of private securities litigations are introduced.

3.2 Private Securities Litigation

Besides the SEC, private individuals or other firms also have the right to sue a firm because of misconduct by its representatives (Security Act of 1933 Sec. 12). Such lawsuits are common after a misrepresentation is made public (Palmrose and Scholz 2004, Karpoff et al. 2008b). However, there is no need for the misrepresentation to become public for a lawsuit to be filed (Choi et al. 2009, Griffin et al. 2004). Until

¹ This is typically done with a letter from the SEC to the firm (SEC comment letter). This letter is published at the end of the inquiry if the SEC does not start a formal investigation.

1995, firms often got sued based on weak evidence because the plaintiff hoped that the firm would prefer a settlement over a long and costly lawsuit (Choi et al. 2009, Pritchard 1999, Ali and Kallapur 2001). Thus, most of the lawsuits at this time were either dismissed or settled (Choi et al. 2009). Consequently, it is difficult to assess which of these lawsuits were caused by a misrepresentation and which were only caused by the desire to settle the unwelcome lawsuit.

Therefore, in December 1995, the US Congress enacted a revision of the law, making it more difficult to sue a firm with weak evidence (Johnson et al. 2000). This revision of the law is called the Private Securities Litigation Reform Act (PSLRA) of 1995. It is possible that filing such a private lawsuit causes more shareholders to become aware of potential problems in a firm. However, for this, the shareholders need to know about the filed lawsuit. One way for shareholders to learn of such a lawsuit is when it is part of the media coverage. Moreover, such a lawsuit might cause the SEC to react or the firm to voluntarily disclose that there might have been a misrepresentation.

3.3 Relevant Institutional Framework Regarding Misrepresentations

US firms have, mainly forced by law but also partially voluntarily, built up several systems to mitigate the likelihood of a misrepresentation. These systems are part of the institutional framework in which the firms navigate. In the following subsections, the relevant institutional framework for mitigating the likelihood of a misrepresentation is introduced. It consists of direct and indirect parts of the framework. Moreover, the importance of the institutional framework in fighting misrepresentations is explained along with the changes due to the Sarbanes–Oxley (SOX) Act from 2002 onwards.

3.3.1 Annual General Meeting

The annual general meeting typically takes place once every year (Garner and Geissinger 2013). The specific regulations depend on the US state in which the firm is incorporated. The meeting is normally held in person. However, there is also an option for a written annual general meeting (Garner and Geissinger 2013). Some states also allow virtual (and hybrid) meetings (SEC 2022). The main purpose of the meeting is the election of directors and the transaction of other appropriate business, including the approval of fundamental corporate changes (e.g., mergers; Garner and Geissinger 2013). It is also the responsibility of the annual general meeting to decide on managements' compensation according to the recommendations of the compensation committee and to approve the independent auditors of the firm (Garner

and Geissinger 2013). To enable a more effective preparation for the annual general meeting, firms often file a proxy statement² that includes relevant information for shareholders, such as information about future proposed management remuneration (Larocque et al. 2020).

3.3.2 Compensation Committee

The task of the compensation committee is to negotiate the remuneration of the firm's top executives and to provide recommendations to the annual general meeting (Garner and Geissinger 2013). The members of the compensation committee must therefore fulfil two requirements: First, they are required to be members of the board of directors, and second, they are required to be independent (Securities and Exchange Act 1934 Sec. 10C(a)(2)). In the assessment of independence, any kind of payment from the firm to the member of the compensation committee, including consulting and advisory compensation, must be considered (Securities and Exchange Act 1934 Sec. 10C(a)(3)(A)). Moreover, payments to an affiliated person (e.g., close relative) of a member of the compensation committee must also be considered in the independence assessment (Securities and Exchange Act 1934 Sec. 10C(a)(3)(B)). Foreign firms that explicitly state their reasons for not having an independent compensation committee, such as limited partnerships, companies in bankruptcy proceedings, and registered open-end management investment companies, are exempt from the requirement to form a compensation committee (Securities and Exchange Act 1934 Sec. 10C(a)(1)).

3.3.3 Audit Committee

The responsibilities of the audit committee are to hire, compensate, oversee, and terminate the independent auditors of the firm (Securities and Exchange Act 1934 Sec. 10A(m)(2)). Thus, it must have the approval of the annual general meeting, and therefore, this is the first group the auditors must report to. The report must include any illegal acts within the firm that the auditor has become aware of during the audit (Securities and Exchange Act 1934 Sec. 10A(b)(1)). Moreover, the audit committee is responsible for establishing procedures for the employees of the firm to complain anonymously about questionable accounting or auditing matters (Securities and Exchange Act 1934 Sec. 10A(m)(4)). To be a member of the audit committee, two requirements must be fulfilled: The member of the committee must be (1) a member of the board of directors and (2) independent (Securities and Exchange Act 1934 Sec. 10A(m)(3)(A)). To be considered independent, neither the member of the

² The proxy statement is regulated in the SEC form DEF14a in the US.

committee nor any person affiliated with him or her (e.g., a family member) must accept any consulting, advisory, or other compensation from the firm (Securities and Exchange Act 1934 Sec. 10A(m)(3)(B)). The SEC only has the authority to exempt a member of the audit committee from the independence requirement under special circumstances (Securities and Exchange Act 1934 Sec. 10A(m)(3)(C)). Hence, all firms listed in the US must have an audit committee, including those headquartered in a foreign country.

3.3.4 Independent Auditor

The responsibility of independent auditors is described in Section 10A(a) of the Securities and Exchange Act of 1934 as follows:

“Each audit required pursuant to this title of the financial statements of an issuer by a registered public accounting firm shall include, in accordance with generally accepted auditing standards, as may be modified or supplemented from time to time by the Commission [the SEC]

- (1) procedures designed to provide reasonable assurance of detecting illegal acts that would have a direct and material effect on the determination of financial statement amounts;*
- (2) procedures designed to identify related party transactions that are material to the financial statements or otherwise require disclosure therein; and*
- (3) an evaluation of whether there is substantial doubt about the ability of the issuer to continue as a going concern during the ensuing fiscal year”*
(Securities and Exchange Act 1934 Sec. 10A(a)).

Hence, the auditors have to assess the firm’s likelihood of survival during the next fiscal year and are responsible for checking the completeness of the financial information; in addition, it is also their duty to detect illegal actions within the firm regarding the financial statement. In other words, their task is, by law, to detect misrepresentations before they are disclosed to the public. This task is also repeated in the auditing standards.

“The auditor has a responsibility to plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misrepresentation, whether caused by error or fraud. Because of the nature of audit evidence and the characteristics of fraud, the auditor is able to obtain reasonable, but not absolute, assurance that material misstatements are detected” (AS 1001.02).

Thus, the auditors are required to detect material misrepresentation due to fraud. However, the standard also highlights that there is no absolute guarantee that the auditors will detect the misrepresentation.

In cases where a misrepresentation is detected, the Securities and Exchange Act of 1934 requires the following obligations from the auditors:

“If, in the course of conducting an audit pursuant to this title to which subsection (a) [the auditing process] applies, the registered public accounting firm detects or otherwise becomes aware of information indicating that an illegal act (whether or not perceived to have a material effect on the financial statements of the issuer) has or may have occurred, the firm shall, in accordance with generally accepted auditing standards, as may be modified or supplemented from time to time by the Commission [the SEC]

- (A) (i) determine whether it is likely that an illegal act has occurred; and*
- (ii) if so, determine and consider the possible effect of the illegal act on the financial statements of the issuer, including any contingent monetary effects, such as fines, penalties, and damages; and*
- (B) as soon as practicable, inform the appropriate level of management of the issuer and assure that the audit committee of the issuer, or the board of directors of the issuer in the absence of such a committee, is adequately informed with respect to illegal acts that have been detected or have otherwise come to the attention of such firm in the course of the audit, unless the illegal act is clearly inconsequential”*

(Securities and Exchange Act 1934 Sec. 10A(b)(1)).

Hence, the auditors are required to assess the impact of the misrepresentation (and other illegal acts) on the financial statement. Moreover, they are required to report their findings to the audit committee (or in their absence to the board directly). It is then the responsibility of the audit committee to decide upon appropriate actions. However, in cases where the audit committee does not take any action, the auditors are required by law to report their findings directly to the SEC (Securities and Exchange Act 1934 Sec. 10A(b)(3)). Deliberate failure to inform the SEC will lead to a civil penalty being imposed on the auditors (Securities and Exchange Act 1934 Sec. 10A(d)).

The numerous laws and standards regarding auditors underline their importance in the fight against misrepresentations. Therefore, it is not very surprising that the appointment of independent auditors is based not only on the audit committee’s suggestion but ultimately also on the direct decision of the shareholders.

3.3.5 The Role of the Institutional Framework in Fighting Misrepresentations

Four bodies have been introduced that play a role in the fight against misrepresentations. The first body is the annual general meeting, whose role is to appoint the board of directors. Here, the shareholders have the possibility of focusing on candidates who are less likely to misrepresent. Furthermore, the independent auditor is typically voted for during the meeting (Cunningham 2016, Dao et. al. 2012). Here, the shareholders have the option to elect an independent person who is supposed to check (among others) the annual reports for misrepresentations.

The second body is the compensation committee. This committee has the option to negotiate compensation for the management that would make it unattractive or pointless to defraud shareholders through a misrepresentation. It is important here to note that the committee consists of independent individuals who are directly elected by the shareholders. Hence, the managers do not negotiate their own remuneration on behalf of the firm.

The third body is the audit committee, the role of which is to make suggestions for an independent auditor. However, their role is also to investigate potential misrepresentations and to attempt to avoid them before they ever occur. They therefore work closely with the auditors. The members of the audit committee consist of independent directors.

Lastly, the fourth body is independent auditors. Their role is to detect potential misrepresentations and make the audit committee aware of the problem. These auditors are specialists in their field. They are expected to work closely together with the audit committee as well as to report to the SEC if the audit committee does not take any action. The auditors are probably the strongest force in the detection of misrepresentations due to their independence, their expertise, and the pressure on them to avoid civil penalties (Kassem and Turksen 2021).

The SEC conducts its investigations on the published financial statements. Hence, they come last in the chain and at a point in time where the “damage” from publication has already been inflicted. They only have the option to mitigate the “damage” and avoid future problems by penalizing the person who acted. Similarly, private lawsuits can only be filed after the misrepresented financial statements are published; thus, they have a similar function as the SEC.

3.3.6 Changes in the Institutional Framework and the SEC Investigations as a result of the Sarbanes–Oxley Act

The previously described institutional framework originates mainly from current (2024) legislation. However, earlier changes have been made to the framework, the most famous of which are probably the changes introduced after the SOX Act 2002.

The SOX Act has been called by politicians and the press “the most far-reaching reforms of American business practices since the time of Franklin D. Roosevelt (Introduction of the Securities and Exchanges Acts of 1933 and 1934)” (Bumiller 2002). Before its introduction, in light of the accounting scandals around Enron and WorldCom, the Government Accountability Office (GAO) was asked by US Senator Paul Sarbanes to analyse misrepresentations (GAO 2002). The results of the GAO report suggested that it was important to re-establish the trust of the financial markets in financial statements (GAO 2002). Hence, the aim of the new act was “to protect investors by improving the accuracy and reliability of corporate disclosures made pursuant to the securities laws, and for other purposes” (SOX Act of 2002 initial sentence).

The SOX Act of 2002 consists of 11 major elements, of which five have a direct influence on the previously described institutional framework or on SEC investigations. These five major elements are as follows: the “Public Company Accounting Oversight Board” (element 1), “Auditor Independence” (element 2), “Corporate Responsibility” (element 3), “Commission Resources and Authority” (element 6), and “Corporate Fraud Accountability” (element 11). The changes almost exclusively affect the audit committee, auditors, and the SEC. In the following three subsections, the changes are explained in more detail.

3.3.6.1 Changes through SOX: Audit Committee

Due to the SOX Act, several changes were implemented in the Securities and Exchange Act of 1934 that affect the audit committee. These changes targeted the independence requirements for audit committee members as well as increased the control rights of the audit committee towards their own firm and its accounting. These control rights include a whistle-blower system for anonymous information from the employees of the firm. Furthermore, the independence of the audit committee when choosing the auditors has been improved by granting the audit committee the necessary funds, and the audit committee has obtained the rights and funds to seek external advice if a case warrants it (SOX Act of 2002 Sec. 301).

3.3.6.2 Changes through SOX: Auditors

Two main changes were made regarding the auditors as a result of the SOX Act. First, the Public Company Accounting Oversight Board (PCAOB) was founded, which has the duty to set auditing and other auditor-relevant standards in cooperation with the SEC and also to control the auditors. Therefore, auditing firms must register themselves with the PCAOB, which then inspects them and conducts investigations in cases where there has been a potential violation of the auditing standards or other

relevant standards. In the matter of enforcement actions, the PCAOB cooperates with the SEC. The PCAOB is constructed as a private, non-profit organization. Hence, the ultimate power of all actions of the PCAOB lies in the hands of the SEC (SOX Act of 2002 Sec. 101-108).

The second change for the auditors due to the SOX Act mainly targeted auditor independence. Since the introduction of the SOX Act, it has in general been prohibited for the auditing firm to provide non-audit services (e.g., consulting) for the firms they are auditing. A major exception is tax services. Further exceptions may be granted by the SEC, but the scope is very limited. All non-audit services must be pre-approved by the audit committee (unless they are immaterial compared with the total audit expenses) and disclosed to the shareholders. Moreover, due to the SOX Act, the audit partner (i.e., the person with primary responsibility for the audit) must change at least every five years, and the auditors must report their results and suggestions, as well as the communication between the management and the auditors, to the audit committee (SOX Act of 2002 Sec. 201-204).

3.3.6.3 Changes through SOX: The SEC

Due to the SOX Act, several changes in the Securities and Exchange Act of 1934 have affected the SEC. Among these changes is an increased budget for the SEC to hire further investigation staff (SOX Act 2002 Sec. 601). Moreover, the SEC obtained the right to prohibit individuals serving as directors or officers in listed firms if they have deliberately manipulated securities, such as through a misrepresentation (to be precise: if they have violated section 10(B); SOX Act 2002 Sec. 1105). Furthermore, the SEC obtained the right through the SOX Act to order payments from the misrepresenting firm to the person targeted by an investigation to be escrowed for a limited period (SOX Act 2002 Sec. 1103). Another change brought about by the SOX Act concerning SEC investigations is an increase in the sentence for violations of the securities law (SOX Act 2002 Sec. 1106). In general, it can be said that the power of the SEC to pursue their investigations and fight manipulators has been increased by the SOX Act.

3.4 Financial Misrepresentations and Related Low Earnings Quality Measures

In influential literature reviews about low earnings quality (Healy and Wahlen 1999, Walker 2013, Dechow and Skinner 2000, and Dechow et al. 2010), the terms earnings management and earnings restatements are used in addition to misrepresentations. The following subsections explain the two concepts behind these

terms and demonstrate how they are related to each other as well as to misrepresentations.

3.4.1 Earnings Management

The term “earnings management” is defined by Healy and Wahlen (1999) as follows:

“Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers”
Healy and Wahlen 1999, p. 368.

The focus of this definition is very much on the negative sides of earnings management. However, a second reasoning behind earnings management also exists in the literature. Subramanyam (1996) demonstrates that firms engage in earnings management to provide outside investors with more information about the future, thereby overcoming the information asymmetry between managers and investors. Hence, earnings management could also have a signalling function. This function is incorporated into the following definition from Dechow et al. (2010):

“Higher-quality earnings provide more information about the features of a firm’s financial performance that are relevant to a specific decision made by a specific decision-maker”
Dechow et al. 2010, p. 344.

Furthermore, the authors identify three features: First, the definition of earnings quality is dependent on the definition of the decision’s usefulness; second, the earnings figure has to contain some information about the performance; and third, the target group of the accounting information is all potential decision-makers (Dechow et al. 2010).

A third, more neutral definition of earnings management is provided by Walker (2013):

“The use of managerial discretion over (within GAAP) accounting choices, earnings reporting choices, and real economic decisions to influence how underlying economic events are reflected in one or more measures of earnings”
Walker 2013, p. 446.

This definition combines the positive and negative sides of earnings management. Furthermore, it introduces real actions to earnings management, which is in contrast to earnings management through accounting and reporting choices.

3.4.2 Earnings Restatement

Restatements are corrections of non-GAAP accounting in previously issued financial statements (Palmrose et al. 2004). Such corrections are required in the US-GAAP by FAS 154.25 and in a newer layout with the same wording by Accounting Standard Codification (ASC) 250-10-45-23. The standard states explicitly that “any error in the financial statement of a period discovered subsequent to their issuance shall be reported as a prior-period adjustment by restating prior-period financial statements” (FAS 154.25; ASC 250-10-45-23). Moreover, FAS 154.26 and ASC 250-10-50-7 state how such restatements should be disclosed:

“When financial statements are restated to correct an error, the entity shall disclose that its previously issued financial statements have been restated, along with a description of the nature of the error. The entity shall also disclose the following:

- a. The effect of the correction on each financial statement line item and any per-share amounts affected for each prior period presented.*
- b. The cumulative effect of the change on retained earnings or other appropriate components of equity or net assets in the statement of financial position as of the beginning of the earliest period presented”*

(FAS 154.26; ASC 250-10-50-7).

Furthermore, the standard grants an exception in cases where the changes due to the error are immaterial (FAS 154: last sentence).

Essentially, FAS 154 requires firms to restate prior errors if they are material. The standard does not distinguish between the reason for the error or an intention behind the error. However, it provides instructions on what a restatement is. In the literature, restatements are distinguished into the following two categories: (1) little-r restatements and (2) big-r restatements (e.g., Hogan and Jonas 2016, Bartov et al. 2021, Krishnan and Li 2023). A little-r restatement is used for restatements that are caused by a multitude of small errors that would alone not be enough for a restatement. By contrast, a big-r restatement stands for a restatement that is caused by an error that is sufficient to lead alone to a restatement.

Definitions for the distinctions between an unintentional error and an intentional error (a misrepresentation) can be found in Hennes et al. (2008). An error is defined as unintentional, while an irregularity is defined as intentional. A major problem is

that firms rarely disclose whether the restatement was the result of an error or an irregularity. Therefore, Hennes et al. (2008) identify the following proxies:

- 1) Firms disclosing to the public that the restatement was caused by “fraud” or “irregularity”;
- 2) Firms that are the subject of SEC enforcement releases regarding their accounting practice (AAER);
- 3) Firms that are accused themselves or whose managers are accused by the Department of Justice (DoJ);
- 4) Firms subject to an independent outside (and non-SEC) investigation.

All remaining restatements are classified as “caused by an error” (Hennes et al. 2008). The proportion of restatements grouped as irregularities (as defined in the 4 groups above) is approximately 25%, while that of those grouped as errors is 75%. Of the irregularity sample, the authors identify approximately 75% through SEC enforcement actions (Hennes et al. 2008). Thus, 18.75% of all restating firms are targeted by AAERs. One problem with these frequency figures is that not every non-GAAP reporting is restated (Hee and Chan 2010). A restatement involves the disclosure of a filing to the SEC and the disclosure of the corrected financial report. However, US-GAAP allows firms to avoid restating their prior financial statement if they consider the error as non-material (Hee and Chan 2010). Firms instead adjust the prior financial figures and explain in a footnote why a difference exists compared with the previous filing (Files et al. 2009). Hence, the exact proportion of restatements due to an error or an irregularity is difficult to assess.

3.4.3 Relationship Between Earnings Management, Earnings Restatements, and Financial Misrepresentations

The terms defined in the previous sections are earnings management, earnings restatement, and financial misrepresentation. Prior literature reviews have extensively discussed the differences and overlap between the three terms (e.g., Dechow and Skinner 2000, Dechow et al. 2010, Amiram et al. 2018). In a typical case, Figure 4 illustrates the alignment of the three terms.

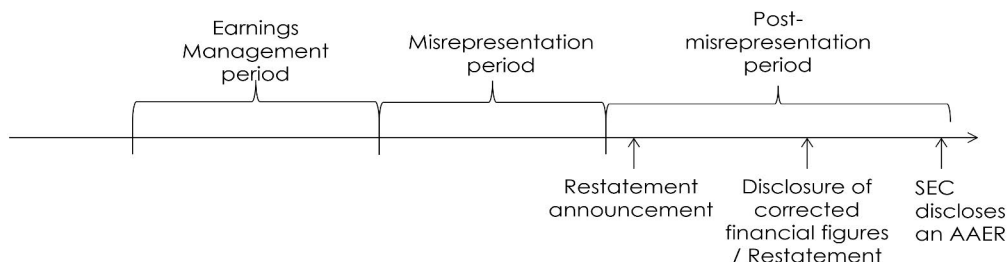


Figure 4: Time sequence for earnings management, earnings restatements, and misrepresentations/fraud.

First, there is an earnings management period (Ettredge et al. 2010, Badertscher 2011), in which firms engage in earnings management but do not violate the GAAP. Once these earnings management options are used up, few firms misrepresent them (Ettredge et al. 2010, Badertscher et al. 2011). Thus, a misrepresentation period follows the earnings management period. Once a misrepresentation is uncovered, the post-misrepresentation period begins. An error (if material) needs to be corrected (restated) following ASC 250-10-45-23. This correction (restatement) process is one of the main processes in the post-misrepresentation period. It starts by announcing the restatement shortly after the firm recognises the (potential) need to restate. After this, the firm requires time to investigate what precisely went wrong and to prepare the corrected (restated) financial figures. Thus, several months – if not years – later, the firm will disclose the corrected financial figures. Another main process in the case of a misrepresenting firm is the SEC investigation. The SEC starts an investigation once it receives knowledge of a (potential) misconduct with regard to the financial figures. Once the investigation has started, it will only end once the SEC reaches a conclusion. In the case of a misrepresenting firm, this conclusion is then disclosed in an AAER. Moreover, the SEC also prosecutes the misconduct.

The typical time sequence for a misrepresentation already suggests that there is a certain degree of overlap among the three terms. In the typical case, firms engage in earnings management, then they misrepresent, then they disclose to the public that prior financial figures were erroneous (restatement announcement), and ultimately they restate previous financial figures. However, this is just the typical case of a misrepresentation. It is, for example, possible that prior to the restatement announcement, an allegation against the firm was raised or a restatement was leaked (Hennes et al. 2008). Nevertheless, without doubt, not every firm that engages in earnings management is misrepresenting; in fact, it is only a small proportion that do. The number of restating firms greatly exceeds the number of misrepresenting firms (Hennes et al. 2008). Figure 5 presents a graphical overview of the frequencies as well as the overlap. Please note that the circles are not based on actual observed numbers; rather, they only serve to provide an idea.

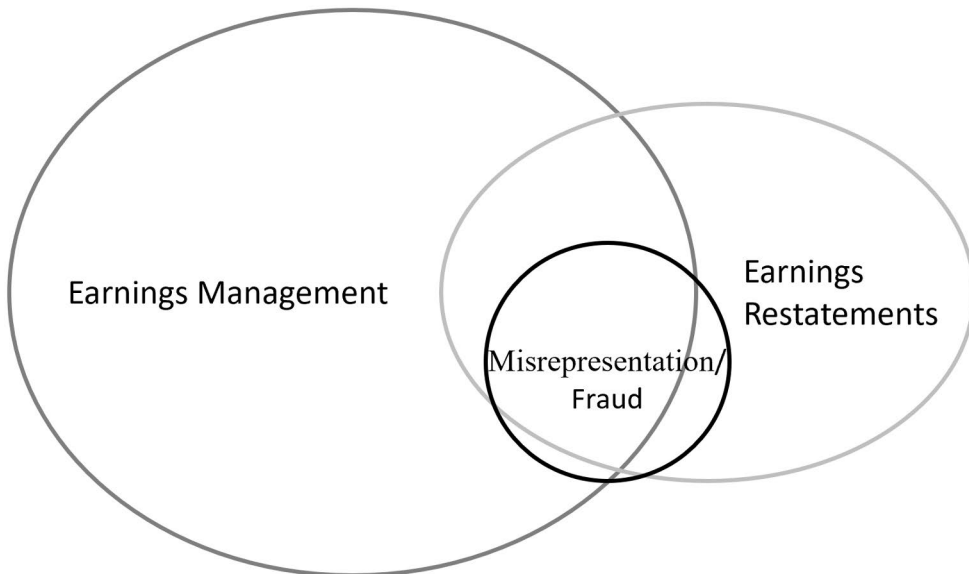


Figure 5: Frequencies and overlap among earnings management, earnings restatements, and misrepresentations/fraud.

The standard case is that a firm engages in earnings management and then misrepresents; then, after the misrepresentation period, it restates its earnings. Thus, there is a huge overlap in the circles between earnings management, misrepresentation, and earnings restatements. However, not every misrepresenting firm engages in earnings management before it misrepresents. Consequently, there is a minor area of the misrepresentation/fraud circle that does not overlap with the earnings management circle but does overlap with the earnings restatements circle. In addition, not every misrepresenting firm issues a restatement. One strategy for circumventing a restatement is by delisting as a consequence of bankruptcy. Therefore, an area of the misrepresenting/fraud circle overlaps with the earnings management circle but not the earnings restatements circle. Furthermore, there are firms that neither engage in earnings management before the misrepresentation nor restate afterwards. These firms are covered by a small part of the misrepresentation/fraud circle, which does not overlap with the other two circles.

3.4.4 Advantages and Disadvantages of Using Data Based on Earnings Management, Earnings Restatements, or Misrepresentations

Each of the three terms – “earnings management”, “earnings restatement”, and “misrepresentation” – can be found in the literature. Although the terms all refer to

low earnings quality, there are differences in the firms they cover and, consequently, in the underlying datasets. The issue of frequency was addressed in the previous section. Earnings management is most frequent, followed by earnings restatements and lastly misrepresentations. The drawback of earnings management is that it is difficult, if not impossible, to quantify reliably (Walker 2013). Dechow et al. (2010) attempt to evaluate models used to detect earnings management. According to them, none of the models are flawless. Thus, it can be said that it is impossible to reliably determine whether a certain firm is engaged in earnings management using models.

Earnings restatements are defined as corrections of inaccurate, incomplete, or misleading previously issued financial statements (Palmrose et al. 2004). Such financial statements accounting can be the result of an error or an intentional fraudulent action (Hennes et al. 2008). The question is then whether such financial statements caused by an error are comparable with such financial statements caused by an intentional fraudulent action. Some researchers have decided to differentiate between these two causes of a restatement (e.g., Palmrose et al. 2004, Hennes et al. 2008). A further problem with a dataset based on restating firms is that not every restatement is publicly announced. Quite naturally, the undetected inaccurate, incomplete, or misleading disclosure is not restated and consequently no restatement is announced. One could argue that, strictly speaking, such firms are not restating and thus they are not covered by an earnings restatement. However, the earnings quality does not depend on whether the firm later restates.

Misrepresentations overcome some of the shortcomings. Unlike earnings management, it can be said with very high certainty whether a firm has misrepresented itself since the detection of the misrepresentation is the outcome of a thorough investigation by the SEC. Moreover, unlike restatements, it can be said with a very high degree of certainty that there is a fraudulent intention behind the misrepresentation because otherwise the SEC would not disclose an AAER and, by definition, there would not be a misrepresentation. A major drawback of misrepresentations is that their detection relies on an external source (the SEC). Whether the SEC can detect every misrepresenting firm is doubtful. Thus, a sample of misrepresenting firms always consists of firms that misrepresented and were apprehended. A further drawback of AAERs is that they are almost exclusively settled without admitting or denying any wrongdoings (e.g., Keul 2015, Miller 2006). Hence, although prior literature considers AAERs as good proxies for misrepresentations, there remains a slim chance that a case is settled because a firm wants to avoid a lengthy procedure against a powerful government agency (Dechow et al. 2010, Dechow et al. 2011, Lennox and Pittman 2010, Keul 2015).

Moreover, although there is an overlap between misrepresentations and other indicators of low earnings quality (see the previous section), to what extent the results for misrepresenting firms are transferable to non-misrepresenting firms with

low earnings quality is unknown. However, this should not hinder conclusions being drawn about misrepresenting firms based on a dataset of misrepresenting firms and investigations of the transferability of the results in a later step.

4 Prior Literature About Misrepresentations and Selected Related Areas

A variety of literature about misrepresentations has been published, and this chapter provides a brief overview of this literature. For a better overview, the literature is grouped according to the time phase compared to the misrepresentation. Hence, Section 4.1 concerns the time before the misrepresentation, including drivers for and against the likelihood of a misrepresentation; Section 4.2 concerns the misrepresentation itself, including the characteristics of the misrepresentation; and Section 4.3 concerns the time after the misrepresentation, including its consequences. Lastly, Section 4.4 provides an overview of the reasons for misrepresentations and the reasons for earnings management. Most of the research has been conducted in the US; thus, if not stated otherwise, the literature is based on US data.

4.1 Prior Literature: Drivers For and Against the Likelihood of a Misrepresentation

Prior literature has covered many aspects of the limiting or enhancement of the likelihood of a misrepresentation. The area of the management's reason is thus excluded from this section since it will be covered in Section 4.2. Among the other factors that influence the likelihood of a misrepresentation are governance factors (Farber 2005). Consequently, Beasley (1996) identifies a negative impact of the percentage of outside directors on a board with the likelihood of a misrepresentation. This result also holds true for outside managers who are aligned with the firm through, for example, consultancy contracts, prior employment at the firm, or being employed by a supplier of the firm. The results are weaker compared with completely independent outside directors but still significant. To the surprise of Beasley (1996), the presence of an audit committee is not related to the likelihood of a misrepresentation. The author attributes this surprising result to a lack of differences between misrepresenting and non-misrepresenting firms in the number of meetings held by the audit committee. Moreover, Beasley (1996) identifies

ownership of shares by board members as negatively linked to the likelihood of a misrepresentation. Positively linked, however, is the size of the board and the number of other director positions held by board members (Beasley 1996). In general, the results can be interpreted as suggesting that better oversight structures lead to a lower likelihood of a misrepresentation.

Auditors, as an important group of outsiders, decrease the likelihood of a misrepresentation. According to Lennox and Pittman (2010), the higher the audit quality, the lower the likelihood of a misrepresentation. These results seem to be stable over time. Furthermore, the results are not influenced by a potential endogenous choice of the firm towards their audit quality. Hence, misrepresenting firms do not choose a particularly lower audit quality *ex-ante*.

A different perspective on the causes of misrepresentations is used by Scharff (2005), who investigates the impact of the behavioural factor of groupthink on misrepresenting firms. Groupthink describes the phenomenon where people in a group seek to minimize conflicts and follow consensus decisions without critical evaluation. Neither a critical evaluation of the group opinion nor a consideration of personal reasons or opinions occur. Famous examples of problems due to groupthink are the invasion of the Bay of Pigs and the Watergate scandal. The author introduces seven dimensions of groupthink and demonstrates, using the case of WorldCom, their existence in misrepresenting firms. First, Scharff examines invulnerability, which describes the belief of members of a group that they are invincible due to their membership of the group and the support and thinking within it. Warning signals of potential problems are often not especially seen in such cases. Second, the author discusses rationalization, which refers to the internal process by which group members justify their behaviour. They tend to misjudge relevant warnings, invent new arguments to support a chosen policy, fail to explore the ominous implications of ambiguous events, forget information that would enable a challenging event to be interpreted correctly, and misperceive signs of the onset of actual danger (Sims 1992).

Third, Scharff (2005) touches upon morality, which in this context means that the group member is loyal to the group. A considerable problem occurs if the means to the end are mistaken. Hence, the group follows a procedure only because nobody stands up and stops it. Fourth, Scharff (2005) mentions pressure, which refers to the direct or indirect pressure of the group on its individual members to agree with the group and not object. Often, the group leader expresses the group's opinion. Many remaining group members lack the confidence to stand up and express differing opinions. Fifth, the author discusses stereotypes, which mean that groups have a negative view of other groups, in which other groups are considered inept, incompetent, and incapable compared with their own group. These opinions are about the group and not necessarily about its members.

Sixth, Scharff (2005) mentions self-censorship. He explains it as a phenomenon where the member of the group avoids deviating from what appears to the member to be the group's consensus. Seventh, the author discusses unanimity, which refers here to the perception of silence as agreement. Group members seek agreement with each other. This agreement is considered better than a discussion on an alternate course of action. Hence, criticism of decisions does not occur.

Scharff (2005) finds evidence for all seven symptoms of groupthink at WorldCom. Thus, he concludes that groupthink played a role in the misrepresentation of the annual reports at the firm. Scharff (2005) consequently suggests several methods for counteracting groupthink: "(1) establishing multiple groups to study the same issue, (2) training all employees in proper ethical conduct, (3) initiating programs organization wide to clarify and communicate ethical conduct, (4) increasing the staff and scope of internal audit departments, (5) using outside experts to review decision processes and ethical conduct, (6) displaying impartiality by not stating preferences at the onset of a project, and (7) rotating new members into the group and old ones out" (Scharff 2005, p. 116).

A different view on the issue is provided by literature about misrepresentations in China. China is an emerging country with high growth rates (Chen et al. 2013, Liscic et al. 2015). Moreover, China has a unique economic, legal, and political landscape (Liscic et al. 2015). Unlike, for example, the US, litigation cases by shareholders against auditors rarely occur and, to the best of the authors' knowledge, are never successful (Liscic et al. 2015). Instead, auditors fear governmental penalties for low audit quality. The government reviews and randomly inspects listed firms. Based on the results of their work, they punish the firm, the managers, or the auditors for the misrepresentation. Moreover, China is known to have weak legal enforcement and shareholder protection compared with developed Western countries (Chen et al. 2013). Furthermore, there are tight controls on the media and trade unions (Chen et al. 2013). Hence, the external governance mechanisms of Western countries are less effective, and internal governance mechanisms gain weight compared with the external ones (Chen et al. 2013).

In such an environment, Chen et al. (2013) identify the important role of the auditor. Auditors in this context play the role of an external person and, hence, an external governance mechanism. However, auditors have a different information environment compared with many other external actors. Consequently, the results of Chen et al. (2013) suggest that auditors serve as an effective mechanism for detecting misrepresentations and preventing further damage to the firm. Furthermore, Liscic et al. (2015) demonstrate that the audit quality of larger audit firms is higher than that of smaller ones. These results are even stronger in the case of regulated industries or industries under the specific monitoring of the government agency, which has the duty to review and inspect firms and their financial statements.

As the examples of prior literature in this section demonstrate, very different solutions exist to the question of drivers of the likelihood of a misrepresentation: Beasley (1996) takes the perspective of the board composition and is able to demonstrate how best to choose directors; Lennox and Pittman (2010) focus on auditors and are able to demonstrate how a clever choice (Big-5 vs. non-Big-5 auditing firm) by auditors can decrease the likelihood of a misrepresentation; and Scharff (2005) takes a behavioural perspective and is able to demonstrate in a case study that groupthink is a problem in misrepresenting firms. Thus, tackling groupthink decreases the likelihood of a misrepresentation. Lastly, Chen et al. (2013) as well as Lisic et al. (2015) have used their knowledge of an emerging economy to demonstrate how culture and law enforcement impact the mechanisms of misrepresentation prevention.

4.2 Characteristics of Misrepresenting Firms/Misrepresentation Detection

The previous sections discussed the findings of prior literature about the prevention of a misrepresentation before any signals in this direction have occurred. The current section discusses the misrepresented period. It follows questions about misrepresented firms during said period. An important aspect is thus the characterization of firms during this period; however, when doing so, authors have faced a major problem. When identifying the special characteristics of misrepresenting firms, the “normal” characteristics must be defined, while the question also arises of which characteristics to examine.

4.2.1 Characterisation of Misrepresenting Firms by Beneish (1999a, b)

Beneish (1999a) answers the question about “normal” characteristics by comparing misrepresenting firms with a group of randomly selected non-misrepresenting firms. Hence, the randomly selected non-misrepresenting firms represent “normal” characteristics. Specifically, the author focuses on accounting characteristics. He limits his research to variables that send signals about future prospects, which are based on cash flow and accruals, and which are drawn from positive accounting theory (Watts and Zimmerman 1986); the result is a choice of variables originating from the fields of leverage and liquidity as well as profitability and growth. The results of Beneish’s analysis suggest that misrepresenting firms are more leveraged than non-misrepresenting firms. Moreover, misrepresenting firms are less profitable, but their sales can be seen to grow faster than those of non-misrepresenting firms. In

terms of liquidity, he can identify no major differences between misrepresenting firms and non-misrepresenting firms.

In a second study, the same author answers the question about “normal” characteristics differently, comparing misrepresenting firms with matched non-misrepresenting firms (Beneish 1999b). The matching criteria are the first industry/year/size and the second industry/year/age of the firm. The characteristics analysed originate from other work in the field of accounting. The results differ depending on the control sample. When examining industry/year/size-matched firms, misrepresenting firms are compared with non-misrepresenting firms. The misrepresenting firms have been listed for a shorter time, have higher growth, and have larger discretionary and total accruals. However, differences in liquidity, leverage, profitability, and cash flow cannot be detected. When examining industry/year/age-matched firms, the author can only identify a difference in discretionary and total accruals. These are, in both cases, larger for misrepresenting firms than non-misrepresenting firms. Hence, in terms of liquidity, leverage, profitability, growth, and cash flow, no changes can be detected.

4.2.2 Characterization of Misrepresenting Firms and Prediction Model Development by Dechow et al. (2011)

Dechow et al. (2011) also approach the question of the characteristics of misrepresenting firms. They define “normal” by using all remaining firms on COMPUSTAT as a control sample. Furthermore, they use a control sample of non-misrepresented firm years of misrepresenting firms and the last non-misrepresented firm years of misrepresenting firms. The variables that characterise the firms originate from the fields of accrual quality, performance, non-financial measures, off-balance-sheet activities, and market-related incentives. In total, the authors use 27 variables. Due to the high number of variables and their different origins, they detect a variety of different characteristics.

In the comparison between the misrepresented firm years and all remaining non-misrepresented firm years available on COMPUSTAT, Dechow et al. (2011) find almost all characteristics differ between the two groups. Such misrepresenting firms have higher accruals independent of how accruals are measured. Therefore, such misrepresenting firms have higher working capital accruals as well as discretionary accruals. The financial performance of misrepresenting firms is, in general, worse than that of non-misrepresenting firms. However, cash sales are an exception. Cash sales are sales in which money is transferred (thus, they exclude receivables). The cash sales of misrepresenting firms increase more steeply than those of non-misrepresenting firms. The non-financial variables provide mixed evidence. While

the changes in employees are significantly more negative for misrepresenting firms compared with non-misrepresenting firms, the changes in the order backlog are insignificant and hence do not support differences between the two datasets. The off-balance sheet variables exhibit clear differences between the misrepresenting and non-misrepresenting firms. Misrepresenting firms use off-balance sheet activities more often than non-misrepresenting firms. In particular, operating lease agreements occur more often and to a greater extent in misrepresenting firms than in non-misrepresenting firms. When examining the market-related variables, the results of Dechow et al. (2011) suggest that misrepresenting firms are more active on the capital market, outperform the market in terms of returns, and priced higher compared with fundamental values such as the book value of equity.

In the comparison between the misrepresented firm years and all remaining non-misrepresented firm years of misrepresenting firms, Dechow et al. (2011) also identify multiple differences between the two datasets. The accrual quality is higher in non-misrepresenting firms than in misrepresenting firms. The financial performance is, except for the changes in cash sales, not different in the misrepresented firm years compared with the non-misrepresented firm years. Cash sales increase in misrepresented firm years more than in non-misrepresented firm years. The non-financial firm characteristics are nonsignificantly different between the two datasets. The off-balance sheet variables provide evidence of different characteristics for misrepresenting firm years compared with non-misrepresented firm years. All variables are significantly larger in the misrepresented case than in the non-misrepresented case. The market-related variables suggest that, especially during the misrepresented firm years, the firms had high market returns, while in the other firm years they had almost no changes in market value.

In the comparison between the misrepresented firm years and all remaining non-misrepresented firm years of the misrepresenting firms, Dechow et al. (2011) do not detect much difference. Among the accrual qualities, only the percentage share of soft assets is significantly different. Soft assets are all assets except for property, plant, and equipment, and cash and cash equivalents. Hence, neither working capital accruals nor several measures for discretionary accruals differ between the time before the misrepresentation and the misrepresented period. This result supports the findings of Ettredge et al. (2010), who find an increase in discretionary accruals in the years prior to the misrepresentation. In addition, the financial performance variables and nonfinancial variables of Dechow et al. (2011) do not suggest any difference between the period before the misrepresentation and during the misrepresentation. Among the off-balance-sheet variables, only the existence of operating leases occurs more often during the misrepresented period. The remaining variables do not hint at any differences. Similarly, among the market-related variables, only a more frequent issuance of equity or debt and a lower earnings-to-

price value can be detected. All other variables are nonsignificant. Hence, it can be said that there is almost no difference between the period before the misrepresentation and the misrepresented period itself.

Following the determination of the characteristics, Dechow et al. (2011) create a prediction model for misrepresentations that uses the same set of variables as for the characterization. The control sample consists of all remaining firms on COMPUSTAT. The authors run a logit regression and the algorithm of Lawless and Singhal (1978) to determine their prediction model. The model consists of the following variables: RSST accruals³ (which originate from Richardson et al., 2005), change in receivables, change in inventory, % soft assets, change in cash sales, change in return on assets, and actual issuance of equity or debt. The model achieves an accuracy of approximately 62% in an out-of-sample test in correctly predicting misrepresentations while correctly not predicting non-misrepresentations.

4.2.3 Tax Characteristics of Misrepresenting Firms

Taxation dimension leads to a different approach to predicting misrepresentations. Therefore, Ettredge et al. (2008) take advantage of the fact that the financial figures disclosed to the capital market do not necessarily coincide with those disclosed to the tax authorities. In fact, there are contrary incentives for disclosure to the capital market compared with the tax authority. Misrepresenting firms typically want to present themselves as being highly profitable for the capital market. However, the firms have an incentive to disclose a profit as low as possible to the tax authority to reduce their own tax burden. The difference between the disclosure to the capital market and the tax authority results in an increase in deferred taxes. Ettredge et al.'s (2008) idea is to use the amount of deferred taxes as a predictor of misrepresentations.

The empirical results support this idea. In the misrepresented period itself, misrepresenting firms have unusually high deferred tax expenses. However, the empirical results for the difference between book income (income disclosed to the capital market) and tax income (income disclosed to the tax authorities) do not hint at any differences for the misrepresented period. The differing results are explained by the higher degree of tax aggressiveness of misrepresenting firms (Lennox et al. 2013). The effective tax rate is lower for misrepresented firm years. Hence, the taxes paid on the same amount of income are lower during misrepresented firm years, and consequently, the deferred taxes increase.

³ RSST accruals are modified accruals based on a paper by Richardson et al. (2005). The aim of the modification is to increase the reliability of the accrual variable. The abbreviation RSST comprises the first letters of the author's surnames.

4.3 Consequences of Misrepresentations

When one examines the consequences of a misrepresentation, multiple stakeholder groups and individuals are affected. First and foremost, the shareholders of the firm are affected. Prior literature has demonstrated that firms lose market value equity once the misrepresentation is revealed (Palmrose et al. 2004, Hennes et al. 2008). Hence, shareholders lose wealth as a consequence of the misrepresentation. On the day of the announcement that there might be problems in the firm and a restatement is likely, the share price of misrepresenting firms drops on average by approximately 20% (Palmrose et al. 2004, Hennes et al. 2008). Looking at a longer time span of 180 days (-90; +90) around the announcement, the share price drops by on average approximately 30% (Hennes et al. 2008). By contrast, firms that disclose that their prior annual report(s) contained a non-deliberate error lost on average no market value equity in a 180-day window (-90; +90) around the announcement of the error.

Three reasons for the market reaction have been detected to date. First, restating firms are more often subject to lawsuits than comparable non-restating firms (Palmrose and Scholz 2004). Multiple groups initiate the lawsuits, most notably governmental agencies (e.g., the Department of Justice and the SEC) and shareholders of the firm (Hennes et al. 2008, Palmrose and Scholz 2004). Second, managers of restating firms suffer a reputational penalty (e.g., Desai et al. 2006, Feldman et al. 2009, and Collins et al. 2009). Third, most of the restatements correct earnings downwards (e.g., Palmrose et al. 2004). Thus, the book value of equity decreases due to the restatement, which leads to a lower liquidation value for the firm.

The special role of auditors in the detection of misrepresentations has already been introduced in Chapter 3.3.4. Once the misrepresentation is revealed, auditors usually suffer a reputational penalty and are commonly replaced (Hennes et al. 2014, Huang and Scholz 2012). Statistically, the likelihood of a replacement is three times as high in misrepresenting firms than in firms that correct a non-deliberate error (Huang and Scholz 2012). Moreover, the likelihood is most pronounced in the non-Big-4 auditing firms (Hennes et al. 2014). An auditor's dismissal by misrepresenting firms is in general perceived as a positive sign by the capital market and helps to restore the trust of the market in the firm's accounting (Hennes et al. 2014).

In a case where a misrepresentation is uncovered, the auditors not only risk losing their reputation and mandate but also becoming involved in litigation. According to Bonner et al. (1998), in 38% of misrepresenting cases, the auditors were sued. The likelihood of litigation increases when the following are involved: larger firms, bankrupt firms, multiple issues addressed by the SEC, and firms from the technology sector (Bonner et al. 1998). Moreover, the likelihood is now increasing for the more frequently occurring cases of misrepresentation. It must be added that Bonner et al.

(1998) also include misrepresentations where the SEC solely targets either the auditors.

While the reputational loss of managers after the revelation of a misrepresentation has already been touched upon, firms also suffer a reputational penalty (Farber 2005). Capital market actors lose faith in the firm and do not believe that they will be able to prevent misrepresentations in the future. Hence, restoring the trust of the market in the firm is an interesting question to approach. Farber (2005) follows the finding of Beaver (1996) that governance is a mitigating factor for misrepresentations. His question is consequently whether improving governance helps to restore the trust of the capital market actors in the (former) misrepresenting firm. Farber (2005) defines governance as a variable for the percentage of outside directors on the board and a variable for the number of audit committee meetings during a fiscal year. The author determines the relationship between the change in the two governance variables from the period before the misrepresentation until up to three years after the misrepresented period and the buy-and-hold abnormal returns for three years after the misrepresentation is uncovered. The results suggest that increasing the percentage share of outside directors on the board has an especially positive effect on the abnormal market returns. However, the economic significance of the results remains unclear. Furthermore, the author highlights the potential econometric and interpretation issues of long-term buy-and-hold abnormal returns and suggests treating the results with the necessary caution (Farber 2005).

4.4 Reasons for Misrepresentations and Earnings Management

Low earnings quality, either through earnings management or misrepresentations, has been subject to several literature reviews (e.g., Healy and Wahlen 1999, Dechow and Skinner 2000, Dechow et al. 2010, Walker 2013). An important question is to what extent the reasons identified for earnings management can be transferred to misrepresentation cases. The presumption made in most relevant studies is that misrepresentations are an indicator of (pre-existent) earnings management (Dechow et al. 2010). This assessment is supported by Ettredge et al. (2010) and Badertscher (2011), who are able to demonstrate an increase in other earnings management indicators prior to a misrepresentation. However, as Dechow et al. (2010) implicitly state, there is also a minority of prior literature that has doubted that misrepresentations are an indicator of earnings management. Hence, it is worth examining the reasons for earnings management and misrepresentations separately while keeping in mind that there might be an overlap between the reasons.

Table 1 provides an overview of the literature concerning the reasons for earnings management (Panel A) and misrepresentations (Panel B). The table consists

of eight columns. In the first column, the author or authors are named, including the publication year. Second, the journal in which the work was published is presented. The third column contains the headline of the work. In the fourth column, the research question is stated. In the fifth column, the dataset and main method are displayed. If not stated otherwise, the dataset refers to a set of US firms or cases related to US firms. In the sixth column, a brief summary of the relevant results is provided. Thus, the focus is placed on results related to the reason for earnings management or misrepresentations. The content of the table aims to be close to the wording in each of the original papers at the cost of potential minor, inconsistent wordings or definitions.

The overview of the main results in Table 1 (column 7) demonstrates the variety of different reasons for earnings management (Panel A) and misrepresentations (Panel B). The list of literature contains more publications in the field of earnings management. In addition, the results are less disputed or questioned by other literature compared with the field of misrepresentations. For example, while the question of whether management compensation contracts are a source for managers to misrepresent is not supported by Dechow et al. (1996), it is supported by Beneish (1999b). The last column of Table 1 (column 8) contains the number of Google Scholar citations as of September 2023, which should provide an indication of the relevance of a certain paper to the field.

Earnings management as well as misrepresentations belong to the wider area of earnings quality research (Dechow et al. 2010). In Table 1, since a collection of earnings management and misrepresentation literature is presented, (almost) all of the papers touch upon earnings quality research and related theories. Panel A consists of literature regarding the reasons for earnings management. An important theory is therefore positive accounting theory (a description of the theory is provided in Section 2.1), since it provides an explanation for the reasons for earnings management in more general terms. However, it is more typical for the papers to cover one aspect, such as the connection between earnings management and management remuneration (e.g., paper no. 1, 3, 16, or 19). In this example, one might also think about principal agent theory. This explicit theory, which the authors consider most relevant, is rather seldomly presented. Therefore, the main theories are not mentioned in the table.

The theories on which the misrepresentation papers are based (Panel B) are typically the same as in the earnings management papers. As explained before, the main theories used are those of low earnings quality and related literature; in addition, most papers are related to positive accounting theory. Some papers (e.g., no. 1, 3, or 4) follow a broader approach and investigate multiple different directions for the reason of the misrepresentation. Consequently, these papers touch upon a multitude of different theories depending on the particular direction investigated.

Nevertheless, the majority of the papers focus on a single direction (e.g., no. 5, 6, and 7). Thus, the number of theories touched upon in these papers is rather limited. In principle, most of these papers investigate, to some extent, the manager's wealth effect as a consequence of the misrepresentation. This effect can mean that managers either take advantage of an artificially increased share price with (insider) trading (e.g., no. 2) or more directly through management compensation contracts (e.g., no. 5). In more recent years, the focus has turned mainly to the question of management's financial incentives to misrepresent (see no. 11, 12, and 13).

The relevance of the reason for the misrepresentation in this dissertation is best illustrated by the example in the first essay. Here, the dataset is split according to the observed reason for the misrepresentation. This split dataset is then analysed from various perspectives. Although the reason is detected based on AAERs and other sources, it largely coincides with prior literature that has relied on proxies for identifying reasons. However, a major distinction of the essay compared with prior literature is that the dataset is split by the observed reason, which allows us to characterize misrepresenting firms from an accounting perspective based on the reason, tool, and outcome of the misrepresentation. The results contribute to the literature by, among others, demonstrating that splitting the dataset by the reason for the misrepresentation leads to different interpretations. Moreover, essay 1 provides an overview of the literature about reasons for misrepresentations and for earnings management. This literature overview aids as a further contribution to prior literature since it collects in a unique way the findings of prior literature mainly in the field of "reasons for misrepresentation".

In the second essay, the impact of the incorrect financial figures due to the misrepresentation of the fundamental firm's value is calculated. The aim is to obtain an idea of the value gain (or loss) of a firm during the misrepresentation period as a consequence of the misrepresentation. Among other factors, the value is interesting since it provides an insight into the financial gains of a manager selling shares at inflated share prices (insider trading). Precisely this aspect has been investigated in multiple papers in the literature (e.g., Table 1 Panel B no. 2, 6, and 10). Unlike prior literature, the focus is on the question of how much value is gained. Therefore, multiple different valuation models are used. Moreover, the gain is compared with the market reaction once the misrepresentation becomes public. The second essay extends prior literature by providing evidence of how much the capital market is misled due to the misrepresentation and how it reacts to the knowledge of the misrepresentation when considering the amount by which it was misled. To the best of my knowledge an attempt to quantify the value difference (as a measure for the severity of the misrepresentation) only Karpoff et al. (2008b) made similar attempts by calculating a rough value based on equity multiples. Identifying the severity of the misrepresentation and compare it with the market reaction is also an attempt e.g.

by Palmrose et al. (2004). Using the value difference as a measure of severity and compare it with the market reaction is unique.

The literature has defined earnings quality as the extent to which reported earnings faithfully represent Hicksian income, where faithfully means “correspondence or agreement between a measure or description and the phenomenon that it purports to represent” (Schipper and Vincent 2003). Hicksian income is defined as all changes in net economic assets other than transactions with owners (Hicks 1939). Since in misrepresented annual reports the reported earnings are misrepresented and thus (typically) not the faithful representation of a Hicksian income, the earnings quality of a misrepresented annual report is rather low. Consequently, as touched upon in Section 3.4, misrepresentations belong, according to the prior literature, to the larger group of (low) earnings quality literature.

The third essay uses the feature of misrepresentations that the low earnings quality is in this case known and observed *ex post*. The question is then how sell-side financial analysts deal with the low earnings quality. The reason for the misrepresentation is directly unimportant. However, it is indirectly at the centre of interest. Sell-side analysts are typically sophisticated capital market actors (Block 1999, Maber et al. 2021). They analyse (typically) the firms in depth before preparing their report. One would therefore think that they should detect in this analysis indicators that hint at a reason for the misrepresentation and act accordingly (e.g., investigate more in the specific direction and drop coverage). Hence, the reason for the misrepresentation, although not explicitly and directly connected to the third essay, reaches it indirectly.

The main novelty of the third essay is that it focuses on the impact that the misrepresentation has on analyst forecasts by comparing the pre- and post-forecasts. The results indicate that analysts adjust the forecast more often upwards as a consequence of the misrepresentation. This is in contrast to a survey conducted by Brown et al. (2015), who find that analysts claim to adjust their earnings forecast downward. Hence, we contribute to the literature by, among others, filling the answers to the survey with observed data.

Table 1. Overview of the Literature About the Reasons for Earnings Management and for Misrepresentations.

Number	Author(s)	Journal	Heading/ Title	Research Question(s)	Method	Main Result(s)	Google Scholar citations (September 2023)
Panel A: REASON for Earnings Management							
1	Healy, P. 1985	<i>Journal of Accounting and Economics</i>	The Effect of Bonus Schemes on Accounting Decisions	What is the association between managers' accrual and accounting procedure decisions and their income-reporting incentives under their bonus plans?	94 firms (Fortune 250 firms), 1527 firm years, 1930–1980, descriptive statistics	Managers engage in earnings-increasing management when they are just below the lower threshold defined in their bonus plan and manage earnings upwards when earnings are above the upper threshold.	7446
2	DeAngelo, L. 1988	<i>Journal of Accounting and Economics</i>	Managerial Competition, Information Costs, and Corporate Governance	What is the use of accounting performance measures in proxy contests for board seats on listed corporations?	86 proxy contests, 1970–1983, descriptive statistics	During the management election campaign, incumbent managers exercise their accounting discretion to portray a favourable picture of their own performance to the voting stockholders.	1067
3	Dechow, P., Sloan, R. 1991	<i>Journal of Accounting and Economics</i>	Executive incentives and the horizon problem	Do earnings-based performance measures provide incentives to focus on short-term performance?	58 CEO changes, 1978–1989, descriptive statistics and OLS regression	Earnings-based incentives encourage executives to focus on short-term performance.	2742

4	Ahorny, J., Lin, C., Loeb, M. 1993	<i>Contemporary Accounting Review</i>	Initial Public Offering, Accounting Choices, and Earnings Management	Do entrepreneurs manipulate earnings income before an IPO?	229 IPOs, 1985–1987, descriptive statistics and OLS-regression	There is only very weak support for the hypothesis that entrepreneurs choose accounting methods to increase reported net income in the period prior to the public offering.	598
5	DeFond, M., Jiambalvo, J. 1994	<i>Journal of Accounting and Economics</i>	Debt covenant violation and manipulation of accruals	Do firms approach covenant violation making income-increasing accounting choices to loosen their debt constraints?	94 firms with debt covenant violation, 1985–1988, OLS-regression	In the year prior to the debt covenant violation, evidence for managing earnings upwards is found. In the year of the violation, evidence for managing earnings downwards is identified.	4780
6	Perry, S., Williams, T. 1994	<i>Journal of Accounting and Economics</i>	Earnings management preceding management buyout offers	Does earnings management occur before a management buyout?	175 firms with a management buyout, 1981–1988, descriptive statistics	Strong evidence is found for managing earnings downwards in cases in which the management participated in the buyout of going-private companies.	845
7	Sweeney, A. 1994	<i>Journal of Accounting and Economics</i>	Debt-covenants violations and managers' accounting responses	Do managers change accounting procedures in response to tightening debt-covenant constraints?	130 firms violating debt covenants, 1980–1989, descriptive statistics and OLS-regression	Managers of default firms make a greater number of income-increasing accounting changes relative to managers of control firms. However, any indication that managers of default firms make income-increasing accounting changes to offset tightening debt-covenant constraints cannot be supported by the evidence.	2219

8	Burgstahler, D., Dichev, I. 1997	<i>Journal of Accounting and Economics</i>	Earnings management to avoid earnings decreases and losses	Do firms avoid reporting earnings decreases and losses? How? Why?	64,466 firms excluding financial institutions and regulated industries, 1976–1994, descriptive statistics	Earnings decreases and losses are frequently managed away.	6070
9	Teoh, S., Welch, I., Wong, T. 1998a	<i>The Journal of Finance</i>	Earnings Management and the Long-Run Market Performance of Initial Public Offerings	Do discretionary accruals predict the cross-sectional variation in post-IPO long-run stock return performance?	1526 IPOs, 1975–1984, descriptive statistics and OLS-regression	Discretionary current accruals – which come under the control of management and proxy for earnings management – are high around the IPO relative to those of nonissuers.	3763
10	Teoh, S., Welch, I., Wong, T. 1998b	<i>Journal of Financial Economics</i>	Earnings management and the underperformance of seasoned equity offerings	Does aggressive management of earnings through income-increasing accounting adjustments lead investors to be overly optimistic about the issuer's (of equity) prospects?	1256 firms with an SEO, 1976–1989, descriptive statistics and OLS regression	Discretionary current accruals – which come under the control of management and proxy for earnings management – grow before the offering, peak in the offering year, and decline thereafter	3367
11	Erickson, M., Wang, S. 1999	<i>Journal of Accounting and Economics</i>	Earnings management by acquiring firms in stock for stock mergers	Do acquiring firms manipulate accounting earnings upward prior to stock for stock corporate mergers?	55 firms involved in stock for stock mergers, 1985–1990, OLS-regression	In the quarters prior to the merger, acquiring firms manage earnings upward.	1208
12	Shivakumar, L. 2000	<i>Journal of Accounting</i>	Do firms mislead investors by overstating	Do managers overstate earnings before announcing	1222 SEOs, 1983–1992, descriptive	Net income and accruals are abnormally high around equity offerings and pre-	948

<p>13</p>	<p>Bartov, E., Givoly, D., Hayn, C. 2002</p>	<p><i>Journal of Accounting and Economics</i></p>	<p>The rewards to meeting or beating earnings expectations</p>	<p>After controlling for the earnings forecast error for the period, is there a market premium to firms that MBE formed just prior to the release of quarterly earnings? (MBE = meet or beat current analysts' earnings expectations)</p>	<p>seasoned equity offerings, and does an offering announcement reveal this overstatement to market participants?</p>	<p>statistics and OLS regression</p>	<p>64,872 firm quarters, 1983–1997, OLS regression</p>	<p>2278</p>	<p>offering abnormal accruals predict subsequent declines in net income. Investors infer this earnings management at the equity offerings announcements and reduce their price response to unexpected earnings released after the offering announcements. Firms that MBE enjoy a higher return over the quarter than firms with similar quarterly earnings forecast errors that fail to meet these expectations. Furthermore, such a premium to MBE exists in the cases where MBE is likely to have been achieved through earnings or expectations management.</p>
<p>14</p>	<p>Dichev, I., Skinner, D. 2002</p>	<p><i>Journal of Accounting Research</i></p>	<p>Large-Sample Evidence on the Debt Covenant Hypothesis</p>	<p>What is the contractual role of accounting-based debt covenants in resolving the conflicts of interest that arise between lenders and corporate borrowers?</p>	<p>2810 borrowing firms, 8004 loan contracts, 1989–1999, descriptive statistics</p>	<p>1711</p>	<p>Managers take actions to avoid debt covenant violations. A small number of firm/quarters have financial measures just below covenant thresholds and an unusually large number of firm/quarters just meet or beat covenant thresholds.</p>		

15	Jaggi, B., Lee, P. 2002	<i>Journal of Accounting, Auditing & Finance</i>	Earnings Management Response to Debt Covenant Violations and Debt Restructuring	Does management response depend on the severity of financial distress and the granting of a waiver by creditors when financial distress is expected to lead to debt covenant violations?	216 distress firms, 1986–1996, descriptive statistics	Managers use positive discretionary accruals when financially distressed firms are granted waivers for debt covenant violations, and they use negative discretionary accruals when waivers are not granted and the debt contract terms are renegotiated, especially when the troubled debts are restructured	414
16	Bergstresser, D., Philippon, T. 2006	<i>Journal of Financial Economics</i>	CEO incentives and earnings management	Is the increasing use of accruals in the 1990s related to the increase in stock-based CEO compensation?	4671 firms, 1996, descriptive statistics	More “incentivized” CEOs – those whose overall compensation is more sensitive to company share prices – lead companies with higher levels of earnings management.	3300
17	Burgstahler, D., Eames, M. 2006	<i>Journal of Business, Finance & Accounting</i>	Management of Earnings and Analysts’ Forecasts to Achieve Zero and Small Positive Earnings Surprises	What are the consequences of realized earnings that differ from forecast earnings?	25,951 firm years, 1986–2000, descriptive statistics	Managers take actions to avoid negative earnings surprises. These actions include both (1) upward earnings management, and (2) downward forecast management.	1197
18	Roychowdhury, S. 2006	<i>Journal of Accounting and Economics</i>	Earnings management through real activities manipulation	Is there a manipulation of earnings through real activities by the management?	3672 firms, 17,338 firm years, 1987–2001, descriptive statistics and OLS regression	There are real activity manipulations around earnings thresholds like the zero-profit threshold.	7054

19	Kalyta, P. 2009	<i>The Accounting Review</i>	Accounting Discretion, Horizon Problem, and CEO Retirement Benefits	Is the impact of managerial retirement on discretionary accounting choices contingent on managerial compensation?	388 CEOs, 1997–2006, descriptive statistics,	An increase in accounting earnings in the pre-retirement period is particularly beneficial for managers whose Supplemental Executive Retirement Plan (SERP) benefits are contingent on firm performance in this period.	186
20	Cohen, D., Zarowin, P. 2010	<i>Journal of Accounting and Economics</i>	Accrual-based and real earnings management activities around seasoned equity offerings	What are the real and accrual-based earnings management activities around seasoned equity offerings?	1511 firms, 1987–2006, descriptive statistics and probit regression	Firms use real, as well as accrual-based, earnings management methods around SEOs. The firm's choices between real and accrual-based earnings management vary predictably as a function of the firm's ability to use accrual management and the costs of doing so.	3272
21	Markarian, G., Gill-de-Albornoz, B. 2012	<i>Working Paper</i>	Income Smoothing and Idiosyncratic Volatility	What is the association between income smoothing, defined as the utilization of accounting discretion to reduce earnings variability, and the firm-specific component of stock return volatility?	88,577 daily stock return data, 1989–2006, OLS regression	Income smoothing adds a further dimension to share price movements that is beyond the signalling/information role of earnings, and beyond that proscribed by cash flow risk, perhaps by affecting investor sentiment.	28
22	He, G. 2014	<i>Review of Accounting Studies</i>	The effect of CEO inside debt holdings on financial reporting quality	Are CEO inside debt holdings related to financial reporting quality?	Up to 1680 firms (7547 firm years), 2006–2011 OLS regression	High CEO inside debt holdings induce high quality financial reporting	156

23	Ham, C., Lang, M., Seybert, N., Wang, S. 2017	<i>Journal of Accounting Research</i>	CFO Narcissism and Financial Reporting Quality	What are the effects of CFO narcissism on financial reporting quality?	939 firms, 2002 OLS regression	313 CFO narcissism is associated with greater accruals and real earnings management, lower conditional conservatism, weaker internal control quality, and an increased likelihood of restatements.
PANEL B: REASON for a Misrepresentation						
1	Dechow, P., Sloan, R., Sweeney, A. 1996	<i>Contemporary Accounting Review</i>	Causes and Consequences of Earnings Manipulation: An Analysis of Firms Subject to Enforcement Actions by the SEC	What are the motives for, and consequences of, earnings manipulation in a sample of firms subject to accounting enforcement actions by the SEC?	92 misrepresenting firms (AAER), 1982–1992, descriptive statistics and logit-regression	6476 Important motivations for earnings manipulation are the desire to raise external financing at low cost and to avoid debt covenant restrictions. Managers do not seem to be manipulating earnings to obtain a larger earnings-based bonus, nor do they appear to be manipulating to sell their stockholdings at inflated prices.
2	Summers, S., Sweeney, J. 1998	<i>The Accounting Review</i>	Fraudulently Misrepresented Financial Statements and Insider Trading: An Empirical Analysis	What is the relationship between insider trading and fraud?	51 fraudulent firms, 1980–1987, logit regression	851 Insider trading and financial statement factors are useful in a model that distinguishes companies where fraud is found from companies where fraud is not found.
3	Beneish, M. 1999b	<i>The Accounting Review</i>	Incentives and Penalties Related to Earnings Overstatements that Violate GAAP	What incentives for earnings overstatements in firms primarily subject to accounting enforcement	67 misrepresenting firms (AAER), 1987–1993, descriptive	898 Managers' desire to sell their equity contingent wealth at higher prices is a motivation for earnings overstatement.

Prior Literature About Misrepresentations and Selected Related Areas

4	Church, B., McMillan, J., Schneider, A. 2001	<i>Auditing: A Journal of Practice & Theory</i>	Factors Affecting Internal Auditors' Consideration of Fraudulent Financial Reporting during Analytical Procedures	What are internal auditors' consideration of fraudulent financial reporting as an explanation for unexpected differences in operating income?	actions by the SEC exist? What penalties are imposed on the managers of such firms?	statistics and probit regression	117
5	Burns, N., Kedia, S., 2006	<i>Journal of Financial Economics</i>	The impact of performance based compensation on misreporting	Do management's incentives, through their compensation contracts, affect the likelihood of engaging in unusual accounting practices that result in a restatement of financial statements? How?	128 internal auditors of 38 firms, experimental research	Internal auditors assign a higher likelihood of fraud when (1) income is greater than expected, (2) an earnings-based bonus plan is used, and (3) debt covenants are restrictive (i.e., conditioned on income being greater than expected). CEOs with option portfolios that are more sensitive to the stock price are significantly more likely to misreport.	1742
6	Erickson, M., Hanlon, M., Madew, E. 2006	<i>Journal of Accounting Research</i>	Is There a Link Between Executive Equity Incentives and Accounting Fraud?	Is there a link between executive equity incentives and accounting fraud?	50 misrepresenting firms (AAER), 1996-2003, logit regression	There is no evidence that the probability of accounting fraud is increasing in the sensitivity of executives' total equity or vested stock and stock option-based wealth to changes in stock prices. Moreover, managerial	1037

7	Johnson, S., Ryan, H., Tian, Y. 2009	<i>Review of Finance</i>	Managerial Incentives and Corporate Fraud: The Sources of Incentives Matter	Do the executives who commit fraud face greater financial incentives to do so?	87 misrepresenting firms (AAER), 1992–2005, descriptive statistics and (conditional) logit regression	550 Executives who commit corporate fraud face greater financial incentives to do so.	exercises of stock options and managerial stock sales are not significantly higher for fraud firms than for nonfraud firms.
8	Armstrong, C., Jagolinzer, A., Larcker, D. 2010	<i>Journal of Accounting Research</i>	Chief Executive Officer Equity Incentives and Accounting Irregularities	What is the relationship between CEO equity incentives and accounting irregularities?	464 firms with restatements due to manipulations, 464 firms with accounting lawsuits, 157 misrepresenting firms (AAER), 2001–2005, logit regression	1049 There is little evidence of a positive relationship between CEO equity incentives and the incidence of accounting-related restatements, shareholder lawsuits alleging accounting manipulation, and AAERs.	
9	Badertscher, B. 2011	<i>The Accounting Review</i>	Overvaluation and the Choice of Alternative Earnings Management Mechanisms	What is the relationship between the duration of overvaluation and management's choice of alternative earnings management mechanisms?	19,775 firm years (3044 firms) within GAAP, 541 firms outside GAAP (restatement due to an irregularity), OLS regression and probit regression	677 Overvalued firms not only exhibit greater evidence of exploitation of within-GAAP earnings management but also, as the duration of overvaluation continues, overvalued firms are more likely to engage in non-GAAP earnings management, which is the most egregious form of earnings management.	

10	Tevenot, M. 2012	<i>Journal of Accounting and Economics</i>	The factors affecting illegal insider trading in firms with violations GAAP	Is illegal insider trading as an equilibrium outcome based on managers' potential costs of private securities litigation and SEC enforcement, financial benefits of avoiding losses due to a drop in price, and personal characteristics such as behavioural preferences and values?	384 firms restating due to accounting irregularities, 1997–2006, probit regression	Illegal insider trading is decreasing in the perceived risk of class action litigation and SEC enforcement related to the restatement and increasing in the financial benefit from trading, as measured by the market reaction to the misrepresentation announcement. Insiders from fraud firms sell more on average but their trading intensity is less likely to be associated with their private information.	59
11	Armstrong, C. Larcker, D., Ormazabal, G., Taylor, D. 2013	<i>Journal of Financial Economics</i>	The relation between equity incentives and misreporting: The role of risk-taking incentives	What is the relationship between equity incentives and misreporting?	2446 restating and/or misrepresenting firm (20,445 firm years), 1992–2009, OLS regression	There is strong evidence of a positive relation between portfolio vega (the sensitivity of the manager's wealth to changes in equity risk) and misreporting, and that the incentives provided by portfolio vega subsume those of portfolio delta (the sensitivity of the manager's wealth to changes in equity price).	514
12	Hass, L. H., Tarsalewska, M., Zhan, F. 2016	<i>Journal of Business Ethics</i>	Equity Incentives and Corporate Fraud in China	(1) Is the effect of management equity incentives on corporate fraud positive? (2) Is the effect of supervisory board equity incentives on	309 firms that faced enforcement actions by regulatory institution detected 2000–	(1) Higher equity incentives for management lead to a higher propensity to commit corporate fraud. (2) There is no evidence that the equity incentives of supervisors affect the propensity to commit fraud.	110

13	Davidson, R. H. 2022	<i>Journal of Accounting and Economics</i>	Who did it matters: Executive equity compensation and financial reporting fraud	corporate fraud negative? (3) Is the effect of management equity incentives on corporate fraud more pronounced in state-owned firms (SOEs) than in non-SOEs?	2010, OLS regression	(3) The result indicates that the relationship between the equity incentives of managers and the propensity to commit corporate fraud is stronger in SOEs.	23
<p>Does the analysis of financial reporting fraud at the executive level and consideration of the specific executives implicated in the fraud provide stronger identification and higher-powered statistical tests of a possible association between executive equity incentives and reporting fraud?</p> <p>Executives implicated in fraud cases have significantly stronger equity incentives than executives in the same firm who are not implicated in the fraud. Executives who commit fraud have stronger equity incentives than their peers in non-fraud firms. Analyzing the association between fraud and equity incentives at the executive level and focusing on the specific executives implicated in the fraud can provide more precise measurement.</p>							

This table provides an overview of relevant literature about reasons for earnings management (Panel A) and reasons for misrepresentations (Panel B). Column 2 contains the name(s) of the author(s) and the year of publication. The papers are sorted according to Column 2 first by publication year and second in alphabetic order. Column 3 names the journal the paper was published in; Column 4 presents the title of the paper; Column 5 presents the research question; Column 6 presents the underlying dataset and the analysis method; Column 7 provides the main relevant results of the paper, and Column 8 the number of Google Scholar citations.. The contents of the table are purposely close to the original wording in the underlying paper, at the cost of minor inconsistencies in the wording.

5 Data Selection

As described in Section 3.1, the SEC frequently investigates the annual reports of firms listed in the US. The number of annual reports investigated is approximately 30% of the potential annual reports (Dechow et al. 2011). In cases where the SEC detects a misrepresentation in their investigation, they disclose the result of their investigation in an AAER and publish this AAER. For this analysis, similar to Dechow et al. (2011), I hand-collected all AAER cases where firms have misrepresented their annual reports by reading the AAERs and determining the misrepresenting firm and the misrepresented firm years. Further supplementary data is gathered from COMPUSTAT, CRSP, and I/B/E/S depending on the need. An overview of the dataset is provided in Table 2, where Panel A presents the sample selection. It reveals that 884 distinct misrepresenting firms could be identified from the AAERs. Of these, 172 firms did not have a Central Index Key (CIK) code as an identifier. Thus, it would not have been possible to identify the firms in the COMPUSTAT database, and therefore, these firms were excluded. Moreover, 28 firms were excluded due to a complete lack of any COMPUSTAT data. Consequently, the total sample consisted of 684 firms with some data on COMPUSTAT and with a CIK code. The kinds of firms that do not have data on COMPUSTAT nor a CIK code cannot be reliably assessed. However, one can envisage that large and well-known firms are included on COMPUSTAT and have a CIK code, and thus, there might be a slight bias towards such firms.

Table 2. Distribution of Misrepresented Firm Years Between 1976 and 2014.

Panel A: Sample Selection of Firms Subject to Accounting and Auditing Enforcement Releases (AAERs) Between 1976 and 2014					
Number of distinct firms			Number		
Firms with at least one annual AAER case			884		
Less: firms with a missing CIK code			(172)		
Less: missing COMPUSTAT data			(28)		
Total number of misrepresenting firms between 1976 and 2014			684		
Number of corresponding firm years			1677		
Panel B: Frequency of Misrepresenting Firm Years by Fiscal Year					
Fiscal Year	Number of Misrepresenting Firms	Percentage	Fiscal Year	Number of Misrepresenting Firms	Percentage
1976	1	0.06%	1996	45	2.68%
1977	1	0.06%	1997	63	3.76%
1978	4	0.24%	1998	75	4.47%
1979	6	0.36%	1999	109	6.50%
1980	14	0.83%	2000	137	8.17%
1981	16	0.95%	2001	135	8.05%
1982	23	1.37%	2002	116	6.92%
1983	19	1.13%	2003	101	6.02%
1984	20	1.19%	2004	77	4.59%
1985	16	0.95%	2005	69	4.11%
1986	25	1.49%	2006	45	2.68%
1987	17	1.01%	2007	42	2.50%
1988	21	1.25%	2008	42	2.50%
1989	35	2.09%	2009	53	3.16%
1990	26	1.55%	2010	52	3.10%
1991	38	2.27%	2011	32	1.91%
1992	37	2.21%	2012	27	1.61%
1993	43	2.56%	2013	18	1.07%
1994	35	2.09%	2014	4	0.24%
1995	38	2.27%	Total	1677	100%

Panel A provides an overview of the sample selection process. Panel B provides an overview of the distribution of misrepresentations throughout the years.

Since firms typically misrepresent multiple years in a row, these 684 firms represent 1677 firm years (average of 2.45 firm years per firm). A distribution of the

misrepresented firm years is included in Panel B. The number of misrepresented firm years mainly increases around 1999 and 2003. According to Palmrose et al. (2004), the increase is a consequence of higher SEC activity. Moreover, the Enron scandal occurred in this particular period, which could explain the high activity of the SEC.

Table 3 contains an overview of the frequency of misrepresented firm years for each misrepresented firm year. It shows that the clear majority of firms misrepresent only a very few firm years, while many misrepresented firm years for a single firm are very rare. Note that a firm might have been misrepresented during more than one period of consecutive firm years and consequently might have been subject to more than one SEC investigation. Thus, a high number of firm years may be the result of more than one misrepresentation.

Table 3. Frequency of Misrepresented Firm Years per Firm.

Number of firm years	1	2	3	4	5	6	7	8
Frequency of firms	290	163	101	51	36	23	9	5
Number of firm years	9	10	11	12	13	14	15	Total
Frequency of firms	5	1	0	3	1	1	1	684

This table provides an overview of the frequency of firms for each number of firm years.

The 684 firms are all mentioned as misrepresenting at least once in an AAER published by the SEC between 1982 and 2017. The corresponding period where the firms were misrepresented is between 1976 and 2014. Two reasons exist for the difference between the publication of the AAER and the corresponding period of the misrepresented annual reports: First, firms often misrepresent multiple years in a row. Thus, there can be a period of time where the misrepresentation remains undetected. However, once the misrepresentation is uncovered, all successively misrepresented firm years will be uncovered. These firms can only be mentioned in an AAER after the misrepresentation is uncovered. This explains why the first misrepresented firm year in the dataset is 1976 while the first AAER originates from 1982. Second, AAERs are the result of an SEC investigation. Such an investigation

typically requires multiple years. Consequently, the last AAER included originates from 2017 while the last misrepresented firm year originates from 2014. A combination of the first and second reasons is the explanation for a decline in the number of misrepresented annual reports after 2010. There are firms that misrepresented, for example, their annual report in 2011. However, these firms also misrepresented multiple years in a row, and even though the SEC might have started an investigation by now, the result of the investigation would nevertheless be published after 2017. Consequently, such a misrepresenting firm is not included in the dataset, and the number of misrepresented firm years declines after 2010.

There are also firms mentioned in the AAERs that do not fulfil the definition of a misrepresentation and are consequently not included in the sample. These are the most notable firms mentioned because of the actions taken by the auditors. For example, in one case, the wrong auditor signed the annual report, which caused an AAER but did not fulfil the definition of a misrepresentation. Bribery cases are another example, and they touch accounting only remotely since the bribes are (most likely) not mentioned explicitly in the annual report. However, the main misconduct is unrelated to accounting, and consequently, such cases are not included in the dataset.

6 Research Papers

This dissertation includes an introductory section and three research essays. The first essay attempts to provide more information on firms that are subject to the phenomenon of misrepresentation. The major novelty lies in introducing the reason for the misrepresentation. This essay aims to provide an overview of why firms misrepresent, which types of firms misrepresent, and how they do so. The second essay examines a specific aspect of the phenomenon of misrepresentation, namely shareholders and the value of the firms. The aim is to obtain an enhanced understanding of how shareholders are financially affected by misrepresentations and to which extent this financial affection corresponds to the reaction of the capital market once the misrepresentation has been uncovered. The concern in the third essay is not misrepresentation but rather the use of this phenomenon as a proxy for very low earnings quality. The aim is to understand how analysts are affected by very low earnings quality before it becomes public knowledge. The essay consequently examines the phenomenon of misrepresentation as it occurs, in contrast to the other two papers, which also consider the time after the misrepresentation is revealed to the public.

The whole dissertation follows the principle of first understanding which phenomenon is being investigated, then going deeply into one dimension of the phenomenon, and lastly using the phenomenon as a proxy. In addition to the individual contributions, the dissertation, as a whole, aims to demonstrate the variety of different options that research into the phenomenon of misrepresentation can provide. Thus, although the phenomenon has been researched previously, there are still opportunities for future research simply by taking a different approach or by zooming into a certain feature of the phenomenon.

The first two papers have a single author – that is, they were solely written by me. The third paper is co-authored with Professor Hannu Schadewitz, who focused on the theory and supported the whole writing process while I focused on the remaining parts of the paper, with a special emphasis on the statistical analyses.

6.1 Summary of Research Paper 1: Firms' Accounting Misrepresentations - Reasons, Tools, and Outcomes

Misrepresenting annual reports is a rare phenomenon. However, prior literature has demonstrated that such cases have a disastrous effect on the efficiency of capital markets (Frankel et al. 2019) and consequently on the value of firms (Hennes et al. 2008). This particular essay investigates and determines the accounting characteristics of misrepresenting firms. In addition, it measures and quantifies the impact of the misrepresentation on the accounting characteristics. Unlike prior literature, it divides the dataset by employing the reason the managers provide for conducting the misrepresentation. These reasons are therefore hand-collected from SEC investigation reports and verified by further sources (mainly newspaper and analyst reports). This allows for the identification of the characteristics and a quantification of the impact of the misrepresentation, depending on the reason for the misrepresentation.

The essay is based on positive accounting theory. In brief, this theory states that accounting figures are used for contracts with various stakeholders (e.g., managers, lenders, and shareholders; Watts and Zimmerman 1986, 1990). There can be explicit contracts, such as a contract between the firm and its management or between the firm and its lenders. There can also be implicit contracts, such as those between a firm and its shareholders. Moreover, the essay is based on the fraud triangle developed by Cressey (1950 and 1953), including its extensions by Wolf and Hermanson (2004) as well as Marks (2012). In brief, the fraud triangle with its extensions consists of the following dimensions: pressure, opportunity, rationalization, capability, and arrogance. Pressure refers to the reason or motive of the individual for committing fraud; opportunity means that the individual must have an opportunity to commit the fraud; rationalization describes the process by which the individuals involved find justifications for their illegal actions; capability refers to the individual's ability to commit fraud; and arrogance denotes the individual's belief in regard to their superiority over others as well as internal control systems.

The research is conducted with descriptive statistics, statistical tests for significance, and a Firth logistic regression (Firth 1993). The results indicate that the reasons firms misrepresent can be classified into the following three main categories:

- Category 1: Misrepresentation for the direct personal gain in wealth of the manager (greed);
- Category 2: Misrepresentation to avoid negative contractual or institutional consequences (flee);
- Category 3: Misrepresentation due to capital market pressure (fear).

Moreover, the results demonstrate that the accounting characteristics of firms differ depending on the reason for the misrepresentation. These characteristics start with the different tools used to misrepresent. Misrepresenting firms in Category 1 mainly use means such as increasing earnings, increasing total assets, and increasing sales. Misrepresenting firms in Category 2 mainly use increasing receivables, increasing sales, increasing earnings, increasing total assets, and decreasing current liabilities. Misrepresenting firms in Category 3 mainly use increasing earnings, decreasing total assets, decreasing inventory, increasing current assets, and decreasing current liabilities. The overlap in the usage of some of the tools can be seen as a reflection of a lack of alternatives for tools causing a misrepresentation.

Furthermore, depending on the category, different outcomes from the misrepresentations are noticeable in the financial figures. Misrepresenting firms in Category 1 are comparatively small, typically highly profitable, and have an average attitude toward risk. Misrepresenting firms in Category 2 are also comparatively small, but they appear to take more risks and deliver average profitability. Misrepresenting firms in Category 3 are comparatively large, typically take as many or more risks as their peers, and deliver average profitability compared with their peers.

This essay contributes to positive accounting theory in several ways. One important contribution is the classification of the reasons into different categories based on observations of them. This allows the dataset to be organized with a high degree of accuracy. The results aim to increase the understanding of misrepresenting firms. This increased understanding should help different stakeholder groups anticipate and deal with (potential) misrepresentations. Furthermore, the essay especially contributes to the pressure dimension of the fraud triangle by providing observed reasons for the misrepresentation. It therefore helps to provide a better understanding of how the fraud could have happened. Moreover, the tools described in the essay can be aligned with the opportunity shown in the fraud triangle. Thus, it can assist in understanding what kind of circumstances enhance misrepresentation. This better understanding, in turn, could help authorities and auditors in their work and also guides investors scrutiny for firms.

6.2 Summary of Research Paper 2: Does the Capital Market Recognize Financial Misrepresentations? – Fundamental Value and Market Analysis

Prior literature has discussed the question of how much value is destroyed through the restatement after a misrepresentation (e.g., Palmrose et al. 2004, Hennes et al. 2008, Akhigbe et al. 2008). Studies have identified a loss in market value for firms

that fraudulently misrepresent their annual reports of around 20% (Palmrose et al. 2004, Hennes et al. 2008). In a 180-day window (-90; +90), the loss in market value amounted to approximately 30% (Hennes et al. 2008). Relevant studies have found three main reasons for this loss:

1. Restating firms are more likely to be involved in a lawsuit (Palmrose and Scholz 2004). These lawsuits are normally costly. The market reaction is hence a reflection of the costs of the lawsuit.
2. Managers of restating firms typically suffer a reputational loss (e.g., Desai et al. 2006, Feldmann et al. 2009). Thus, investors lose some of their trust in the management and consequently adjust their expected future earnings.
3. Restatements of fraudulently misrepresented annual reports normally lead to lower book values of equity (Palmrose et al. 2004). Hence, the fundamental value changes from the perspective of the shareholders due to the restatement.

The first aim of this essay is to quantify the amount of fundamental value difference due to the misrepresentation. The second aim is to determine whether the amount of the fundamental value difference corresponds to the market reaction once the misrepresentation is revealed to the public. The revelation date is thereby defined as the first point in time when the capital market definitely knows about a potential misconduct by the firm. The market efficiency hypothesis, in its semi-strong form, states that all publicly available information is fully included in the current share price in a timely manner (Fama 1970). This would mean, in the case of a misrepresentation, that the information “misrepresentation” becomes included in the share price once revealed to the public. Hence, one might expect the capital market to at least reverse the unwarranted gain in the market value of equity based on the misrepresented fundamental information. This reversal should logically increase with an increasing difference in the fundamental value of the firm. However, to the best of my knowledge, whether this logic can also be found in practice has never previously been tested.

The first aim is tested by calculating firm values based on restated (non-misrepresented) fundamental information with the help of common valuation methods (i.e., residual income valuation following Ohlson [1995] and valuation with multiples [Palepu et al. 2019]). Thus, initially, the firm value is calculated for the hypothetical case as if no misrepresentation had occurred in the first place. These values are then compared with the observed firm’s values from the stock exchange of the same firm and firm year based on misrepresented financial information. This comparison leads to a value difference between the firm’s value as valued by the capital market and the firm’s value based on fundamental information for the same firm in the same year. The

results for the first aim indicate a substantial difference between the market value of a firm during the misrepresented period and the firm's value based on fundamental information. The difference depends on the method used and ranges, on average, between 7.7% and 29.6%. The median value ranges between 1.6% and 17.6%.

The second aim is achieved by comparing the difference in the firm's value with the later-observed market reaction once the misrepresentation is revealed to the public (restatement announcement). The results for the second aim suggest no relationship between the value difference and the market reaction. The interpretation of the results is robust to changes in the valuation method and to changes in the measurement of the observed market reaction.

The essay increases our knowledge about the magnitude of a misrepresentation as measured by the fundamental value difference. Moreover, the essay provides insights into the capital market's behaviour in the case of an uncommon and drastic event. Whether this capital market's behaviour is in line with the efficient market hypothesis could not be answered conclusively in the essay. Consequently, this could be an interesting task for future research. In addition, questions about why the capital market behaved as it did might be an interesting topic for future research.

6.3 Summary of Research Paper 3: To Rely, or Not to Rely? Sell-Side Financial Analysts and Low Earnings Quality

The purpose of accounting is to “provide information that allows investors to make inferences about the manager's actions” (Beyer et al. 2010, p. 297). Similarly, Schipper and Vincent (2003) define earnings quality as “the extent to which reported earnings faithfully represent Hicksian income [...]” (p. 98). Hence, high-quality earnings provide better information to the investor about the manager's actions than low-quality earnings. Misrepresented financial figures are by definition incorrect (see Chapter 3) and thus do not faithfully represent a Hicksian income. Hence, misrepresenting firms have a very low earnings quality. One may even argue that their earnings quality is nonexistent.

The aim of this essay is to determine whether and to which extent sell-side analysts are affected by low earnings quality (as proxied by misrepresentations). Here, sell-side analysts serve as a proxy for dedicated capital market actors, such as shareholders or banks, for two reasons: Their data is readily available and they are sophisticated capital market actors (Block 1999, Maber et al. 2021).

This essay is situated between three streams of literature: (1) the literature concerning (sell-side) analysts; (2) the literature on (low) earnings quality; and (3), the literature regarding the efficient market hypothesis. Consequently, the results should contribute to all three literature streams.

The research design considers various options regarding the means of measuring how analysts are affected by low earnings quality (proxied by misrepresentations). The measurements are based, in general, on a comparison between the last consensus forecast before the misrepresented annual report was published and the first one after. One possible way for analysts to react to low earnings quality is to drop their coverage. Thus, the change in the number of analysts is one important variable in the study. Another possible way for analysts to react is to rely less on the (misrepresented) financial figures when preparing forecasts. Hence, there would be a lower impact of the annual report on the forecast and consequently fewer differences between before and after the annual report was published. However, it is also possible that only a few analysts rely less on the (misrepresented) financial figures while the majority still do. To account for this possibility, the difference in the standard deviation of the analysts' consensus forecast is also used. The control sample consists of all non-misrepresented firm years of the same firms in the dataset. Thus, any firm-specific factors should be limited.

The results suggest that the mean and median of the consensus forecast are influenced positively by the misrepresented financial figures, indicating an increase in the forecast by the analysts. The positive influence seems to be uniform for all analysts since there does not seem to be a difference in the standard deviation of the consensus forecast. Moreover, the number of analysts following a firm increases when earnings quality is low. Hence, the positive influence on the mean or median consensus forecast is not driven by pessimistic analysts ceasing to follow the firm. The results provide new insights into how analysts are affected by low earnings quality. The interpretation is that (almost) all analysts do not discover the misrepresentation.

The results contribute to the existing literature in multiple ways. Clearly, and in the first instance, they contribute to the literature concerning financial analysts. Furthermore, the results shed light on the reliability of analysts in terms of their role in overcoming information asymmetry between firms and (potential) shareholders. Hence, the question of the efficient allocation of capital on the capital market is raised.

The practical implications of the results are first connected with analysts and users of analyst reports. It seems as though a need exists to be cautious with analyst reports when a misrepresentation is suspected. Analysts in such cases are not only of "no help" but can also be detrimental since they overvalue the firms. Second, the question arises of whether other capital market actors are also affected by the misrepresentation, such as sell-side analysts. Third, the results have practical implications for investment strategies based on the efficient market hypothesis. Such investors might be interested in adjusting their strategy to incorporate the described anomaly.

7 Conclusion

The title of the dissertation is “What if firms fake their accounting figures?”. Although the focus is narrowed down to primarily accounting figures and not, for example, the surrounding text in external reports, a complete answer cannot be provided. Nevertheless, some insights into the question can be demonstrated. First, misrepresentations are deliberate actions by firm managers, who have reasons for their deliberate actions. Depending on the reason, a specific tool for misrepresentation is used – each of which leads to a different outcome. Thus, the accounting characteristics of misrepresenting firms differ depending on the reason for the misrepresentation. Returning to the question “What if firms fake their accounting figures?”, the results indicate that “fake accounting figures” is not a uniform term for all “fake accounting figures”. It rather depends on the specific case. This explicitly includes the reason for the misrepresentation.

Second, misrepresentations typically lead to an overvaluation of firms due to incorrect (faked) accounting figures. Here, the question “What if firms fake their accounting figures?” is approached differently – namely through checking the extent of the overvaluation. The results indicate a measurable overvaluation. Moreover, a comparison between the overvaluation and the market reaction once the misrepresentation is revealed to the public reveals no signs of shareholders identifying the overvaluation correctly. Thus, another answer to the question “What if firms fake their accounting figures?” is that the capital market surrounding such events is not always efficient.

Third, misrepresented annual financial figures are, by definition, incorrect (faked). Hence, the question arises as to how these incorrect figures impact the capital market. The capital market is, in this instance, represented by sell-side financial analysts. The results provide support for the conclusion that analysts are rather unaware of the misrepresentation; however, on the contrary, the results also provide evidence that analysts are actually deceived by the misrepresentation. Returning to the question “What if firms fake their accounting figures?”, the results imply that the capital market (as proxied by sell-side analysts as the major professional actors in the market) is unaware of the fake figures and may even be misled by them.

The results of each essay have their caveats. Therefore, their validity and reliability are discussed in each of the essays. Notably, various robustness checks were performed to confirm validity and reliability. However, since the data in each case relies on misrepresented financial figures, the drawbacks of the datasets can be found to a certain extent in each essay. This includes most notably the requirement that the misrepresentation is detected. The detection process is performed by the SEC. Thus, the data is only as good as said process. Furthermore, relying on observed and detected misrepresentations increases the reliability of the data since the phenomenon is observed. However, the disadvantage is that the number of cases that remain undetected is unknown, and consequently, these are not included in the dataset. This might become a problem and bias the results, especially when the undetected cases are not missing in a random manner. Moreover, most of the AAER cases are settled without admitting or denying any wrongdoing (e.g., Keul 2015, Miller 2006). Thus, in many cases, there is neither a conviction by a court nor an admission by the accused. Therefore, it is possible that a few cases are incorrectly identified as misrepresented.

The results have multiple implications. From a theoretical perspective, the results contribute to the positive accounting literature, the fraud triangle, and the efficient market hypothesis. In the case of positive accounting theory, the results demonstrate that firms misrepresent to influence various contracts. These include written contracts, such as the employment contract of the managers, as well as unwritten contracts, such as the contract between the firm and its shareholders. Depending on the recognized reason, different tools are used to misrepresent, which leads to different outcomes. Thus, positive accounting theory is applicable to the phenomenon of a misrepresentation.

The fraud triangle helps to explain why individuals commit fraud. In the context of this dissertation, the pressure dimension is the first to become relevant since the actual and observed reasons (pressure) for the misrepresentation could be identified. Moreover, a contribution is made to the opportunity dimension since the tool (how the misrepresentation was done) can also be seen as an opportunity (what option was available to misrepresent). In the case of the efficient market hypothesis, it could be demonstrated that there are occasional doubts about its applicability. Thus, there are some doubts about its applicability to the phenomenon of misrepresentation and regarding what extent the hypothesis is realized in the context of this study.

Moreover, the insights provided into the phenomenon of misrepresentation might help various groups to avoid misrepresentation, detect it, or reduce losses. Among these groups are standard-setters, who might be able to draft standards to make misrepresentations more difficult; auditors, who might be able to detect a misrepresentation better; and shareholders, who might be able to adjust their trading strategy based on these insights.

This dissertation is only able to provide a small insight into the phenomenon of misrepresentation. Thus, several possibilities for future research remain. One future area, following the first essay, would be to identify and explain in finer detail why firms misrepresent. Such explanations might follow the reason–tool–outcome path as in the first essay or use a different path. A second area would be to further investigate the impact of a misrepresentation on capital market actors like shareholders. This could be conducted either directly, as in the second essay, where the firm’s value is the focus, or indirectly, as in the third essay. The outcome could be an enhanced understanding of how the capital market perceives and deals with misrepresentations. It could even lead to insights into other areas of low earnings quality. A third area might be to expand the work of the second essay, in which the extent of the overvaluation is compared with the market reaction once the misrepresentation is revealed. One would assume that the overvaluation as well as the market reaction are good measures of the severity of the misrepresentation. However, since the second essay could demonstrate that both measures are unrelated, they would both lead to different conclusions about the severity level. Thus, identifying the measures of severity for a misrepresentation might be another interesting area for future research. Lastly, the data used in the dissertation originates from a large, developed economy with strong law enforcement and stable political surroundings. One could ask whether the results would also hold true, for example, in a developing country or in a country with weak law enforcement.

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Original Publications

**Kloppenburg, I. (2024)
Firms' Accounting Misrepresentations – Reasons, Tools and Outcomes**

I

Firms' Accounting Misrepresentations - Reasons, Tools, and Outcomes

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Abstract

Although a variety of research has been conducted on misrepresentations, surprisingly little is known about the reason for the misrepresentation in combination with the characteristics of misrepresenting firms. This paper investigates and determines the profile of misrepresenting firms through accounting ratios. Moreover, it measures the impact of misrepresentation on accounting characteristics. Unlike the prior literature, it separates from the dataset the managers' reason for causing the misrepresentation. Therefore, the reasons are hand-collected from SEC investigation reports and verified by further sources. This enables the identification of the characteristics and quantification of the impact of the misrepresentation, depending on its reason. The reason has thus far been treated as a black box in prior literature, and the aim of this paper is to open this box. The research is conducted with statistical tests for significance and a Firth logistic regression (Firth 1993). The results reveal that there are indeed differences in the characteristics of misrepresenting firms, depending on the reason for the misrepresentation. In total, three main categories of reasons for misrepresentations are identified. The first category comprises small, well-performing firms. Here, the data indicate that the main reason for the misrepresentation is the enrichment of the managers (greed), such as through bonuses. The second category comprises small, almost bankrupt firms (flee). Here, the data indicate that the managers typically misrepresent to avoid bankruptcy. The third category comprises larger, well-established firms. Here, the data indicate that misrepresentation is performed in an effort to deal with capital market pressure, such as through analyst forecasts (fear). Moreover, the results suggest that, depending on the reason (and consequently the category), the misrepresentations are made through different accounting components (earnings, total assets, sales, current assets, current liabilities, and inventory). The results are generally in line with positive accounting theory as established by Watts and Zimmerman (1986), since they underline the importance

of accounting in various contracting situations, such as in the negotiation of management remuneration systems. Thus, the results contribute to the theory by increasing the understanding of the use of accounting figures in their context. Moreover, the results demonstrate how the pressure dimension of the fraud triangle is visible in the specific setting of a misrepresentation as well as provide insights into the opportunity dimension in the context of a misrepresentation.

Keywords: Earnings Quality, Financial Statement Fraud, Financial Misrepresentation, Reason For a Misrepresentation, Accounting Characteristics, Accounting and Auditing Enforcement Releases (AAER), Fraud Triangle

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Introduction

Why do firms (and their managers) misrepresent their accounting figures? How do these firms misrepresent? What kind of firms misrepresent? The aim of this paper is to contribute to answering these questions. Therefore, the study combines the reason for misrepresentation (the ‘why’) with the characterization of the misrepresenting firm (the ‘how’). The underlying idea is that a misrepresentation must, by definition, be intentional on the part of the firm’s manager(s); hence, there must be a motive or reason. The follow-up question is then whether this reason is reflected in the way firms misrepresent themselves and in their appearance (i.e., accounting characteristics). Combining the reason with the means and appearance produces a refined view of the firm’s reporting behavior. The major advantage of my research is that the fact of the misrepresentation and the reason for it utilized in the research design are observed and thus known with a high degree of accuracy.

In prior research, either misrepresenting firms were characterized based on their accounting characteristics or the reason for the misrepresentation was detected/analyzed. In the case of the firms’ characterization, research has thus far been conducted across all pooled misrepresenting firms, while the reason has been treated as a black box (e.g., Dechow et al. 2011, Beneish 1999a and b). Regarding the reason for the misrepresentation, the focus has always been placed on the non-existence of a reason, while the firm’s accounting characteristics have also been treated like a black box (e.g., Burns and Kedia 2006, Chu et al. 2019). The major novelty of this paper is that it combines these two literature streams, thus opening both black boxes.

The research aims to contribute to positive accounting literature.⁴ Positive accounting theory generally concerns the conflicting interests of different stakeholder groups and their impact on accounting. For example, the manager’s interest is in increasing their own benefits, while the shareholders are mainly interested in the value of their shares (Scott 2015). Misrepresenting is then one way in which the firm’s management can influence the conflict. Thus, the questions addressed in this paper are as follows: Which type of conflict (reason) is influenced by misrepresentation? How are these conflicts influenced from an accounting perspective? What are the accounting characteristics of these firms given a certain type of conflict? Moreover, the paper demonstrates an application of the fraud triangle, which consists of pressure (why individuals commit fraud), opportunity (the possibility for a person to commit fraud), and rationalization (the justification of the action for oneself), by identifying the reason for committing the fraudulent behavior of a misrepresentation in SEC investigation reports.

⁴ This theory is also known as efficient contracting theory (Scott 2015).

Misrepresenting financial figures strikes at the very heart of accounting. Consequently, a multitude of further accounting-related theories could apply to the data and the problem discussed in this paper. However, to keep the paper focused, these theories are not discussed, and the paper concentrates solely on accounting figures.

The beneficiaries of the paper are, first and foremost, the stakeholder groups noted in positive accounting theory. These include the debtholder and the shareholder. In the case of debt covenants, debtholders are the interest group. Enhanced knowledge can, for example, help debtholders to formulate a more precise/suitable covenant. In the case of management remuneration, the firm itself is directly affected. However, overpaying the managers reduces earnings and thus shareholders' wealth. Additionally, shareholders may want to dismiss underperforming managers, and therefore, they need to reliably know whether the managers are performing well.⁵ In the case of a misrepresented annual report, this knowledge cannot come from the financial figures, so it is in the interest of the shareholders to identify misrepresentations.

The task of auditors is to obtain reasonable assurance as to whether the financial statements are free from misrepresentations (AS 1001.02). Consequently, they play a key role in the prevention of misrepresentations (Zager et al. 2016). Thus, auditors are a further target group of this paper. The results are intended to benefit auditors since they will be able to create a more focused and sharper audit process, which will ultimately save them time during the audit and money due to (potential) penalties.

I conduct the research using a descriptive analysis of certain accounting ratios, a statistical test for differences in these accounting ratios, and a logit regression. Furthermore, I employ investigation reports by the Securities and Exchange Commission (SEC) to identify the reasons why managers engage in misrepresentation. Using the investigation reports increases the credibility of the detected reasons since they differ from those observed in the prior literature (e.g., Beneish 1999 a and b, Dechow et al. 2011). The sample is divided into several sub-samples, according to the observed reasons. Consequently, the characteristics of misrepresenting firms and the impact of misrepresentations are not only determined for all firms in the sample but also separated by the reason for the firms' misrepresentation. Thus, different conflicts between the stakeholder groups are analyzed separately. Moreover, as I hand-collect the restated financial figures, it is possible to compare the same firm-year once in the misrepresented state and once in the non-misrepresented state. This comparison allows me to identify the accounting items that the firms misrepresented.

The results suggest that there are indeed different reasons for misrepresentation, of which, due to insufficient observations, only the following three main categories are analyzed: (1) misrepresentation for the direct personal gain of the manager (greed);

⁵ Here, an overlap can be observed of positive accounting theory with principal agent theory.

(2) misrepresentation to avoid negative contractual or institutional consequences (flee); and (3) misrepresentation due to capital market pressure (fear). In each of these categories, the method of misrepresentation and the accounting characteristics differ.

This paper aims to improve the knowledge about misrepresenting firms by creating a profile of each one based on their accounting characteristics and then differentiating them using the reason for the misrepresentation. This, in turn, contributes to positive accounting theory by improving the understanding of how the utilization of accounting is related to certain motives. In addition, the results have regulatory implications as well as implications for debtholders and auditors.

The remainder of the paper is structured as follows: In the now following section, the prior literature is reviewed, with a special emphasis on the reason for the misrepresentation. Then, the next section describes the method employed to conduct the study, while the fourth section describes the data gathering process and the detection and categorization of the reasons for the misrepresentation. Thereafter, the fifth section reports and discusses the results, while the sixth section presents a robustness test. The last section provides a summary of the paper.

Prior Literature

Definition of the Terms “Misrepresentation” and “Reason”

In the prior literature, the term “financial misrepresentation” has a variety of different names. For example, it has been termed “misreporting” by Burns and Kedia (2006), “accounting fraud” by Miller (2006), and “misstatement” by Dechow et al. (2011). However, the definitions of the terms coincide in all cases, and the underlying dataset relies on SEC investigation reports in all cases (as do I).

I follow Amiram et al. (2018) in using the term “financial misrepresentation”, which I shorten to “misrepresentation”. The aim of Amiram et al. (2018) is for experts from multiple fields, including law, to endeavor to find an optimal definition. The authors define the term “financial misrepresentation” as a violation of Section 13(b) of the 1934 Securities and Exchange Act. According to this section, firms are required to produce and keep books that fairly and accurately reflect the transactions and dispositions of their assets; moreover, firms are required to devise and maintain a system of internal controls to assure accurate reporting. Accurate reporting can be simplified here as within-GAAP reporting (Amiram et al. 2018). Thus, a misrepresentation is a violation of GAAP.

An important aspect is that a misrepresentation is, according to the Securities and Exchange Act, a deliberate action by a person or a group of persons (e.g., managers). These individuals must either have deliberately decided to (allegedly) violate GAAP or at least (allegedly) deliberately decided to make use of a lack of internal control. The key is the deliberate aspect. Errors or unintentional mistakes are not covered in this paper; consequently, a person must have the intention or a motive driving them

to deliberately cause a misrepresentation. This intention or motive is termed the “reason” in this paper.

Theoretical Background

In a perfect and complete capital market, all information on a firm is reported in a timely fashion to all actors in the market. Capital markets, however, are neither perfect nor complete (Frankel et al. 2019). In particular, the managers of a firm possess private information on the firm, which is likely, when accessed, to have an influence on other stakeholders’ decisions. According to Frankel et al. (2019), this information asymmetry can be mitigated through the financial report, a function of which is to fulfil the liquidity needs of the firm through, for example, borrowing from a lender. A second function is to help determine the compensation of the managers for their services. A third function, according to the authors, is to give shareholders the opportunity to assess the performance of the managers and to decide whether to retain them (Frankel et al. 2019).

As this brief summary by Frankel et al. (2019) indicates, financial reports are important for many reasons; therefore, altering them intentionally has adverse effects on many stakeholders of a firm. Consequently, the current paper touches upon multiple accounting-related theories, such as efficient market theory and agency theory.

However, the theory that covers most aspects dealt with in this research is probably positive accounting theory (also known, in some references, as contracting theory). According to this theory, accounting information plays an important role in actions between different contracting parties (e.g., managers, lenders, and shareholders; Watts and Zimmerman 1986, 1990). Positive accounting theory describes the actual accounting choices of managers vis-à-vis the most accurate choices (Watts and Zimmerman 1986, 1990). It studies how the relationship between different stakeholders is resolved (Scott 2015). Since this paper is mainly about misrepresentations, it essentially intends to contribute to positive accounting theory.

In the prior literature, positive accounting theory has been well utilized for providing the reasons for misrepresentations (and earnings management). This becomes most apparent in the case of misrepresentation due to management compensation contracts. Monetary bonuses bound to the achievement of certain financial targets are a common part of such contracts (Healy 1985). Misrepresenting the financial figures assists in meeting these targets (at least on paper). A similar logic applies to other forms of compensation tied to financial targets. A further straightforward case for the application of positive accounting theory is debt covenants in lending contracts. It would be in line with positive accounting theory if management altered its financial figures either to avoid the breach of a debt covenant or to facilitate renegotiations of debt contracts.

There are also implicit contracts. In these contracts, the management runs the firm on behalf of the shareholders and reports its work frequently to the public, including the shareholders, by filing documents such as the annual report. Based on these figures, potential and actual shareholders evaluate the value of the firm and, consequently, the share price. When managers alter financial figures in such a way that the share price increases, and consequently the value of personally held shares also increases, this is an application of positive accounting theory. Similarly, when managers alter financial figures due to various capital market incentives, such as meeting the expectations of analysts or shareholders, this is also an application of positive accounting theory, since management alters the figures instead of providing the most accurate picture of the firm.

For the sake of a complete description, it should be added that positive accounting theory also has a political contract aspect (Watts and Zimmerman 1986, 1990). “Political contracts” refer to the use of accounting information for the firm in its relationship with entities such as governments, campaigning networks, and ideological organizations, such as in the case of lobbying or to withstand various pressures. This aspect of positive accounting theory does not appear in the prior literature on misrepresentations, nor is there any evidence of it in the results of this paper. Consequently, this aspect is not covered herein.

In approximately 75% of cases, a misrepresentation causes a criminal charge for fraud against an individual (Amiram et al 2018). Consequently, some examples in the prior literature have considered a misrepresentation to be fraud (e.g., Miller 2006, Bao et al. 2020, Blanco et al. 2022, Lennox and Pittman 2010). One could, of course, argue that 75% is not 100% and that some misrepresentations do not cause a charge of fraud. However, my paper focuses explicitly on the reason for an individual to intentionally cause a misrepresentation. This “intentional act” of causing a misrepresentation is also the definition of fraud from an accounting perspective (Huber 2017). Consequently, I consider the following fraud triangle with its extensions to be applicable to my research.

The fraud triangle was developed by the criminologist Cressey (1950 and 1953). Through interviews with criminals, he identified mainly the following three drivers (edges of the triangle) of people violating trust in them by committing fraud: pressure, opportunity, and rationalization. In the following paragraphs, I examine each of these concepts.

Pressure (or perceived pressure) refers to the motive/incentive for a person to commit fraud. Pressure can thus be personal when a person needs to pay for their lifestyle and vices; it can also be due to employment stress due to the contingent employment structure or management’s financial interests. Pressure can also be due to external pressure, such as threats to the business’ financial stability, debt covenants, or capital market expectations (Lister 2007, Rae and Subramanian 2008, Vona 2008). In addition to financial and non-financial pressure, Murdoch (2008) sees political and

social pressure as potential drivers of fraudulent behavior. Here, the author mainly refers to the individual's status within society as well as their reputation.

Opportunity (or perceived opportunity) means that the person(s) committing the fraud must also have an opportunity to do so (Kelly and Hartley 2010). This could be, for example, a weak internal control system or flaws in the governance system. The person committing the fraud then takes advantage of the situation.

Rationalization refers to the concept of finding a justification or an excuse for unethical behavior by the person themselves (Schuchter and Levi 2019). The fraudulent behavior is thus reinterpreted in a way that makes it morally acceptable to oneself (Tsang 2002). An example of such a rationalization is that the person(s) committing the fraud may claim to only act in the best interests of the firm. Rae and Subramian (2008) consider a lack of personal integrity or a lack of moral reasoning to be the driver of rationalization.

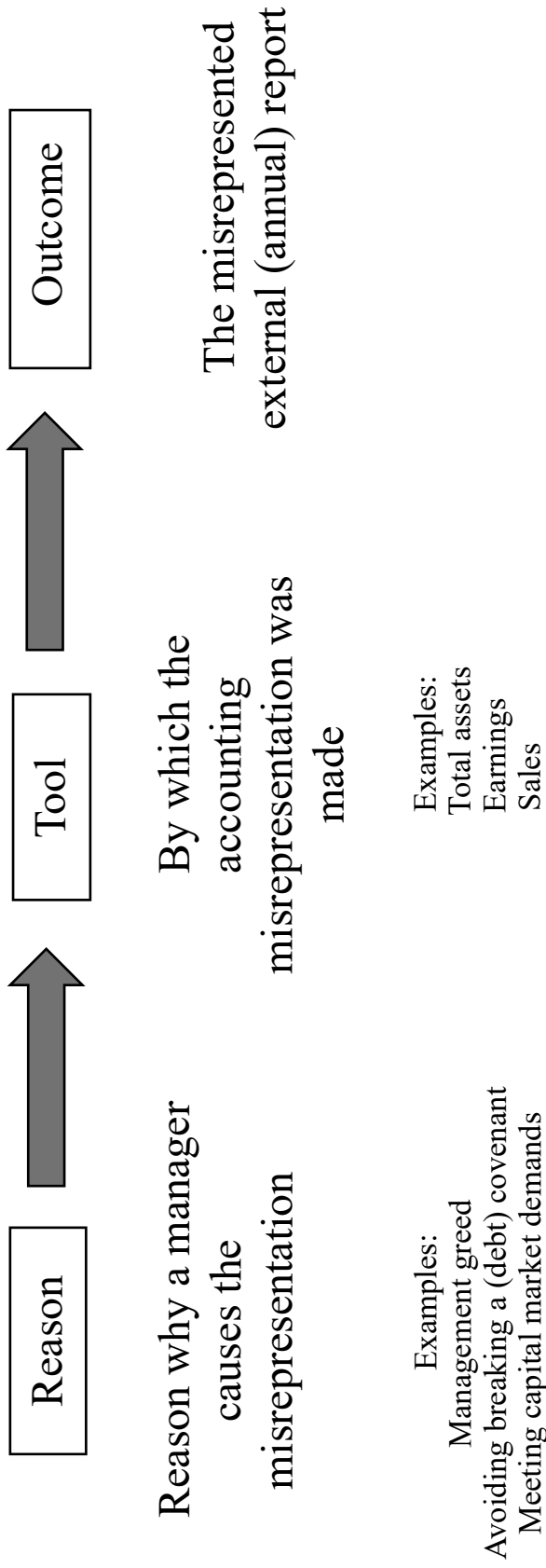
An expansion of the fraud triangle is the fraud diamond developed by Wolf and Hermanson (2004). The major addition to the fraud triangle is that the person(s) committing the fraud must also have the capability to commit it. This capability includes their position in the firm; a CEO or CFO is in a much more influential position to commit fraud than an ordinary employee. Moreover, the person(s) committing the fraud must be sufficiently intelligent and creative to commit the fraud. Furthermore, the person(s) must have a certain type of personality that can enhance an act of fraud. This includes their ego as well as their ability to coerce others to support their behavior.

A further addition to the fraud triangle originates from Marks (2012), who adds the elements of capability and arrogance. Here, arrogance refers to a person's attitude of superiority and entitlement, or greed, and their belief that internal controls simply do not apply to them personally. Thus, one can also see arrogance as hubris by the person who says that "nothing can go wrong".

Research Question Development

A typical stylized chain of a misrepresentation process can be seen in *Figure 1*. It starts with the reason for the misrepresentation, which describes why a normal individual would intentionally cause a misrepresentation. It is thus comparable with the pressure concept from the fraud triangle. The reason could be management greed, where individual managers aim to increase their personal bonuses; thus, the intention or motive behind the misrepresentation would be management greed. Later, this paper provides an overview of the actual observed reasons for the misrepresentation (*Table 3*), and that later section provides greater detail.

Figure 1 From Cause to Outcome: The Chain of a Misrepresentation



The aim of misrepresentations that originate from the reason in *Figure 1* is to present the firm in a certain (favorable, intended) way. To achieve this aim, certain accounting components must be altered to present the firm in the desired way, perhaps in sales accounting. In this example, the manager may recognize that the sales do not yet fulfil the criteria to be recognized (premature revenue recognition). The ultimate outcome is then the misrepresented report to the public. In the case of the example in this paper, it is the annual report (10-K), but other reporting to the public can also be affected (e.g., 10-Q). The misrepresented report (outcome) consists of the non-misrepresented accounting figures altered by the accounting components (tools).

Several elements of the fraud triangle can be found in *Figure 1*. Most notably, the pressure dimension of the fraud triangle and the reason in *Figure 1* both share the question of why people commit fraud/a misrepresentation. Hence, common to both is the search for the motive behind the action. Moreover, elements of the opportunity dimension can be found in the tool in *Figure 1* since the tool can also be described as the opportunity chosen and how the annual report is deliberately altered. Hence, the tool is part of the opportunity dimension. However, said dimension also contains many more aspects than simply which options exist to alter the annual report.

Prior literature has used different datasets to capture misrepresentations or similar phenomena. These datasets include Accounting and Auditing Enforcement Releases (AAERs; e.g., Dechow et al. 2011, Beneish 1999a and b), class action lawsuits (e.g., Griffin 2003, Griffin et al. 2004), and restatement announcements collected by the Government Accountability Office (GAO; e.g., Desai et al. 2006, Srinivasan 2005) or by the Audit Analytics database (e.g., Jia 2019, BenYoussef and Drira 2020). Obviously, mixtures of these two or more databases are possible (e.g., Hennes et al. 2008, Hennes et al. 2014). Each of these datasets consists of different firms and leads to slightly different results when used in an analysis (Karpoff et al. 2017). AAERs are the outcome of an SEC investigation focused on deliberate violations of GAAP (Dechow et al. 2011, Dechow et al. 2010). However, since most of them are settled without any wrongdoing being admitted or denied, AAERs remain allegations. Class action lawsuits refer to lawsuits on a federal level initiated by the Department of Justice (DoJ) for (alleged) violations of GAAP (Griffin 2003, Griffin et al. 2004). The GAO database originates from a report to the US Senate regarding restatements in the aftermath of the Enron scandal (GAO 2002). When preparing the report, the GAO collected a database of restating firms. The Audit Analytics database refers to a private database provider that collected (among others) firms' restatement announcements (Hennes et al. 2014).

Although each of these datasets consists of firms that do not keep their books flawlessly, they do not consist of the same firms (Karpoff et al. 2017). An important distinction here is how the datasets handle errors and irregularities. Hennes et al. (2008) and Palmrose et al. (2004) have demonstrated that restatements due to errors are perceived as less harmful than restatements caused by an irregularity. An irregularity is therefore captured through (among others) the proxy of an AAER or a

federal class action lawsuit. Thus, a major difference between the GAO dataset / Audit Analytics dataset and the AAER / class action lawsuits databases is that the first two datasets contain errors and irregularities, while the latter two only contain cases classified as having irregularities in prior examination (Hennes et al. 2008). Consequently, the largest dataset is the one based on audit analytics (Karpoff et al. 2017). The GAO dataset is considerably smaller, but it is based on the classification choice of the GAO. The AAER dataset is the smallest of all of them.

Although the DoJ has civil and criminal jurisdiction in regard to all laws, it normally defers cases of securities violations to the SEC (Karpoff et al. 2017). However, especially cases with multiple law violations, where a security violation is one of them, are handled by the DoJ. Moreover, the DoJ has the sole authority for prosecuting criminal offenses. Thus, there is only some overlap between the dataset based on class action lawsuits and AAERs. The AAERs are thus more focused on isolated violations of Section 13(b) of the 1934 Securities and Exchange Act (i.e., deliberate violations of GAAP), while class action lawsuits cover a wider range of misconduct. In both cases, the sample is biased since it depends on the decision made by the SEC or the DoJ to investigate and take action (Karpoff et al. 2017).

When considering the differences in the source of the dataset, it is probably not surprising that Karpoff et al. (2017) identify a variety of different characteristics depending on the underlying dataset. For example, the dataset based on class action lawsuits exhibits the most differences in the firm's accounting characteristics (e.g., working capital, capital expenditures, or return on assets) between the last year before the violation period and the first violated year. In addition, the GAO dataset exhibits some differences in the firm's accounting characteristics, while the remaining two datasets do not provide any differences between these two points in time.

When choosing the most appropriate dataset, I considered that the most important cases for my work were deliberate GAAP violations. Thus, I needed a dataset that focuses on irregularities (and excludes errors). Moreover, I needed a dataset where GAAP violations are at the center of attention and not simply one misconduct among multiple others. Therefore, similar to Dechow et al. (2011), I chose the dataset based on AAERs. An in-depth explanation of the dataset can be found in the Data section of this paper. I am therefore aware of the limitation that drawing conclusions on class action lawsuits or restatements, for example, might become more difficult. However, the dataset provided me with data that was mainly focused on intentional misrepresentations.

In a typical study in the prior literature, a proxy for the reason for the misrepresentation is determined (e.g., Burns and Kedia 2006, Armstrong et al. 2010, Badertscher 2011). It then checks whether this proxy (and consequently the reason) occurs in a sample of misrepresenting firms. The conclusion is then whether or not this reason causes the misrepresentation. Consequently, the tool and outcome are considered to be black boxes. Furthermore, some studies have compared misrepresented firm-years with non-misrepresented firm-years (e.g., Beneish 1999a,

Beneish 1999b, Dechow et al. 2011). This reason for the misrepresentation, however, is treated as a black box. The current paper aims to go through the chain from reason to outcome without the black boxes. In other words, I start by examining the reasons for a misrepresentation, followed by the reasons combined with the tools, and ultimately at the reasons, tools, and outcome together. Therefore, there is no black box for “reason” and no black box for “outcome” in my paper. The benefit of this is that it will be possible to say something about the outcome, given a certain reason. Writing this in question format results in the following three research questions (RQs):

RESEARCH QUESTION 1. *What reasons for a misrepresentation can be empirically detected in enforcement reports?*

RESEARCH QUESTION 2. *Is there a link between the manager’s reason for the misrepresentation and the tool for the misrepresentation?*

RESEARCH QUESTION 3. *Is there a link between the manager’s reason for the misrepresentation and the profile (approximated by accounting ratios) of a misrepresenting firm?*

The first research question is by nature explorative, so making predictions on possible answers to the question is difficult. The outcome of the remaining two questions depends on the outcome of the first; therefore, making predictions about probable answers is also difficult and is therefore inconceivable.

Approximating the profile of a firm with accounting ratios from the accounting perspective (data originating from financial statements) is a common method suggested in standard text books (e.g., Stolowy and Lebas 2006 pp. 557–565). Moreover, accounting ratios are commonly used by outsiders to support their analysis of the firm, such as during or in the valuation of a company (Ak et al. 2013, Nissim and Penman 2001, Sloan 2019).

Evolution of AAER Research

Research based on or about AAERs has existed for many years. In this subsection, the most influential papers based on the number of Google Scholar citations are introduced. An example of an early work is a paper by Feroz et al. (1991). The authors provide an overview of AAERs, their frequency, and their impact on various stakeholder groups, including capital market actors. Dechow et al. (1995) use a sample of firms mentioned as (allegedly) misreporting in AAERs and test it using various earnings management detection models. They find that a model modified by the authors performs best. This modified model has become a frequently used model for detecting earnings management despite the key role of misrepresentations in its creation (e.g., Jaggi and Lee 2002, Teoh et al. 1998a and 1998b, Shivakumar 2000). Beneish (1997) adopts the idea of creating a prediction model for earnings management. However, unlike Dechow et al. (1995), he considers misrepresentations as “extreme” cases of earnings management. The novelty of his model is that it also

includes managers' incentives. However, his model is less frequently applied compared with the model of Dechow et al. (1995).

In an attempt to provide more insights into misrepresentations, Dechow et al. (1996) approach the question of a misrepresentation mainly from a governance perspective. Nevertheless, the authors also examine further characteristics, such as a connection between earnings management and misrepresentations and any recent capital market activities of misrepresenting firms. Beasley (1996) examines also the question of the governance of misrepresenting firms. However, his special focus is on the perspective of the board, its composition, and its committees.

In the work of Bonner et al. (1998), the impact of misrepresentations on the firm's independent auditors comes into focus. The authors are most interested in litigation against the auditors as a consequence of the misrepresentations. In addition, in the late 1990s, the first questions about management and managers' characteristics and misrepresentations were investigated (Beneish 1999a and b). More research on this topic was conducted from the 2000s onwards. An overview of the research is provided in the subsequent sections and is therefore excluded here.

In 2000, Dechow and Skinner (2000) address the distinction between earnings management and misrepresentations. They argue that earnings management is covered by the GAAP and thus legal; misrepresentations are violations of the GAAP and consequently illegal. This distinction can be seen as a contrast to Dechow et al. (1995) and Beneish (1997), neither of whom separate earnings management from misrepresentations.

In 2001 and 2002, Enron and WorldCom had to announce their accounting misconduct, which led to an increase in research about restatements (e.g., Hribar and Jenkins 2004, Srinivasan 2005, Burns and Kedia 2006). Misrepresentations in this stream of literature play an important role in distinguishing the unintentional violations of GAAP (errors) from intentional ones (irregularities; Palmrose et al. 2004, Desai et al. 2006, Hennes et al. 2008).

Moreover, the question of detecting only explicit misrepresentations has become increasingly relevant. This can be seen in the example of Miller (2006), who investigates the role of the press in detecting misrepresentations and in spreading the news about third parties alleging that a firm has misrepresented. This has led to prediction models explicitly for misrepresentations only and not for earnings management (e.g., Cecchini et al. 2010, Dechow et al. 2011, Bao et al. 2020). Most recently, Huang et al. (2023) approach the question of the role of credit rating agencies in predicting misrepresentations.

In all previous literature, and as one of the major distinctions in the current paper, it is common that misrepresentations are considered uniform without any separations, such as for the reason that causes the misrepresentation.

Reasons for Misrepresentations and Earnings Management

Low earnings quality, through either earnings management or misrepresentations, has been studied intensively as well as the subject of several literature reviews (e.g., Healy and Wahlen 1999, Dechow and Skinner 2000, Walker 2013, Dechow et al. 2010, Amiram et al. 2018). An important question thus concerns the extent to which the reasons identified for earnings management can be transferred to misrepresentation cases. The presumption in most of the prior literature is that misrepresentations are an indicator of prior earnings management (Dechow et al. 2010). This assessment has been supported by Ettredge et al. (2010) and Badertscher (2011), who demonstrate an increase in other earnings management indicators prior to a misrepresentation. However, as Dechow et al. (2010) implicitly state, a minority in the research community also doubt the link between misrepresentations and earnings management.

Probably the greatest distinction between earnings management and misrepresentations is that earnings management is within legal boundaries, while misrepresentations are by definition always a violation of the law and thus illegal (Dechow and Skinner 2000). Earnings management can play a role in overcoming the information asymmetry between management and outside investors by providing said investors with private information concerning the firm (Subramanyam 1996). Moreover, earnings management is performed to mislead stakeholders or influence the contractual outcome (Healy and Wahlen 1999). In the prior literature, a misrepresentation is always connected to misleading stakeholders or influencing the contractual outcome (Dechow et al. 2010). Since this paper concerns misrepresentations, the focus is on the following two aspects: misleading stakeholders and influencing contracts.

A major difference between the reasons for misrepresentation and those for earnings management is the identification of the reason for the strategy, which is explained as follows: In the literature, the reason for earnings management is typically identified by taking a sample of firms where the reason occurred and determining whether earnings management occurred as well. An example of the use of this strategy is found in the research of Kalyta (2009), who determines a sample of firms where the manager had a (financial) incentive to engage in earnings management. The author then tests whether earnings management occurred in the sample.

When researchers analyze the reasons for misrepresentations, they typically collect a sample of misrepresenting firms. The reason is then identified through proxies. An example of this approach is provided by Johnson et al. (2009), who collect a sample of misrepresenting firms (from AAERs) and a control sample. The authors also define proxies to measure the personal monetary incentives of managers to misrepresent. Finally, they test whether, among all the misrepresenting firms, personal monetary incentives, as defined by the proxy, existed. The use of a proxy leads to the question of whether the proxy measures what it should. Furthermore, detection

depends on the selection of a suitable control sample. To overcome these problems, I rely on the reasons determined by the SEC in its investigation reports. I also confirm the results of the reports with the help of newspaper articles, other media publications, and further litigation reports, if possible, so that the actual reason for the misrepresentation is observed and used in the analysis (more about the reasons and how they are determined in the result section).

A brief overview of the reasons for a misrepresentation is provided in the following subsection. For an in-depth analysis, I refer readers to Dechow et al. (2010). Moreover, since the literature on misrepresentations only covers a small proportion of the possible reasons, a brief overview of the reasons for earnings management is also provided. When interpreting the reasons for earnings management, the discussion on the extent to which the earnings management literature can be applied to misrepresentation cases should be kept in mind. The aim of the overview of the prior literature with regard to the reasons is to assist the understanding of those reasons that the prior literature has mentioned along with what results can be expected. Thus, using earnings management literature may help to extend the reach of the reasons provided by prior literature; it can also assist in better understanding the entire field for these reasons. Moreover, it should assist in clarifying whether the reasons found in the prior literature based on the proxies coincide with the reasons found in SEC investigation reports.

Reasons for a Misrepresentation

The literature on reasons for misrepresentation is sparse. When examining management compensation contracts, although the prior literature might indicate that misrepresenting firms are using earnings-based bonus plans as often as non-misrepresenting firms (Dechow et al. 1996, Beneish 1999b), the existence of such bonus plans does not necessarily mean that an incentive might arise (Dechow et al. 2010). Moreover, prior literature has demonstrated that managers misrepresent due to their stock options (Johnson et al. 2009) and to increase the proceeds of the sale of personally held shares (Summers and Sweeney 1998, Tevenot 2012, Beneish 1999b). However, according to Burns and Kedia (2006), only the sensitivity of the CEO's option portfolio is linked to misrepresentation, while other forms of compensation remain unrelated to a misrepresentation. This finding has been further strengthened by Erickson et al. (2006) and Armstrong et al. (2010), who are not able to identify a link between stock-based compensation and misrepresentations. Despite the mixed empirical findings, internal auditors consider the risk of a misrepresentation higher if the income is above expectations and an earnings-based bonus plan exists (Church et al. 2001).

According to Dechow et al. (2010), avoiding the breach of a debt covenant is a reason for misrepresentation, but evidence for this reason in the prior literature is rare. Dechow et al. (1996) identify a greater need for external finances and a higher

leverage ratio for misrepresenting firms than for non-misrepresenting firms, whereas Beneish (1999b) cannot confirm these results; therefore, the empirical literature is unclear on whether lending contracts are a reason for misrepresentation. Nevertheless, internal auditors consider it likely that misrepresentations occur in cases of earnings exceeding expectations if debt covenants are highly restrictive (Church et al. 2001).

Misrepresentation due to capital market incentives has seldom been discussed in the prior literature. There is a dispute between Dechow et al. (1996) and Beneish (1999b) as to whether misrepresenting firms have a greater need for external finances (and consequently whether they are more likely to misrepresent to attract the finances). Furthermore, Jensen (2005) discusses the pressure of the capital market on management to deliver the desired financial results and avoid its members losing their positions. Empirical evidence supports Jensen's idea. Some firms that have been overvalued in the past or that have built up a valuation premium attempt to maintain their status, first by engaging in earnings management and then, if these sources are exhausted, by misrepresenting (Badertscher 2011, Chu et al. 2019). The interpretation is that managers fear negative consequences, such as a loss of their position, if they do not maintain the firm's status.

A special approach is used by Schrand and Zechman (2012), who screen SEC investigation reports with the aim of identifying managers' characteristics. Their results suggest that, in 13 of the 49 cases, the reason was the intention of the managers to enrich themselves. In the remaining cases, the authors assume overconfident managers, where the misrepresentation is only the outcome of them overestimating their own abilities. However, as the results are mixed, it is unclear whether managers in the remaining 36 cases were in fact overconfident.

In most cases, the misrepresentation was orchestrated by the CEO (Feng et al. 2011). In some cases, the CFO was involved as well due to pressure from the CEO to participate. However, cases also exist in which neither the CEO nor the CFO are involved.

Reasons for Earnings Management

The literature on the reasons for earnings management is more extensive than that for misrepresentations. Some aspects have been alluded to when examining the case of misrepresentations, but more reasons for earnings management than for misrepresentations have been discussed in the prior literature. Therefore, the reasons for earnings management are introduced in this subsection to complement the reasons for misrepresentations.

When examining management compensation contracts as a reason, multiple papers since Healy (1985) have demonstrated that (some) managers engage in earnings management when they have a monetary incentive to do so. This incentive could be in the form of bonus payments (Healy 1985), a pension plan (Dechow and Sloan 1991, Kalyta 2009), or stock options (Bergstresser and Phillippon 2006). The

assumption that the manager's personal wealth is the driving force is common to all of the papers.

When examining lending contract-related reasons, avoiding the breach of a debt covenant is a typical reason for earnings-increasing management (DeFond and Jiambalvo 1994, Jaggi and Lee 2002). After such a breach, earnings-decreasing management typically occurs (Sweeney 1994, Jaggi and Lee 2002). The interpretation is that managers want to avoid the breach, but once the breach has occurred, they seek to achieve a more desirable position for the renegotiation of the covenants. Earnings management is performed through accruals and real choices in these cases (Roychowhury 2006).

In literature reviews, capital markets as a reason for earnings management cover a wide variety of aspects (Healy and Wahlen 1999, Dechow et al. 2010, Walker 2013). These aspects include earnings management around seasoned public offerings (SEOs; e.g., Teoh et al. 1998b, Cohen and Zarowin 2010, Shivakumar 2000), before announcements of mergers by the acquiring firms (Erickson and Wang 1999), and before management buyouts (e.g., DeAngelo 1988, Perry and Williams 1994). Moreover, a dispute exists between Teoh et al. (1998a) and Aharony et al. (1993) on the one side and Ball and Shivakumar (2008) on the other as to whether earnings management exists around the initial public offering (IPO). Furthermore, earnings management could be performed to avoid disclosing a loss (Burgstahler and Dichev 1997, Burgstahler and Eames 2006) and failing to meet analysts' forecast (Bartov et al. 2002, Burgstahler and Eames 2006).

Characteristics of Misrepresenting Firms

Questions about the characteristics of misrepresenting firms have typically been discussed in the prior literature when examining descriptive statistics before conducting a further analysis. For example, Dechow et al. (2011) present a descriptive statistic that compares the characteristics of misrepresenting firms with those of the remaining firms on COMPUSTAT, the non-misrepresented firm-years of misrepresenting firms, and the last non-misrepresented firm-year of misrepresenting firms. However, the main purpose of their paper is to create a prediction model for misrepresentations.

The literature on the accounting characteristics of misrepresenting firms normally compares a set of accounting characteristics with a control sample to identify which characteristics of misrepresenting firms differ from benchmark firms. The main distinction within the literature is the definition of the control sample. Beneish (1999a) uses randomly selected, non-misrepresenting firms as the control sample. The results of their analysis suggest that misrepresenting firms are more leveraged than non-misrepresenting firms. Moreover, misrepresenting firms are less profitable, but their sales grow faster than those of firms that do not misrepresent. In terms of liquidity, no

major differences between misrepresenting and non-misrepresenting firms can be identified in the results.

Beneish (1999b) employs two control samples. One comprises size-matched firms and the other age-matched firms. The results differ depending on the control sample. When examining the size-matched firms, the misrepresenting firms are found to have been listed for a shorter period of time, delivered higher growth, and had larger discretionary and total accruals. However, differences in liquidity, leverage, profitability, and cash flow cannot be detected. When examining age-matched firms, the only difference that the author can identify is in discretionary and total accruals. In both cases, these are larger for misrepresenting firms than for non-misrepresenting firms. Thus, in terms of liquidity, leverage, profitability, growth, and cash flow, no changes are detected.

As mentioned before, Dechow et al. (2011) aim to create a misrepresentation prediction model through an intensive descriptive analysis of misrepresenting firms. They use a total of three different control samples. First, they use all non-misrepresented firm-years available on COMPUSTAT within the given time period. Second, they use all non-misrepresented firm-years available for the firms that misrepresented. Third, they use the last non-misrepresented firm-year of misrepresenting firms. The authors therefore employ a cross-sectional and a time-series comparison. Depending on the control sample used, they identify a number of special characteristics of misrepresenting firms. Compared with the remaining firms on COMPUSTAT, misrepresenting firms are found to differ in almost all characteristics, but only in a few characteristics in the last non-misrepresented year.

As these three examples from the prior literature demonstrate, there are a variety of different approaches for addressing the question of how to provide an accounting-based characterization of misrepresenting firms. The comparison between the misrepresented firm-year and the control sample is a common thread. The results vary, first based on the variables used and, second, on the control sample. However, the underlying assumption of each approach is that firms misrepresenting is uniform. All firms that misrepresented have been taken together and compared with a control sample. The possibility that there may be a small number of sub-categories or contrary characteristics has been overlooked.

Methods

Overview of Research Design

The first research question is investigated by determining the reasons for the misrepresentation based on the AAERs and verified by further sources. The design is a textual analysis of the underlying information sources and a descriptive statistic. More explanations are provided on this theme at the beginning of the Results section.

The second research question is answered by comparing the accounting ratios of misrepresented firm-years with the non-misrepresented firm-years of the same firm and the same fiscal year. The firm thus serves as its own control. The comparison takes advantage of the legal requirement for firms to correct materially false annual reports (FAS 154.25); thus, firms normally publish a corrected version of the misrepresented annual report. Consequently, two versions of their financial figures will exist for the same firm in the same fiscal year: one incorrect version (as misrepresented) and one corrected version (as restated). For the comparison, the characteristics of the firms are determined based on the two versions of the annual reports. As a result, one can deduce which accounting characteristics are affected by the misrepresentation. The aim is to identify certain misrepresentation strategies or patterns that correspond to certain reasons for the misrepresentation. These patterns should indicate which tool (accounting component) is used for the misrepresentation. The comparison is made with a descriptive statistic and suitable statistical tests.

The third research question is answered by determining the profile approximated by the accounting ratios of the misrepresenting firms. Prior literature in the misrepresentation field has already addressed similar questions. Dechow et al. (2011) use the method of a descriptive statistic and a statistical test for the mean difference. Beneish (1999a) also use a statistical test for the median difference and a probit-regression analysis. The overall design of this study follows designs used in the prior literature. The design comprises descriptive statistics, statistical tests for mean and median differences, and a regression analysis.

The third question is also answered by comparing the characteristics of misrepresenting firms with the characteristics of peer firms. The variables in which misrepresenting firms differ compared with their peers provide evidence of special accounting characteristics. The special characteristics are used to create a profile for the misrepresenting firm based on the outcome of the misrepresentation. It is important to note that the dataset is divided by the reason (see the first question) for the misrepresentation. This is done to separately determine the special accounting characteristics of the firm according to the reason for the misrepresentation. A comparison is made once with the descriptive statistics and statistical test and once with the regression analysis.

The comparisons are made with descriptive statistics, statistical tests, and Firth logistic regression. An explanation of the statistical tests can be found in *Appendix A*. The following subsection describes a comparison using logistic regression, after which the variables are defined.

Regression Analysis

The aim of the methods is to compare misrepresented data with non-misrepresented data from peer firms. This comparison is first made with a suitable statistical test; however, as another form of comparison, a Firth logistic regression is

performed. A Firth logistic regression uses the mean values and neglects the median values. This is one drawback of the regression analysis since it limits the scope of the results, but the major advantage of the logistic regression is that all variables are used in the comparison simultaneously. Therefore, in addition to the descriptive statistics, including the statistical test, a logistic regression analysis is also performed in this study.

A major problem with using logistic regression is that misrepresentations are a very rare event. Consequently, misrepresenting firms is very rare in the whole dataset (below 1%). Due to some adjustments, the actual proportion of misrepresenting firms in the dataset analyzed is approximately 2–3%. This is, however, still a very low proportion. Logistic regressions typically have accuracy problems for such rare events (e.g., King and Zeng 2001, Firth 1993). To overcome the problem, Firth (1993) develops an adjustment to the logistic regression. Specifically, he develops a penalty term, which is added to the maximum likelihood-based score equation (Rahman and Sultana 2017). The penalty term reverts to zero as the sample size increases (Wang 2014). Firth logistic regression is a common tool for rare events for binary outcome analyses, at least in medical research (Puhr et al. 2017). However, since this setting (rare event and binary outcome analysis) also exists in the current research, the application of a Firth logistic regression is selected. The regression is used with the following regression equation:

$$(1) \text{misrepresent} = \alpha + \beta * \text{characteristics variables} + \varepsilon$$

where

misrepresent = a binary variable that has a value of 1 if a firm misrepresented and a value of 0 otherwise;

characteristics variables = variables that reflect different accounting ratios for creating the accounting ratio profile of the firm,

The regression comprises the binary variable “misrepresent”, which takes a value of 1 if the firm-year is misrepresented and “0 otherwise” as a dependent variable, and a set of variables for determining the accounting characteristics as independent variables. The variables that reflect the accounting characteristics are defined in the next subsection. The regression is run once for all misrepresenting firms pooled and once again with a reduced sample of firms that misrepresent for a specific reason only (including the corresponding control samples).

Variable Definition

The aim of this paper is to identify the accounting profile of misrepresenting firms. As suggested by prior literature, a variety of variables are chosen, which allows the creation of an accounting profile for the misrepresenting firm (Sloan 2019). Due to the importance of accounting ratios, especially for the valuation of firms, the focus of

the relevant variables is on such ratios (Ak et al. 2013, Gallizo et al. 2003, Nissim and Penman 2001).

Chen and Shimerda (1981) collect “useful financial ratios” from various instances in the literature. The included literature is from the fields of firm failure, bond ratings, market returns, and mergers. The wide range of fields that the ratios originate from makes them a good choice for creating an accounting profile. The ratios allow characterizations of the firms to be made from different perspectives. Moreover, they have been proven to be effective at explaining firms; therefore, the assumption that they will also do so in this paper is a straightforward conclusion.

Specifically, Chen and Shimerda (1981) collect a total of 64 accounting ratios from the literature prior until 1976. Among these ratios, the authors identify an overlap. For example, there is a ratio of net income/total assets and a ratio of EBIT/total assets. First, the overlap in the denominator is apparent, since in both cases it is the same balance sheet item. Moreover, the difference between net income and EBIT is by definition interest and taxes, so there is also a clear overlap in the numerator. To approach the overlap, the authors suggest running a principal-component analysis, which combines variables with a common variation (the overlap) into one factor. This factor is then represented by only one variable (in this case a ratio). Therefore, the authors focus next on papers that have run a principal-component analysis and identify the factors that these papers have considered best due to the analysis.

Essentially, Chen and Shimerda (1981) find 10 factors⁶ originating from five papers. An overview is provided in *Table 1*. In each of the papers, the factors are determined with a principal-component analysis. These factors are considered by the authors, based on prior literature, optimal for use in an accounting characterization of firms. The 10 factors presented are as follows: *asset balance*, *activity*, *profitability*, *liquidity*, *cash position*, *receivable turnover*, *inventory turnover*, *return on investment*, *capital intensiveness*, and *financial leverage* (Pinches and Mingo 1973, Pinches et al. 1973, Stevens 1973, Libby 1975, Pinches et al. 1975). Based on the specific paper, suitable ratios are identified for each of the factors to represent the remaining ratios in the factor. An overview of the variables is provided in *Table 1*. The goal of the factors is to describe the firm from the perspective of the capital market with the aim of posing questions about the firm’s profitability and the riskiness of the investment. The assignment covering this aspect (profitability or riskiness) can also be found in *Table 1*. A more detailed explanation of this as well as the factors and corresponding ratios are provided in the following paragraphs.

The factor of *asset balance* is represented by the ratio of current assets to total assets. The factor essentially describes what proportion of the asset side of the balance

⁶ The paper identifies 12 factors. However, two of the factors are explained by the same ratio, so they would not add any new insights to this paper’s analysis and are consequently disregarded.

sheet consists of non-current (fixed) assets and what proportion consists of current assets. It should provide an understanding of the basic structure on the asset side of the balance sheet. Since it explains the extent to which the assets are meant to be quickly sellable as well as the extent to which they are meant to be held for longer periods, the factor concerns the riskiness. The factor of *activity* is represented by the ratio of current assets to sales. The ratio reflects how quickly the current assets can be sold. The faster the current assets can be sold, the smaller the ratio becomes; therefore, a decreasing ratio means that the firm is more active. Since the activity is closely linked to current sales and thus to net income, the factor of *activity* is assigned to the profitability aspect.

TABLE 1 Factors for Accounting Characterization of Firms and Related Ratios

Factor represented by the ratio	Source	Calculation of the ratios	Aspect the factor belongs to
<i>Asset balance</i>	Libby (1975)	Current assets/total assets	Riskiness
<i>Activity</i>	Libby (1975), Stevens (1973)	Current assets/sales	Profitability
<i>Profitability</i>	Libby (1975), Stevens (1973)	Net income/total assets	Profitability
<i>Liquidity</i>	Libby (1975), Stevens (1973)	Current assets/current liabilities	Riskiness
<i>Cash position</i>	Pinches et al. (1973 and 1975), Libby (1975)	Cash/total assets	Riskiness
<i>Receivable turnover</i>	Pinches et al. (1973 and 1975)	Receivables/sales	Profitability
<i>Inventory turnover</i>	Pinches et al. (1973 and 1975)	Inventory/sales	Profitability
<i>Return on investment</i>	Pinches and Mingo (1973), Pinches et al. (1973 and 1975)	Net income/book value of equity	Profitability
<i>Capital intensiveness</i>	Pinches and Mingo (1973), Pinches et al. (1973 and 1975)	Sales/total assets	Riskiness
<i>Financial leverage</i>	Pinches and Mingo (1973), Pinches et al. (1973 and 1975)	Debt/total assets	Riskiness

An overview of the factors identified in the prior literature and the financial ratios that best describe them. Column 1 contains the factor names; Column 2 presents the authors from whom the factors and the ratios originate; Column 3 presents the ratios that best represent the factors; and Column 4 presents the aspects to which the factors are assigned.

The factor of *profitability* is reflected by the ratio of net income to total assets, which is also known as the return on assets. As the name already suggests, and since net income is included as a major profitability indicator for the firm, the factor is assigned to the profitability aspect. The factor of *liquidity* is reflected by the ratio of

current assets to current liabilities. Since current assets are assets meant to be sold quickly and current liabilities are liabilities meant to be redeemed quickly, this factor explains the short-term liquidity of the firm. A problematic liquidity situation is typically a sign of financial difficulties (Ohlson 1980). Consequently, the factor is assigned to the riskiness aspect. The factor of *cash position* is reflected by the ratio of cash to total assets, which indicates how much cash the firm has. To make the cash more comparable, it is scaled by the firm's size (total assets). Similar to the previous factor, the cash position measures liquidity; therefore, this factor is also assigned to the riskiness aspect.

The factor of *receivable turnover* is reflected by the ratio of receivables to sales, which indicates to what extent the sales have been paid for by the customer. A lower ratio indicates that more sales have been remunerated. Since the factor indicates the extent to which the receivables have been paid, and since this helps to explain the extent to which the net income is based on cash income, this factor is assigned to the profitability aspect. The factor of *inventory turnover* is reflected by the ratio of inventory to sales, which indicates how quickly the inventory is being sold; thus, a low value is an indicator of a high turnover rate. With similar argumentation as the factor of *activity*, the factor of *inventory turnover* is assigned to the profitability aspect.

The factor of *return on investment* is reflected by the ratio of net income to book value of equity, which is also known as the return on equity. It indicates how much the firm earned based on the capital provided (invested) by the shareholders in the firm. The factor thus takes the perspective of the shareholder only. It is assigned to the profitability aspect for a similar reason as the factor of *profitability*. Net income, as a key profitability indicator, dominates this factor.

The factor of *capital intensiveness* is reflected by the ratio of sales to total assets, which indicates how much capital is required to achieve sales. The higher the ratio, the lower the capital requirement. The more capital is required (and thus the lower the ratio), the higher the risk of bankruptcy (Altman 1968). Consequently, the factor of *capital intensiveness* is assigned to the riskiness aspect. The factor of *financial leverage* is reflected by the ratio of debt to total assets, which should indicate the extent to which the firm is financed by debt or equity. This is a standard factor in bankruptcy prediction models (e.g., Altman 1968, Ohlson 1980), so it is assigned to the riskiness aspect.

As described earlier in this section, the factors have been considered by prior literature to be good indicators for creating an accounting profile for the firm from the perspective of the capital market. Since the aim of this paper is to identify the accounting profile of misrepresenting firms, these factors are used to determine the accounting profile. The underlying ratios of the factors are therefore calculated and compared with the same ratios based on later restated financial figures for the same year and firm to determine the tool (how the firms misrepresented). Moreover, the underlying ratios of the factor are compared with a matched control sample (described

in the following section) to determine the outcome (i.e., differences between the misrepresenting firms compared with non-misrepresenting firms).

Data

Data Collection

The SEC, a U.S. governmental agency, is tasked with, among other things, investigating and detecting potential misrepresentations. As described by Cunningham and Leidner (2019) and Stice-Lawrence (2019), the process typically starts by reviewing a firm's periodic filings, including annual reports. The SEC also reviews public sources, such as earnings calls, and non-public sources, such as whistle-blower information. If the SEC becomes suspicious of certain accounting practices, then it will contact the specific firm and ask for clarification. If the clarification fails to satisfy the SEC, a full investigation will be conducted. If, in the full investigation, a serious wrongdoing is discovered, then the SEC will issue an AAER and prosecute the case further. However, as the SEC's resources are limited, it is unable to check all of the information made available (Ahn 2022). The choice of information to be checked and the firms targeted by SEC enforcement actions lie solely in the hands of the SEC itself. Nevertheless, it is known that certain triggering events, such as a voluntary restatement, may lead to an investigation (Dechow et al. 2011).

A further constraint is that firms and the SEC typically settle the allegations presented to them in AAERs without admitting or denying any wrongdoing (e.g., Keul 2015, Miller 2006). This leads to the problem that the allegations remain allegations since there is neither an admittance nor a court ruling. The firms might then argue that they preferred settling against a powerful government agency, especially considering that the penalties are normally considered low (Keul 2015). This has led to discussions about these "without-admitting-or-denying" practices (e.g., Keul 2015, Turk 2017, Rosenfeld 2017). The problem with the remaining allegations in AAER cases is that the accuracy of the dataset depends on the quality of the SEC's investigations. However, prior literature has commonly used AAERs as a proxy for misrepresentations while acknowledging that a low number of cases remain false allegations (e.g., Dechow et al. 2010, Dechow et al. 2011, Lennox and Pittman 2010).

In this paper, misrepresentations are defined as violations of Section 13(b) of the 1934 Securities and Exchange Act. Hence, only publications by the SEC on violations of this section were of interest in the data collection. Such cases are published in AAERs. Consequently, I collect the data from these AAERs in a similar way to Dechow et al. (2011).

A major limitation to the selection of the dataset is the requirement for available restated financial figures. These figures are collected from the annual or quarterly

publication (10-K or 10-Q) of the misrepresenting firms that continue to misrepresent after the detection of the misrepresentation. Said publications are retrieved from the EDGAR database, which is provided by the SEC. In it, almost all filings to the SEC since 1996 are made available to the public. Among these filings are the annual and quarterly reports, and therefore, restated data filed with the SEC before 1996 cannot be collected. Given the data availability problems, the number of distinct misrepresenting firms identified from AAERs is 463. An explanation of the data collection from the 463 firms can be found in *Appendix B*.

Data collection is time-consuming. To obtain the restated data, all relevant annual and quarterly reports must be checked for potential further restatements. Identifying the reason for the misrepresentation from various sources, including all relevant AAERs (as is explained further in the section titled “Determining the Reason for the Misrepresentation”) is also a time-consuming task. Additionally, the question arises of whether using the total population would actually bring different results; therefore, I limit the dataset to 100 randomly selected firms. I then create and implement the following steps to reduce the sample size from 463 to 100 randomly selected misrepresenting firms with sufficient data:

- 1) Each of the 463 firms has a random number assigned to it;
- 2) The firms are sorted according to the randomly assigned number from the lowest to the highest;
- 3) Starting with the first firm, the data from COMPUSTAT is confirmed, if available, by the filings to the SEC disclosed on EDGAR, and if there is no overlap between COMPUSTAT and the filings, the firm is excluded;
- 4) Starting with the first remaining firm, relevant restated data is collected from EDGAR on the filings to the SEC, and if no restated data are available, then the firm is excluded from the sample;
- 5) The collected restated numbers are checked for plausibility by comparing the numbers with the newspaper articles and AAERs; firms whose restated figures do not coincide with the findings published by the SEC or the media are excluded from the sample.

Through the selection process, the 100 misrepresented firms with the lowest randomly assigned number and with sufficient information available are identified and included in the sample. The 100 firms that had been misrepresented correspond to 245 misrepresented firm-years between 1993 and 2009. An overview of the distribution of the firm-years is presented in *Table 2*:

As *Table 2* shows, the majority of the misrepresented firm-years lie between the fiscal years 2000 and 2005. The decline in numbers after 2005 is a reflection of the following phenomenon: firms sometimes misrepresent several firm-years in a row. The average in the sample is 2.45 firm-years consecutively per firm, but there are also cases of seven or more misrepresented firm-years in succession. Once the

misrepresentation is uncovered (after the misrepresented period), the SEC begins its investigation. At the end of the investigation, the AAER is published, and the firm is included in the dataset. The investigation normally takes 2–3 years. The last AAER on which the dataset is based originates from 2015; hence, 2006 and the years thereafter are likely misrepresented firm-years, which have not (yet) been made public in an AAER. Consequently, the number of misrepresented firm-years in the sample is lower from 2006 onwards than in the prior years.

TABLE 2 Frequency of Misrepresenting Firm-Years by Fiscal Year from a Sample of 100 Randomly Selected Firms

Fiscal Year	Number of Misrepresenting Firms	Percentage	Fiscal Year	Number of Misrepresenting Firms	Percentage
1993	1	0.41	2002	28	11.42
1994	5	2.04	2003	32	13.06
1995	6	2.45	2004	24	9.80
1996	14	5.71	2005	18	7.35
1997	10	4.08	2006	10	4.08
1998	11	4.49	2007	10	4.08
1999	16	6.53	2008	6	2.45
2000	24	9.80	2009	2	0.82
2001	28	11.42	Total	245	100

Overview of misrepresented firm-years by fiscal year for 100 randomly selected misrepresenting firms in the dataset.

Control Sample

One part of identifying the accounting profile is to determine the differences between the misrepresenting firms compared with their peers. However, a variety of definitions exist for what constitutes a peer. For example, Dechow et al. (2011) use all non-misrepresenting firms on COMPUSTAT as peers. A drawback of this approach is that the misrepresenting firm is then also compared with firms that naturally have quite different characteristics. An instance of these naturally different characteristics would be those firms that operate in the financial services sector compared with those in the industrial sector. To mitigate the impact of such natural differences, I create a sample with matched firms. A resulting difficulty is that a misrepresenting firm will not (by definition) differ from its matching partners in the matching criteria. Therefore, as a compromise to make the control sample comparable but also allow the control sample to differ in key characteristics, the following three matching criteria are used: year, industry, and size.

Year refers to the fiscal year. The financial figures of the misrepresenting firms and the matched peer firms must originate from the same fiscal year. A fiscal year is

defined as the year that contains the majority of days in the reporting period. For example, a firm-year with the reporting period April 2004–March 2005 would be assigned to 2004, since most days of the reporting period are in 2004. A firm-year with the reporting period November 2004–October 2005 would be assigned to 2005, since most days of the reporting period are in 2005. Industry refers to the industry sector in which the misrepresenting firm and hence the matched firm operate.

To identify the industry sector, the Standardized Industrial Classification (SIC) code is used. SIC codes are determined by the US government and employed, for example, by the SEC to classify firms. Each code consists of four digits. The first is the most general and assigns the firm to an overall sector. The last digit is the most specific and assigns the firm to a narrow subsector. As in the prior literature (e.g., Desai et al. 2006, Beneish 1999b), firms are matched on the first two digits of the SIC code. Using two digits is thus a compromise between a very general and a very specific perspective.

Size is defined here by total assets. Matched firms should have an amount of total assets that is equal to that of the misrepresenting firm; however, it is highly unlikely that two firms will have precisely the same amount of total assets. Therefore, firms are considered matched when their amount of total assets is within a limited range around the total assets of the misrepresenting firm. There must be a compromise between considering as many firms as possible and the closeness to the total assets of the misrepresenting firm. Here, the range is assigned to $\pm 30\%$ ⁷ around the total assets of the misrepresenting firm.

Based on the financial figures of the same fiscal year, peers are therefore defined as the misrepresented financial figures of all firms within the same industry sector with a two-digit SIC code and with total assets ranging from 70% to 130% of the misrepresenting firm's total assets. The control sample comprises a total of 4,794 non-misrepresented firm-years.

Results and Discussion

Determining the Reason for the Misrepresentation

The first research question requires an examination of the alleged reasons for a misrepresentation originating from SEC enforcement filings (AAER). I therefore determine the reasons for the misrepresentation based on the explicit statements in AAERs, and I read through the AAERs and retrieve the reason from the report itself. The assessment is further systematically confirmed and extended by additional litigation documents from the SEC, information from newspaper articles, analyst

⁷ Using a smaller corridor (e.g., $\pm 20\%$) leads to generally similar results.

reports, and conference calls. A main source for this supportive material is FACTIVA and the SEC website. I then group the reasons according to similarities.

In general, I assign the individual reasons to seven (separated into three main and four minor) more general clusters of reasons (in the following named “category”). I base the assignment on similarities among the reasons. First, there are firms where the managers obtained a personal and direct, mostly monetary, benefit from the misrepresentation. This includes financial gain from the sale of personally held company stocks by the manager at prices inflated by the misrepresentation. It also covers misrepresentations for higher bonus payments and misrepresentations to cover asset misapplication by the management. Theoretically, cases of option-backdating would also fall into this category, since options are backdated to directly increase managers’ personal wealth. However, the accounting characteristics of firms that back their options differ in nature only in a very limited scope between the misrepresented and restated cases. Therefore, to avoid a distortion, firms for which option-backdating was the dominant reason for the misrepresentation are assigned to their own category. The keywords for assigning firms to the first category are as follows: “sale at inflated stock price”, “maximizing bonus payment”, “securing bonus payment”, “inflating stock price to maximize proceeds from the sale of options”, “maximizing remuneration”, “embezzling the firm’s funds”, “abusing the firm’s funds”, and “buying private items with the firm’s money”. These keywords are combined with a search for the position of the person that the SEC deemed mainly responsible for the misrepresentation. This person could not be responsible just for a subsidiary.

Second, there are firms that conceal or mask their true financial health. Such firms fear that without this concealing and masking process, they will either be unable to raise the funds vital for their survival or they may incur contractual penalties such as debt covenants, which could jeopardize their future. Typically, the main reason these firms provide for misrepresenting is to decrease the likelihood of bankruptcy. The keywords for assigning firms to the second category are as follows: “avoiding the breach of a covenant”, “raising vital funds”, “hiding true financial health”, “hiding financial difficulties”, and “disclosing negative equity”.

Third, there are firms where misrepresentation is a response to pressure from the capital market. This can even be described as a fear of the consequences if the capital market’s expectations are not met. This pressure can originate directly from capital market actors such as investors and analysts. It can also be the result of past actions of the firm, such as past years’ earnings or earnings guidance. The keywords for assigning firms to the third category are as follows: “meeting/beating/exceeding [...] target”, where [...] is the specific target; “meeting/beating/exceeding expectations”; “disguising performance below expectations”; “reporting favorable performance”; “market pressure”; and “surprise the market”. The keywords must be combined with some external category that has bolstered expectations or with an external communication that caused the market participants to raise their expectations.

The three main categories are summarized below:

Category 1: Misrepresentation for the direct personal financial gain of the manager (greed);

Category 2: Misrepresentation to avoid negative contractual or institutional consequences (flee);

Category 3: Misrepresentation due to capital market pressure (fear).

All three main categories contain at least 10 distinct firms. This number enables the analysis of the categories while mitigating the impact of outliers; yet, there are three further categories with fewer than 10 distinct firms. First, there are firms that conceal the backdating of options. This category has already been mentioned. Backdating options enables managers to execute their options at a lower strike price and thus increase their wealth. However, in accounting terms, barely any changes can be detected, so these firms are grouped separately into Category 4. The keyword here is option-backdating in the AAER. Second, there are firms that misrepresent for internal reasons, most notably internal targets. The keywords for this category are similar to those for Category 3: “meeting/beating/exceeding [...] target”, where [...] is the specific target; “meeting/beating/exceeding expectations”; “disguising performance below expectations”; and “reporting favorable performance”. The major distinction is that the targets or expectations are internal and not disclosed to the public. Moreover, Category 5 includes firms where no evidence of an outside direction of the target could be detected; therefore, Category 3 only includes cases where the misrepresentation was due to external targets, and doubtful cases are allocated to Category 5. Third, Category 6 contains firms that misrepresent to increase the proceeds of capital market activities (an IPO or SEO). The keywords here are “SEO” or “IPO” and are connected to the firm’s willingness to “increase” or “maximize” its “proceeds” or “gains”. Lastly, Category 0 contains firms where a reason could not be identified from any of the sources.

Each firm is assigned to only one category at a time, so the categories are defined as strictly non-overlapping. In most cases, the information provided by the sources makes it possible to make a clear judgement and to include the specific firm in one category only. However, in approximately two to five cases per main category, the information is unclear or leads to the allocation of firms into several categories. For example, a firm communicates a target externally, and the bonus for the management is tied to meeting this target; consequently, the firm misrepresents to achieve the externally communicated target, thus ensuring that the management receives the bonus. The external communication is an indication of a case that belongs to Category 3 while the explicit mention of the bonus in the AAER indicates a case for Category 1. The explicit mention of bonuses (or other rewards for management) occurs comparatively rarely in AAERs. Furthermore, management contracts normally have bonuses tied to performance. Consequently, as the explicit mention of a bonus is special in AAERs, those cases where the information allows a firm to be assigned

equally well to both Category 1 and Category 3 are assigned to Category 1. Similarly, firms are assigned to Category 2 rather than Category 3 since the explicit mention of financial difficulties is specific to AAERs. In the case of an overlap between Category 1 and Category 2, firms are assigned to Category 1 for similar reasons to the distinction between Categories 1 and 3; the explicit mention of managers' benefits is rare and specific to AAERs. In cases where a decision between a main category and a minor category is necessary, I include the firm in the minor category so that the results of the main categories are as clean as possible.

Table 3 provides an overview of the reasons detected in the AAERs and further sources, as well as the categories into which the reasons are assigned. The table presents the reason for the misrepresentation in one column and the number of occurrences of this reason in the sample in another column. The table is also divided into multiple panels, each of which represents one category. It should be noted that multiple reasons may occur. For example, a firm might misrepresent to maximize the managers' bonus payment and their proceeds from the sale of personally held shares. In such cases, both reasons are presented in *Table 3*, but there is still only one firm misrepresentation.

The column with the reason for the misrepresentation (*Table 3, Column 1*) contains the reasons for the misrepresentation as written in the AAER. This leads to similar wording and explanations being used for the reasons collected in Column 1. For instance, Panel C contains the reason "meeting or beating analysts' earnings expectations". Moreover, the same panel has the reason "meeting or exceeding Wall Street expectations". The relevant meaning in both cases for this paper is that management felt pressured into achieving the expectations of the capital markets. However, since its wording is slightly different in the AAERs, the wording is also different in *Table 3*.

The remaining reasons for the misrepresentation are presented in *Panels D–F*. The total frequency of the firms in *Table 3* is not 100 for two reasons: First, there are 18 firms where the reason for the misrepresentation could not be identified based on the AAERs and further sources. Thus, these firms do not appear in the table. Second, in cases where multiple reasons for the misrepresentation could be detected in the AAERs and further sources, the firm occurs multiple times in the table. The best example of this is the overlap between Categories 1 and 4. As explained previously, option backdating, strictly speaking, belongs to Category 1. However, since the impact in accounting terms is rather limited, the cases of option backdating are assigned to their own category, namely Category 4. In *Table 3*, these cases of option backdating appear once in *Panel A* for Category 1 and once in *Panel D* for Category 4.

TABLE 3 Overview of the Reason for the Misrepresentation in a Sample of 100 Misrepresenting Firms

Reason for the misrepresentation	Number of occurrences in AAERs
Panel A: Reason for the misrepresentation in Category 1 (manager's greed)	
Sale of company stock by the management	11
Maximizing the personal bonuses of the management	6
Maximizing the remuneration of the top management	5
Embezzling firm's funds	2
Hiding a trading loss by the president of a subsidiary	1
Sum of the number of occurrences – Panel A	25
Panel B: Reason for the misrepresentation in Category 2 (avoidance of contractual or institutional penalties)	
Hiding the true financial situation	8
Obtaining vital financing	5
Avoiding disclosing negative equity	3
Avoiding violating a debt covenant	2
Hiding poor operating results	1
Hiding financial difficulties in one subsidiary	1
Sum of the number of occurrences – Panel B	20
Panel C: Reason for the misrepresentation in Category 3 (capital market pressure/fear of the capital market)	
Meeting or beating analysts' earnings expectations	16
Meeting or exceeding Wall Street expectations	2

Meeting the revenue target	2
Meeting internal targets to increase stock price and surprise analysts/mislead the investing public	1
Reporting favorable earnings to public investors	1
Meeting targets communicated to investment bankers	1
Meeting outside revenue expectations	1
Meeting internal revenue and earnings goals based (in part) on analysts' expectations	1
Market pressure to achieve the past year's performance despite substantial renovation of the stores	1
Meeting own earnings guidance	1
Meeting earnings/gross sales expectations	1
Disguising the performance to be below market expectations	1
Meeting company's (externally communicated) earnings target	1
Sum of the number of occurrences – Panel C	30
Panel D: Reason for the misrepresentation in Category 4 (backdating options)	
Increasing the managers' proceeds from the exercise of the option	5
Panel E: Reason for the misrepresentation in Category 5 (internal reasons)	
Avoiding the disclosure of a loss	2
Disclosing the budgeted gross-margin	1
Meeting a subsidiary's financial target	1
Meeting internal sales target of one division	1
Meeting internal financial targets	1

Achieving results closer to the internal annual plan	1
Concealing the extent of the losses internally	1
Hiding losses by the head of the insurance division	1
Sum of the number of occurrences – Panel E	9
Panel F: Reason for the misrepresentation in Category 6 (increasing proceeds from the capital market)	
Decreasing the stock costs during a merger, increasing the proceeds of a SEO	1
Underrepresenting labor costs to increase the gains of an IPO	1
Sum of the number of occurrences – Panel F	2
Total number of occurrences in all categories (excluding unclassifiable)	91

This table contains an overview of the reasons for the misrepresentation as disclosed in the AAERs by the SEC. The table is ordered by similar reasons, where each panel represents one category of similar reasons. Multiple reasons can originate from one firm and be disclosed multiple times in the table. Moreover, firms where the reason for the misrepresentation could not be detected are not listed in the table. In the case of multiple reasons appearing in one category, the cases were disclosed multiple times in the same panel.

The reason (or pressure) for committing fraud is a key element of the fraud triangle. Thus, identifying for most of the firms a reason for the fraudulent behavior of a misrepresentation indicates the relevance of the fraud triangle in understanding misrepresentations. The three main categories (1–3) identified in *Table 3* are covered well by the framework developed by Lister (2007). Category 1 thus refers to personal pressure and employment pressure in Lister’s framework, while Categories 2 and 3 both fall under external pressure in said framework.

Frequency of Misrepresentations by Category

An overview of the frequency of each category within the total sample is provided in *Table 4*. Column 2 of *Table 4* lists the frequency of firms in each category compared with the total for the 100 firms, while Column 3 excludes Category 0 (unassignable firms). Column 4 presents the corresponding firm years, while Column 5 lists the average number of firm-years per firm. Note that the frequency in Column 3 is shown as a percentage.

TABLE 4 Frequency of Misrepresenting Firms for Each of the Categories

Category	Frequency	As a percentage excluding category 0	Number of firm-years	Average number of firm-years per firm
1 (management greed)	20	24%	61	3.05
2 (bankruptcy prevention)	18	22%	27	1.50
3 (fear of the capital market)	28	34%	64	2.29
Other reasons (category 4–6)	16	19%	53	3.31
0 (unclassifiable)	18		48	2.67
total	100		245	2.45

This table contains the number of distinct firms for each category, the percentage distribution excluding category 0 (unidentified reason for misrepresenting), the number of corresponding firm years, and the average number of firm-years per distinct firm.

As shown in *Table 4* Column 3, the three main categories (1–3) together cover 80% of the misrepresented firms, with 24% belonging to Category 1, 22% to Category 2, and 34% to Category 3. However, the option-backdating cases are separated from Category 1 for statistical reasons, as including them would have led to 30% of the misrepresenting firms being in Category 1 and the option-backdating cases. In total, the three main categories and the option-backdating cases cover 86% of all reasons for misrepresentation. On average, one firm misrepresents 2.45 firm-years, but this number also depends on the reason. The most misrepresented firm-years can be found in the option-backdating cases with 7.6 firm-years (not shown in the table) and the fewest in Category 2 with 1.5 firm-years. Why there are so few firm-years in Category

2 cannot be concluded with certainty. It may be that the firms ceased trading because the misrepresentation was uncovered, the aim of the misrepresentation was achieved, or the firm disappeared from the market.

The literature has seldom qualified the reasons, such as in Schrand and Zechman (2012). They analyze 49 cases, of which 13 (26.5%) would, according to this study, fall into Category 1. The fact that the 26.5% in the study of Schrand and Zechman (2012) is close to the 24% in *Table 4* supports the validity of the results in *Table 4*. In the study of Schrand and Zechman (2012), 26 of their 49 cases (53%) would fall into Categories 3 and 5. Moreover, some of these 26 cases might also fall into Category 2. In my paper, Categories 3 and 5 combined account for 45%, which is approximately three to four cases short of the 56% in Schrand and Zechman's study, further validating the results of *Table 4*.

In addition, the non-misrepresenting firms in the control sample are also assigned to the categories. The specific category is the category of the corresponding (matched) misrepresenting firm. Of the total 4,794 non-misrepresented firm-years of the control firms, 2,397 are assigned to Category 1, 955 to Category 2, and 1,830 to Category 3. It should also be noted that 388 firm-years are assigned to multiple categories.

Comparison of the Reasons from the Prior Literature and AAERs

Many reasons for the misrepresentation identified in the AAERs in this study can also be found in the prior literature, while in some cases, the reasons found in the prior literature can be extended or specified. An overview of the extensions and specifications is described in the following paragraphs.

Firms in Category 1 misrepresented to inflate the stock price before the sale of stocks by the management to maximize remuneration for the managers and to hide asset misappropriation. Prior literature has discussed the maximization of remuneration (Dechow et al. 1996 and Beneish 1999b), although clear evidence has not been identified. Moreover, the sale of personally held stock by managers at inflated share prices has been described in previous studies (Summers and Sweeny 1998, Tevenot 2012, Beneish 1999b); however, there is also literature that has expressed reservations about these results (e.g., Burns and Kedia 2006, Erickson et al. 2006, Armstrong et al. 2010). The results of the AAERs may therefore help to clarify this disagreement in the literature. Asset misappropriation in connection with misrepresentations has not been covered by prior literature and can thus be seen as an extension of the existing literature.

Firms in Category 2 misrepresented to hide or mask their true financial health. While this reason is not mentioned in the prior literature, in some cases the hiding and masking were aimed at raising funds vital for the firm's survival or the avoidance of contractual penalties, such as from a debt contract; both of these reasons can be found in the prior literature. Dechow et al. (1996) identify a need for external financing as a reason for firms to misrepresent. Moreover, some firms engage in earnings

management around SEOs (e.g., Teoh et al. 1998b, Cohen and Zarowin 2010, Shivakumar 2000), and this raising of funds from the equity market vital for the firm's survival has been covered by prior literature. In addition, the avoidance of breaking a debt covenant through a misrepresentation and the subsequent contractual penalty has also been covered by prior earnings management literature (e.g., Watts Zimmerman 1990, DeFond and Jiambalvo 1994, Jaggi and Lee 2002). However, further contractual penalties or other bankruptcy threats are not covered by the prior earnings management or misrepresentation literature.

Firms in Category 3 misrepresented due to capital market pressure to meet certain targets. These targets can originate from actors in the capital market, such as analysts or investors, but they can also originate from within the firm, such as from pressure to achieve the past year's earnings or earnings guidance. Misrepresentations as a form of management entrenchment to meet market pressure in a general form are covered by Badertscher (2011). In the earnings management literature, the focus lies more on the actors or reasons for the market pressure. This includes meeting analysts' forecasts (Bartov et al. 2002, Burgstahler and Eames 2006) and avoiding reporting a loss (Burgstahler and Dichev 1997); thus, the reasons in Category 3 are well covered by the prior literature.

Firms in Category 4 misrepresented to hide option-backdating. The link between option-backdating and misrepresentation or earnings management has not yet been covered by the prior literature; therefore, the question must be raised of whether the misrepresentation is just the logical consequence of option-backdating. Thus, such cases are covered by the option-backdating literature, although the connection to the misrepresentation is not drawn explicitly. Firms in Category 5 misrepresented themselves to meet internal targets. The link between internal targets and misrepresentations has also not been dealt with in the prior literature; therefore, the question arises of whether the misrepresentation exists or whether it is the last part of a sequence of events covered in the prior literature but ultimately not linked to misrepresentation. Firms in Category 6 misrepresented to increase the proceeds of an IPO. This reason can be found, for example, in the papers of Teoh et al. (1998a) and Aharony et al. (1993) as a reason for earnings management. Ball and Shivakumar (2008) provide evidence of more conservative accounting. The results of the AAERs can help to clarify the dispute in prior literature. Indeed, managers sometimes misrepresent to increase the proceeds of an IPO, but given the entire population of firms (especially those that engage in earnings management), one cannot know how common this is as a reason for misrepresentation.

In summary, the reasons identified in the AAERs and the reasons suggested in the prior literature largely coincide. There are some areas that have not been expanded on in the prior literature, as in the case of Category 2, but they are rather minor.

Determining the Tool for the Misrepresentation

The second research question concerns the link between the reason for the misrepresentation and the tool used for the misrepresentation. The tool is thus defined as the accounting component through which the misrepresentation is made. The tool can also be seen as the “opportunity” following the fraud triangle since it describes what kind of options for misrepresentation must be available to enhance its occurrence. To answer this question, the individual ratios of the misrepresenting firm are compared once when they misrepresented and once when they were later restated. The aim here is to identify, through the different ratios, the underlying component.

The results are presented in *Table 5*, which comprises four panels. The first panel shows all misrepresenting firms originating from Categories 1–3. It should reflect the results and when there was initially no division of the reasons. The other panels comprise firms originating from only one category, so it is possible to determine the component depending on the reason for the misrepresentation. After the table, an in-depth explanation is provided of the design and an interpretation of the first panel (Panel A). The others are structured in the same way, so I consider further explanations not to be necessary.

Table 5 comprises 13 columns. In the first column, the factor is named. A definition of the variables can be found in *Table 1*. In the next three columns, the number of observations and the mean, median, and standard deviations are named for the misrepresented firm-year. In the following columns, the same is shown for the restated firm-year. The last four columns contain the results of the test for mean difference and the test for differences in distribution (henceforth “median difference”). There are good reasons to prefer the mean or median because only if the mean (median) differs significantly can it be argued that the firm-years differ. However, if both differ, the results can be considered stronger since they verify each other.

Table 5 Panel A contains a comparison of the same financial ratios for the same fiscal year for the same firm. The firm consequently serves under its own control. When looking at the individual results, the factors of *profitability*, *liquidity*, *return on investment*, and *financial leverage* differ significantly, at least by approximately 10% of their mean and median between the misrepresented and restated cases. We can therefore safely assume that firms differ in these factors due to the misrepresentation. Moreover, *receivable turnover* and *inventory turnover* differ in their median but not in their mean; therefore, whether the firms differ in this characteristic is open to discussion. From the mean perspective, there is no difference, while there is one difference from the median perspective.

TABLE 5 Comparison of Misrepresented Firm-Years to Restated Firm-Years

Panel A: Comparison of misrepresented firm-years to restated firm-years – Categories 1–3												
Categories 1–3	Firm-year as disclosed (misrepresented)				Firm-year as restated (non-misrepresented)				Mean difference t-test		Median difference signed rank test	
	N	mean	median	std. dev.	N	mean	median	std. dev.	t-value	p-value (two-sided)	z-value	p-value (two-sided)
<i>asset balance</i>	135	0.502	0.520	0.242	135	0.519	0.532	0.269	-1.666	0.098	-0.687	0.492
<i>activity</i>	86	0.664	0.534	0.700	86	3.525	0.434	25.522	-1.038	0.302	-0.567	0.571
<i>profitability</i>	134	0.027	0.036	0.117	134	-0.001	0.014	0.137	3.762	0.000	6.662	0.000
<i>liquidity</i>	85	2.584	2.172	1.731	85	2.141	1.897	1.363	3.292	0.002	3.806	0.000
<i>cash position</i>	150	0.130	0.064	0.159	150	0.131	0.069	0.173	-0.188	0.852	0.271	0.786
<i>receivable turnover</i>	152	0.664	0.201	2.119	152	1.204	0.178	7.241	-0.953	0.342	2.693	0.007
<i>inventory turnover</i>	146	0.150	0.101	0.162	146	0.953	0.132	9.525	-1.020	0.310	-5.664	0.000
<i>return on investment</i>	130	0.139	0.097	0.437	130	-0.041	0.066	1.072	1.874	0.063	5.367	0.000
<i>capital intensiveness</i>	150	1.037	0.951	0.736	150	1.030	0.927	0.698	0.181	0.857	0.552	0.581
<i>financial leverage</i>	147	0.533	0.542	0.290	147	0.633	0.590	0.476	-3.531	0.001	-7.766	0.000

Panel B: Comparison of misrepresented firm-years to restated firm-years – Category 1 (greed)

Category 1	Firm-year as disclosed (misrepresented)				Firm-year as restated (non-misrepresented)				Mean difference t-test				Median difference signed rank test			
	N	mean	median	std. dev.	N	mean	median	std. dev.	mean of the percentage difference	t-value	p-value (two-sided)	median of the percentage difference	z-value	p-value (two-sided)		
<i>asset balance</i>	56	0.485	0.463	0.246	56	0.520	0.464	0.287	-9%	2.459	0.017	0%	1.424	0.154		
<i>activity</i>	31	0.669	0.433	0.876	31	8.270	0.387	42.499	-2133%	0.994	0.328	0%	-0.294	0.769		
<i>profitability</i>	51	0.120	0.110	0.113	51	0.077	0.064	0.211	58%	-2.137	0.038	21%	-4.026	0.000		
<i>liquidity</i>	30	2.810	2.606	1.663	30	2.581	2.055	1.354	1%	-1.207	0.237	0%	-1.164	0.244		
<i>cash position</i>	61	0.108	0.053	0.138	61	0.119	0.059	0.164	-16%	1.528	0.132	-1%	2.168	0.030		
<i>receivable turnover</i>	61	1.095	0.206	2.986	61	1.264	0.206	3.311	-3%	0.847	0.400	0%	-1.139	0.255		
<i>inventory turnover</i>	61	0.165	0.141	0.171	61	0.192	0.147	0.232	-22%	1.501	0.139	-2%	4.038	0.000		
<i>return on investment</i>	57	0.113	0.102	0.184	57	0.077	0.070	0.368	81%	-0.870	0.388	4%	-3.157	0.002		
<i>capital intensiveness</i>	61	0.950	0.855	0.649	61	1.046	0.828	0.706	-10%	2.199	0.032	0%	1.099	0.272		
<i>financial leverage</i>	58	0.440	0.327	0.278	58	0.499	0.388	0.286	-25%	-4.766	0.000	-4%	-4.285	0.000		

Panel C: Comparison of misrepresented firm-years to restated firm-years – Category 2 (flee)

Category 2	Firm-year as disclosed (misrepresented)				Firm-year as restated (non-misrepresented)				Mean difference t-test				Median difference signed rank test			
	N	mean	median	std. dev.	N	mean	median	std. dev.	mean of the percentage difference	t-value	p-value (two-sided)	median of the percentage difference	z-value	p-value (two-sided)		
<i>asset balance</i>	25	0.548	0.590	0.252	25	0.535	0.577	0.250	-7%	-0.367	0.717	0%	-0.215	0.830		
<i>activity</i>	21	0.888	0.568	0.863	21	0.767	0.573	0.620	-11%	1.014	0.323	0%	0.000	1.000		
<i>profitability</i>	26	-0.084	0.011	0.271	26	-0.156	-0.069	0.285	29%	-1.862	0.074	8%	-2.718	0.007		
<i>liquidity</i>	21	2.178	2.008	1.509	21	1.825	1.899	1.382	17%	-1.769	0.092	3%	-2.364	0.018		
<i>cash position</i>	26	0.160	0.087	0.193	26	0.152	0.086	0.188	-10%	-0.419	0.679	0%	0.102	0.919		
<i>receivable turnover</i>	27	0.243	0.194	0.148	27	0.286	0.163	0.720	2%	0.339	0.737	10%	-2.391	0.017		
<i>inventory turnover</i>	24	0.160	0.119	0.143	24	0.196	0.175	0.153	-82%	1.980	0.060	-2%	2.837	0.005		
<i>return on investment</i>	19	0.482	0.109	1.002	19	-0.014	-0.009	0.719	9%	-2.006	0.060	0%	-2.857	0.004		
<i>capital intensiveness</i>	26	0.913	0.829	0.452	26	0.991	1.029	0.668	-9%	0.852	0.402	0%	0.559	0.576		
<i>financial leverage</i>	26	0.755	0.748	0.355	26	1.030	0.804	0.798	-36%	2.038	0.052	-1%	3.572	0.000		

Panel D: Comparison of misrepresented firm-years to restated firm-years – Category 3 (fear)

Category 3	Firm-year as disclosed (misrepresented)			Firm-year as restated (non-misrepresented)			Mean difference t-test			Median difference signed rank test				
	N	mean	median	std. dev.	N	mean	median	std. dev.	mean of the percentage difference	t-value	p-value (two-sided)	median of the percentage difference	z-value	p-value (two-sided)
<i>asset balance</i>	54	0.497	0.516	0.236	54	0.506	0.531	0.237	-6%	1.141	0.259	0%	0.000	1.000
<i>activity</i>	34	0.597	0.502	0.566	34	0.828	0.494	1.514	-23%	1.330	0.193	0%	1.361	0.174
<i>profitability</i>	57	0.059	0.083	0.123	57	-0.038	0.063	0.295	42%	-2.942	0.005	13%	-6.205	0.000
<i>liquidity</i>	34	2.636	2.132	1.912	34	1.949	1.756	1.292	18%	-2.601	0.014	2%	-3.311	0.001
<i>cash position</i>	63	0.140	0.084	0.163	63	0.133	0.075	0.162	6%	-2.103	0.040	1%	-2.787	0.005
<i>receivable turnover</i>	64	0.430	0.197	1.395	64	0.379	0.173	1.140	-10%	-1.343	0.184	0%	-1.295	0.195
<i>inventory turnover</i>	61	0.130	0.093	0.161	61	0.143	0.097	0.187	-31%	1.381	0.172	-1%	2.869	0.004
<i>return on investment</i>	54	0.046	0.082	0.188	54	-0.209	0.067	1.500	-2%	-1.266	0.211	1%	-3.346	0.001
<i>capital intensive-ness</i>	63	1.173	1.007	0.884	63	1.073	0.977	0.740	6%	-1.858	0.068	1%	-2.588	0.010
<i>financial leverage</i>	63	0.526	0.554	0.217	63	0.580	0.590	0.232	-14%	3.701	0.001	-3%	5.147	0.000

This table presents a comparison between the financial ratios that represent a factor as first disclosed (misrepresented) and then later restated (non-misrepresented) financial ratios of all misrepresenting firms in Categories 1–3 (Panel A), Category 1 (Panel B), Category 2 (Panel C), and Category 3 (Panel D). An overview of the variable definitions can be found in Table 1. The current table consists of means, medians, and standard deviations. Moreover, the mean and median are compared with a t-test and a signed-rank-test. As a further measure of the difference between a misrepresented and non-misrepresented case, the mean and median percentage differences are shown. Values shaded in grey indicate a significance of at least 10%. The financial ratios are winsorized at 1% and 99% to mitigate the impact of outliers.

The results themselves indicate that there is indeed a difference between misrepresented and non-misrepresented financial figures. This conclusion is probably less surprising since a restatement implies that something must be changed. Moreover, the net income can be seen to have increased through the misrepresentation – a conclusion based on the increase in the *profitability* factor. This factor is represented by the return on asset ratio. Since the control sample is assessed based on total assets, the ratio only reflects the changes in net income, which leads to the conclusion that net income has been increased through the misrepresentation. This conclusion is further strengthened by the *return on investment* factor, which is reflected in the return on equity ratio, the main part of which is the net income. Since the ratio increased because of the misrepresentation, the net income increased as well. Furthermore, income is attached to equity, so an increase in net income also increases equity. Equity is not only the denominator of the return on equity but also the numerator of the ratio for the factor of *financial leverage*. Consequently, the factor of *financial leverage* decreases due to the misrepresentation.

The median *receivable turnover* is significantly higher in the misrepresented cases than in the non-misrepresented ones. This is a consequence of an increase in the numerator receivables because of, for example, premature revenue recognition. In the case of the *inventory turnover*, the median is lower, which hints at a lower inventory because of the misrepresentation. This may also be, for example, the effect of premature revenue recognition. The products that are not yet sold appear as inventory, so early recognition lowers the inventory. The receivables and the inventory are part of current assets. This account is also the numerator of the *liquidity* factor, which is higher in the misrepresented cases than in the non-misrepresented ones. This increase could be a reflection of a steeper increase in receivables than a decrease in inventory, but there could also be other factors that influence the current assets upwards or the current liabilities downwards. The remaining factors (*asset balance*, *activity*, *cash position*, and *capital intensiveness*) are not significantly different (mean and median difference), which indicates that they are not affected by the misrepresentation. In summary, for all firms in Categories 1–3, the misrepresentation was made by increasing net income, probably even combined with boosting sales and consequently receivables.

Panel B of *Table 5* contains a comparison of the misrepresented firm-year with the later restated firm-year for firms in Category 1 (management greed). The results indicate that the mean and median differ only in the cases of *financial leverage* and *profitability*. Moreover, there is a significant mean difference in *asset balance* and *capital intensiveness* but no median difference in these cases. In addition, *cash position*, *inventory turnover*, *return on investment*, and *capital intensiveness* differ only in the median but not in the mean.

When a firm misrepresents its earnings through, for example, premature revenue recognition, the equity increases since earnings are part of equity. Increasing equity

leads to an increase in total assets, so the denominator of the *financial leverage* ratio increases, which causes the *financial leverage* ratio to decrease. This is also the explanation for the lower *cash position* in the misrepresented case. As explained previously, the cash and cash equivalent accounts are difficult to manipulate, but the denominator total assets are affected by the increase in earnings; therefore, the *cash position* decreases. The median of the *inventory turnover* in the misrepresented case is slightly below the median of the *inventory turnover* in the restated case. Since the difference is at the third digit behind the decimal point, doubt exists as to whether it has an economic impact. Nevertheless, the lower value hints at a certain misrepresentation strategy. Increasing sales through, for example, premature revenue recognition leads to an increase in the denominator and hence to a decrease in the overall ratio.

When *capital intensiveness* is examined, the higher mean value in the restated cases can shed further light on the interplay between sales and total assets. Total assets are increased through certain misrepresentation strategies (e.g., capitalizing costs) but sales are also increased through certain misrepresentation strategies (e.g., premature revenue recognition). For at least some firms, total assets increased more than sales, resulting in greater *capital intensity*. At least for some firms, the mean difference in *asset balance* is a consequence of higher total assets. The *return on investment* is a consequence of increasing earnings; therefore, in summary, the following three components of the financial figures can be identified on which the misrepresentation is based: increasing earnings, increasing total assets, and increasing sales.

Panel C of *Table 5* contains a comparison of the misrepresented firm-year with the later restated firm-year for firms in Category 2 (bankruptcy avoidance). The effect of misrepresentation was to increase the ratio of *profitability*, *liquidity*, and *return on investment* while decreasing *inventory turnover* and *financial leverage*. Moreover, the median, but not the mean, is significantly higher in the case of *receivable turnover*. *Receivable turnover* thus hints at a misrepresentation strategy. The receivables are increased due to the misrepresentation, for example, through premature revenue recognition or faked sales, so the sales also increase. The increased sales cause the denominator of *inventory turnover* to increase, which leads to a decrease in inventory turnover. Unless the firm produces its goods or services at a loss, increasing sales also increase earnings. This increase in earnings is reflected in *profitability* and the *return on investment* ratio. In the restated case, *profitability* and *return on investment* are negative but, apart from mean *profitability*, they are positive in the misrepresented case. This indicates that such firms misrepresent themselves to avoid disclosing their losses. Earnings can thus be considered a major tool for misrepresentation. Increasing earnings leads to an increase in equity, since earnings are a part of equity. Consequently, the total assets increase, which causes the equity to decrease.

A little outside the chain is *liquidity*. An increase in receivables also increases current assets, which is the numerator of *liquidity*, so *liquidity* increases. However, current assets are also the numerator of the asset balance. *The asset balance* is not just

affected by the misrepresentation. Another consequence is that the denominator of current liabilities is decreased to appear more liquid. This can be achieved by, for example, failing to present all current liabilities. In summary, the misrepresentation is mainly made through receivables, sales, earnings, total assets, and current liabilities.

Panel D of *Table 5* contains a comparison of the misrepresented firm-year with the later restated firm-year for firms in Category 3 (capital market pressure). The misrepresentation affects a variety of accounting ratios. Such firms increase their *profitability*, *liquidity*, *cash position*, and *capital intensiveness* and decrease their *financial leverage*. The median difference also signals an increase in *return on investment* and a decrease in *inventory turnover*.

Cash and cash equivalents can be retrieved from the bank statement or physically counted; therefore, they are difficult to misrepresent. The increase in *cash position* therefore hints at a decrease in the denominator of the *cash position* ratio, namely the total assets. The *profitability* factor comprises net income scaled by total assets, and therefore, the increase in the factor can be achieved either by increasing earnings or decreasing total assets. The increase in *profitability* can be partly attributed to the decrease in total assets, which could be seen in the cash position. However, the decrease in total assets is too small to explain the difference in the *profitability* factor alone, so earnings must also have increased due to the misrepresentation. Furthermore, the increase in earnings can be seen in the *return on investment*. Here, no total assets are involved. The ratio comprises earnings scaled by equity, but the *return on investment* is greater in the misrepresented cases than in the restated cases. The earnings are thus increased due to the misrepresentation. An increase in earnings leads to an increase in equity. As equity is the numerator of the *financial leverage* factor, said factor increases. This increase is further strengthened since total assets are the denominator. As explained earlier in this paragraph, total assets decreased due to the misrepresentation, so both effects can also be confirmed by *financial leverage*. The total assets are the denominator of the *capital intensiveness* ratio, and since the total assets decreased due to the misrepresentation, the ratio increases.

The decrease in *inventory turnover* due to the misrepresentation can be explained by, for example, premature revenue recognition. This involves products being recognized as sold, although they in fact still belong to the firm and consequently to the balance sheet as inventory. When correcting the issue, the inventory account increases, which increases the nominator of *inventory turnover*. Moreover, in the case of premature revenue recognition, the sales figure increases. Sales are the denominator of the inventory turnover ratio; thus, both effects – inventory and sales – work together to decrease *inventory turnover* due to the misrepresentation. The ratio that reflects *liquidity* comprises current assets divided by current liabilities. Increasing *liquidity* could be achieved by increasing current assets by, for example, capitalizing costs or by decreasing current liabilities by failing to disclose a liability.

Without repeating the tools for each category again, one can observe an overlap in the tools used by the firms to cause the misrepresentation in each category. This

observation might be caused by a limited range of easily available tools. However, one should notice that the differences in the extent to which the tools were used vary. For example, if one compares the differences in *profitability* in Categories 1 and 2, one can observe a much larger mean or median difference for Category 1 compared to Category 2. Thus, firms in Category 1 use their tools more to increase profitability compared with firms in Category 2.

The accounting component (tool) through which the misrepresentation was caused can also be seen as the opportunity that the management took to deliberately alter the annual report. Hence, accounting competence is part of the opportunity dimension of the fraud triangle.

Profile of Misrepresenting Firms – Statistical Tests

The third research question addresses the profile of firms that misrepresent. This perspective is the last part of the chain – namely the outcome. It is therefore based on the published, misrepresented annual report. *Table 6* presents an overview of the misrepresenting firm's size, measured once by total assets and once by sales. The size is compared between Categories 1, 2, and 3. The misrepresenting firms in Category 1 have a mean that is roughly three times smaller and a median that is two times smaller in both proxies for size compared with firms in Category 3. The results are thus significant with respect to mean and median, and therefore, one can infer that misrepresenting firms in Category 1 are comparatively small.

Furthermore, misrepresenting firms in Category 2 are equal in size to those in Category 1 but are much smaller than firms in Category 3. In fact, firms in Category 3 have total assets much greater than those in Category 2, and therefore, the gap in sales is even larger. Here, however, it must be noted that firms in Category 2 are in financial distress, so the low sales might be a reflection of this financial distress rather than a good proxy for size. Misrepresenting firms in Category 3 are larger than firms in Categories 1 and 2. In fact, they are much larger in terms of total assets and sales, and therefore, firms in Category 3 can be considered larger. They are clearly the largest firms among all three categories.

TABLE 6 Firm Size of Misrepresenting Firms by Category

	Category 1 (greed)		Category 2 (flee)		Category 3 (fear)		Mean difference t-test		Median difference rank-sum-test	
	mean	median	mean	median	mean	median	t-value	p-value (two-sided)	z-value	p-value (two-sided)
<i>total assets</i>	1728.533	467.171	1742.814	136.971			0.0198	0.984	-0.873	0.383
<i>sales</i>	1334.31	401.628	1015.784	94.348			-0.3494	0.728	-0.647	0.518
<i>total assets</i>	1728.533	467.171			4726.960	824.538	2.899	0.004	2.618	0.009
<i>sales</i>	1334.31	401.628			4397.938	1134.945	2.190	0.030	3.882	0.000
<i>total assets</i>			1742.814	136.971	4726.960	824.538	2.001	0.049	2.884	0.004
<i>sales</i>			1015.784	94.348	4397.938	1134.945	1.751	0.083	2.989	0.003

The table contains the size of the misrepresenting firm, proxied once by total assets and once by sales. The size is compared to the size of the firms in the other categories with a t-test and a rank-sum test. Values shaded in grey indicate a significance of at least 10%.

Table 7 presents a comparison between the misrepresented firm-years and non-misrepresented firm-years of the respective peer firms.⁸ Thus, two samples of firms are compared. The table is structured in the same fashion as *Table 5*, leading to the same style of interpretation⁹. Panel A compares firms originating from Categories 1, 2, and 3 with their peer firms. Taking a larger sample, such as one that comprises all misrepresenting firms in the dataset, does not lead to qualitatively different results.

Prior literature has already demonstrated that misrepresenting firms in general differ from their peers (e.g., Dechow et al. 2011). Moreover, it has assessed the characteristics of misrepresenting firms in general. Unsurprisingly, as in the prior literature, the results in Panel A indicate that misrepresenting firms differ from their peers; therefore, the results can be seen as confirmation of the prior research and as support for the validity of the underlying dataset.

The results in *Table 7 Panel B* indicate that misrepresenting firms in Category 1 (management greed) have a lower *asset balance*, higher *profitability*, lower *cash position*, higher *inventory turnover*, and lower leverage than their peers. Whether misrepresenting firms have lower *activity* due to a significant median difference but a lack of significance for the mean is open to discussion. When these firms are examined from the perspective of profitability, higher *profitability*, a higher *inventory turnover*, and lower *activity* indicate a profitable firm. Lower *financial leverage* is a sign of low riskiness in investing by the firm, while a lower *cash position* and a lower *asset balance* signal the opposite. The latter two signal a lack of liquid funds and an inability to quickly increase these funds through normal operations; therefore, due to the opposite directions of the variables assigned to the riskiness aspect, riskiness as such can be considered average. It is neither high since the *financial leverage* is low nor low due to the *cash position* and *asset balance*.

The results in *Table 7 Panel C* indicate that misrepresenting firms in Category 2 (bankruptcy avoidance) are less liquid, have an inferior cash position, and are more highly leveraged than their peers, since these three variables are very different among their peers. According to the prior literature, lower liquidity, a lower *cash position*, and higher *financial leverage* are all indicators of an increased default probability and consequently an increased risk for the firm (Skogsvik 1990). As variables related to the profitability aspect do not differ, one can infer from the results that misrepresenting firms in Category 2 take more risks and might default sooner than their peers, but they appear to be as profitable as their peers.

⁸ It should be noted that a peer firm is in very rare cases (fewer than 10 peer firms) the control firm of two misrepresenting firms. In such cases, the peer firm occurs only once in the control sample.

⁹ Differences in the number of observations between *Table 5* and *Table 7* can be attributed to missing restated financial figures.

TABLE 7 Descriptive Statistics and Statistical Tests: Firms in Categories 1–3

Panel A: Comparison of misrepresented firm-years to firm-years of peers – Categories 1–3																
Categories 1–3	Firm-year as disclosed (misrepresented)						Control firms (peers)						Mean difference t-test		Median difference rank-sum test	
	N	mean	median	std. dev.	N	mean	median	std. dev.	t-value	p-value (two-sided)	z-value	p-value (two-sided)				
<i>asset balance</i>	137	0.505	0.527	0.242	4457	0.594	0.632	0.245	-4.171	0.000	-4.167	0.000				
<i>activity</i>	137	0.623	0.519	0.592	4392	1.592	0.598	4.485	-2.527	0.012	-4.370	0.000				
<i>profitability</i>	140	0.023	0.036	0.129	4190	-0.010	0.019	0.142	2.758	0.006	2.486	0.013				
<i>liquidity</i>	137	2.689	2.462	1.705	4457	3.273	2.200	3.536	-1.926	0.054	0.111	0.911				
<i>cash position</i>	152	0.132	0.065	0.160	4792	0.258	0.177	0.248	-6.202	0.000	-6.114	0.000				
<i>receivable turnover</i>	152	0.664	0.201	2.119	4703	0.685	0.197	2.078	-0.125	0.901	-0.965	0.335				
<i>inventory turnover</i>	146	0.150	0.101	0.162	4660	0.121	0.052	0.217	1.569	0.117	3.714	0.000				
<i>return on investment</i>	134	0.137	0.092	0.429	4073	0.186	0.081	0.745	-0.756	0.450	1.039	0.299				
<i>capital intensiveness</i>	152	1.036	0.951	0.732	4786	0.939	0.809	0.743	1.591	0.112	2.303	0.021				
<i>financial leverage</i>	152	0.527	0.531	0.287	4785	0.566	0.464	0.497	-0.961	0.337	0.820	0.412				

Panel B: Comparison of misrepresented firm-years to firm-years of peers – Category 1 (greed)													
Category 1	Firm-year as disclosed (misrepresented)				Control firms (peers)				Mean difference t-test			Median difference rank-sum test	
	N	mean	median	std. dev.	N	mean	median	std. dev.	t-value	p-value (two-sided)	z-value	p-value (two-sided)	
<i>asset balance</i>	56	0.485	0.463	0.246	2161	0.609	0.656	0.245	-3.740	0.000	-3.626	0.000	
<i>activity</i>	56	0.618	0.463	0.678	2144	1.431	0.622	3.898	-1.559	0.119	-3.494	0.001	
<i>profitability</i>	56	0.105	0.107	0.140	2194	-0.009	0.037	0.185	4.579	0.000	5.357	0.000	
<i>liquidity</i>	56	3.036	2.821	1.723	2161	3.171	2.250	3.165	-0.331	0.741	1.419	0.156	
<i>cash position</i>	61	0.108	0.053	0.138	2397	0.257	0.190	0.240	-4.853	0.000	-4.834	0.000	
<i>receivable turnover</i>	61	1.095	0.206	2.986	2374	1.012	0.209	2.702	0.236	0.813	-0.830	0.407	
<i>inventory turnover</i>	61	0.165	0.141	0.171	2331	0.118	0.047	0.209	1.748	0.081	2.920	0.004	
<i>return on investment</i>	60	0.110	0.098	0.180	1962	0.204	0.083	0.715	-1.019	0.309	1.032	0.302	
<i>capital intensiveness</i>	61	0.950	0.855	0.649	2391	0.902	0.773	0.722	0.520	0.603	1.199	0.231	
<i>financial leverage</i>	61	0.437	0.353	0.271	2393	0.580	0.458	0.517	-2.146	0.032	-1.951	0.051	

Panel C: Comparison of misrepresented firm-years to firm-years of peers – Category 2 (flee)

Category 2	Firm-year as disclosed (misrepresented)				Control firms (peers)				Mean difference t-test		Median difference rank-sum test	
	N	mean	median	std. dev.	N	mean	median	std. dev.	t-value	p-value (two-sided)	z-value	p-value (two-sided)
<i>asset balance</i>	26	0.553	0.601	0.248	947	0.593	0.639	0.258	-0.780	0.436	-0.909	0.363
<i>activity</i>	26	0.717	0.568	0.574	925	1.995	0.615	5.631	-1.156	0.248	-1.157	0.247
<i>profitability</i>	25	0.026	0.037	0.193	874	-0.026	0.024	0.187	0.003	0.998	-0.343	0.732
<i>liquidity</i>	26	2.021	1.881	1.477	947	3.698	2.304	4.349	-1.961	0.050	-2.215	0.027
<i>cash position</i>	27	0.156	0.082	0.190	955	0.267	0.177	0.258	-2.199	0.028	-2.324	0.020
<i>receivable turnover</i>	27	0.243	0.194	0.148	931	0.257	0.181	0.595	-0.126	0.900	1.045	0.296
<i>inventory turnover</i>	24	0.160	0.119	0.143	927	0.150	0.105	0.222	0.227	0.820	1.226	0.220
<i>return on investment</i>	20	0.460	0.073	0.981	755	0.234	0.066	0.885	1.122	0.262	1.018	0.309
<i>capital intensiveness</i>	27	0.910	0.833	0.443	954	0.917	0.804	0.740	-0.049	0.961	0.733	0.464
<i>financial leverage</i>	27	0.736	0.746	0.363	952	0.548	0.426	0.543	1.782	0.075	3.341	0.001

Panel D: Comparison of misrepresented firm-years to firm-years of peers – Category 3 (fear)

Category 3	Firm-year as disclosed (misrepresented)			Control firms (peers)				Mean difference t-test		Median difference rank-sum test		
	N	mean	median	std. dev.	N	mean	median	std. dev.	t-value	p-value (two-sided)	z-value	p-value (two-sided)
<i>asset balance</i>	55	0.502	0.520	0.237	1719	0.568	0.589	0.240	-2.012	0.044	-1.995	0.046
<i>activity</i>	55	0.584	0.465	0.507	1692	1.478	0.549	4.122	-1.609	0.108	-2.525	0.012
<i>profitability</i>	59	0.063	0.085	0.123	1695	0.014	0.058	0.179	2.067	0.039	2.282	0.023
<i>liquidity</i>	55	2.653	2.266	1.717	1719	3.016	2.037	3.289	-0.815	0.415	0.948	0.343
<i>cash position</i>	64	0.145	0.087	0.166	1828	0.260	0.171	0.253	-3.609	0.000	-3.411	0.001
<i>receivable turnover</i>	64	0.430	0.197	1.395	1784	0.382	0.194	1.116	0.332	0.740	-1.033	0.302
<i>inventory turnover</i>	61	0.130	0.093	0.161	1782	0.092	0.014	0.209	1.403	0.161	3.671	0.000
<i>return on investment</i>	54	0.058	0.084	0.179	1521	0.195	0.095	0.753	-1.331	0.183	-0.649	0.516
<i>capital intensiveness</i>	64	1.171	1.022	0.877	1822	1.006	0.847	0.769	1.678	0.093	1.780	0.075
<i>financial leverage</i>	64	0.524	0.554	0.216	1825	0.548	0.481	0.414	-0.471	0.638	0.951	0.342

The table contains a comparison between the financial ratios that represent a factor as disclosed (misrepresented) and the same financial ratio of peer firms of all misrepresenting firms in Categories 1–3 (Panel A), Category 1 (Panel B), Category 2 (Panel C), and Category 3 (Panel D). An overview of the variable definition can be found in Table 1. The current table consists of means, medians, and standard deviations. Moreover, the mean and median are compared with a t-test and a rank-sum test. Values shaded in grey signal a significance of at least 10%. The financial ratios are winsorized at 1% and 99% to mitigate the impact of outliers. Differences in the number of observations (N) between the factors can be attributed to the data availability.

The results of the comparison of the accounting ratios between misrepresenting firms in Category 3 and their peers are presented in *Table 7 Panel D* (capital market pressure). The results indicate that misrepresenting firms in this category have a lower *asset balance*, higher profitability, a lower *cash position*, and higher *capital intensiveness*. Moreover, the median of *activity* is below the median of their peers, and the median of *inventory turnover* is above that of their peers.

The lower *asset balance* means that there are more non-current (fixed) assets in such misrepresenting firms than in their peers, but current assets are meant to be sold quickly and are consequently closer to liquid funds. Therefore, in this case, the ratio *asset balance* hints at higher riskiness. The same is true for the *cash position* following similar argumentation. The *cash position* in this case is below that of the peers, so there are fewer liquid funds available; consequently, the risk is higher. Moreover, the *capital intensiveness* ratio for misrepresenting firms is higher than the same ratio for their peers. As a higher ratio is proven to increase the default risk of a firm (Altman 1968), *capital intensiveness* in this case also signals high riskiness. Consequently, according to their misrepresented figures, misrepresenting firms in Category 3 are even more inclined to take risks than their peers.

Lower *activity* means that the firms are more successful in selling their current assets (inventory), and therefore, this is a sign of profitability. Moreover, the *profitability* factor itself is higher for misrepresenting firms than for their peers, which leads to the conclusion that misrepresenting firms in Category 3 are more profitable. However, *inventory turnover* indicates the opposite. This ratio indicates how fast inventory is sold. A higher *inventory turnover* ratio is a sign of the faster sale of the inventory and, ultimately, of higher profitability. In this case, *inventory turnover* for peer firms is higher than for misrepresenting firms, indicating that firms that misrepresent are less profitable. Consequently, the accounting ratios provide a mixed picture of profitability. Two ratios point to being profitable and one to lower profitability; thus, the profitability aspect can be considered average.

Profile of Misrepresenting Firms – Regression Analysis

Table 7 compares misrepresenting firms with peer firms through descriptive statistics and statistical tests. However, one issue here is that the variables are taken separately and not together; therefore, to strengthen the analyses, I perform a Firth logistic regression analysis. Since the event of a misrepresentation is rare within the dataset, using a Firth logistic regression generates, according to Firth (1993), more accurate results than a logistic regression without the adjustments.

The dependent variable is the binary variable *misrepresent*, which has a value of 1 if the firm-year is misrepresented and 0 otherwise. The independent variables are the same as shown in *Table 1* and represent the factors as in the previous table; therefore, the independent variables cover a variety of different accounting characteristics.

TABLE 8 Comparison of Misrepresented Firm-Years to Firm-Years of Peers: Firth Logistic Regression

	(A)	(B)	(C)	(D)
	Categories 1–3	Category 1 (greed)	Category 2 (flee)	Category 3 (fear)
VARIABLES	misrepresent	misrepresent	misrepresent	misrepresent
<i>asset balance</i>	-0.241 (-0.781)	-1.387*** (-3.068)	1.055* (-1.690)	-0.078 (-0.159)
<i>Activity</i>	-0.014 (-0.594)	-0.050 (-1.412)	0.021 (-0.991)	-0.007 (-0.225)
<i>profitability</i>	0.625* (-1.696)	3.995*** (-4.086)	0.025 (-0.047)	-0.248 (-0.441)
<i>Liquidity</i>	0.0395* (-2.201)	0.064*** (-2.651)	-0.019 (-0.489)	0.051** (-2.133)
<i>cash position</i>	-1.487*** (-3.578)	-1.394** (-2.244)	-1.201 (-1.620)	-1.451** (-2.368)
<i>receivable turnover</i>	0.0767 (-0.587)	0.378*** (-2.693)	0.081 (-0.619)	0.031 (-0.144)
<i>inventory turnover</i>	0.597* (-1.86)	2.260*** (-3.957)	0.243 (-0.523)	0.609 (-1.332)
<i>return on investment</i>	0.071 (-1.007)	-0.732* (-1.654)	0.148* (-1.858)	-0.031 (-0.242)
<i>capital intensiveness</i>	-0.0275 (-0.330)	0.138 (-1.248)	-0.242 (-1.178)	0.001 (-0.008)
<i>financial leverage</i>	-0.175 (-1.090)	-0.227 (-0.993)	0.432** (-2.164)	-0.265 (-1.159)
<i>Constant</i>	-1.531*** (-10.75)	-1.501*** (-8.192)	-2.328*** (-8.688)	-1.587*** (-7.599)
Observations	3,676	1,746	752	1,452
*** p < 0.01, ** p < 0.05, * p < 0.1				

This table contains the result of a Firth logistic regression with the binary variable 'misrepresent' (1 if the firm misrepresented, otherwise 0) as a dependent variable and the variables defined in Table 1 as independent variables. Robust z-statistics are in parentheses. Note that a Firth logistic regression has no R². The difference between the number of observations in case A and those in cases B, C, and D combined originates from the multiple assignments of one control firm to misrepresenting firms.

Table 8 presents the results in (A) for misrepresenting firms in Categories 1–3 combined, in (B) for firms in Category 1 (management greed) only, in (C) for firms in Category 2 (bankruptcy avoidance, flee) only, and in (D) for firms in Category 3 (capital market pressure, fear) only. It is therefore possible to draw conclusions for all misrepresenting firms in the pooled dataset and for the misrepresenting firms separated by the reason for the misrepresentation.

The results for the cases in Categories 1–3 combined (column A) and the results from the previous statistical tests reveal the following differences: While the *return on investment* and the *asset balance* are significant in previous statistical tests, they lose significance in the regression analysis. Moreover, the factor of *liquidity* gains significance in the regression analysis compared with the previous statistical tests. Since the purpose of the combination of Categories 1–3 is to investigate whether differences exist between the misrepresenting firms and the control firms, the results are sufficient to confirm differences without going into much detail as to what they are. This question is rather of interest when considering the reasons for the misrepresentation (split into the categories). Thus, the previous interpretation that there are differences is confirmed.

Moreover, the results for firms in Category 1 (column B) differ between the regression analysis and the previous statistical tests. In the regression analysis, the factors of *liquidity*, *receivable turnover*, and *return on investment* exhibit significant differences, while *financial leverage* loses its significance. As a reminder, the interpretation of the results for the previous statistical tests indicates average riskiness and high profitability. When attitudes toward riskiness are examined, as in the case of the statistical tests, the negative coefficient of *cash position* and *asset balance* signals increased riskiness, but the positive coefficient for *liquidity* signals decreases riskiness. The riskiness aspect can therefore be considered average. When the profitability aspect is examined, the positive coefficients for *receivable turnover*, *inventory turnover*, and *profitability* indicate highly profitable firms compared with their peers. Nevertheless, the negative *return on investment* factor indicates the opposite. The *return on investment* factor, however, reflects profitability from the perspective of the shareholder – and therefore the interpretation of a profitable firm in general – with a small potential exception for shareholders. Both interpretations, in principle, coincide with the results of the previous statistical tests.

The results for Category 2 (column C) only indicate that one factor differs by approximately 5% between the misrepresenting and peer firms – namely *financial leverage*. This one factor, however, develops in line with expectations. Firms in Category 2 are more highly leveraged, indicating a higher propensity for riskiness. Since the factors aligned with the profitability aspect remain not significant at 5%, it can be concluded that profitability generally remains equal to that of peer firms. Both interpretations are in line with the interpretations of the results of the statistical tests, where the interpretation is that riskiness increases while profitability remains equal.

The results for Category 3 (column D) only partly confirm the results of the previous statistical tests. The interpretation of the profitability of the statistical tests is difficult due to the results pointing in different directions. In the case of the regression analysis, no factor associated with the profitability aspect is significant; therefore, the interpretation is that misrepresenting firms in this category appear to be as profitable as their peers. In terms of riskiness, the interpretation of the previous statistical tests is that misrepresenting firms in Category 3 take more risks than their peers. The results of the regression analysis suggest that misrepresenting firms in this category are more liquid but have a lower *cash position*. Higher *liquidity* would indicate lower riskiness, while a lower *cash position* would suggest higher riskiness, in which case no clear interpretation is possible. Given that the remaining variables do not signal any significance, it can be said that misrepresenting firms in Category 3 appear to be similar to their peers. The higher propensity for riskiness in the previous statistical tests cannot be confirmed.

Robustness Test

Next, a multitude of further robustness tests are conducted. Among them is the question of whether the Sarbanes–Oxley (SOX) Act, as an example of a major change in the law, had an impact on the interpretation of the results. Therefore, the dataset is divided into a pre- and post-SOX Act period. Although the results (not disclosed) are impacted by a lower number of observations, the interpretation between before and after the SOX Act remains the same.

A further question arises because of the control sample. One could argue that a different control sample would lead to different results. Therefore, I repeat the analysis with all remaining firms on COMPUSTAT in the respective firm years as a control sample. The results (not disclosed) do not lead to a different interpretation compared with the chosen control sample in the main analysis.

The variables chosen in this paper are selected since they have been considered by prior literature to provide a good reflection of the characteristics of firms. However, whether they actually do is open to discussion. In prior research, some other variables have also been employed. Subsequently, the question arises as to whether the results can be confirmed with the different variables used by other researchers. As an example, I select the variables used by Dechow et al. (2011), who call them “financial statement variables”. *Table 9* provides an overview of these variables and their definitions:

I reproduce *Table 7* using the variables of Dechow et al. (2011), and the results can be found in *Table 10*. The table and statistical tests are designed in the same manner as those for *Table 7*, so the results can be interpreted in the same way. The initial question that arises is whether the results are comparable with those of Dechow et al. (2011). I therefore focus especially on *Table 6* of Dechow et al. (2011, pp. 48–

49), where the authors compare misrepresented firm-years with the remaining firm-years on COMPUSTAT.

TABLE 9 Variable Description According to Dechow et al. (2011)

Variable	Calculation
<i>wc accruals</i>	$((\Delta \text{current assets} - \Delta \text{cash and short-term investments}) - (\Delta \text{current liabilities} - \Delta \text{debt in current liabilities} - \Delta \text{taxes payable})) / \text{average total assets}$
<i>rsst accruals</i>	$(\Delta(\text{current assets} - \text{cash and short-term investments} - \text{current liabilities} - \text{debt in current liabilities}) + \Delta(\text{total assets} - \text{current assets} - \text{investments and advances} - \text{total liabilities} + \text{current liabilities} + \text{long-term debt}) + \Delta(\text{short-term investments} + \text{long-term investments} - \text{long-term debt} - \text{debt in current liabilities} - \text{preferred stock})) / \text{average total assets}$
<i>change in receivables</i>	$\Delta \text{accounts receivable} / \text{average total assets}$
<i>change in inventory</i>	$\Delta \text{inventory} / \text{average total assets}$
<i>%soft assets</i>	$(\text{total assets} - \text{PP\&E} - \text{cash and cash equivalent}) / \text{total assets}$
<i>modified Jones model discretionary accruals</i>	The modified Jones model discretionary accruals estimated cross-sectionally using all observations in the same year and the same two-digit SIC code. The residual of the following regression is used as the modified Jones model discretionary accruals: $\text{WC accruals} = \alpha + \beta(1 / \text{beginning assets}) + \gamma(\Delta \text{sales} - \Delta \text{rec}) / \text{beginning assets} + \delta \Delta \text{PPE} / \text{beginning assets} + \epsilon$
<i>mean-adjusted absolute value of DD residuals</i>	The mean absolute value of the residual of the following regression is calculated for each industry and then subtracted from the absolute value of each firm's observed residual: $\Delta \text{WC} = b_0 + b_1 * \text{CFO}_{t-1} + b_2 * \text{CFO}_t + b_3 * \text{CFO}_{t-1} + \epsilon$
<i>studentized DD residuals</i>	Mean-adjusted absolute value of DD residuals (resid) with studentized residuals
<i>change in cash sales</i>	Percentage change in cash sales where cash sales is: $\text{sale} - \Delta \text{accounts receivable}$
<i>change in cash margin</i>	Percentage change in cash margin where the cash margin is: $1 - ((\text{cost of goods sold} - \Delta \text{inventory} + \Delta \text{accounts payable}) / (\text{sales} - \Delta \text{accounts receivable}))$
<i>change in return on assets</i>	$(\text{Earnings}_t / \text{average total assets}_t) - (\text{earnings}_{t-1} / \text{average total assets}_{t-1})$
<i>change in free cash flow</i>	$\Delta(\text{earnings} - \text{RSST accruals}) / \text{average total assets}$
<i>deferred tax expenses</i>	Deferred tax expenses for year t / total assets for year t-1

At first glance, several differences in results exist between Table 6 of Dechow et al. (2011; in the following D6) and my *Table 10 Panel A*. I focus my comparison on whether the t-tests for the mean difference exhibit any significance, since the authors only disclose the results of the t-test and not, for example, a rank-sum test. In Dechow et al. (2011), all accrual quality variables are significantly different while all performance variables are not significantly different.

TABLE 10 Robustness Test with the Financial Statement Variables of Dechow et al. (2011)

Panel A: All misrepresenting firms independent of the reason for the misrepresentation											
	Misrepresented firm-years			Non-misrepresented firm-years			Mean difference t-test		Median difference rank-sum test		
	N	Mean	Median	N	Mean	Median	t-value	p-value (two-sided)	z-value	p-value (two-sided)	
Accruals quality variable											
<i>wc accruals-</i>	214	0.036	0.018	7206	0.012	0.006	2.296	0.022	2.542	0.011	
<i>rsst accruals</i>	205	0.105	0.067	6821	0.069	0.039	1.571	0.116	2.509	0.012	
<i>change in receivables</i>	241	0.033	0.015	8050	0.026	0.016	1.306	0.192	0.441	0.659	
<i>change in inventory</i>	232	0.021	0.003	7987	0.007	0.000	4.931	0.000	4.673	0.000	
<i>%soft assets</i>	245	0.647	0.680	8547	0.556	0.578	5.481	0.000	5.245	0.000	
<i>modified Jones model discretionary accruals</i>	218	0.064	0.055	7244	0.046	0.044	2.332	0.020	2.488	0.013	
<i>mean-adjusted absolute value of DD residuals</i>	214	0.026	0.009	6590	0.020	0.010	0.742	0.458	0.085	0.933	
<i>studentized DD residuals</i>	214	0.008	0.003	6590	0.006	0.003	0.741	0.459	0.080	0.937	
Performance variables											
<i>change in cash sales</i>	233	0.270	0.151	7378	0.314	0.110	-0.455	0.649	2.359	0.018	
<i>change in cash margin</i>	223	0.001	0.000	7126	0.004	0.000	-0.311	0.756	0.404	0.686	
<i>change in return on assets</i>	225	0.006	-0.004	7153	0.013	0.001	0.601	0.548	1.374	0.169	
<i>change in free cash flows</i>	193	0.019	0.009	6058	0.015	0.008	0.688	0.491	0.696	0.486	
<i>deferred tax expenses</i>	230	0.024	0.003	7502	0.013	0.000	4.792	0.000	6.181	0.000	

Panel B: Firms in Category 1 (Misrepresentation for the direct personal gain of the manager)

	Misrepresented firm-years		Non-misrepresented firm-years		Mean difference t-test		Median difference rank-sum test			
	N	Mean	Median	N	Mean	Median	t-value	p-value (two-sided)	Z-value	p-value (two-sided)
Accruals quality variable										
<i>wc accruals</i>	53	0.048	0.024	1918	0.021	0.008	1.821	0.069	1.738	0.082
<i>rsst accruals</i>	54	0.171	0.093	1845	0.056	0.038	2.620	0.009	3.159	0.002
<i>change in receivables</i>	58	0.047	0.022	2216	0.031	0.018	1.276	0.202	1.009	0.313
<i>change in inventory</i>	58	0.020	0.003	2173	0.008	0.000	2.008	0.045	2.106	0.035
<i>%soft assets</i>	61	0.733	0.762	2397	0.566	0.586	4.909	0.000	4.975	0.000
<i>modified Jones model discretionary accruals</i>	54	0.084	0.063	1947	0.051	0.046	1.901	0.058	1.701	0.089
<i>mean-adjusted absolute value of DD residuals</i>	53	0.032	0.016	1781	0.040	0.016	0.432	0.666	0.383	0.702
<i>studentized DD residuals</i>	53	0.009	0.005	1781	0.012	0.005	0.436	0.663	0.379	0.704
Performance variables										
<i>change in cash sales</i>	54	0.222	0.153	1978	0.234	0.096	0.059	0.953	1.283	0.200
<i>change in cash margin</i>	53	0.000	0.000	1919	0.001	0.001	0.088	0.930	0.744	0.457
<i>change in return on assets</i>	54	0.005	0.004	1911	0.012	0.000	-0.248	0.804	0.262	0.793
<i>change in free cash flows</i>	51	0.041	0.024	1580	0.030	0.011	0.243	0.808	1.387	0.166
<i>deferred tax expenses</i>	55	0.044	0.010	2090	0.014	0.000	5.878	0.000	6.734	0.000

Panel C: Firms in Category 2 (Misrepresentation to avoid negative contractual or institutional consequences)										
	Misrepresented firm-years			Non-misrepresented firm-years			Mean difference t-test		Median difference rank-sum test	
	N	Mean	Median	N	Mean	Median	t-value	p-value (two-sided)	Z-value	p-value (two-sided)
Accruals quality variable										
wc accruals	25	0.064	0.017	866	0.007	0.002	2.526	0.012	1.882	0.060
rst accruals	24	0.010	0.044	845	0.074	0.031	0.878	0.380	0.408	0.683
change in receivables	27	0.053	0.017	906	0.016	0.009	2.299	0.022	1.495	0.135
change in inventory	24	0.032	0.012	903	0.006	0.000	2.384	0.017	2.094	0.036
%soft assets	27	0.656	0.625	953	0.530	0.548	2.600	0.010	2.637	0.008
modified Jones model discretionary accruals	25	0.083	0.055	880	0.039	0.040	1.655	0.098	1.610	0.107
mean-adjusted absolute value of DD residuals	25	0.082	0.014	800	0.037	0.016	1.783	0.075	0.109	0.913
studentized DD residuals	25	0.025	0.004	800	0.011	0.005	1.780	0.076	0.109	0.914
Performance variables										
change in cash sales	25	0.403	0.093	822	0.439	0.093	0.112	0.911	0.490	0.624
change in cash margin	22	0.003	0.001	796	0.006	0.000	-0.080	0.936	0.627	0.531
change in return on assets	22	0.039	-0.003	774	0.010	0.000	0.686	0.493	0.287	0.774
change in free cash flows	21	-0.005	-0.011	740	0.001	0.001	0.085	0.933	0.746	0.456
deferred tax expenses	26	0.005	0.000	882	0.010	0.000	0.933	0.351	0.647	0.517

Panel D: Firms in Category 3 only (Misrepresentation due to market pressure)

	Misrepresented firm-years		Non-misrepresented firm-years		Mean difference t-test		Median difference rank-sum test			
	N	Mean	Median	N	Mean	Median	t-value	p-value (two-sided)	z-value	p-value (two-sided)
Accruals quality variable										
<i>wc accruals</i>	52	0.025	0.015	1569	0.010	0.004	1.112	0.267	1.084	0.279
<i>rsst accruals</i>	48	0.076	0.049	1473	0.082	0.043	-0.114	0.909	0.495	0.621
<i>change in receivables</i>	64	0.020	0.009	1707	0.025	0.015	0.489	0.652	0.834	0.404
<i>change in inventory</i>	61	0.029	0.003	1704	0.006	0.000	4.163	0.000	3.614	0.000
<i>%soft assets</i>	64	0.633	0.604	1824	0.568	0.596	2.101	0.036	1.820	0.069
<i>modified Jones model discretionary accruals</i>	55	0.042	0.050	1574	0.044	0.043	0.156	0.876	0.481	0.631
<i>mean-adjusted absolute value of DD residuals</i>	52	0.046	0.017	1435	0.019	0.013	1.471	0.142	1.199	0.231
<i>studentized DD residuals</i>	52	0.014	0.005	1435	0.006	0.004	1.477	0.140	1.201	0.230
Performance variables										
<i>change in cash sales</i>	63	0.434	0.190	1594	0.398	0.128	0.209	0.834	1.452	0.147
<i>change in cash margin</i>	60	0.002	0.000	1540	0.005	0.000	0.154	0.877	0.567	0.571
<i>change in return on assets</i>	51	0.013	0.014	1508	0.007	0.004	1.138	0.255	2.317	0.021
<i>change in free cash flows</i>	44	-0.022	0.002	1336	0.004	0.006	0.543	0.587	0.966	0.334
<i>deferred tax expenses</i>	62	0.020	0.009	1622	0.016	0.000	1.008	0.314	3.432	0.001

The table contains a comparison between the financial ratios that represent a factor as first disclosed (misrepresented) and the later restated (non-misrepresented) financial ratios of all the firms (Panel A), only the firms in Category 1 (Panel B), only those in Category 2 (Panel C), and only those in Category 3 (Panel D). The variables used in the table are defined in Table 10. Values shaded in grey indicate a significance of at least 10%. The financial ratios are winsorized at the 1% and 99% levels to mitigate the impact of outliers. Differences in the number of observations (N) between the factors can be attributed to the data availability.

Upon examining *Table 10 Panel A*, these results can only be partly confirmed. Among the accrual quality variables, *rsst accruals*,¹⁰ *change in receivables*, and both forms of *DD residuals* are nonsignificant. The *rsst accruals* and the *change in receivables* are nonsignificant due to the matching criteria. In a comparison with an unmatched sample, the variables become significant. The variables for *DD residuals* remain nonsignificant in all cases. Among the performance variables, only the *deferred tax expenses* are significantly different in *Table 10 Panel A*, while they are nonsignificant in D6. As before, the reason for this is the matching process. The variable is nonsignificant when no matching is performed, and the entire dataset is used; thus, one can conclude that the results in *Table 10 Panel A* are generally in line with the results of Dechow et al. (2011).

The results in *Table 7 Panel A* of this work indicate that there is indeed a difference between misrepresenting firms and their peers in terms of accounting characteristics. The same conclusion can be drawn from *Table 10 Panel A*. Misrepresenting firms differs in many of their characteristics. There is a mean and median difference for *working capital accruals (wc_acc)*, *modified Jones model discretionary accruals*, *changes in inventory (change in inventory)*, *deferred tax expenses*, and the *percentage of soft assets (%soft assets)*. Moreover, a median difference in cash sales and *RSST accounts* indicates a significant difference between misrepresenting firms and their peers.

The results in *Table 7* suggest that the accounting characteristics of misrepresenting firms differ depending on the reason for the misrepresentation. The same conclusion can be drawn from the remaining panels of *Table 10*. Misrepresenting firms in Category 1 differ in five of the eight accrual quality variables in their mean and median and in one performance variable. For Category 2, the firms differ in seven of the eight accrual quality variables in terms of the mean, but only in three of the eight variables in terms of the median. The performance variables do not signal any differences between misrepresenting firms in Category 2 and their peers. In Category 3, only two of the eight accrual quality variables differ significantly in their mean and median. Among the performance variables, no variable differs when only the mean differences are examined, and two differ when the median differences are considered. In general, there is a recognizable trend in the number of significant variables from several in Category 1 to a few in Category 3. All of this supports the aforementioned statement that misrepresenting firms differ in their accounting characteristics depending on the reason for the misrepresentation. The results of the paper are therefore robust in terms of changes in the underlying variables.

¹⁰ Named after the authors where the variable was first mentioned (Richardson et al. 2005).

Conclusion

This paper has focused on three elements found to be essential for a misrepresentation – namely the reason, the tool, and the outcome. The results indicate that these elements influence each other. A certain reason (as identified by the SEC) causes the use of certain tools, and these ultimately cause a certain outcome. When produced in greater detail, the paper offers the following results: When the reasons are examined, the following three main categories were detected: misrepresentation for the direct personal gain of the manager, avoidance of negative contractual or institutional consequences, and pressure from the capital market. Excluding option-backdating cases, misrepresentations for the personal gain of managers occurred in 24% of the cases, for avoiding negative contractual or institutional penalties in 22%, due to capital market pressure in 34%, and for other reasons (including option-backdating cases) in 20%.

These reasons give rise to the use of different tools on the part of management when making misrepresentations. Firms that misrepresent for the direct personal gain of the manager (Category 1) mainly use the following tools: increasing earnings, increasing total assets, and increasing sales. Firms that misrepresent to avoid negative contractual or institutional consequences (Category 2) mainly use increasing receivables, increasing sales, increasing earnings, increasing total assets, and decreasing current liabilities. Firms that misrepresent due to capital market pressure (Category 3) mainly use increasing earnings, decreasing total assets, decreasing inventory, increasing current assets, and decreasing current liabilities.

Summarized, one can say that the focus with regard to tools across all categories is on increasing earnings. It can be seen as a reflection of the relevance of earnings for capital markets. Nevertheless, there are distinctions among the tools by category. One can see the differences probably best at the example of Category 1. Here, firms misrepresent for the direct personal gain of the manager. The focus of these firms is on misrepresenting sales and earnings. When considering the relevance of these items for firm's valuation, this result is probably less surprising (Nissim and Penman 2001).

The reasons resulted in the use of different tools to influence the final outcome, namely the published report. This includes the non-misrepresented financial figures and adjustments due to the misrepresentation. The results suggest that the firm's characteristics (outcome) differ depending on the reason for the misrepresentation. Firms that misrepresent for the direct personal gain of the manager (Category 1) are comparatively small, typically highly profitable, and have an average attitude toward riskiness. Those that misrepresent to avoid negative contractual or institutional consequences (Category 2) are also comparatively small but appear to take more risks and deliver average profitability. Firms that misrepresent due to capital market pressure (Category 3) are comparatively large, typically take as many or more risks than their peers, and deliver average or normal profitability.

Furthermore, this paper estimated the proportion of management wealth-related misrepresentation cases compared with the total population of cases. An estimation was also possible for misrepresentations to avoid negative contractual or institutional penalties as well as due to capital market pressure. In all cases, this study confirmed the existence of misrepresentations for a specific reason and estimated the proportion of misrepresentations due to the specific reason compared with the total population of cases. The validity and reliability of the results were tested using (among others) a different set of variables from prior literature. The interpretation of the results remained unaffected by the change in variables, which led to the conclusion that the results are robust to changes in the variables.

This paper contributes to positive accounting theory by increasing the understanding of the use of accounting figures in their context. The paper also contributes to the pressure dimension of the fraud triangle by providing reasons observed by the SEC for the fraudulent behavior of a misrepresentation. A major advantage is that the reasons for misrepresentation were collected from AAERs and verified, if possible, by further sources; thus, the accuracy of the reasons is high. However, the accuracy is not quite 100% since, in most cases, the allegation was settled without any wrongdoing being admitted or denied. Based on these observed reasons, a distinction was made between the misrepresenting firms. The firms were therefore characterized as differentiated by the conflict of interest between the stakeholders (reason), which caused the misrepresentation. This characterization includes the tools (accounts) through which the misrepresentation was made, as well as the outcome (financial reports). This information could assist in more effectively anticipating and dealing with misrepresentations regarding the relevant stakeholder categories (e.g., shareholders, analysts, auditors, financial supervisory bodies, and regulators), since knowledge about these types of firms can increase awareness of the problem. The information about the characteristics of firms, especially the tools, could be aligned to the opportunity dimension of the fraud triangle. Thus, both can help to explain what circumstances enhance individuals.

It is possible to envision many future fields of research when the dataset is divided by the reason for the misrepresentation. The main part of this study involved reconducting prior research with a dataset differentiated by the reason for the misrepresentation. Future research could analyze the governance characteristics of misrepresenting firms by also using the reason for the misrepresentation. This would allow the identification of more powerful governance methods and ultimately help to avoid misrepresentations. Another example would be to test the impact of the audit quality on the likelihood of a misrepresentation depending on the reason for the misrepresentation. A further field for future research might be to use the results for refining prediction models for misrepresentations. This could either be done by assuming a certain reason and predicting the likelihood of a misrepresentation or by using a model that predicts the likelihood of a misrepresentation combined with the

reason. Moreover, a final field for future research might be to test the reasons and characteristics in different settings, such as in an emerging market.

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APPENDIX A

Explanation of the t-test for mean difference, signed-rank test, and Wilcoxon rank-sum test

For the data analysis, three statistical tests are used: the two-sample t-test for the mean difference as well as the signed rank-sum and Wilcoxon rank-sum tests. The two-sample t-test determines whether the mean of two underlying populations of two samples equals each other. It therefore assumes a normal distribution.

The signed-rank test compares the distribution of two samples (Newbold et al. 2013, p. 602); therefore, one observation of the first sample is randomly matched with one observation of the second sample. The difference between the two observations is then calculated. This is continued until there is, in one sample, no unmatched observation left. The absolute values of the differences are then ranked. The algebraic sign (+ or -) is added afterwards to the rank of the pair of observations. The following table presents a short example of the described procedure. The question in the end is whether the ranking of the differences between the pairs, including their signs, is normally distributed (Z-values).

Sample 1	Sample 2	Difference	Absolute difference	Rank	Sign x rank
1	4	-3	3	2	-2
5	3	+2	2	1	+1
3	7	-4	4	3	-3

An example of a signed-rank test. The table indicates how a signed-rank test works. First, the two samples that should be compared are matched randomly. Second, the differences are calculated. Third, the absolute values of the differences are taken. Fourth, based on the absolute values of the differences, the rank is determined. Fifth, the sign of the differences is put on the rank.

The Wilcoxon rank-sum test shares similarities with the signed-rank test. It is also based on the rank of the firm in the sample and also tests for differences in the distribution of the sample. However, the signed-rank test randomly pairs one observation from the first sample with one from the second, and thus, only as many observations are examined as are in the first or second sample. In the one with more observations, as many observations as are in the other sample are randomly selected. Due to the large misfit between the sample sizes and the small number of misrepresenting firms in the categories, the rank-sum test might be more accurate since the risk of randomly selecting an outlier in the larger sample disappears.

The Wilcoxon rank-sum test sorts the observations of both samples from the smallest to the largest (Newbold et al. 2013, p. 611). Each of the observations has a number assigned to it, starting with 1 for the smallest (2 for the second-smallest, 3 for the third-smallest, and so forth). The numbers (ranks) of the observations for each sample are summed. The sum of the ranks is then adjusted by the number of observations. The claim of the test is that the ranking of the observations is normally distributed; thus, the adjusted sum of the ranks is standardized and easier to compare with the standard normal distribution (Z-values).

In all cases, the mean difference is compared to a t-test. The signed-rank test has advantages in having an equal size between the treatment category and control category, while the Wilcoxon rank-sum test has advantages for unequal sizes. The dataset for research question 1 is largely unequal, while that for research question 2 is (naturally) equal, so the differences in the distribution (hereinafter “median differences”) are measured for the first research question with the Wilcoxon rank-sum test and for the second research question with the signed-rank test.

APPENDIX B

Sample selection of the subject of accounting and auditing enforcement releases (AAERs) of firms between 1993 and 2013

Number of distinct firms	Number
Firms with at least one annual AAER case	585
Less: firms with a missing CIK code	(102)
Less: missing COMPUSTAT data	(20)
Total number of misrepresenting firms between 1993 and 2013	463
Number of firm-years	1,123

The data are limited on one side by collectability from EDGAR. EDGAR data are typically available from 1996 onwards, so restated figures for previous incorrect annual reports cannot be obtained from publications before 1996. As an SEC investigation normally takes about three years, a restatement from 1996 normally becomes part of an AAER published in 1999. Therefore, no firm is included in the dataset whose misrepresentation was published in an AAER before 1999; thus, the dataset consists of AAERs published between 1999 and 2015. Since the AAERs are published at the end of a long investigation process, the dataset covers 1993–2013. In total, 585 distinct firms are identified, of which 122 firms must be excluded due to a missing CIK code¹¹ or no data at all on COMPUSTAT; subsequently, the remaining dataset consists of 463 firms misrepresenting 1,123 firm-years or 2.43 misrepresented firm-years per misrepresenting firm. The results of the selection process are presented in the table above.

¹¹ A firm without a CIK code is also not likely to be in EDGAR; therefore, no attempts are made to obtain further identifiers.

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Does the Capital Market Recognize Financial Misrepresentations? –
Fundamental Value and Market Analysis

II

Does the Capital Market Recognize Financial Misrepresentations? – Fundamental Value and Market Analysis

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July 2024

Abstract

The efficient functioning of a (capital) market is a key element in economics (e.g., Marshall 2009, Mankiw 2014). This paper attempts to shed more light on the market efficiency hypothesis in cases where the rare event of a deliberate violation of the GAAP has taken place (misrepresentation). The aim of this paper is twofold. The first aim is to determine the extent to which misrepresented firms are overvalued due to the misrepresentation. Therefore, I compare the actual firm's value with a hypothetical firm's value based on the fundamental value of the firm without misrepresentation. The latter is calculated with conventional valuation methods. The second aim is to compare the value difference with the market reaction once the misrepresentation became public knowledge in the following way: The firm's value difference, computed in the first phase, is compared with the market reaction around the date when the misrepresentation was revealed to the public. Thus, the method is an OLS regression. The analysis is based on a dataset of misrepresenting firms detected by the US Securities and Exchange Commission (AAER cases). The results indicate a substantially higher market value due to the misrepresentation and, depending on the method, an average value of up to 29.6% and median values ranging from 1.6% to 17.6%. Moreover, the results indicate that the market reaction once the misrepresentation is revealed is independent of the value difference. The results are robust for the valuation method and market reaction horizon.

Keywords: Market Efficiency Hypothesis, Accounting and Auditing Enforcement Release (AAER), Financial Misrepresentation, Accounting Fraud

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Introduction

Prior literature has analyzed the ability of financial reports to diminish the information asymmetry in capital markets (Frankel et al. 2019). Consequently, it has identified financial misrepresentations (hereinafter “misrepresentations”) as a significant threat to the existence and efficiency of capital markets (Amiram et al. 2018). The threat can be demonstrated by the question of how potential investors should evaluate an investment in a firm if the reports on which they base their valuation are incorrect. This question becomes difficult, if not impossible, to answer.

According to the prior literature, firms that misrepresent their annual reports exhibit higher earnings and higher equity (e.g., Kloppenburg 2021, Palmrose et al. 2004). This is not so surprising since earnings (and consequently equity) are the result of a series of transactions and book entries of a firm. Thus, they cover and aggregate a variety of financial accounts. Moreover, earnings are an important figure from the perspective of the shareholder because they reflect, among other things, how much of the past year’s income is available for distribution to the shareholders. Consequently, since common valuation methods either directly (e.g., residual income valuation model) or indirectly (e.g., discounted cash flow model) rely on the financial data originating from annual reports, the firm’s computed value is (very likely) to be higher on average for a firm during the misrepresentation period than it would be without the misrepresentation. However, how much the value of the firm is influenced is unknown, and hence, it cannot be estimated whether the valuation bias due to the misrepresentation would be economically significant or whether markets can discern the misrepresentation. Thus, the first research question for this paper is whether this artificially created gain (or loss) in fundamental value is substantial. Substantial is defined in this paper in both a statistical and an economic sense.

First, the knowledge of a substantial gain (or loss) in fundamental value due to a misrepresentation is of primary interest in this research. If the difference in fundamental value is non-substantial, then it would raise doubts about whether further investigations are necessary. However, in addition to academic interest, other interested groups also exist. Regulators may be less pressured to address the issue if the fundamental value difference is non-substantial. Moreover, investors do not need to consider the difference if it is economically immaterial.

Second, this paper takes the issue further. According to prior literature, the share price drops significantly the moment the misrepresentation becomes public knowledge (e.g., Palmrose et al. 2004, Hennes et al. 2008). The question is – given the fundamental value gain (or loss) due to the misrepresentation – whether there is a linkage between the change in market value during the misrepresentation period and the drop in the share price. A major advantage of this paper is that I base my

reevaluation of misrepresenting firms on restated financial figures of the same firms and the same firm-years. This allows me to maintain a high degree of comparability between the value of the misrepresented and the non-misrepresented firms.

Theoretically, the paper is embedded in the efficient market hypothesis. Said hypothesis, in its semi-strong form, states that all publicly available information is fully included in the current share price in a timely manner. The hypothesis thus assumes that capital markets are rational (Fama 1970). This means, when applied to this paper, that the larger the gain (or loss) due to the misrepresentation of the fundamental value, the stronger the market reaction once the misrepresentation is revealed. The underlying idea is that a larger value gain (or loss) means that more value needs to be corrected. However, misrepresentations are rare events (Dechow et al. 2011, Kloppenburg 2021). Thus, the question arises of whether the efficient market hypothesis maintains its position in such uncommon and extreme cases as misrepresentations. Consequently, a further major target group for the paper is capital market actors, for whom the incidence of market efficiency could have favorable economic consequences. For example, shareholders can create a trading strategy based on the actions of their fellow shareholders.

Moreover, since this paper is concerned with the core feature of accounting, namely financial reports, it touches on multiple accounting and accounting-related theories (e.g., information asymmetry and corporate governance theory). However, the focus of this paper is on efficient market theory, and I make this the central point of the paper while acknowledging other relevant theories in this context.

The efficiency of a (capital) market is a key element in economics (e.g., Marshall 2009, Mankiw 2014). Consequently, financial reports serve to provide information to the actors in the capital market so that they can allocate funds more optimally/efficiently (Kothari et al. 2010). In general, by its nature, an incorrect (misrepresented) financial report provides rather limited informational content. Thus, in an optimal case (from the perspective of market efficiency), the misrepresented report will be ignored by market participants. In this case, the capital market would not be affected at all. Only the costs of preparing the misrepresented financial report from the firm's side and processing it on the capital market's side would occur.

In a less optimal case, the misrepresentation could significantly distort capital allocation. Market participants would rely fully on the misrepresented report and allocate funds inefficiently. Those directly affected by an inefficient capital market are the shareholders and other actors in the market. However, since the capital market is a means of financing a firm, many stakeholders in the firm are indirectly affected, such as employees, who require job security, or the government, which is interested in tax revenue. Consequently, while the results of this paper are of interest to a

variety of groups within society, they have a special relevance for capital market actors such as shareholders.

In this paper, I compute the fundamental value of a firm for a hypothetical case of no misrepresentation with the help of well-established valuation methods and the restated financial reports of the same firm for the same fiscal year. My results indicate that a substantial difference exists between the market value based on the misrepresented figure and the fundamental value of the same firm based on non-misrepresented figures. The differences are statistically significant and economically relevant. Furthermore, the results raise doubts about the efficiency of the capital market in this particular setting. There seems to be no statistically significant linkage between market overpricing due to the misrepresentation and the market reaction once the misrepresentation is revealed.

The remainder of the paper is structured as follows: First, the prior literature is reviewed and discussed. This includes the development of the research questions as well as a brief explanation of the theoretical background. Second, the method is explained, followed by the dataset. Third, the results as well as the robustness tests are presented and discussed. The final section provides a short conclusion, including an outlook for future research.

Prior Literature and Research Question Development

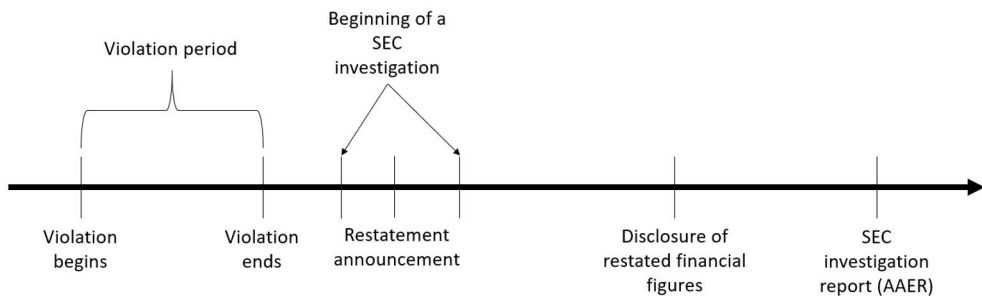
The term “financial misrepresentation” (hereinafter “misrepresentation”) has a variety of different names in prior literature. These include “misstatement” (Dechow et al. 2011), “misreporting” (Burns and Kedia 2006), and “accounting fraud” (Miller 2006, Palmrose et al. 2004). However, the definition in all cases is the same as in the current paper, and it relies on the SEC investigation reports and the SEC definition of a misrepresentation.

The current paper uses the same definition as Amiram (2018) and Kloppenburg (2021): A misrepresentation is a violation of Section 13(b) of the 1934 Securities and Exchange Act. According to this section, firms are required to make and keep books, records, and accounts that fairly and accurately reflect the transactions and dispositions of their assets. Moreover, according to the section, firms are required to devise and maintain a system of internal controls to ensure accurate reporting. The SEC’s mandate is (among others) to investigate and prosecute violations of the section. If a misrepresentation is found, the results of their investigations are disclosed to the public. Thus, a misrepresentation is revealed by the SEC after the investigation ends. My dataset is based on these investigation reports.

The typical time sequence of such a misrepresentation is illustrated in Figure 1. It initially starts with a violation period. During this period, GAAP are violated in such a way that Section 13(b) of the 1934 Securities and Exchange Act is also

violated. Thus, the financial figures are misrepresented. The violation period is followed by a restatement announcement. A firm is legally required under the US-GAAP (SFAS 154.25) to correct errors in previous financial statements by a restatement.

FIGURE 1 Typical Sequence of a Misrepresentation



The restatement in the case of a misrepresentation consists of two parts, namely the restatement announcement and the disclosure of the restated financial figures. The restatement announcement typically refers to the moment at which the firm itself discloses that the previous financial statements should not be trusted. This disclosure is normally done by filing Form 8-K with the SEC, but other options are also accepted, such as a press release (Palmrose et al. 2004). The content of a restatement announcement varies widely. It ranges from a simple statement indicating that the prior year's financial reports might not be trusted to provide a clear explanation of what went wrong, including a quantification of the restatement (Palmrose et al. 2004). Common to all restatement announcements is that the capital market is informed about (potential) problems with the financial figures. I more broadly define the restatement announcement in Figure 1 as the moment at which the first information about a (potential) restatement becomes public. This largely includes the firm's own filings and publications. Moreover, it includes newspaper articles, analyst reports, and other public sources that discuss a possible restatement. Furthermore, part of the restatement is the disclosure of the restated financial figures (SFAS 154.26). This can occur at the same time as the restatement announcement (Palmrose et al. 2004). However, it does not in this paper. The date of the restatement announcement serves as "event day" in the context of the event study design in this study.

If the misrepresentation was unknown to the management, then there are multiple ways for the management or directors to obtain knowledge of it, while if the misrepresentation was known to the management or directors, then there are events that may have persuaded the management to admit the misrepresentation publicly. An example of a misrepresentation that might be unknown to the

management could be one by a subsidiary. If the top management of the parent company did not have a sufficient internal control system, then it would be unaware of the misrepresentation. An example of a misrepresentation that is known to the management could be one that maximizes management bonuses. In this case, top management would deliberately have caused the misrepresentation with full knowledge.

There are multiple ways for top management to obtain knowledge of a misrepresentation or ways in which they can be persuaded to admit the misrepresentation. These may include the aforementioned suspicions raised in newspaper articles or analyst reports, while they could also be a whistleblower, an auditor, or a question from the SEC. Where the SEC has doubts about the disclosed financial statements, they will start their inquiry by privately asking the particular firm questions (Karpoff et al. 2008), which could result in the firm identifying their misconduct and announcing a restatement. Moreover, these questions could be the consequence of the restatement announcement since it is typically an event that triggers the SEC to look into a case (Dechow et al. 2011). Thus, the beginning of the SEC investigation can be prior to or after the restatement announcement.

In the following, two processes are seen to run parallel: the restatement and the SEC investigation. The restatement continues after the announcement by the firm preparing the corrected restated financial figures (Palmrose et al. 2004). These are then normally disclosed with one of the next quarterly or annual reports. Parallel to the firm's internal process, the SEC runs its own investigation. At the end of its investigation, the SEC can either dismiss the case or prosecute the firm. In the latter case, they prepare an accounting and auditing enforcement release (AAER). The SEC makes AAERs publicly available on their website.¹²

There is an extensive body of literature about the market reaction around the restatement announcements of misrepresenting firms (e.g., Palmrose et al. 2004, Hennes et al. 2008, Gordon et al. 2013). Thus, the restatement announcement serves as an indicator of the first point in time at which the potential misconduct was made public. A restatement can possibly be caused by an (unintentional) error (Hennes et al. 2008). However, in this paper, the intention to alter the financial statements is a central aspect. Therefore, the focus lies solely on misrepresentations, and consequently, errors are excluded. Palmrose et al. (2004) identify, on average, a drop in market value of -20% in window 0, that is, day 1 for firms restating because of a prior (intentional) misrepresentation. Hennes et al. (2008) measure the window as a $-1/+1$ decline in market value of approximately -12% . Thus, misrepresentations have a drastically negative impact on a firm's value once they become public. In a

¹² <https://www.sec.gov/divisions/enforce/friactions.htm>

window of 180 days around the announcement of the restatement for a misrepresenting firm, Hennes et al. (2008) measure a drop of up to -25% . Moreover, the authors identify a drift in the market value of approximately -13% in the period of -90 days to -8 days. They interpret the drift to signal a prior suspicion by some capital market actors.

With regard to the reasons for the negative market reaction, the prior literature has mainly identified three reasons. First, in a sample of restating firms, Palmrose and Scholz (2004) identify litigation cases against 38% of the restating firms. The likelihood of litigation increases if the restatement was caused by a misrepresentation. Second, the managers suffer a reputational penalty, which has been identified for CEOs (Desai et al. 2006, Arthaud-Day et al. 2006), CFOs (Feldman et al. 2009, Arthaud-Day et al. 2006, Collins et al. 2009), and outside directors (Arthaud-Day et al. 2006, Srinivasan 2005). The result of the reputational penalty is increased management turnover, which is a tool for firms to regain trust and market value. Third, restatements, especially due to misrepresentations, must typically correct relevant values such as earnings or equity downwards (Palmrose et al. 2004, Kloppenburg 2021). Thus, there is also a decline in the market value due to a decline in the figures used for the firm's valuation.

Theoretically, this paper is related to the efficient market hypothesis. This hypothesis states, in its semi-strong form, that all publicly available information is instantaneously included in the current share price (Fama 1970). A misrepresentation, as such, is information relevant to the capital market. The complete information about the misrepresentation only becomes known to the capital market at a later stage. However, the latest point in time at which the capital market knows about the misrepresentation is when the first clear evidence of the misrepresentation is revealed, such as through a restatement announcement. Nevertheless, prior research demonstrates that before a misrepresentation period, earnings management typically occurs (Ettredge et al. 2010). Earnings management is, as measured by Ettredge et al. (2010), observable in the capital market. Hence, warning signals of lower earnings quality occur in typical cases before the misrepresentation is revealed to the public. Jensen (2005) theoretically and Badertscher (2011) empirically have demonstrated that misrepresenting firms are overvalued by the capital market compared with their fundamental value. This overvaluation slowly builds up, first during the earnings management period and then during the misrepresentation period. Thus, it can be concluded that hints/indications of a (potential) misrepresentation can be found even before the revelation of the misrepresentation.

Although the prior literature acknowledges the fact that the fundamental information originating from annual reports is misrepresented to increase the market value of equity (or other short-term benefits for firms and/or their manager), there

has thus far been – to the best of my knowledge – only one paper written by Karpoff et al. (2008) that has touched upon the (artificial) gain in the fundamental value due to the misrepresentation before the restatement was announced. However, the authors use a general model to determine the value based on equity and an industry average multiple. Moreover, as they do not follow up on their results, their attempt does not go into depth. Consequently, the first research question (RQ) of the present study is as follows:

RQ1: What is the firm's (artificial) value gain (loss) due to a misrepresentation computed using fundamental information?

Prior research demonstrates that most restatements correct earnings downwards (Palmrose et al. 2004). Hence, the expectation for the outcome of the first research question is an increase in the fundamental value of the firm based on the suitable valuation models because of the misrepresentation. The extent of the gain, however, cannot be estimated *ex ante*. The amount is relevant since it can indicate the extent to which market participants were misled by the misrepresentation.

The efficient market hypothesis is a much-debated concept. On the one hand, researchers have frequently stressed and demonstrated that the hypothesis holds true (e.g., Fama 1970, Timmermann and Granger 2004, Borges 2010). On the other hand, they have also demonstrated that the hypothesis does not hold true in special circumstances. Multiple reviews of these anomalies have been provided in the relevant literature. An early work is by Jensen (1978), but I also refer to more recent reviews by Rossi (2015) and Naseer and bin Tariq (2015). To the best of my knowledge, no study has been published about the efficient market hypothesis connected with misrepresentations. Therefore, in the following paragraphs, I introduce some typical exemplary anomalies to provide an overview of different anomalies, although notably I do not intend to provide an exhaustive list of anomalies.

One example of such an anomaly is the post-announcement drift. Given the efficient market hypothesis, one may expect the new information made public in an annual report to be quickly included in the stock price (Ball 1978). However, as Ball and Brown (1968) discover, a few days are required for the new public information to be included in the stock price. Moreover, Foster et al. (1984) demonstrate that it might even take up to 60 trading days for the stock prices to include the new information provided by the annual report.

A further group of anomalies is calendar anomalies. Following the efficient market hypothesis, each trading day is independent of the previous trading day. Thus, the returns on each trading day should, on average, be equal. However, in reality, there are deviations. Agrawal and Tandon (1994) test previously found anomalies in

the calendar effects on a sample of financial markets in 18 countries during the 1970s and 1980s. They find support across 18 different countries that the returns are significantly weaker on a Friday than on every other trading day. Moreover, the authors confirm for nine of the 18 countries that returns are unusually large around the turn of the month. In 11 of the 18 countries, the returns are higher before and during the holiday period (e.g., Christmas). Lastly, the authors confirm that returns are larger in January and lower in December for most countries.

Within the field of anomalies, fundamental value anomalies represent a different direction. They are closer to the phenomenon studied in this paper than, for example, calendar anomalies. I introduce the value-investing anomaly as an example. However, there are multiple further anomalies in the field. Value investing means investing in firms that seem to be undervalued compared with their book value of equity (Piotroski 2000). Following the efficient market hypothesis, since the financial information (the book value) is publicly known, it should not be possible to outperform the market. However, prior literature has demonstrated that firms with a high book-to-market ratio can surprise the market with high returns (e.g., Fama and French 1992, Rosenberg et al. 1984, Lakonishok et al. 1994, Piotroski 2000). Ball et al. (2020) refine the measure and even demonstrate that the retained earnings component of the book value of equity is the driver of the returns.

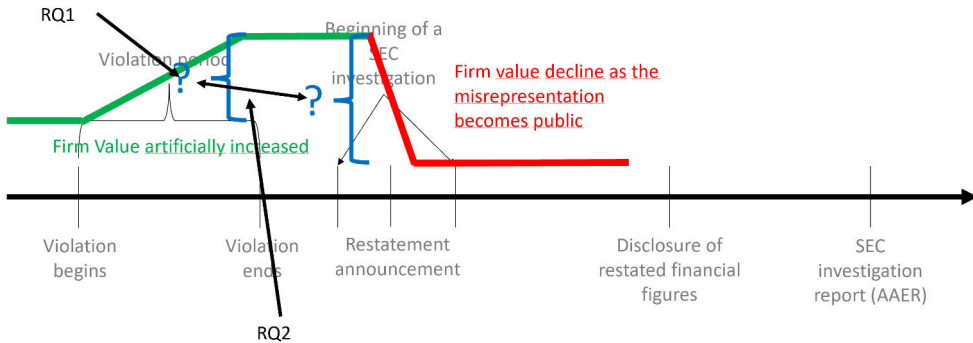
Once the misrepresentation is revealed, the market receives new information. I define “revealed” for the current paper as the first point in time when the market definitely knows about a potential misconduct by the firm. This point in time is normally the date of the restatement announcement. Following the efficient market hypothesis, markets revise the share price based on that new information. Consequently, assuming rationality among the actors, the unwarranted gain in the market value of equity based on the misrepresented fundamental information should be reversed. Logically, this reverse should be higher for firms with a larger difference in the fundamental firm value. Moreover, the question arises of whether a larger fundamental value difference hints at a more severe case of misrepresentation and, consequently, a larger market reaction once the misrepresentation is revealed. This leads to the second research question:

RQ2: Is there an association between the (artificial) value gain (loss) of a misrepresenting firm computed by using fundamental information and the market reaction once the misrepresentation is revealed to the public?

Here, “revealed” refers to the restatement announcement in Figure 1 (as explained at the beginning of the section). It is the moment at which the information about potential misconduct is first made public, such as through an 8-K filing with the SEC. The outcome of the second research question should either provide

supporting evidence for a connection between the value gain (or loss) and the market reaction or it should not. Finding supporting evidence would indicate that the efficient market theory holds true, while the opposite would raise questions about the efficient market hypothesis in the specific setting.

FIGURE 2 Typical Sequence of a Misrepresentation, Including the Research Questions



Both research questions are illustrated in Figure 2 in a simplified manner. Figure 2 follows the sequence presented in Figure 1 and illustrates the time sequence of the misrepresentation from the beginning of the violation of GAAP until the disclosure of the SEC’s investigation report (AAER). Moreover, this figure reflects the impact on the firm’s value in the case of an increase during the violation period. In such a case, the firm’s value would increase during the violation period (please note that it could also decrease) since the firm presents itself as more positive than it actually is. Then, the (potential) violation of GAAP becomes public (restatement announcement). Around this day, the stock price of the firm and consequently the firm’s value decline drastically (e.g., Palmrose et al. 2004, Hennes et al. 2008). RQ1 is about quantifying the increase in the firm’s value, while in RQ2 the increase in the firm’s value during the violation period and the decrease in its value around the restatement announcement are compared and analyzed together.

Method

The research questions are approached by comparing the actual share price with an estimated share price in cases where the firm did not misrepresent in the first place. The results are then used as a proxy for the severity of the misrepresentation. The logic is that as more of the capital market is misled by the misrepresentation, the more severe the misrepresentation will become. The severity is compared with the actual market reaction of the misrepresenting firm around the date of the revelation of the misrepresentation. Thus, the following two different methods are used in this study paper: (1) the firm's value in the misrepresented state is estimated, and (2) the difference in the share price is compared between the misrepresented case of the firm and the non-misrepresented case with the actual market reaction after the revelation of the misrepresentation.

Determining the Market Value Difference

When determining the difference in the market value of the firm, two values are important – namely the value of the firm in the misrepresented case and the value of the firm in the non-misrepresented case. The share price (and hence the market value) of the firm in the misrepresented case is known as it originates from the price on the stock exchange (in this case: CRSP). Similar to Badertscher (2011), each time the share price is the average price in June of the year following the misrepresentation, since on this date most (if not all) annual reports are published and consequently considered in the valuation; moreover, very little new further information is published before this date (June of the following year) that might have influenced the capital market. The share price of a firm in the case of one that did not misrepresent in the first place is unknown. The firm's misrepresentation and the capital market's reaction cannot be undone. Hence, collecting the share price (and consequently the firm's value) of a misrepresenting firm in a case where there was no misrepresentation is impossible. However, as I discuss in the following paragraphs, it is possible to estimate the firm's value with similar, well-known methods, such as those used by rational, representative shareholders.

Standard textbooks as well as prior literature provide a variety of different methods for making valuations of firms, such as discounted free cash flow and other cash flow valuation methods, residual income valuation, economic value added, and multiples (e.g., Imam et al. 2008, Lee 2013, Penman 2013, Palepu et al. 2019). When choosing the appropriate valuation method, I consider that misrepresentations are concerned with altering financial figures disclosed in annual reports. In essence, there is an incorrect financial report on which the capital market has based its valuation, and there is a later corrected (restated) financial report for the same period

as the misrepresented one. Both reports are observable ex post. Thus, I take advantage of the corrected financial figures for the firm's valuation. Consequently, the aim of the valuation method is to be customary and standard but also to utilize the financial figures from the financial reports.

The residual income valuation (RIV) following Ohlson (1995) is based on the book value of equity and earnings. It is therefore selected as it fulfills the criterion of being based on the annual report data. Other common valuation methods, especially those related to cash flow, lead to the same firm value since they all rely on the same reality and the same assumptions (Fernandez 2007). Thus, other common methods, such as the discounted cash flow method, are disregarded. Methods that are not based on the same assumptions and thus do not lead to the same results are multiples (Fernandez 2007). Valuation with multiples simplifies the way in which a measure for the performance of value is chosen (e.g., earnings, sales, cash flow, book value of equity, and book value of assets) and the measure is multiplied with a certain value (the multiple; Palepu et al. 2019). The multiple itself can come from various sources and is at the discretion of the user. Typically, multiples are used to gauge, for example, the difference between the measure for performance and the market value of the firm and of other firm(s) in the same industry (Palepu et al. 2019). The result of the measurement of the performance times the multiple is the estimated firm's value. Valuation through multiples is among the most often used valuation methods for capital markets (e.g., Imam et al. 2008, Demirakos et al. 2004, Gleason et al. 2013). Probably its greatest strength is that it is quick and easy to use. Therefore, as a further valuation method and to validate the results, I also use valuation through multiples.

The residual income valuation model in its general format is based on the following equation (Frankel and Lee 1998):

$$(1) V_t = B_t + \sum_{i=1}^{\infty} \frac{(ROE_{t+i} - r_e) * B_{t+i-1}}{(1 + r_e)^i}$$

where

V_t = market value of equity of the firm in period t

B_t = book value of equity in period t adjusted by the dividend paid out

r_e = cost of equity capital

ROE_t = return on equity in period t

The future ROE (and hence the term behind the sigma) cannot be estimated until infinity, as the equation suggests. Therefore, simplification is required. Following Frankel and Lee (1998) and similar to Badertscher (2011) and Dong et al. (2006), the equation used in this paper is as follows:

$$(2) V_t = B_t + \frac{(ROE_{t+1}-r_e)}{(1+r_e)} * B_t + \frac{(ROE_{t+2}-r_e)}{(1+r_e)^2} * B_{t+1} + \frac{(ROE_{t+3}-r_e)}{(1+r_e)^2 * r_e} * B_{t+2}$$

where

V_t = market value of equity of the firm in period t

B_t = book value of equity in period t adjusted by the dividend paid out

r_e = cost of equity capital

ROE_t = return on equity in period t

Like Badertscher (2011) and Dong et al. (2006), I limit the forecast period to three years, since Lee et al. (1999) demonstrate that the quality of the valuation is not sensitive to a longer forecast horizon than three periods. Similar to Badertscher (2011) and Dong et al. (2006), I assume constant future $ROEs$ after the third period. Of all the parameters, only the book value of equity in t (B_t) is known since misrepresenting firms must disclose this figure to the public in their restatement; the remaining parameters are unknown. These include the equity of future periods, the r_e , and the ROE (for all future periods). For these parameters, suitable values need to be found.

Prior literature about earnings forecasts has demonstrated that a good indicator for the next year's earnings is the past year's earnings (Collins 1976, Kinney 1971). Consequently, many studies have used past-year earnings to predict future earnings (e.g., Banker and Chen 2006, Yosra and Fawzia 2015, Dichev and Tang 2009). Collins (1976) tests the accuracy of a variety of methods, all of which are based on past earnings. I select the mean-reversion method of Collins (1976) for several reasons. First, the model has reasonably good accuracy in its ability to predict future earnings. Second, the model is consistently independent of the misrepresented or restated financial figures. It rather relies on a combination of earnings prior to the misrepresentation period and either the misrepresented or restated earnings figures. Third, the model is independent of non-balance sheet items like GDP-growth rate predictions. Fourth, I only predict future ROE for three periods and assume a constant ROE afterwards. Thus, it is a reasonably short period of time. The future ROE is estimated with the following formula:

$$(3) ROE_t = \frac{ROE_{t-1} + ROE_{t-2} + ROE_{t-3}}{3}$$

The future book value of equity (e.g., in period t+1) is the book value of equity in the previous period adjusted by the earnings of the previous period and by the remunerated dividend. The earnings of the previous period can be derived from the

ROE. Thus, only the future dividends need to be estimated. For this, I select a similar method to the one used for the *ROE*. The assumption is that the dividends paid are equal to the average of the dividends from the last three periods. Mathematically, it is based on the following equation:

$$(4) \text{div}_t = \frac{\text{div}_{t-1} + \text{div}_{t-2} + \text{div}_{t-3}}{3}$$

where

div_t = dividend paid in period t

Hence, the parameters that are known or possible to estimate are the book value of equity for all periods (B_t) and the *ROE* for all periods. The one missing when the formula is applied is the cost of equity (r_e). I therefore take advantage of the knowledge of the misrepresented market value of the firm. In the misrepresented case, the market value of equity is known since the capital market valued the firm and gave its shares a price. The book value of equity and the *ROE* are estimated as described before. Thus, in this case, only the costs of equity (r_e) are unknown. Since it is an equation with one unknown, it is solvable; consequently, the costs of equity can be calculated. The corresponding equation is as following:

$$(5) V_t^{\text{misrepresent}} = B_t^{\text{misrepresent}} + \frac{(ROE_{t+1}^{\text{misrepresent}} - r_e)}{(1+r_e)} * \\ B_t^{\text{misrepresent}} + \frac{(ROE_{t+2}^{\text{misrepresent}} - r_e)}{(1+r_e)^2} * B_{t+1}^{\text{misrepresent}} + \\ \frac{(ROE_{t+3}^{\text{misrepresent}} - r_e)}{(1+r_e)^2 * r_e} * B_{t+2}^{\text{misrepresent}}$$

where

$V_t^{\text{misrepresent}}$	= market value of equity of the firm in period t in the misrepresented case
$B_t^{\text{misrepresent}}$	= book value of equity in period t adjusted by the dividend paid out in the misrepresented case
r_e	= cost of equity capital
$ROE_t^{\text{misrepresent}}$	= return on equity in period t in the misrepresented case

Everything except the r_e is known. Hence, the equation can be solved and the r_e in the misrepresented case can be determined. The value is then inserted in the same formula with the non-misrepresented values and the market value of equity in the

non-misrepresented case is estimated. The crucial assumption here is that the costs of equity (r_e) would have been the same without the misrepresentation. One can challenge the assumption and argue that the riskiness in the non-misrepresenting case is higher since the firm's characteristics (e.g., profitability, liquidity, and leverage ratio) are typically more favorable during the misrepresentation period (Kloppenbunrg 2021). Consequently, an investor could consider the likelihood of a profitable future as higher and the riskiness of the investment as lower. However, a greater r_e would result in a smaller firm value. Thus, choosing the smaller r_e would work against finding differences.¹³ The market value of equity in the restated case (if there was no misrepresentation in the first place) is then derived with the following equation:

$$(6) V_t^{restated} = B_t^{restated} + \frac{(ROE_{t+1}^{restated} - r_e)}{(1+r_e)} * B_t^{restated} + \frac{(ROE_{t+2}^{restated} - r_e)}{(1+r_e)^2} * B_{t+1}^{restated} + \frac{(ROE_{t+3}^{restated} - r_e)}{(1+r_e)^2 * r_e} * B_{t+2}^{restated}$$

where

$V_t^{restated}$ = market value of equity of the firm in period t in the non-misrepresented case based on restated data

$B_t^{restated}$ = book value of equity in period t adjusted by the dividend paid out in the non-misrepresented case based on restated data

r_e = cost of equity capital

$ROE_t^{restated}$ = return on equity in period t in the non-misrepresented case based on restated data

Hence, with the help of these formulas, I calculate the market value of equity for the hypothetical case where there has been no misrepresentation in the first place. It is important to note that the market value in the restated case $V_t^{restated}$ can mathematically fall below 0. However, I intend to shed some light on the market efficiency. Therefore, I adopt the market perspective. A negative firm value is for a shareholder equivalent to a value of precisely 0. Therefore, negative values for $V_t^{restated}$ are set to 0. Since the market value of equity for the misrepresented case is known (share price times shares outstanding), I am able to calculate, based on these values, the gain in market value due to the misrepresentation. To be precise, I use the following formula to calculate the difference in market value:

¹³ Changing the r_e by, for example, +1% does not lead to qualitatively different results.

$$(7) \text{ value_difference} = \frac{V_t^{\text{misrepresent}} - V_t^{\text{restated}}}{V_t^{\text{misrepresent}}}$$

where

$V_t^{\text{misrepresent}}$ = market value of equity in the misrepresented in period t
 V_t^{restated} = market value of equity in the non-misrepresented (restated) in period t

value_difference = percentage gain of a firm through the misrepresentation

The values for V_t^{restated} are defined in the previous paragraph as strictly positive. Thus, they cannot fall below 0 but they can become 0. Therefore, to avoid a division by 0, V_t^{restated} is not chosen as reference point for the value difference and thus is not in the denominator. Instead, $V_t^{\text{misrepresent}}$ is chosen as the denominator.

The *value_difference* can be challenged since it is only as good as the valuation of the firm in the restated case. Therefore, to validate the results of the *value_difference* variable, I also estimate its value based on the different valuation method of multiples. The choice of multiples is mainly based on the following three reasons: First, prior literature has identified multiples as one of the most commonly used valuation methods by the capital market (e.g., Imam et al. 2008, Demirakos et al. 2004, Gleason et al. 2013). Second, with the given information, multiples are applicable to a wide range of misrepresenting firms. For example, no forecasts are required for the future. Third, many common valuation methods result in the same firm's value since they rely on the same assumptions and realities (Fernandez 2007). Multiples are an exception. Among them, I use the price-earnings multiple (earnings multiple) and the price-to-book value multiple (equity multiple) since they are both commonly used and cover a different part of the financial figures (Imam et al. 2008, Demirakos et al. 2004). Furthermore, to overcome problems with loss-making firms, I also include revenue multiples. The firm's values are calculated by using multiples according to the following formulas:

$$(8) V_t^{\text{misrepresent}} = \text{figure}_t^{\text{misrepresent}} * \text{multiple}$$

$$(9) V_t^{\text{restated}} = \text{figure}_t^{\text{restated}} * \text{multiple}$$

where

$V_t^{\text{misrepresent}}$ = market value of equity in the misrepresented case in period t
 V_t^{restated} = market value of equity in the non-misrepresented (restated) case in period t

$\text{figure}_t^{\text{misrepresent}}$ = the underlying financial figure (earning, book value of equity, or revenue) in the misrepresented case in period t

$figure_t^{restated}$ = the underlying financial figure (earning, book value of equity, or revenue) in the non-misrepresented (restated) case in period t
multiple = the factor by which the financial figures is multiplied (earnings multiple, equity multiple, or revenue multiple)

The aim is to determine the firm's value in the restated case, $V_t^{restated}$. Therefore, following Equation 9, the underlying financial figure (earnings or book value of equity) and the multiplying factor are needed. The underlying financial figure is known from the restated annual reports. The multiplying factor is unknown and cannot be observed since the firm misrepresented in the first place. I therefore approximate the factor similarly to the r_e in the RIV model. In Equation 8, the market value of equity ($V_t^{misrepresent}$) is known, as is the underlying financial figure. Only the multiplying factor *multiple* is unknown. Hence, the equation can be solved and the factor can be determined. This factor is then inserted into Equation 9. Since the financial figures in the non-misrepresented case are known (from the restatement), $V_t^{restated}$ can be calculated. $V_t^{restated}$ is then inserted into Equation 7 to calculate an alternative value difference.

Determining the Market Reaction

Following the second research question, the aim is to compare the *value_difference* with the market reaction once the misrepresentation is revealed publicly. The *value_difference* here serves as a proxy for the severity of the misrepresentation. To capture the market reaction, I calculate the cumulative abnormal returns (*CAR*)¹⁴ around the days of the restatement announcement (see Figure 1 for a detailed explanation of the restatement announcement). As Hennes et al. (2008) highlight, it is rather difficult to determine exactly when the capital market will start to anticipate that there are issues with prior annual reports, and hence, it is difficult to determine the exact date of the event window. Hennes et al. (2008) solve the problem by using multiple event windows. Following these authors, I also use several windows around the event day (day 0), the longest of which is -90 days to +90 days and the shortest is -1 day to +1 day. Moreover, I use a symmetrical event window (e.g., -90/+90) since Hennes et al. (2008) are able to demonstrate that there is already a substantial shift in returns before the event date (see Appendix B for more information). A symmetrical event window is also more effective at capturing this shift than an event window that starts on the event date.

Identifying the exact event day is crucial for an event study (Boehmer et al. 1991, Brown and Warner 1980 and 1985, Kothari and Warner 2007). The aim of

¹⁴ For a detailed explanation of the method, I refer readers to MacKinlay (1997).

determining the market reaction in this paper is to compare it with the value difference due to the misrepresentation. The question is as follows: At what date was the information available for the market to react and it consequently reacted? Prior literature has typically used the restatement date (e.g., Palmrose et al. 2004, Hennes et al. 2008). I deviate slightly from this by choosing the date when the first doubts were raised publicly, such as in a newspaper article. In choosing this date, I am able to capture, for example, lawsuits targeting the firm for an alleged misrepresentation.

The impact of the deviation in regard to timing is minor since in the entire sample, the restatement announcement is a maximum of one day¹⁵ behind the doubts previously raised publicly. This difference is covered by the event window. One benefit of this approach is that I could fairly accurately determine the date when the public first had access to a potential misrepresentation. The drawback of the date is that the extent of the misrepresentation remains unclear. The extent is disclosed by the firm typically months if not years later and is often attached to a quarterly or annual report. A more detailed overview of the data follows in the Data section.

It would therefore be interesting to observe the market reaction at the point in time when the misrepresentation, including its extent, becomes public knowledge. In reality, this is not a point in time; it is rather a time span. It starts with the revelation, typically by the firm itself, that something has gone wrong with past financial reports. The whole extent of the problems in financial terms becomes known to the public once the firm restates (Palmrose et al. 2004). However, the restatement can be months, if not years, after the revelation. Moreover, the restatement is typically included in a quarterly or annual report; consequently, it is not an isolated event. It is rather one event accompanied by multiple pieces of further information. Hence, choosing the whole restatement period from the announcement until the disclosure of the corrected financial figures would result in a long event window and consequently be very difficult to measure reliably. Moreover, the effects of the disclosure of the restated financial figures are difficult to measure since they are typically disclosed jointly with other non-restated financial figures. Therefore, I solely focus on the restatement announcement as the event day.

Following the suggestion of Ahern (2009), I calculate normal returns based on the Carhart four-factor model¹⁶ (Carhart 1997) as follows:

$$(10) \text{ret}_{i,t} = \alpha_i + \beta_i R_{M,t} + s_i \text{SMB}_t + h_i \text{HML}_t + u_i \text{UMD}_t + \epsilon_i$$

¹⁵ I explicitly check for lawsuits mentioned in newspaper articles as well as indications of a SEC investigation published before the restatement date.

¹⁶ Inferences are the same if I use, for example, the market model (see Corrado 2010 for details) or the Fama–French five-factor model (Fama and French 2015).

where

$ret_{i,t}$ = observed returns of firm i on trading day t

$R_{M,t}$ = return on CRSP equal-weighted index on trading day t

SMB_t = (Small Minus Big) = a mimicking portfolio to capture risk related size on trading day t

HML_t = (High Minus Low) = a mimicking portfolio to capture risk associated with book-to-market characteristics on trading day t

UMD_t = (Up Minus Down) = a mimicking portfolio for trading day t designed to address risk associated with prior returns by subtracting a portfolio of low prior return firms from a portfolio of high prior return firms where prior returns are measured over the past $t-12$ to $t-2$

The regression presented in Equation 10 is used during an estimation period with known returns prior the relevant event window to determine the coefficients for $\alpha_i, \beta_i, s_i, h_i, u_i,$ and ϵ_i . Similar to Carhart (1997), $SMB, HML,$ and UMD are returns on value-weighted, zero-investment, factor-mimicking portfolios for size, book-to-market equity, and one-year momentum in stock returns.¹⁷ The model, including its coefficients originating from the prior regression, is then used to calculate normal (expected) returns during the event window. The abnormal returns are the difference between the observed returns and the calculated normal returns. The abnormal returns summed over the event window result in the cumulative abnormal returns (CAR). Kothari and Warner (2007) provide a more in-depth explanation of an event-study design. Mathematically written, the following equations (11) and (12) determine the CAR :

$$(11) AR_{i,t} = ret_{i,t} - E(ret_{i,t})$$

$$(12) CAR_{(t1,t2)} = \sum_{t1}^{t2} \frac{1}{N} \sum_{i=1}^N AR_{i,t}$$

where

$AR_{i,t}$ = abnormal returns of firm i on trading day t

$ret_{i,t}$ = observed returns of firm i on trading day t

$E(ret_{i,t})$ = expected returns for firm i based on a multifactor model on trading day t

$CAR_{(t1,t2)}$ = cumulative abnormal returns around the day event day; $t1$ and $t2$ are the beginning and the end day for the event window (e.g., $t1 = -90$)

¹⁷ The data for $SMB, HML,$ and UMD are generously provided on Kenneth French's website.

days, $t2 = +90$ days).

N = number of firm-years in the sample

Relationship Between the Market Value Difference and the Market Reaction

The market value difference is used in this paper as a proxy for the severity of a misrepresentation. This difference is then compared with the market reaction around the time the misrepresentation was revealed. The underlying question is whether a more severe misrepresentation causes a greater market reaction. The analysis is performed with the following OLS regression:

$$(13) CAR_{(t1,t2)} = \alpha + \beta_1 value_difference_i + \epsilon$$

where

$CAR_{(t1,t2)}$ = cumulative abnormal returns around the day where news about incorrect prior financial figures was disclosed; $t1$ and $t2$ define the lower and upper end of the event window (e.g., $t1 = -90$ days, $t2 = +90$ days)

$value_difference_i$ = percentage gain of a firm through the misrepresentation; i represents the method (RIV method and multiples) with which the percentage gain (and consequently the value difference) is calculated

According to the semi-strong form of the market efficiency hypothesis, all publicly available information is instantaneously included in the current share price (Fama 1970). The CAR is capturing the movement in the market price around the date when the information of a (potential) misrepresentation become publicly available. The $value_difference$ captures the gain in market value of a firm as a consequence of the misrepresentation. Logically, this gain needs to be reversed once the misrepresentation becomes public knowledge. Moreover, one could argue that a larger gain in the market value can be seen as a signal for the severity of the misrepresentation. Therefore, the expectation is that shareholders would react more strongly to an increasing severity of misrepresentation. Hence, the expected result for the β_1 -coefficient would be negative and significant. To ensure that the moment when the misrepresentation becomes public knowledge is captured, I am using various event windows including one consisting of 181 trading days around the restatement announcement date.

Data

In the U.S. government, there is an agency named the SEC, whose tasks include investigating and detecting potential misrepresentations. The process by which the SEC determines misrepresentations has been described by Cunningham and Leidner (2022) and Stice-Lawrence (2021). According to them, such an investigation typically starts by reviewing the periodic filings of firms, such as annual reports. Moreover, the SEC uses further public sources (e.g., earnings calls) and non-public sources (e.g., whistle-blower information). If the SEC has concerns after the initial investigation, it will contact the particular firm and asks for clarification. If the answers from the firm do not satisfy the SEC, a full investigation will be launched. In cases where violations are found, the SEC makes them public in their AAERs. Moreover, a team of SEC prosecutors takes the case further.

The SEC does not check every disclosure of the firm due to a lack of resources. However, they check approximately 30% of the annual reports filed with them (Dechow et al. 2011). The choice of which firm to investigate lies solely in the hands of the SEC. Nevertheless, it is known that the SEC starts investigations following certain indicators, such as a voluntary restatement (Dechow et al. 2011). Thus, the firms are not chosen randomly by the SEC but according to certain criteria.

A violation of Section 13(b) of the 1934 Securities and Exchange Act would be the outcome of an investigation that the SEC would report in an AAER. Since this is also the definition of a misrepresentation in this paper, I collect data similar to that of Dechow et al. (2011) from AAER reports. It is also the same dataset as in Kloppenburg (2021).

Moreover, I take advantage of firms that restate their annual reports after a misrepresentation. From these, I collect restatement equity and earnings figures for cases where the firm did not initially restate. This creates a problem because such a restatement is typically only disclosed as part of a quarterly (10-Q) or annual report (10-K). Hence, the firm must be listed when the restatement needs to be published. This excludes several firms from the dataset who were delisted, for example, as part of bankruptcy procedures. The restated data is hand-collected from EDGAR; non-restated (as disclosed) data originates from COMPUSTAT; and capital market information is collected from the CRSP. Since filings to the SEC are available on EDGAR for most firms from 1996 onwards, the dataset is limited to firms that restated after 1996. It should be noted that these firms could have been misrepresented before 1996, but if they published their restated financial figures during or after 1996, they are included in the dataset.

In total, 463 firms were identified from the AAERs. An overview of the selection process can be found in *Appendix A* (which originates from Kloppenburg [2021] Appendix B). Collecting the restated financial figures in particular as well as

calculating the firms' values are time-consuming tasks. Therefore, I restrict the dataset to 100 randomly selected firms; therefore, I use the same dataset as Kloppenburg (2021), who uses the following identification strategy for the 100 randomly selected firms:

- 1) Each of the 463 firms is assigned a random number;
- 2) The firms are sorted according to a randomly assigned number, from smallest to largest;
- 3) Starting with the first firm, the data from COMPUSTAT is confirmed, if available, by the filings to the SEC disclosed on EDGAR; in cases where there is no overlap between the COMPUSTAT and the filings, the firm is excluded;
- 4) Starting with the first remaining firm, the relevant restated data is collected from the filings to the SEC from EDGAR; in cases where no restated data is available, the firm is excluded from the sample;
- 5) The collected restated numbers are checked for plausibility by comparing the numbers with newspaper articles and AAERs; firms whose restated figures do not coincide with the findings published by the SEC or the media are excluded from the sample (Kloppenburger 2021, pp. 18–19).

TABLE 1 Overview of the Data

Panel A: Frequency of Misrepresenting Firm-years by Fiscal Year of the Sample of 100 randomly selected firms

Fiscal Year	Number of Misrepresenting Firms in the Year	Percentage	Fiscal Year	Number of Misrepresenting Firms in the Year	Percentage
1993	1	0.41	2002	28	11.42
1994	5	2.04	2003	32	13.06
1995	6	2.45	2004	24	9.80
1996	14	5.71	2005	18	7.35
1997	10	4.08	2006	10	4.08
1998	11	4.49	2007	10	4.08
1999	16	6.53	2008	6	2.45
2000	24	9.80	2009	2	0.82
2001	28	11.42	Total	245	100

Overview of misrepresented firm-years by fiscal year for 100 randomly selected misrepresenting firms in the dataset. The table follows Kloppenburg (2021) Table 2.

Panel B: Overview of the Reduction in Sample Size

Development of the sample within each model	Number of firms	Number of firm-years
RIV model		
Number of firms randomly selected	100	
Number of firms excluded because of missing equity and earnings data	48	
Number of firms excluded because of an r_e below 0	5	
Number of firms included for the RIV method	47	89
Earnings multiple		
Number of firms randomly selected	100	
Number of firms excluded because of insufficient earnings data	37	
Number of firms included for the earnings multiple	63	142
Equity multiple		
Number of firms randomly selected	100	
Number of firms excluded because of missing equity data	42	
Number of firms included for the equity multiple	58	129
Revenue multiple		
Number of firms randomly selected	100	
Number of firms excluded because of missing revenue data	41	
Number of firms included for the revenue multiple	59	132

Finally, the 100 firms with the lowest numbers and sufficient plausible data are selected. The 100 firms misrepresented 245 firm-years between 1993 and 2009. An

overview of the firms can be found in *Table 1 Panel A*. The distribution is similar to the distribution of the total sample to the extent that is possible.

The majority of the misrepresented firm-years are between 2000 and 2005. The data is collected from the AAERs, which are the result of SEC investigations. Such investigations normally take approximately 2–3 years. An investigation typically starts once the misrepresentation period is over. Such a period can take up to 7 years. Hence, a misrepresentation can take over 10 years before it enters the dataset. The last AAER on which the dataset is based is from 2015. Consequently, there is a decline from 2006 onwards.

Table 1 Panel B indicates that not all of the 100 randomly selected firms and the 245 firm-years can be used in the analysis. A total of 48 firms are excluded because of missing equity or earnings data. Moreover, I calculate the following equation (5). For five firms, this is negative for all the firm-years. I consider a negative discount rate to be unreasonable and consequently exclude the firms. Thus, the total sample for the RIV model consists of 47 distinct misrepresenting firms, representing 89 firm-years.

For the earnings multiple, 37 firms with missing earnings figures on EDGAR are excluded. Thus, there are 63 firms (142 firm-years) left from which the firm's value can be calculated. Restated equity values are missing in 42 cases. This leads to a sample of 58 firms (129 firm-years) being used to calculate the firm's value with the equity multiple. Restated revenue values are missing in 41 cases. Thus, the sample used to calculate the revenue multiple consists of 59 firms (132 firm-years).

An important event date in this study is the date when the misrepresentation was first revealed to the public. I collect these dates from the restatement announcements of the firm itself, the firm's press releases, from newspaper articles, or analyst reports. I primarily rely on the database of FACTIVA.¹⁸ The FACTIVA search is based on the following steps:

- 1) In the dataset, I check which firm year(s) a firm misrepresents. Any uncovering of the misrepresentation should take place afterward.
- 2) I type the company name in FACTIVA as a search term combined with the terms "accounting", "fraud", "misstatement", "misrepresentation", and "cooking the books".
- 3) I go through the list of search results until I find the first hint towards a misrepresentation (= restatement date).
- 4) I check whether the search result refers to another source (e.g., an analyst report) to identify the event date from the other source instead.

¹⁸ FACTIVA is a database that contains products of thousands of media sources, such as newspaper articles. Among other items, they cover all of the major newspapers in the USA. (<https://professional.dowjones.com/factiva/>)

5) I check whether the selected search result is from a printed or online source and determine the event-date accordingly, since a printed source is published a day later than the online source.

In case of doubt, I cross-check the event date originating from the search results with the 8K filings on EDGAR. The event data typically do not differ from the restatement announcement date in the 8K filings by more than 1 day.

As Hennes et al. (2008) highlight, there is already a negative market reaction before the restatement announcement date. A similar pattern can be found in the dataset for this paper (see Appendix B). Hennes et al. (2008) explain the negative market reaction to leakages before the official announcement date. These leakages do not materialise in any source that I use to determine the event data. Thus, I cannot localise the date. However, for the analysis, I choose different event windows around the event date. The widest event window covers the whole period of negative market reactions before the event date. Hence, potential prior leakages are covered by the research design and are consequently unproblematic.

Results

This section is structured in line with the Method section. It starts with the valuation of the firm in cases where there was no initial misrepresentation. Thereafter, the *CAR* is determined. In the final section, the *CAR* and the difference in market value between the misrepresented and non-misrepresented cases are presented and discussed.

Market Value Difference

The first main aim of the research is to identify how much unwarranted market value of equity was created by a misrepresenting firm because of the misrepresentation. In other words, my aim is to measure the difference between the observed market value of the misrepresenting firm and a hypothetical market value at the same point in time if the firm had not originally misrepresented. In principle, the aim is achieved by comparing the market value of the firm as it is observed with an estimated market value for the case of no-misrepresentation. I therefore take advantage of the firm's own restated financial figures and calculations based on its fundamental value. This fundamental value for the non-misrepresented case is estimated with the RIV model and as a validity check with multiples. A detailed explanation of the calculation steps can be found in the Method section.

Table 2 provides an overview of the most relevant descriptive statistics for the valuation of the firms. The table contains the earnings (*earnings*), book value of equity (B_t), revenue (*revenue*), return on equity (*ROE*), and market value of equity (V_t) both in the misrepresented case and in the non-misrepresented case to the extent that is observable. Hence, the market value of the equity in the non-misrepresented case is not presented. A more in-depth analysis of the accounting characteristics of misrepresenting firms can be found in Kloppenburg (2021).

The descriptive values disclosed in *Table 2* indicate, first and foremost, that misrepresenting firms typically misrepresent to increase their *earnings*, *book value of equity*, *revenue*, and *ROE*. As the t-test for the mean difference and the sign-rank test for the difference in the distribution indicate, the increase in the figures is significant with the exception of the mean difference in the *revenue* and *ROE*. Moreover, the sample of misrepresenting firms covers a variety of different-sized firms. Whether seen from the perspective of the *book value of equity* or the *market value of equity*, the mean is at least twice that of the median. Since the mean is more prone to outliers, this gap between the mean and median reflects the presence of a few large firms in the dataset. Because the values are not scaled, this state of affairs is quite normal.

TABLE 2 Descriptive Statistics

Variable	N	Misrepresented			Non-misrepresented			t-test		Sign-rank test	
		mean	median	st. dev.	mean	median	st. dev.	t-value	p-value (two-sided)	z-value	p-value (two-sided)
earnings	89	115.678	28.017	530.525	99.639	20.223	510.061	2.272**	0.026	5.999***	0.000
book value of equity (B _t)	89	827.245	315.844	1895.559	735.068	281.053	1720.564	2.400**	0.019	6.645***	0.000
revenue	89	1956.243	605.817	5074.128	1883.345	558.164	5006.544	1.561	0.122	4.064***	0.000
ROE	89	0.074	0.098	0.275	0.060	0.074	0.264	1.467	0.146	4.370***	0.000
market value of equity (V _t)	89	3408.008	737.775	11948.940							

*** p < 0.01, ** p < 0.05, * p < 0.1

The valuation of the firms relies on identifying the cost of equity (r_e) or on the multiplying factor(s). Hence, one part of my calculations aims to identify these values using valuation models commonly employed in capital markets (e.g., Imam et al. 2008, Demirakos et al. 2004, Gleason et al. 2013). The results are displayed in *Table 3*. The difference in the sample size is due to the limitations of the available data. In addition, costs of equity below 0 are considered unreasonable and consequently disregarded. Moreover, it should be noted that earnings can be negative (firms making losses). The market value of equity can, by definition, not fall below 0. Thus, a negative multiple is required for negative earnings to result in a positive market value. The same logic applies to the book value of equity, although these cases are much more rare.

TABLE 3 Underlying Valuation Variable: Costs of Capital and Multiples

Variable	N	Mean	std. dev.	0.25-percentile	median	0.75-percentile
r_e	89	0.035	0.034	0.013	0.026	0.044
Earnings multiple	142	26.333	120.254	-1.407	19.398	33.283
Equity multiple	129	3.430	4.231	1.424	2.407	4.160
Revenue multiple	132	2.528	4.280	0.638	1.185	2.693

A median for the cost of equity (r_e) of 2.6% suggests that investors only expect a return of 2.6% on their invested capital. In addition, the 75th percentile is only 4.4% moderately higher. However, the 10-year US treasury bond yields in the years of my analysis decreased to 2.42%¹⁹ in December 2008. In November 2008, the 2-year US treasury bond yields decreased to 0.8%. Hence, the costs of equity of 2.6% and below are feasible.²⁰

The results of the valuation are presented in *Table 4*. It should be noted that firm values below zero are set to zero since this is the minimum value of a firm from an investor's perspective. In *Panel A*, the firm's value is estimated with the RIV model. In the first column of this panel, the firm's values in the misrepresented firm-years are shown as they occurred in the capital market; in the second column, the estimated firm's value of the non-misrepresented case is disclosed; and the third column contains the nominal difference between the misrepresented and non-misrepresented firm's value. The remaining columns present the results of the t-test for the mean

¹⁹ Data originating from FRED, the economic research database of the Federal Reserve Bank of St. Louis.

²⁰ Excluding firm-years with, for example, a cost of equity below 1% does not meaningfully influence the results. The same is true when adding e.g. 0.01, 0.02, 0.03, 0.04, or 0.05 to the r_e .

difference and the sign-rank test for differences in distribution (see for the sign-rank test Newbold et al. 2013, pp. 602ff.). They suggest that firms typically gain in the market value of their equity due to the misrepresentation. This gain is reflected in the difference between the mean values above \$400 million and the median value above \$300 million. Both value differences already show in the nominal range, without calculating the difference in percentage, the high degree of impact of the misrepresentation on the firm's value.

The results of the firm's valuation using earnings multiples are presented in *Table 4 Panel B*. Earnings can change the algebraic sign due to the misrepresentation. Hence, a firm making a profit (loss) in the misrepresented case might make a loss (profit) in the non-misrepresented case. Such firms would then be multiplied by a positive (negative) multiple. The firm's value would consequently become negative. To check whether the results are affected by this phenomenon, I make two modifications: First, I exclude all firm-years where a profit became a loss or a loss became a profit due to the misrepresentation. Second, I change the algebraic sign of the multiple. A negative multiple, which was used for a loss in the misrepresented case, became positive for a profit in the non-misrepresented case, and vice versa. The results of both modifications do not differ qualitatively from the results without modification. The algebraic signs, especially in *Table 4 Panel B*, as well as the significances, remain the same. Thus, with these data, the firm's values are robust in regard to the phenomenon of changes in the algebraic sign of earnings between the misrepresented and non-misrepresented cases.

When analyzing the results of *Table 4 Panel B*, the question of significance must first be addressed. As seen from the mean difference, there is no significance. Hence, when observing only the means, the firm's value of misrepresenting firms does not differ from the firm's value of the non-misrepresented cases. However, seen from the difference in the distribution (the sign-rank test), a clear difference is notable. Firms have higher valuations in the misrepresented cases compared with the non-misrepresented ones. When looking at the firm's values themselves, the value in the misrepresented cases seems to be consistently above the value given in the non-misrepresented cases. This observation seems to be consistent for the mean, 25th percentile, median, and 75th percentile of the difference in the firm's value.

The results of the firm valuation using equity multiples are presented in *Table 4 Panel C*. Similar to the results of the earnings multiples, the results for the equity multiples reveal a consistently higher firm value in the misrepresented case compared with the non-misrepresented one. However, unlike in the case of earnings multiples, the difference is statistically significant when seen from the mean difference (t-test) or the median difference (sign-rank test). It can therefore be concluded that, in general, misrepresenting firms increases their value with the misrepresentation.

TABLE 4 Value Difference Between Misrepresented Firm-Year and Non-Misrepresented Firm-Year

PANEL A: Fundamental value RIV model (in million USD)						
	Misrepresented	Non-misrepresented	Difference	Significance tests		
				t-value	z-value	p-value (two-sided)
N	89	89				
Mean	3408.008	2992.755	415.253	2.209**		0.030
st. dev.	11948.940	11792.410	156.530			
0.25 percentile	299.947	114.282	185.665			
Median	737.775	424.859	312.916		6.556***	0.000
0.75 percentile	1698.325	1464.162	234.163			
PANEL B: Fundamental value earnings multiple (in million USD)						
	Misrepresented	Non-misrepresented	Difference	Significance tests		
				t-value	z-value	p-value (two-sided)
N	142	142				
Mean	3178.573	2743.826	434.747	0.657		0.512
st. dev.	10746.190	12575.590	-1829.400			
0.25 percentile	260.058	124.024	136.034			
Median	758.696	551.327	207.369		4.470***	0.000
0.75 percentile	1698.325	1473.990	224.335			
PANEL C: Fundamental value equity multiple (in million USD)						
	Misrepresented	Non-misrepresented	Difference	Significance tests		
				t-value	z-value	p-value (two-sided)
N	129	129				
Mean	3412.310	2926.698	485.612	2.447**		0.016
st. dev.	11250.900	10365.640	885.260			
0.25 percentile	257.483	175.570	81.913			
Median	753.036	646.679	106.358		7.180***	0.000
0.75 percentile	2011.990	1677.979	334.011			

Panel D: Fundamental value revenue multiple (in million USD)						
				Significance tests		
	Misrepresented	Non-misrepresented	Difference	t-value	z-value	p-value (two-sided)
N	132	132				
Mean	3352.212	3161.575	190.637	2.031**		0.044
st. dev.	11128.970	10853.000	275.970			
0.25 percentile	248.107	228.746	19.362			
Median	747.206	708.923	38.283		4.686***	0.000
0.75 percentile	1990.668	1981.425	9.243			

This table contains the market value of the equity, first for the misrepresented sample as it was shown on the capital market. Second, it contains the non-misrepresented fundamental value as it was calculated with the RIV model (Panel A), earnings multiple (Panel B), equity multiple (Panel C), and revenue multiple (Panel D). The nominal difference between the two valuations follows in the next column. Furthermore, the differences between the misrepresented and non-misrepresented firm's value are measured with a t-test for the mean difference and a sign-rank test for the median difference (*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$).

The results of the valuations of the firms using revenue multiples are presented in *Table 4 Panel D*. A major difference between revenue on the one hand and earnings as well as equity on the other hand is that there are numerous cases where the revenue is not misrepresented. This can occur, for example, when only expenses are misrepresented. Hence, the calculated firm's value using the revenue multiple does not differ; consequently, the differences in firm's value are much lower compared with previously discussed results. However, despite the lower nominal differences in the firm's value, the results indicate a statistically significant difference in this case. The question about economic relevance could well be raised given the differences of "only" \$9 million in the case of the 75th percentile. Nevertheless, one should keep the cases without misrepresented revenues in mind. Moreover, the difference in the mean is, with regard to a sum of \$191 million, rather economically relevant.

Table 5 presents the results for the variable of *value_difference*. This variable reflects the difference between the misrepresented and non-misrepresented firm's value scaled by the misrepresented firm's value. The table is divided by the different valuation methods, starting with the RIV model. The results indicate that the gain in the firm's value based on the RIV model is on average 29.6%, while the median gain is 17.6%. Thus, from the perspective of the RIV model, there is a clear percentage increase in the firm's value due to the misrepresentation.

In the case of the misrepresented firm's value calculated with an earnings multiple, the amount of the increase in the firm's value varies. Seen from the average

perspective, the firm’s value increases by 76%. Since the 75th percentile is clearly lower at 14.8%, few outliers have influenced the result upwards. If I exclude all the firm’s value gains above 100% and all the firm’s value losses below –100%, the mean falls to 4.15%. The median value is comparatively low at 2.6%. Nevertheless, for a firm with a median value, 2.6% of the firm values exhibit a difference of almost \$15 million. Thus, I argue that this is sufficient not only to be deemed of economic relevance.

TABLE 5 Value Difference as a Proportion of its Firm’s Value

Variable value_difference				
	RIV model	Earnings multiple	Equity multiple	Revenue multiple
N	89	142	129	132
Mean	0.296	0.760	0.077	0.141
st. dev.	0.355	8.445	0.478	0.704
0.25 percentile	0.060	-0.118	0.000	0.000
Median	0.176	0.026	0.028	0.005
0.75 percentile	0.536	0.148	0.093	0.041

This table contains the difference in the firm’s value between the misrepresented and non-misrepresented case scaled by the firm’s value in the misrepresented case (variable *value_difference*).

The cases of equity and revenue multiples both exhibit a smoother distribution of the percentage difference compared with the equity multiple. In the case of the equity multiple, the results suggest a mean difference of 7.7% while the median remains at 2.8%. The median is therefore close to the median of the earnings multiple. Thus, the interpretation that a significant difference exists remains unchanged. The valuation with the revenue multiple exhibits a mean difference of 14.1% – a clear difference between the misrepresented and the non-misrepresented cases. However, the median of 0.5% is rather low. Multiple cases are also included where no revenues were misrepresented. If these cases are excluded, the median rises to 1.6%. Whether 1.6% is economically significant is a question for each individual investor. However, it should be highlighted that a difference in a firm’s value of 1.6% is for a firm with a median value of approximately \$11 million.

The first research question is concerned with the extent to which the fundamental firm’s value differs. The results can be found in *Tables 4* and *5* and in the paragraphs above. The mean gain in values ranges from 7.7% to 29.6%, while the median gain in values ranges from 1.6% to 17.6%. The differences in the values are explained by the different valuation methods used. However, the direction is, in all cases, the same. Independent of the method, the results consistently indicate that there is an

economically substantial increase in the fundamental firm's value due to the misrepresentation.

Market Reaction to the Restatement Announcement

Table 6 presents the results of the *CAR* around the date when the misrepresentation was first revealed to the public. The date itself can vary depending on the source from which it is collected. However, this variation is in this paper for a maximum of 1 day. Moreover, typically on the event day itself, the full extent of the misrepresentation is not known. Normally, some information is disclosed to the public, indicating that prior financial statements are likely to be incorrect. Further information is then provided in the days, months, or even years that follow.

TABLE 6 Market Reaction Enveloping the Revelation of a Misrepresentation (Restatement Announcement)

Day window		-1/+1	-3/+3	-5/+5	-15/+15	-90/+90
CAR	Mean	-0.0874	-0.0996	-0.1177	-0.1519	-0.3546
	Median	-0.0333	-0.0357	-0.0507	-0.0969	-0.2308

This table contains the mean and median value for the misrepresenting firms once the misrepresentation is revealed to the public (typically a restatement announcement) for a day range around the announcement of -1/+1, -3/+3, -5/+5, -15/+15, -90/+90.

The results of the market reactions around the time of the first revelation are provided in windows of -1 day to +1 day, -3/+3 days, -5/+5, -15/+15 days, and -90/+90 days.²¹ The results indicate first and foremost a decline in the market value due to the revelation of the misrepresentation. This decline becomes larger as the window becomes wider. Thus, while the mean drop in market value is in the -1/+1 window at "only" -8.7%, it is -35% in the case of a -90/+90 window. The median market drop is in general lower than the mean drop. It ranges from -3.3% for the -1/+1 window to -23% in the -90/+90 window. It seems to be a gradual decrease in market value over time instead of a sudden drop on a certain day, and it might be related to the disclosure of further information about the (potential) misrepresentation. A graph showing the *CAR* for the period -120/+120 is provided in *Appendix B*. It depicts a stable *CAR* in the range around -120 to -60 as well as +60 to +120, while a downward shift is visible in the remaining days. This suggests that an abnormal change in the share price occurs only in the limited time span around the restatement announcement.

²¹ Other windows (e.g., -3/+15, -5/+90) have been tested as well without any qualitatively different results (but naturally quantitatively different results).

Prior literature has determined the market reaction to the announcement of a restatement as a consequence of a previous misrepresentation (e.g., Palmrose et al. 2004, Hennes et al. 2008). Results have suggested that the market reaction around the event day ranges from approximately -13% (Hennes et al. 2008) to -20% (Palmrose et al. 2004). My results for the same window $(-1/+1)$ with a mean of -8.7% are less negative compared with those in prior literature. For the $-90/+90$ window, a previous study identifies a mean drop in market value of -26.6% (Hennes et al. 2008). My results at -35% are even more negative. A potential explanation for the differing results is the difference in the underlying datasets. For example, Palmrose et al. (2004) use a dataset from 1995 until 1999. While my dataset covers these years, its main weight is after 2000 (as seen in *Table 1*). Hence, differences in market perception or in the legal framework as a result of, for example, the Enron scandal and the introduction of SOX may have had an impact on the market reaction. Another potential explanation for the differences in the market reaction is the requirement of my dataset for restated financial figures. To calculate the firm's value, I rely on restated financial figures. However, not every misrepresenting firm automatically restates. Most notably, firms that disappear from the market because of bankruptcy, for example, are not in my dataset. Thus, the comparability of my results with prior literature is somewhat limited. However, since the direction and the general magnitude are similar, I would consider my results to be in line with the prior literature.

Market Value Difference and Market Reaction

The second aim of the research is to identify whether an association exists between the gain (or loss) in the fundamental value of the misrepresenting firm and the market reaction once the misrepresentation is revealed to the public. The results that correspond to this aim are disclosed in *Table 7*. The table contains the results of an OLS regression where the *CAR* is the dependent variable and the fundamental value difference is the independent variable. There is one regression for each *CAR* window $(-1/+1, -3/+3, -5/+5, -15/+15, \text{ and } -90/+90^{22})$ and for each of the different valuation methods (RIV model, earnings multiple, equity multiple, and revenue multiple). The window size is not increased since the market reaction outside the window of $-90/+90$ does not indicate any changes in the market participants' perception (see *Appendix B*). It must be noted that the numbers of observations is reduced compared with previous tables because of a lack of data. For example, the CRSP requires a firm to provide sufficient data for at least 180 trading days before and 90 trading days after the restatement announcement. Hence, if there is

²² Longer windows are disregarded since the drop in the market value stabilises after 90 days.

insufficient data in the period, the firm is excluded from the analysis. Earnings can be positive in the misrepresented and negative in the restated case. The multiple would in such a case be positive, leading to a negative firm value. The algebraic sign of the multiple is changed in such cases. Thus, the firm value remains positive. Excluding such cases does not lead to qualitatively differing results.

All of the results, with two exceptions, are nonsignificant. This means that there is no discernible linkage between the value gain due to the misrepresentation and the value loss once the misrepresentation is revealed. The two exceptions are in the $-5/+5$ range of the valuation with the equity multiple and in the $-90/+90$ range of the valuation with the earnings multiple. Otherwise, the coefficients are not only nonsignificant by a margin but there is also no sign that they have any systematic direction, as some coefficients are positive while others are negative. The two exceptions are both positive and significant. However, when the remaining results are considered, they seem to be exceptions likely due to a statistical anomaly, as opposed to indicating any meaningful result; thus, they are disregarded. The R-squared values are in all cases low to very low, which supports the interpretation of no systematic and discernible connection between the *CAR* and the value difference.

The second research question examines the association between the (artificial) value gain (or loss) of the misrepresenting firm and the market reaction once the misrepresentation was revealed. Given the lack of significance (with two exceptions), the market reaction is interpreted to be independent of the value gain due to the misrepresentation. Thus, I am unable to identify hardly any association between the difference in the fundamental value and the market reaction around the day the misrepresentation was revealed. This is, to a certain extent, unforeseen since the adjustment of the share price once the misrepresentation is revealed should logically include at least the amount gained due to the misrepresentation. However, the adjustment seems to be unaffected by the value difference due to the misrepresentation. One explanation for this finding could be the phenomenon that the revelation of the misrepresentation (typically a restatement announcement) normally contains only scant information beside the announcement that the prior annual report(s) should not be trusted. Nevertheless, the lack of significance also exists in the cases of $-15/+15$ and even $-90/+90$. This was 90 trading days after the announcement, when the capital market actors had the opportunity to scrutinise the prior annual reports with the knowledge that something was incorrect and there was still no significant value difference. The number of days is therefore the number of days when the stock is traded on the market. Since the stock is not traded on, for example, a public holiday, the number of calendar days exceeds 90. Due to the number of days on which the capital market actors had time to reassess the prior financial figures, the lack of information does not seem to be the explanation for the phenomenon.

TABLE 7 Connection of the Cumulative Abnormal Returns and the Fundamental Value Difference

Valuation Method	3-day window (-1/+1)			7-day window (-3/+3)			11-day window (-5/+5)						
	CAR	CAR	CAR	CAR	CAR	CAR	CAR	CAR	CAR	CAR	CAR	CAR	
RIV model	0.0129 (0.159)			0.0564 (0.615)						-0.00462 (-0.0436)			
Earnings multiple		0.00487 (0.103)				-0.0171 (-0.254)					0.00246 (0.0383)		
Equity multiple			0.00983 (0.855)				0.0164 (1.368)					0.0299** (2.46)	
Revenue multiple								4.14E-05 (0.891)					3.32E-05 (0.57)
Constant	-0.110** (-2.721)	-0.0985** (-2.381)	-0.0828** (-2.669)	-0.112** (-2.626)	-0.0997** (-2.455)	-0.0947** (-2.676)	-0.155* (-1.884)	-0.122** (-2.398)	-0.123** (-2.770)	-0.124*** (-3.242)	-0.160* (-1.842)		
Observatio ns	27	35	31	27	35	31	35	27	35	31	35	31	35
R-squared	0	0	0.006	0.007	0.001	0.013	0.015	0	0	0.036	0	0.036	0.006
Robust t-statistics in parentheses *** p < 0.01, ** p < 0.05, * p < 0.1													

-----Continued-----

TABLE 7 (Continued)

Valuation Method	31-day window (-15/+15)			181-day window (-90/+90)		
	CAR	CAR	CAR	CAR	CAR	CAR
RIV model	-0.0832 (-0.686)			-0.264 (-1.169)		
Earnings multiple		0.0426 (0.745)			0.218*** (3.023)	
Equity multiple			0.00549 (0.35)			0.0507 (1.181)
Revenue multiple						9.03E-05 (0.648)
Constant	-0.163** (-2.551)	-0.167*** (-2.800)	-0.140** (-2.624)	-0.230* (-1.791)	-0.346*** (-3.875)	-0.321*** (-3.165)
Observations	27	35	31	27	35	31
R-squared	0.008	0.004	0.001	0.033	0.046	0.016
Robust t-statistics in parentheses						
*** p < 0.01, ** p < 0.05, * p < 0.1						

The table contains an OLS regression with the cumulative abnormal returns (CAR) in the respective day window as a dependent variable and the fundamental value difference as an independent variable (more about the regression equation is provided in the Method section). Differences in the number of observations depend on the data availability.

If the market value of the firm's equity was too high by a certain percentage due to the misrepresentation, then one might assume that the market value should decrease at least by a certain percentage once the misrepresentation is revealed. However, the results do not support this train of thought. In fact, there seems to be no relation between a gain in market value due to the misrepresentation and the loss in market value once the misrepresentation is revealed. One way to interpret the results is that the investors were aware of the misrepresentation before it was revealed publicly. Nevertheless, the SEC must have been unaware of the misrepresentation since it did not initiate an investigation before the event. The consequence would be that the investors were aware of the misrepresentation while the SEC was not. Whether this combination is feasible can be doubted. Hence, I do not see any support for investors being aware of the misrepresentation before it was revealed to the public.

Furthermore, the results can be interpreted as a failure of the market to take the fundamental value difference into account when revaluing the firm once the misrepresentation has been revealed. Given the value relevance of earnings indicated in prior literature (e.g., Bae and Jeong 2007, Collins et al. 1997, Clarkson et al. 2011), this interpretation would be unpredictable. Moreover, I can only think of rare scenarios in which the capital market can be considered rational and efficient when it disregards the fundamental value of a firm. However, concluding that the efficient market hypothesis is violated might go too far. I would rather see it as a first indicator of an interesting phenomenon that calls for further investigation.

Research question 2 asks whether there is an association between the artificial gain in a firm's value due to the misrepresentation and the market reaction once the misrepresentation becomes public knowledge. The evidence suggests that there is no such association. It seems as if the market reaction does not consider how much the firm's value was previously increased as a consequence of the misrepresentation.

Robustness Checks

I conduct a variety of robustness checks to verify the results. In this subsection, I introduce the most relevant checks. Despite the findings of Hennes et al. (2008), one might question the usage of a long-term event window before the event "restatement announcement date" (e.g., $-90/+90$). To overcome such questions, I reperform the analysis with event windows of $-1/+3$, $-1/+5$, $-1/+15$, and $-1/+90$. Therefore, I first calculate the *CAR* for the specific windows and then rerun the regression with the *CAR* as the dependent variable and the value difference as the independent variable. The results for the *CAR calculation* with a reduced event window are presented in *Table 8*.

TABLE 8 Market Reaction Enveloping the Revelation of a Misrepresentation (Restatement Announcement)

Day window		-1/+1	-1/+3	-1/+5	-1/+15	-1/+90
CAR	Mean	-0.0874	-0.0747	-0.0810	-0.0859	-0.1316
	Median	-0.0333	-0.0278	-0.0306	-0.0538	-0.0792

This table contains the mean and median value for the misrepresenting firms once the misrepresentation is revealed to the public (typically a restatement announcement) for a day range around the announcement of -1/+1, -1/+3, -1/+5, -1/+15, -1/+90.

The *CAR* values are lower than those in *Table 6* due to a shorter time period before the restatement announcement (event date). This finding confirms the results of Hennes et al. (2008), who are able to demonstrate that a decrease in the share prices of misrepresenting firms also occurs before the restatement announcement. This strengthens the choice made earlier in the paper to also include the period before the announcement in the analysis as it has a relevant impact on the value.

The results of the regression with *CAR* as a dependent variable and the value difference as an independent variable are presented in *Table 9*.

The major differences from *Table 7* are the different windows around the restatement announcement (event date) and consequently the different *CAR* values. Upon comparing the results in *Table 9* with those in *Table 7*, some minor differences can be noted. However, these minor differences do not lead to a change in the interpretation that the *CAR* and the value difference do not seem to be related.

TABLE 9 Connection of the Cumulative Abnormal Returns and the Fundamental Value Difference

Valuation Method	3-day window (-1/+1)			5-day window (-1/+3)			7-day window (-1/+5)					
	CAR	CAR	CAR	CAR	CAR	CAR	CAR	CAR	CAR	CAR	CAR	CAR
RIV model	0.0129 (0.159)			0.0231 (0.264)			-0.00481 (-0.0470)					
Earnings multiple	0.00487 (0.103)			-0.0128 (-0.231)			-0.0126 (-0.220)					
Equity multiple	0.00983 (0.855)			0.00793 (0.693)			0.00859 (0.751)					
Revenue multiple												
Constant	-0.110** (-2.721)	-0.0985** (-2.381)	-0.0828** (-2.669)	-0.145* (-1.778)	-0.0996** (-2.181)	-0.0867** (-2.098)	-0.0770** (-2.100)	-0.131* (-1.697)	-0.112** (-2.120)	-0.0953** (-2.107)	-0.0878** (-2.199)	-0.138 (-1.673)
Observations	27	35	31	35	27	35	31	35	27	35	31	35
R-squared	0	0	0.006	0.01	0.001	0.001	0.003	0.01	0	0.001	0.003	0.007
Robust t-statistics in parentheses												
*** p < 0.01, ** p < 0.05, * p < 0.1												

-----Continued-----

TABLE 9 (Continued)

Valuation Method	17-day window (-1/+15)			92-day window (-1/+90)		
	CAR	CAR	CAR	CAR	CAR	CAR
RIV model	0.00897 (0.0874)			0.171 (1.026)		
Earnings multiple		-0.0139 (-0.249)			-0.0132 (-0.138)	
Equity multiple			0.00814 (0.629)			0.0853*** (3.366)
Revenue multiple				2.12E-05 (0.344)		-3.61E-05 (-0.333)
Constant	-0.154** (-2.709)	-0.121** (-2.375)	-0.0997** (-2.163)	-0.200** (-2.268)	-0.129* (-1.866)	-0.133* (-1.937)
Observations	27	35	31	27	35	31
R-squared	0	0.001	0.002	0.023	0	0.096
Robust t-statistics in parentheses						
*** p < 0.01, ** p < 0.05, * p < 0.1						

This table contains an OLS regression with the cumulative abnormal returns (CAR) in the respective day window as a dependent variable and the fundamental value difference as an independent variable (more about the regression equation is provided in the Method section).

Conclusion

This paper has analyzed whether the capital market perceives financial misrepresentations and how it reacts when misrepresentations are revealed. A major novelty of the paper is that the firm value of a misrepresenting firm was calculated based on fundamental information in the hypothetical case of no misrepresentation in the first place. To the best of my knowledge, this has not been done previously. Misrepresentations are rather uncommon events. However, according to the prior literature, when misrepresentations occur, they have a drastically negative impact on share prices (e.g., Palmrose et al. 2004, Hennes et al. 2008). Testing the market behavior in this context may not only help to improve our knowledge about misrepresentations; it also helps to improve our knowledge about the market's behavior when an uncommon event has drastic effects on it.

The efficient market hypothesis, in its semi-strong form, states that all publicly available information is included in the share price of a company. In the context of this paper, this means that the new information about a misrepresentation should be reflected in the share price once the information about the misrepresentation becomes publicly available. This is evidenced by a fall in share prices after the announcement of a restatement. However, I went further. I calculated the fundamental value for cases where the firm disclosed the non-misrepresented financial statements in the first place based on restated financial figures and with the help of two common valuation methods (the RIV model and validation with multiples). The results suggest that the market reaction is independent of the difference in the fundamental firm's value. There seems to be no linkage between the difference in the fundamental firm's value due to the misrepresentation and the market reaction once the misrepresentation becomes public, at least on a horizon of up to 90 trading days. It is at least questionable whether such behavior is in line with the efficient market hypothesis.

Another aim of the paper was to identify the amount of value that the misrepresenting firm gains due to the misrepresentation. Depending on the method used to determine the firm's value in the non-misrepresented cases, an average gain in value of up to 29.6% could be demonstrated. The median value, which is less influenced by the few extreme observations, ranges, depending on the method, between 1.6% (after adjusting for non-misrepresented revenues) and 17.6%. In all cases, the median difference was statistically and economically significant. Hence, the unwarranted value gain through a misrepresentation is substantial. In sum, the research questions can be answered as follows: A substantial (artificial) gain in the firm's value occurs as a consequence of the misrepresentation, and there is no

association between the (artificial) gain in the firm's value and the market reaction once the misrepresentation is revealed to the public.

The results are based on a random²³ sample of misrepresenting firms. Hence, these firms were all detected to have deliberately altered financial figures by the SEC. Consequently, the quality of the sample and the transferability to other firms or other countries depend on the quality of the SEC's work. Moreover, the requirement for misrepresenting firms in the sample is that they had to provide reliable restated financial figures. Thus, firms not restating because they went bankrupt, for example, were not included in the sample. What impact this requirement has on the results cannot be estimated due to the lack of data. However, considering these two points, the tests were constructed in such a way that the results can be considered valid and reliable.

As with many other studies, this study also faced some limitations. Most notably, the firm's value as the misrepresenting firm in cases where the firm did not misrepresent could not be observed. The calculation of the fundamental firm's value was based on valuation methods. Thus, although these valuation methods are standard, their outcome is only an approximation of what the true value would have been. A further limitation arises from the choice of the event window. The longer the chosen event window, the more likely it is that the other events around the event will be included in that event window. This can, in the case of this paper, be of benefit, such as if some information is leaked before the restatement announcement; it can also be unfavorable if an unrelated event occurs. This paper attempted to address the problem by choosing different event windows. However, the effect of such unfavorable events could not be eliminated.

Beside the theoretical contribution, the results have several practical implications. The most straightforward among them are probably the implications for shareholders whose wealth is affected by the change in the firm's value. Further practical implications of the results are those that affect government bodies, including legislators, since they are aware – judging from the results – that the misrepresentation has not been handled efficiently by the capital market. This might result in changes to the legislation, such as for increasing the flow of information within the firm or towards the firm's external stakeholders.

The results provide insights into the behavior of shareholders toward misrepresenting firms. A major question is whether this behavior is in line with or contradicts standard theories. I am mainly eyeing the efficient market hypothesis in its semi-strong form. Further tests could be performed to investigate how my findings support this hypothesis. They may lead to interesting insights, especially for

²³ Aside from a minor bias due to firm's necessity to survive until it restates as well as a positive expected return on equity.

shareholders, since exploiting market inefficiency could mean that there are lucrative investment opportunities existing.

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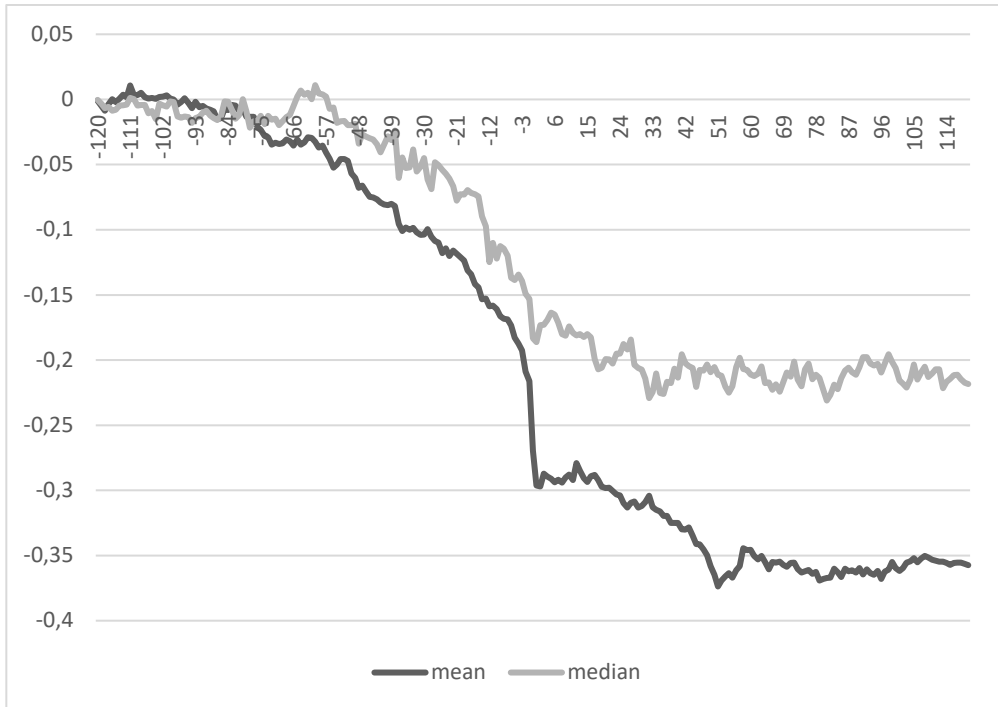
APPENDIX A: Sample Selection of the Firms Subject of Accounting and Auditing Enforcement Releases (AAERs) Between 1993 and 2013 as in Kloppenburg (2021)

Number of Distinct Firms	Number
Firms with at least one annual AAER case	585
Less: firms with missing CIK code	(102)
Less: missing COMPUSTAT data	(20)
Total number of misrepresenting firms between 1993 and 2013	463
Number of firm-years	1123

The data is mainly limited, by the collectability from EDGAR. EDGAR data has been available since 1996 onwards. Hence, restated figures for previous incorrect annual reports cannot be collected from publications before 1996. An SEC investigation normally takes around 3 years. Thus, a restatement from 1996 normally becomes part of an AAER published in 1999. Therefore, no firm is included in the dataset whose misrepresentation was published in an AAER before 1999. Consequently, the dataset consists of AAERs published between 1999 and 2015. Since the AAERs are published at the end of a long investigation process, the dataset covers 1993–2013. In total, 585 distinct firms can be identified. Of these 585 firms, 122 firms must be excluded due to a missing CIK code²⁴ or no data at all on COMPUSTAT. For this reason, the remaining dataset consist of 463 misrepresenting firms and 1123 firm-years or 2.43 misrepresented firm-years per misrepresenting firm. The results of the selection process are disclosed in the table above.

²⁴ A firm without a CIK code is unlikely to be in EDGAR. Hence, no attempt was made to find further identifiers.

APPENDIX B: Cumulative Abnormal Returns 240 Days Surrounding the Restatement Announcement (Day 0)



This graph plots the cumulative abnormal returns, starting from day -120 before the restatement announcement until day +120. A major shift downward occurs in the abnormal returns, which can be seen around day -60 until day +60. In the time before and afterwards, the abnormal returns can be best described as “constant”. A major movement downward is visible around day 0, which is the day of the restatement announcement. This is in line with prior literature (e.g., Palmrose et al. 2004, or Feldmann et al. 2009). The graph itself qualitatively coincides in its rough shape with Figure 2 of Hennes et al. (2008). The values just differ slightly. A reason for the difference could be the different strategies used in identifying the sample: Hennes et al. (2008) rely on a sample that consists of more than just firms identified in AAERs. Moreover, my dataset requires the firm’s survival until the disclosure of restated financial figure

**Kloppenburg, I., and Schadewitz, H. (2024)
To Rely, or not to Rely? Sell-Side Financial Analysts and Low
Earnings Quality**



To Rely, or not to Rely? Sell-Side Financial Analysts and Low Earnings Quality

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Abstract

There is a gap in the literature specifying how analysts, as sophisticated capital market actors, are affected by low earnings quality. Our aim is to reduce this gap. Our dataset originates from the Securities and Exchange Commission (SEC) and consists of misrepresenting firms during the years 1991-2013. These firms have been apprehended by the US authorities deliberately altering their financial statements. Hence, it can be inferred that the earnings quality is very low. We take advantage of the *ex post* knowledge that misrepresented annual reports have a low earnings quality. We test the impact of the low earnings quality on sell-side financial analysts. The impact on analysts is measured by three factors: change in the number of analysts following a firm, change in the mean and median earnings forecast, and change in the standard deviation of the earnings forecast among the analysts. The results indicate, after applying all the measurements, that analysts are misled by misrepresentations. The results contribute to the literature by shedding light on the analysts' actions in the context of low earnings quality. In general, from the legislative perspective, our results highlight the importance of an independent market monitoring function. This function, in turn, would further an undistorted information supply and also support the work of analysts. Ultimately, as a result of this, the efficient allocation of capital would be enhanced.

Keywords: Financial Analysts, Financial Misrepresentation, Earnings Quality, Accounting Fraud, AAER

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Introduction

In a survey conducted by Brown et al. (2015), sell-side analysts got asked how they would react to a “red flag” indicating for them management’s effort to intentionally misrepresent the financial statements. More than half of the respondents answered with “revise earnings forecasts downwards”. This survey result leads to the question: Do analysts detect such “red flags” in actual cases of a misrepresentation and act as they responded in the survey?

The purpose of accounting is to “provide information that allow investors to make inferences about the manager’s actions” (Beyer et al. 2010, p. 297). Earnings is one key figure providing information to analysts and other interested parties regarding a firm’s performance. Schipper and Vincent (2003) define earnings quality as “the extent to which reported earnings faithfully represent the Hicksian income (...)” (p. 98). Hence, high quality earnings provide better information about the manager’s actions compared to earnings with a low quality. The task of this study is to detect how sell-side financial analysts react to financial reports with very low earnings quality. We have used sell-side analysts as a proxy for dedicated financial market actors due to the better availability of the data e.g. compared to buy-side analysts and because sell-side analysts are typically considered to be sophisticated capital market actors (Block 1999, Maber et al. 2021).

We have taken advantage of a sample of firms who were apprehended for deliberately altering (misrepresenting) their financial statements by the Securities and Exchange Commission (SEC). Since the SEC discloses who they have detected after a thorough and individual investigation, it can be stated with high reliability that the firms in our sample misrepresented their financial figures (although not 100%). Misrepresented financial figures are by definition incorrect and thus it is questionable to what extent these figures can provide information content (if any). We use our ex post knowledge of the misrepresented financial figures to determine how sell-side financial analysts react to low or even non-existing information content in the summarizing figure: earnings. We focus on sell-side analysts because this group of sophisticated capital market actors openly disclose their earnings forecasts. We can take advantage of the readily available data from these sophisticated market participants in terms of their monitoring of activities and earnings forecasts. The question therefore is: How affected are they by the very low earnings quality which are proxied by misrepresented annual reports? This question is exploratory in its nature. However, it can potentially have three outcomes: analysts can either detect the low earnings quality and act accordingly; they can treat the misrepresenting firm like a non-misrepresenting one; or they can be misled and even overreact to the misrepresented annual report.

We aim to contribute with our research question to the literature on earnings quality. Moreover, we also want to contribute to the literature concerning analysts by providing insights into the context within which analysts make their decisions. We want to shed light on the extent to which experts on the capital market are affected by the low earnings quality of a misrepresentation and whether they are capable of detecting it as a misrepresentation. Moreover, our results can contribute to an understanding of the extent to which the earnings provided in annual reports are an important information source for analysts. This knowledge can potentially help to comprehend how the misrepresented annual report is perceived by the capital market before clear indicators of the misrepresentation are declared either by the firm itself (e.g. through a restatement announcement) or by the SEC.

Analysts play a major role as information intermediaries for capital markets (Schipper 1991, Block 1999, Maber et al. 2021). Their assessments of the firm play a relevant role in overcoming the information asymmetry between firm and (potential) shareholder (Maber et al. 2021). Thus, the analysts reports are helping to improve the efficiency of the capital market. The efficiency of markets in general is an important topic in economics literature (e.g. Marshall 2009; Mankiw 2014). The capital market is one of these markets and any inefficiency typically causes a loss for society. Thus, the efficiency of the capital market is in the interest of every member of society. However, some groups are more affected than others. Most notably, those affected are the capital market actors like the shareholders who base their investment decision partially on the analyst reports, the analysts themselves whose reputation is at risk, and those firms where facing a loss of integrity could cause problems raising future capital. Consequently, our results are of interest for multiple groups within a society but most importantly for capital market actors.

We analyzed our data with the help of multiple regressions. The dependent variable in each case was one characteristic of the analyst consensus forecasts. Our results indicate that the analysts were not at all aware of the misrepresentations. All the variables with which we captured the reaction of the analysts (change in number of analysts, change in the mean and median consensus forecast, change in the standard deviation of the consensus forecast) indicated that the analysts were unaware of the misrepresentation. In fact, the results indicated that the situation was quite the reverse, and that all the measures rather suggested that the analysts were surprised by the misrepresentation.

The remainder of the paper is structured as follows. In section two, relevant prior literature is presented and discussed. This section includes the research question and a brief outline of the theoretical background. The method is presented in Section 3 and the data applied are introduced in Section 4. Section 5 displays and discusses the obtained results. Moreover, section 5 contains an extensive robustness check. The last section, Section 6, concludes the paper.

Prior Research

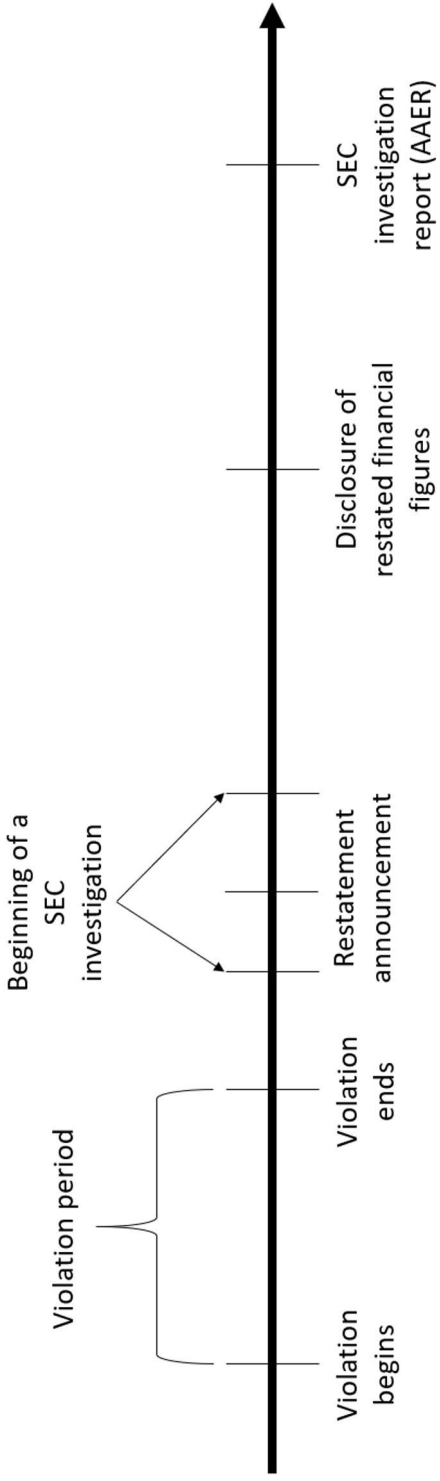
The phenomenon “financial misrepresentation” (short form: misrepresentation) has a variety of different names in the prior literature. For example, it is called “misstatement” by Dechow et al. (2011), “misreporting” by Burns and Kedia (2006), and accounting fraud by Miller (2006) and Palmrose et al. (2004). However, each of the various terms refers to the same phenomenon. In each case, it is the result of a SEC-investigation in which the SEC (among others) has identified the misrepresenting firm and the misrepresented firm years.

Our definition of misrepresentation follows Amiram et al. (2018), Kloppenborg (2021a), and Kloppenborg (2021b) by defining a misrepresentation as a violation that has occurred of Section 13(b) of the 1934 Securities and Exchange Act. This specific section states that firms must make and keep books which fairly and accurately reflect the transactions and dispositions of the firm’s assets. Additionally, firms are required to devise and maintain a system of internal controls to assure accurate reporting. The role of the SEC is (among others) to investigate and prosecute deliberate violations against this particular section. Only if the SEC identifies a violation after a thorough investigation, do they disclose their results publicly in an Accounting and Auditing Enforcement Release (AAER)²⁵. These AAERs are the basis of our dataset. Thus, the dataset consists of firms which have deliberately (fraudulently) altered their annual report.

Figure 1 shows the timeline between the first misrepresentation and the disclosure of the corresponding AAER. The process thereby is as follows: First, there is a misrepresentation during the violation period (Karpoff et al. 2008); in our case, we only focus on misrepresented annual reports. Second, the firm reveals with the restatement announcement that “something is wrong” with their past annual report(s). This can take place months or years (seldom days) after the misrepresented annual report was published, and the information revealed by the firm can be voluntary or forced e.g. by the auditors. Often the firm states that “something is wrong” and nothing further is explained. The statement of the firm can be caused by an investigation initiated by the SEC. Alternatively, the SEC could initiate an investigation as a consequence of the statement. Independent of the path leading to the investigation, the SEC carries out an investigation and publishes the relevant findings (if there are any findings) in an AAER after the investigation is completed (the SEC does not disclose any information earlier). Parallel to the SEC investigation, the firm first announces that it has to restate its past financial figures and later discloses the restated financial figures. The focus of this paper lies on the violation period.

²⁵ AAERs can be found under the following link:
<https://www.sec.gov/divisions/enforce/friactions.htm>

FIGURE 1 Typical Sequence of a Misrepresentation



The relevance of the past year's earnings for forecasts by analysts has been the subject of multiple prior research work. One apparent example of this relevance is the importance of the p/e ratio in analysts' valuation of a firm (e.g. Baker 1999; Day 1986; Demirakos et al. 2004; Brown et al. 2015). A different perspective is taken by Barker and Imam (2008) and by Graham et al. (2002). They show that past accounting-based information is important for analysts in determining the earnings quality and consequently influence the analysts' forecasts. Brown et al. (2015) go one step further in their survey by explicitly asking analysts how they would react if they detected a red flag implying there was an intentional misrepresentation. The response of more than half of the sell-side analysts participating in the survey indicated that they would revise their stock recommendation and earnings forecasts downwards. Ceasing the coverage of the firm was considered as an unlikely reaction to a misrepresentation by the survey participants.

Earnings quality was defined by Schipper and Vincent (2003) as the extent to which reported earnings faithfully represents the Hicksian income, where faithfully means "correspondence or agreement between a measure or description and the phenomenon that it purports to represent". The Hicksian income refers to a definition of income provided by Hicks (1939). The Hicksian income is basically the change in net economic assets other than those from transactions with the owners.

The prior literature shows that the Hicksian income is in almost all cases affected by misrepresentations (Dechow et al. 2011). This can be illustrated by the example of Diebold Inc. Diebold Inc. is headquartered in Cincinnati, Ohio, USA. The company is mainly working in providing electronic solutions for banks like ATMs (Automated Teller Machines). According to AAER number 3137 (June 2nd 2010), Diebold Inc. engaged in fraudulent accounting practices including: improper use of "bill and hold" accounting, recognition of revenue on a lease agreement subject to a side buy-back agreement, manipulating reserves and accruals, improperly delaying and capitalizing expenses, and the writing up the value of used inventory. This example shows, in just this one case, the variety of methods by which the Hicksian income can be defaced due to misrepresentation. It should also illustrate how unreliable misrepresented financial reports can be and consequently provides evidence of the very low earnings quality of misrepresenting firms.

There is extensive literature about low earnings quality. Only a brief overview is provided here and for an in-depth overview one of the literature reviews about the topic is recommended, e.g. Dechow et al. 2010, Walker 2013, Amiram et al. 2018. Some of the literature, especially the early works, focused on earnings quality measured by the extent of earnings management (e.g. Healy 1985; Jones 1991; Teoh et al. 1998a and b). Although methods measuring earnings management have been refined (e.g. Dechow et al. 1995; Kothari et al. 2005), none of these methods are able to reliably identify low earnings quality for a specific firm (Walker 2013). This is also the main reason for the use in this research of a sample of firms subject to AAERs.

These firms have an incorrect annual report and thus almost completely fulfill the definition of very low earnings quality. Moreover, it can be assumed with very high reliability that the earnings quality is low because the conclusion is based on a thorough and in-depth on-site investigation by the SEC.

In more recent years, researchers have also applied more firm-specific measures for low earnings quality. Authors like Desai et al. (2006), Francis et al. (2013), or Lin et al. (2006) used the restatement announcements of the firms as a proxy for low earnings quality. A major drawback of restatements is that they can be caused either by error or intention (Hennes et al. 2008) and therefore Hennes et al. (2008), for example, refined their dataset even further. These authors considered low earnings quality only for the following restating firms: those who stated publicly in one of their filings that fraud had occurred; those who were accused in an AAER; those who had been investigated by the SEC or the US department of Justice two years prior or after the restatement announcement; and those who had an independent non-governmental investigation in the four years surrounding the restatement announcement. We limited our dataset to only firms subject to AAERs since we consider the AAER as the strongest and clearest, noncontroversial, indication of low earnings quality. We thereby only focused on AAERs targeting deliberate accounting violations by a firm.

Analysts are according to the prior literature sophisticated financial statement users who digest both financial and non-financial information to derive earnings estimates (Schipper 1991, Block 1999, Maber et al. 2021). The role of sell-side analysts in particular is to analyze, interpret, and disseminate information to capital market participants (Brown et al. 2015). Thereby analysts help to overcome the information asymmetry between firms and (potential) shareholders (Maber et al. 2021). Analysts have been in focus in numerous prior research studies. Some research, especially in the early period, focused on the statistical properties of analyst forecasts (e.g. Brown 1993; Gu and Wu 2003; Lys and Sohn 1990). In more recent years, the orientation has been more on the context in which analysts make their decisions (e.g. Call et al. 2009; Duru and Reeb 2002; Huang and Wright 2015; Ayres et al. 2017). This study follows the analysts' context-related literature and also relies on sell-side analysts since sell-side analysts are sophisticated capital market actors. In addition, analysts allocate a reasonable amount of their time reading the annual reports and further publications of the firms. Moreover, we rely on sell-side analysts because the data is accessible unlike e.g. buy-side analysts.

Prior research has increased our knowledge of the decision process of analysts. For example, prior research shows that the accuracy of forecast analysts increases with the availability of new information (e.g. Hope 2003a; Hope 2003b; Baginski et al. 2011; Dhaliwal et al. 2012), the instructiveness of the information (e.g. Lang and Lundholm 1996; Lehavy et al. 2011), and the reliability of the information (Behn et al. 2008). Moreover, it is known from prior research that analyst accuracy decreases when the degree of difficulty to forecast increases. The difficulty of the forecast is

subsequently measured (among other measures) as goodwill impairment charges (Chen et al. 2015), a high level of intangible assets (Barron et al. 2002), a restructuring of charges (Chaney et al. 1999), international diversification (Duru and Reeb 2002), and an amount of political involvement in the firm (Huang and Wright 2015; Chen et al. 2010).

The combination of low earnings quality and analyst forecasts has also been the topic of prior research. Behn et al. (2008) used the audit quality as a measure of earnings quality. Audit quality in the Behn et al. study is proxied by the size and industry specialization of the auditors. Their findings suggest that, in general, the audit quality and consequently the earnings quality has a positive impact on the accuracy of the earnings forecast by the analysts. Lobo et al. (2012) measured low earnings quality by the number of (discretionary) accruals. These authors were able to show that the number of analysts following a firm increases with decreasing earnings quality. Cotter and Young (2007), in turn, used AAERs as a proxy for low earnings quality. The authors showed that the likelihood of analysts discontinuing their coverage of a firm prior to a publication of the fraud (misrepresentation) increases when a misrepresentation is large. However, they were unable to show in general a drop in the analysts following a firm before the misrepresentation became public. Moreover, they could not identify a higher frequency in the downward revision in the earnings forecasts of misrepresenting firms prior to the misrepresentation becoming public knowledge. Similarly, McNichols and O'Brien (1997) found evidence of analysts dropping the coverage instead of issuing unfavorable investment recommendations.

Salerno (2014) relied on accruals' measures as proxy for the earnings quality. The author showed that forecast accuracy increases with an increase in earnings quality. Bilinski (2014) also used accruals as proxy for earnings quality. However, this author measured the change in analysts' behavior by their likelihood of creating a cash flow forecast. The author showed that analysts rarely prepare cash flow forecasts if the earnings quality is low.

The focus in a further major literature stream is concerned with the reaction of sell-side financial analysts once the low earnings quality is uncovered. Ye and Yu (2017), for example, are part of this stream of literature and they investigated analysts' reactions to all the restatement announcement irrespective of whether they were due to error or intention. Qasem et al. (2020) distinguish between restatements due to an error and restatements due to a misrepresentation. Griffin (2003) only took the perspective of (alleged) intentional misrepresentation. Griffin (2003) identified a clear drop in the coverage of analysts following a firm as a consequence of a restatement announcement due to an intentional misrepresentation. Moreover, the study found a downward revision of earnings forecasts by analysts once the misrepresentation was made public. These results could in general be confirmed by later research (e.g. Ye and Yu 2017; Kryzanowski and Zhang 2013; Young and Peng 2013).

Ye and Yu (2017) go somewhat farther and show that analysts react differently depending on whether the restatement was caused by an unintentional error or an intentional misrepresentation. Their focus is therefore mainly on whether the information environment is more severely hit by a misrepresentation than by an error. Consequently, the forecast dispersion is larger for misrepresenting firms compared to firms only restating due to an error. Qasem et al. (2020) used a dataset from an emerging market. Thus, the frequency of restatements is larger. The results, for restatements due to an error or misrepresentation combined, confirms the prior literature that in these situations analysts reduce their coverage, analysts' forecast accuracy decreases, and their recommendations are downgraded.

We attempt to contribute to the combined literature stream of earnings quality and analyst forecasts by using misrepresentations as a more reliable proxy for low earnings quality. Unlike prior literature (e.g. Griffin 2003; Ye and Yu 2017; Kryzandowski and Zhang 2013), we focus on the period before the misrepresentation clearly becomes public knowledge e.g. due to a restatement announcement. Moreover, the prior literature has focused on measuring forecast accuracy (forecasted value minus actual value). In contrast to this, we focus on the change in the forecast before and after the annual report was published (forecast after minus forecast before). In this way, we can directly measure the impact of the misrepresented annual report. We focus on the context of low earnings quality and ask how this context affects analysts' earnings forecasts. It leads to the following research question:

RESEARCH QUESTION: *How are sell-side financial analysts affected by low earnings quality when creating their earnings forecasts?*

We define affected as meaning those changes made in the earnings forecast due to the annual report and its surrounding activities. We use misrepresentations as a proxy for low earnings quality. The research question can logically only have three outcomes: no analyst is affected by the low earnings quality, some analysts are affected, and all the analysts are affected. The following question is then whether analysts are able to identify the misrepresentation itself and act accordingly. Acting accordingly would be, for instance, to stop following the underlying firm or to be more cautious when preparing the forecasts.

Method

Main Regressions

The underlying objective of the paper is to compare the effect of low earnings quality (the misrepresented annual report) on sell-side financial analysts. This leads first to the question of how the “effect” should be measured. An advantage here is that sell-side analysts by the nature of their profession publish an extensive amount of information about their assessment of firms. Similar to the prior literature, in our study we use the earnings per share since it reflects the expected earnings of the firm from the shareholder’s perspective (e.g. Ayres et al. 2017, Hunton and McEwen 1997, Duru and Reeb 2002). Moreover, we make use of the change in the number of analyst reports. The following question crystallizes our objective: Does the forecasts or coverage of analysts differ between immediately before and immediately after the publication of the annual report when comparing a misrepresented annual report with a non-misrepresented one? If there is a difference, we are also interested in knowing how the forecasts and coverage differ.

To answer the question, we take advantage of I/B/E/S which combines analyst forecasts within the time frame of one month to a set of forecasts. The database also provides the mean and median forecast for the set of analyst reports. This not only allows a comparison of the changes in analyst forecasts but also allows an analysis of the change in the actual number of analysts providing a forecast. It results in the following three OLS-regressions:

- (1) $\Delta Forecast_{i,j,t} = \alpha + \beta_1 Misrepresent_i + \beta_2 controls + \varepsilon$
- (2) $\Delta SD_Forecast_{i,t} = \alpha + \beta_1 Misrepresent_i + \beta_2 controls + \varepsilon$
- (3) $\Delta Follow_i = \alpha + \beta_1 Misrepresent_i + \beta_2 controls + \varepsilon$

where

Forecast = the EPS forecast for firm i of the analyst j for period t

SD_Forecast = the standard deviation of the analyst forecasts for firm i and forecast period t

Follow = number of analysts following firm i

Misrepresent = indicator variable showing 1 if the financial report of firm i is misrepresented and 0 else

controls = represents a set of control variables detailed in the next section.

Each of the three dependent variables is calculated as the difference between the last set of analyst forecasts before the annual report was disclosed and the first one after the annual report was disclosed (calculation: after minus before, all variables

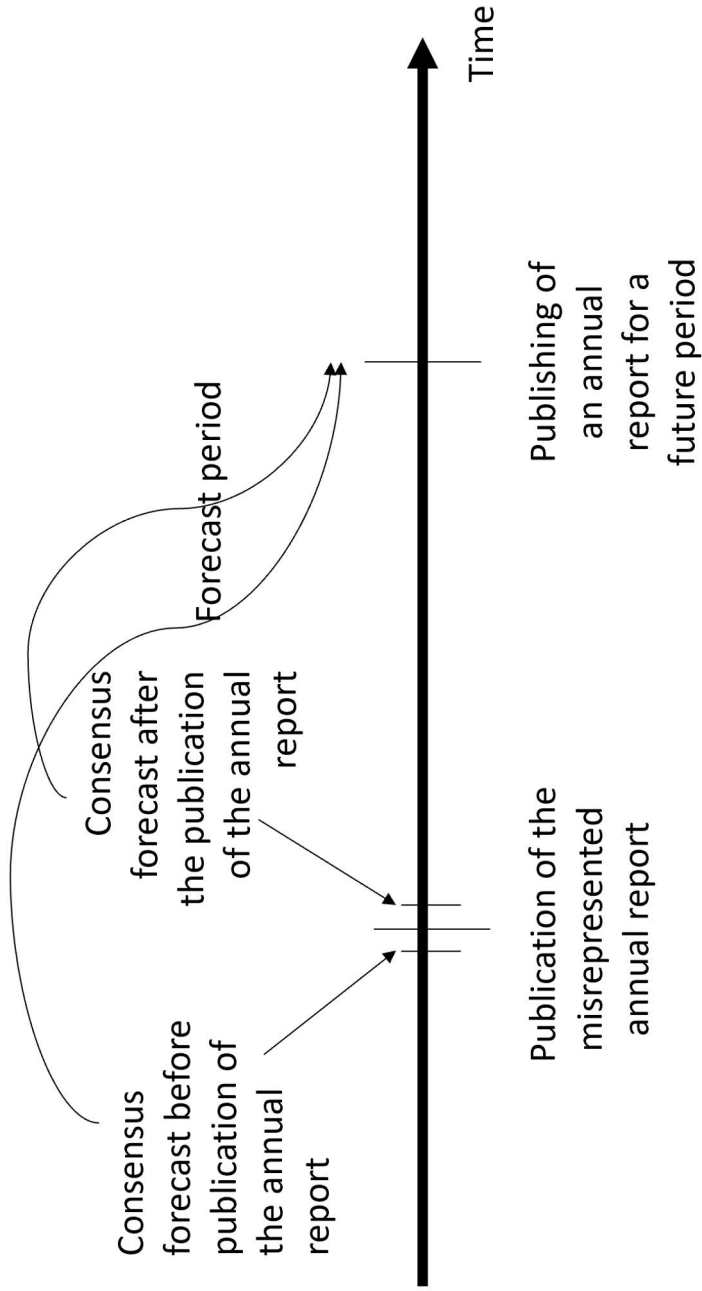
are reported in Appendix A).²⁶ Hence, $\Delta Forecast$ is the difference between the first EPS consensus forecast after the annual report was published minus the last EPS consensus forecast before the annual report was published (calculation: after minus before). $\Delta Forecast$ is thereby split once into the difference in the mean consensus forecast among all analyst ($\Delta Mean_Forecast$) and difference in the median consensus forecast among all analysts ($\Delta Median_Forecast$).

Our expectation for the outcome is for the case that analysts are unaffected by the low earnings quality (do not notice the misrepresentation) that there is no difference in the change in the EPS forecasts. Consequently, our dependent variable $\Delta Mean_Forecast$ ($\Delta Median_Forecast$) would be in this case unaffected by the independent variable *Misrepresent*. However, it is known from a survey conducted by Brown et al. (2015) that analysts adjust the EPS forecast downwards if they identify a “red flag” suggesting a (possible) misrepresentation. Hence, the analyst reports of those analysts identifying a “red flag” contains (in many cases) a lower EPS forecast. Consequently, our expectation in the case of analysts detecting the low earnings quality (misrepresentation) is that the independent variable *Misrepresent* has a negative impact on the dependent variable $\Delta Mean_Forecast$ ($\Delta Median_Forecast$).

We took special care to ensure that the forecast in each case was done for the same period in the future. This special care approach is illustrated in Figure 2. There exists a consensus forecast before and a consensus forecast after the misrepresented annual report is published. However, both of these forecasts are for the same period in the future (the realized figures will be disclosed in the same forthcoming (future) annual report). It is important to note that the forecast horizon drops by one after the annual report is published since with the publication “one year” passed in terms of analysts’ forecasts. Thus, e.g. a forecast two years before the disclosure of the misrepresented annual report is compared with a forecast one year after the misrepresented annual report was published. In other words, the target period for forecasting is the same in before and after misrepresented situations.

²⁶ It is theoretically possible that first the knowledge of a potential misrepresentation becomes public and then the analysts’ forecasts occur. However, the number of cases where this could potentially have happened is low and consequently disregarded.

FIGURE 2 Settling to Compare Analysts' Consensus Forecasts



The $\Delta SD_Forecast$ is the standard deviation of the EPS-forecasts for the set of analysts. The underlying question here was whether some analysts identified the annual report as misrepresented but did not adjust their forecast based on the report while some did not identify the misrepresentation and hence rely on the report and adjust their forecast. The consequence of this would be an increase in the spread among the analysts which would result in a larger standard deviation. Our expectation was that if only some analysts identify the low earnings quality (misrepresentation) then β_1 in equation 2 would be positive. As for the previous dependent variables, we ensured that the analyst forecasts for the same period in the future were compared with each other.

$\Delta Follow$ is the difference between the number of analysts providing a forecast before the annual report was disclosed and after (calculation: after minus before). The idea for this dependent variable $\Delta Follow$ is that an analyst who senses something suspicious could simply choose to stop following the firm. Consequently, the expectation for analysts being suspicious about the annual report is the significantly negative coefficient for β_1 in equation 3. Theoretically, the analysts providing the forecast before the misrepresentation do not need to be the same as after. However, a certain level of fluctuation among analysts is normal and would affect the control group as well.

Our research design is distinguished from others reviewed in this paper by the fact that we concentrated on the difference between two consecutive consensus forecasts. A typical design in the prior literature was rather a means of testing the accuracy of analyst forecasts (e.g. Behn et al. 2008; Salerno 2014). This means that in a typical design, the analyst forecast is compared with the actual earnings. We do not follow this design mainly due to the following reasons: Once the misrepresentation is revealed, financial figures are disturbed (Kloppenburger 2021a). Hence, the forecasts from before the misrepresentation is revealed might be highly inaccurate due to unreliable financial figures. Moreover, a suitable control sample of firms in a comparable state or situation would be difficult or impossible to find.

Therefore, our research design aims to compare the important elements of the work of the analysts (following a firm and forecasting) between two points in time. More specifically, our design allow us to compare the elements of analysts' work around the phenomenon of the misrepresentation and thereby how analysts are affected by the misrepresentation.

Controls

In line with prior literature, we used the following set of control variables (see also Appendix A for the list of variables):

Size = log(total assets)

Number of segments = log(no. of segments)

Numest = number of analyst reports after the (misrepresented) annual report was published

SD_ROE = standard deviation of past years' return on equity

EPS_growth = difference between prior year's EPS and current years EPS

Sales_growth = Compound average growth rate over the prior three to five fiscal years

Book-to-market = book value of equity/market value of equity

Prior literature has shown that larger firms are more likely to have several analysts covering them (Bhushan 1989; Brennan and Hughes 1991), and more forthcoming disclosure policies (Lang and Lundholm 1996). Consequently, the accuracy of the analysts is higher for these firms (Lang et al. 2003). Therefore, to control for such effects, we included the logarithm of the total assets (*Size*) as a control variable. Furthermore, the complexity of a firm quite naturally makes it harder for analysts to provide exact forecasts. Thus, following the prior literature, we included the logarithm of the number of segments (*Number of segments*) to control for complexity (Bhushan 1989, Bhandari et al. 2018, Lehavy et al. 2011). Additionally, we included the number of analysts preparing an analyst report (*Numest*) since the prior literature demonstrates that their number probably affects the information environment and analyst forecast characteristics (Barron et al. 1998; Chen and Tiras 2015). The latter control variable is not included in equation 1 since the number of analysts is covered in the dependent variable.

Following Lang and Lundholm (1996) as well as Bhandari et al. (2018), we measured the volatility of earnings as the standard deviation for all available past years' return on equity (*SD_ROE*) with a maximum of ten years. The idea behind this is that stable earnings are easier to forecast and thus the forecast quality increases. Additionally, similar to the prior literature, we measured the growth in earnings-per-share (*EPS_growth*) between the last and the current annual report (Bhandari et al. 2018; Lehavy et al. 2011). The aim of the variable is to measure to what extent the analysts have been surprised by the earnings disclosed in the current annual report. Moreover, we included the compound average growth rate in sales over the prior three to five years (*Sales_growth*) as a proxy for the growth in the firm. Following Lehavy et al. (2011), the growth in sales is a good proxy for the overall growth of a firm. The idea behind this is that high growth makes it difficult for an analyst to make accurate

forecasts. Moreover, the prior literature was able to show that firms with a lower book value of equity to market value of equity ratio (closer to 0) have a greater information asymmetry and consequently are harder to forecast (Huddart and Ke 2007; Donnelly 2014). Hence, we included the book-to-market ratio (*Book-to-market*) as a control variable as well. Furthermore, variables capturing year- and industry- (two digit SIC-code) fixed effects are included to control for these unrelated effects. All continuous variables are winsorised at the 1 and 99% level. The standard errors are robust and clustered at the firm level. The data originates from I/B/E/S and COMPUSTAT.

Design of Additional Tests

With the additional tests displayed in this section we endeavoured to scrutinise whether our main results were sensitive to adjustments in dependent variables. The results from these tests provide information about the robustness of our main results. We introduce in the following two exemplary variations. First, the underlying estimate for the mean and median consensus forecast as well as for the standard deviation in earnings per share. Thus, the earnings are scaled by the shares outstanding. However, one can argue that the number of shares outstanding varies too much to make firms comparable. Consequently, a different scaling variable needed to be used. In the case of the number of analysts following a firm, we do not apply any scaling. However, one can argue that where there is a low number of analysts following the firm one more (or one less) analyst makes a greater impact than it would do with a large number of analysts following. Hence, scaling the variable to increase its comparability could be considered. Second, the prior literature typically took the absolute value when calculating the forecast accuracy (e.g. Bhandari et al. 2018; Lang and Lundholm 1996; Lang et al. 2003). Although, strictly speaking, we do not measure the forecast accuracy, it could be argued whether our measure is in fact comparable with prior literature.

To overcome these two points of potential critique, we re-ran equations 1, 2 and 3 with slightly modified dependent variables in the following way (see also Appendix A for the variables):

Equation 1: The dependent variable in equation 1 is the difference between the mean (median) analysts' last consensus forecast before the misrepresented annual report is disclosed and the first after the disclosure. We addressed the issue of scaling the outstanding shares by computing the percentage difference. We therefore divided the difference in the mean (median) consensus forecast by the last forecast before the disclosure of the misrepresented report. Moreover, to increase the comparability to prior literature, we took the absolute value so that the dependent variable in the modified version reflects the absolute difference in percentage between the last consensus forecast before the misrepresented annual report was disclosed and the first

after the disclosure. We name these modified variables as *Percent_absolute_ΔMean_Forecast* and *Percent_absolute_ΔMedian_Forecast*.

Since we use absolute values, the negative outliers become positive. However, they remain outliers. Therefore, we winzorise at the 0 and 98% level²⁷.

Equation 2: The variation of the dependent variable in equation 2 follows the logic of a lack of scaling. The standard deviation measures the dispersion between analysts. Subsequently, one can argue that the interpretation of the difference in the dispersion depends on the base value of the dispersion (dispersion before the annual report is published). Simplified this means: a change in the dispersion by \$0.01 has a greater impact if the base value of the dispersion is very small compared to a large value. Therefore, we modified the change in the dispersion by calculating the change in the dispersion in percentage (*Percent_ΔSD_Forecast*).

In contrast to equation 1, we did not use the absolute values since a decrease in the dispersion would lead to a different interpretation compared to an increase. A decrease would show that analysts agree more with each other on the forecast while an increase could be interpreted as a higher degree of disagreement among analysts. A discussion of the results of the additional tests is presented in the result section after the main results.

Equation 3: The dependent variable in equation 3 is the difference in the number of analysts included in the consensus forecast in the month before and the month after the misrepresented annual report was published. To overcome the scaling problems, we calculated the percentage change in the number of analysts following. We created the variable *Percent_ΔFollow* by dividing the difference in the number of analysts following (the previous dependent variable *ΔFollow*) by the number of analysts following the last consensus forecast before the disclosure of the misrepresented annual report. We did not take the absolute values since analysts stopping following the firm is an important part of our research question. Using absolute values would prevent this part.

²⁷ We alternatively winzorised at the 1 and 99% level and took the absolute values afterwards. Qualitatively this did not change the results.

Data

One of the tasks of the US government agency Securities and Exchange Commission (SEC) is to, among others, supervise and monitor annual reports to detect misrepresentations. An overview of the investigation process including the selection process of the investigated firms can be found in Cunningham and Leidner (2020) and Stice-Lawrence (2023). Described in brief, every year the SEC checks around one third of all annual reports for potential misrepresentation. The choice of which annual reports are examined depends on the SEC and is case-specific. However, it is known that certain events (e.g. restatement announcement) trigger an inquiry by the SEC (Dechow et al. 2011). The process of the inquiry is as follows: In the first step, the SEC analyzes the annual report (10-K filing). If questions arise, they informally ask the firm to answer these questions. In cases where the answer to the questions do not satisfy the SEC, they start a formal investigation. In cases where the SEC identifies violations in the formal investigation, they publish their findings in an Accounting and Auditing Enforcement Release (AAER) and prosecute the cases in court. These AAERs are the basis of our dataset.

A violation of Section 13(b) of the 1934 Securities and Exchange Act is (if detected) disclosed in an AAER. Thus, we rely in our study, similar to Cotter and Young (2007), on the firms mentioned in these AAERs as “misrepresenting”. A major advantage of the dataset is that it is based on the investigation of the SEC. The SEC as a US government agency is powerful and neutral. Hence, the outcome of their investigations can be considered credible.

We collected from the AAERs similar to Dechow et al. (2011) misrepresenting firms. We focused on AAERs due to accounting malpractice by the firm itself. Thus, AAERs due to other reasons like auditor misbehavior are excluded. We cover AAERs published until the year 2017. However, there are only misrepresented firm years until 2013. The difference in years is the time needed by the SEC for the investigation. We collected the financial information for the annual reports from COMPUSTAT and analyst specific data from I/B/E/S.

It needs to be noted that there are two different types of forecasts available: GAAP and “street” earnings. There has been a debate about the question of using forecasts based on GAAP rather than “street” earnings (e.g. Bradshawn and Sloan 2002; Livnat and Mendenhall 2006; Gu and Chen 2004; Bradshawn et al. 2018). GAAP earnings are the reported earnings by the company. These earnings follow (or at least claim to follow) all regulations according to GAAP. Street earnings are earnings adjusted by the analysts. In these earnings certain expenses considered to be “non-recurring” or “non-cash” are excluded (Bradshawn and Sloan 2002). This leads to street earnings being higher or on the same level compared to GAAP-earnings (Abarnell and Lehavy

2007). As Bradshaw et al. (2018) show, the number of forecasts based on GAAP earnings available on I/B/E/S is far below the number of “street” earnings. In the years before 2003, almost no forecasts based on GAAP earnings are available. Thus, for our research we used “street” earnings.

Using “street” earnings instead of GAAP earnings leads to the question of the impact the choice has on the results. Here the question arises of whether there is a systematic problem meaning that the misrepresented annual report is treated by analysts differently than the non-misrepresented one. One could argue that due to certain items being excluded in the “street” earnings this could be the subject of misrepresentations. The question then arises as to whether these items and the number of these items have been consistently excluded in the forecast before the publication of the misrepresented annual report and afterwards. In such cases, there would not be any impact on the dependent variables since the dependent variables capture the difference between these two points in time. Moreover, it is known that most of the misrepresentations are done via revenue recognition or main expense items (Dechow et al. 2011). Hence, the impact of using “street” earnings on the results can be seen as minimal.

An overview of the data can be found in *Table 1*. As *Panel A* shows, we could identify 520 firms in the AAERs who misrepresented their annual reports between 1991 and 2013. We had to delete 106 firms since they were not available on I/B/E/S. This could be, for example, because there had never been any analyst following the firm. Second, we deleted 182 firms who had no data on I/B/E/S during the misrepresented firm year. This could be, for example, because there was no analyst following the firm in the particular year. Lastly, we deleted 54 firms because of insufficient COMPUSTAT data. This led to a total sample of 178 misrepresenting firms and 373 misrepresented firm years between 1991 and 2013. An overview of the number of misrepresented annual reports per year can be found in *Table 1 Panel B*. The distribution shows a low number at the beginning of the 90s, a peak around the year 2001, and a decline in the years afterwards. Multiple factors influenced the distribution. One main factor is the availability of the data in other databases (especially I/B/E/S). Another factor is the delay between the misrepresentation period and the publication of the AAER, which has been previously explained. It naturally requires time until the potential misrepresentation is uncovered and only after this event occurs can the SEC start their investigation. The time until the misrepresentation is uncovered can vary from a few months to several years. The SEC investigation typically takes multiple years as well. Thus, there are several firms in the latter years of our dataset which misrepresented and will become part of an AAER but were undetected when we were collecting the data.

Table 1 Overview of the Data

Panel A Overview of the Reduction in Sample Size

Firms with misrepresented firm years between 1991 and 2013	520
Firms not on I/B/E/S	- 106
Firms with Misrepresented firm years in I/B/E/S between 1991 and 2013	414
Firms with no analysts following during the misrepresentation period	- 182
Firms with insufficient COMPUSTAT data	- 54
Total number of firms in the dataset	178

Panel B Overview of Misrepresented Firm Years

Year	Number	Percentage	Year	Number	Percentage
1991	8	2.14%	2003	29	7.77%
1992	4	1.07%	2004	23	6.17%
1993	3	0.80%	2005	18	4.83%
1994	9	2.41%	2006	12	3.22%
1995	10	2.68%	2007	11	2.95%
1996	10	2.68%	2008	6	1.61%
1997	22	5.90%	2009	6	1.61%
1998	29	7.77%	2010	8	2.14%
1999	34	9.12%	2011	9	2.41%
2000	30	8.04%	2012	11	2.95%
2001	45	12.06%	2013	1	0.27%
2002	35	9.38%	Total	373	100.00%

An analyst can provide a forecast for one period or for multiple periods. Thus, it is possible that several forecasts have been influenced by one misrepresented annual report. In such cases, we included all forecasts influenced by the misrepresented annual report in our dataset. This led to 681 forecasts influenced by a misrepresented annual report. An overview of the data and its distribution can be found in *Table 2 Panel A*. It can be seen that the number of misrepresentations in *Table 1 Panel B* and the number of analysts' forecasts have a quite similar profile in terms of occurrence.

Table 2 Overview of the corresponding numbers of analyst forecasts

Panel A Misrepresented Firm Years

Year	Number	Percentage	Year	Number	Percentage
1991	9	1.32%	2003	64	9.40%
1992	8	1.17%	2004	54	7.93%
1993	4	0.59%	2005	36	5.29%
1994	12	1.76%	2006	23	3.38%
1995	17	2.50%	2007	18	2.64%
1996	16	2.35%	2008	9	1.32%
1997	38	5.58%	2009	14	2.06%
1998	46	6.75%	2010	13	1.91%
1999	51	7.49%	2011	18	2.64%
2000	51	7.49%	2012	19	2.79%
2001	89	13.07%	2013	2	0.29%
2002	70	10.28%	Total	681	100.00%

Since it is possible that analysts make forecasts for multiple periods, one misrepresented annual report might influence multiple sets of analysts' forecasts. The panel shows the distribution of the sets of analysts' forecasts.

Panel B Control Sample

Year	Number	Percentage	Year	Number	Percentage
1991	174	4.42%	2003	170	4.32%
1992	185	4.70%	2004	207	5.26%
1993	172	4.37%	2005	230	5.85%
1994	166	4.22%	2006	218	5.54%
1995	163	4.14%	2007	226	5.74%
1996	165	4.19%	2008	146	3.71%
1997	140	3.56%	2009	225	5.72%
1998	134	3.41%	2010	233	5.92%
1999	98	2.49%	2011	253	6.43%
2000	74	1.88%	2012	235	5.97%
2001	98	2.49%	2013	32	0.81%
2002	163	4.14%	Total	3934	100.00%

The control sample bases on all non-misrepresented annual reports of misrepresenting firms within our time range. The distribution of the sets of analyst forecasts based on these non-misrepresented annual reports are shown in the Panel.

Panel C Total Sample

Analyst reports influenced by a misrepresented annual report	681
Analyst reports influenced by a non-misrepresented annual report	3934
Total Sample	4615

The distribution of the control sample is shown in *Table 2 Panel B*. Our control sample consists of 1888 non-misrepresented annual reports and 3934 sets of analyst forecasts. We chose as the control sample all the non-misrepresented firm years of the misrepresenting firms between 1991 and 2013. We used the same firms as a control to mitigate firm-specific effects. Moreover, it is known that misrepresenting firms typically engage in earnings management before the misrepresentation period (Ettredge et al. 2010). This often leads to an overvaluation compared to the fundamental firm value in the period prior the misrepresentation (Badertscher et al. 2011). Thus, it can be inferred that around the misrepresentation period, the earnings quality is also low, and thus it can be inferred that the control sample as well as the sample of misrepresenting firms have a low earnings quality. This is important to note when considering the comparability between both samples.

The total sample of sets of analyst reports exposed to the misrepresented annual reports and the control sample are shown in *Table 2 Panel C*. It consists of 4615 analyst reports. Of the sample 14.76% are analyst reports influenced by misrepresented annual reports and 85.24% belong to the control sample.

Results

Descriptive Statistics

The descriptive statistics are shown in *Table 3 Panel A-C*. In *Panel A*, the results for all the firm years have been pooled irrespective of whether or not their annual report were misrepresented. The results show that from the mean of the variable *Misrepresent* it can be concluded that the sample is divided into 14.79% misrepresented firm years and consequently 85.21% non-misrepresented firm years. Thus, although the non-misrepresented firm years are dominant, a misrepresented firm year in the sample is not a rare event.

The mean and median differences between the last consensus forecast before and the first after the misrepresented annual report was published ($\Delta Mean_Forecast$ and $\Delta Median_Forecast$) have almost the same mean values and have the same values in the 25th, 50th and 75th percentile. This denotes a similar distribution in both variables and consequently a smooth distribution of the analyst forecasts. The difference in the standard deviation ($\Delta SD_Forecast$ ²⁸), which reflects the dispersion among the analysts, increases in a comparison between immediately before and immediately after the annual report was published. The increase can be a reflection of multiple different interpretations of the annual report by the analysts. With a longer time after the publishing of the annual report there may be a clearer picture from the perspective of the analysts and thus a lower standard deviation would. Thus, the standard deviation would decrease as more time transpires between the annual report and the consensus forecast. It should be noted that there needs to be at least two analyst reports to have a standard deviation. Hence, the number of observations related to the standard deviation drops is compared to the remaining variables in *Table 3*.

The difference in the number of analysts ($\Delta Follow$) is constantly negative in the 75th percentile. Thus, it can be concluded that the number of analysts decreases during the window before and after the annual report is published by the firm. One possible explanation can be that the information asymmetry which needs to be overcome by the analyst report is lowest after the firm itself publishes extensive information about themselves as part of the annual report.

²⁸ It is a requirement for a standard deviation to occur that a consensus forecast consists of at least two analysts following the firm before and after the disclosure of the annual report. Since this is not always the case, the number of observations is lower for the variable $\Delta SD_Forecast.l$

Table 3 Descriptive Statistics

Panel A All firms pooled

	N	mean	stdev	25	median	75
<i>Misrepresent</i>	4615	0.148	0.355	0.000	0.000	0.000
<i>ΔMean_Forecast</i>	4615	0.286	1.220	-0.140	0.050	0.450
<i>ΔMedian_Forecast</i>	4615	0.245	0.766	-0.140	0.050	0.450
<i>ΔSD_Forecast</i>	2431	0.108	0.168	0.010	0.050	0.160
<i>ΔFollow</i>	4615	-5.794	6.951	-9.000	-4.000	-1.000
<i>Percent_absolute_ΔMean_Forecast</i>	4609	0.766	1.671	0.073	0.209	0.556
<i>Percent_absolute_ΔMedian_Forecast</i>	4610	0.768	1.674	0.074	0.208	0.563
<i>Percent_ΔSD_Forecast</i>	2289	2.809	4.051	0.188	1.500	3.833
<i>Percent_ΔFollow</i>	4615	-0.442	0.598	-0.824	-0.571	-0.167
<i>Size</i>	4615	7.590	2.153	6.107	7.544	9.258
<i>Number of segments</i>	4615	0.896	0.757	0.000	1.099	1.609
<i>Numest</i>	4615	4.335	5.283	1.000	2.000	6.000
<i>SD_ROE</i>	4615	0.622	1.600	0.088	0.188	0.385
<i>EPS_growth</i>	4615	0.138	0.480	0.010	0.026	0.080
<i>Sales_growth</i>	4615	0.110	0.177	0.014	0.071	0.158
<i>Book-to-market</i>	4615	0.424	0.594	0.202	0.382	0.598

All continuous variables are winzorized, absolute values are winzorized at a 0 and 98% level, all other at a 1 and 99% level. The variables are explained in the method section. A short overview can be found in Appendix A.

Panel B Only Misrepresented Firm Years

	N	mean	stdev	25	median	75
<i>Misrepresent</i>	681	1.000	0.000	1.000	1.000	1.000
<i>ΔMean_Forecast</i>	681	0.427	1.167	-0.080	0.130	0.620
<i>ΔMedian_Forecast</i>	681	0.357	0.788	-0.100	0.130	0.600
<i>ΔSD_Forecast</i>	353	0.101	0.328	0.000	0.040	0.100
<i>ΔFollow</i>	681	-5.554	6.544	-8.000	-4.000	-1.000
<i>Percent_absolute_ΔMean_Forecast</i>	680	0.939	1.835	0.097	0.277	0.801
<i>Percent_absolute_ΔMedian_Forecast</i>	679	1.060	2.464	0.099	0.273	0.808
<i>Percent_ΔSD_Forecast</i>	326	3.278	4.794	0.000	1.516	5.000
<i>Percent_ΔFollow</i>	681	-0.453	0.520	-0.833	-0.625	-0.182
<i>Size</i>	681	7.465	1.972	6.135	7.225	8.845
<i>Number of segments</i>	681	0.941	0.766	0.000	1.099	1.609
<i>Numest</i>	681	3.990	4.566	1.000	2.000	5.000
<i>SD_ROE</i>	681	0.420	0.989	0.079	0.185	0.330
<i>EPS_growth</i>	681	0.095	0.357	0.008	0.020	0.063
<i>Sales_growth</i>	681	0.188	0.208	0.058	0.138	0.266
<i>Book-to-market</i>	681	0.451	0.454	0.188	0.342	0.599

All continuous variables are winzorized, absolute values are winzorized at a 0 and 98% level, all other at a 1 and 99% level. The variables are explained in the method section. A short overview can be found in Appendix A.

Panel C Control Sample

	N	mean	stdev	25	median	75
<i>Misrepresent</i>	3934	0.000	0.000	0.000	0.000	0.000
<i>ΔMean_Forecast</i>	3934	0.261	1.228	-0.150	0.040	0.420
<i>ΔMedian_Forecast</i>	3934	0.225	0.761	-0.150	0.030	0.420
<i>ΔSD_Forecast</i>	2078	0.138	0.366	0.010	0.050	0.160
<i>ΔFollow</i>	3934	-5.838	6.769	-9.000	-4.000	-1.000
<i>Percent_absolute_ΔMean_Forecast</i>	3929	0.736	1.639	0.070	0.200	0.524
<i>Percent_absolute_ΔMedian_Forecast</i>	3931	0.824	2.154	0.071	0.200	0.525
<i>Percent_ΔSD_Forecast</i>	1963	2.731	3.910	0.231	1.500	3.667
<i>Percent_ΔFollow</i>	3934	-0.458	0.459	-0.818	-0.571	-0.167
<i>Size</i>	3934	7.610	2.182	6.084	7.621	9.308
<i>Number of segments</i>	3934	0.887	0.755	0.000	1.099	1.609
<i>Numest</i>	3934	4.385	5.379	1.000	2.000	6.000
<i>SD_ROE</i>	3934	0.657	1.682	0.089	0.190	0.385
<i>EPS_growth</i>	3934	0.146	0.498	0.010	0.027	0.084
<i>Sales_growth</i>	3934	0.097	0.167	0.010	0.063	0.142
<i>Book-to-market</i>	3934	0.419	0.616	0.205	0.396	0.598

Panel D Comparison Between Misrepresented Firm Years and Non-Misrepresented Firm Years

	Misrepresented firm years			Non-Misrepresented firm years			Tests for statistical significance			
	N	mean	median	N	mean	Median	t-value	p-value	z-value	ranksum test
<i>Misrepresent</i>	681	1.000	1.000	3934	0.000	0.000				
<i>ΔMean_Forecast</i>	681	0.427	0.130	3934	0.261	0.040	3.279	0.001	4.752	0.000
<i>ΔMedian_Forecast</i>	681	0.357	0.130	3934	0.225	0.030	4.146	0.000	4.580	0.000
<i>ΔSD_Forecast</i>	353	0.101	0.040	2078	0.138	0.050	1.799	0.072	2.173	0.030
<i>ΔFollow</i>	681	-5.554	-4.000	3934	-5.838	-4.000	0.993	0.321	0.430	0.667
<i>Percent_absolute_ΔMean_Forecast</i>	680	0.939	0.277	3929	0.736	0.200	2.927	0.003	4.640	0.000
<i>Percent_absolute_ΔMedian_Forecast</i>	679	1.060	0.273	3931	0.824	0.200	2.577	0.010	4.553	0.000
<i>Percent_ΔSD_Forecast</i>	326	3.278	1.516	1963	2.731	1.500	2.259	0.024	0.212	0.832
<i>Percent_ΔFollow</i>	681	-0.453	-0.625	3934	-0.458	-0.571	0.291	0.771	1.259	0.208
<i>Size</i>	681	7.465	7.225	3934	7.610	7.621	1.544	0.123	2.366	0.018
<i>Number of segments</i>	681	0.941	1.099	3934	0.887	1.099	1.756	0.079	1.943	0.052
<i>Numest</i>	681	3.990	2.000	3934	4.385	2.000	1.550	0.121	0.603	0.529
<i>SD_ROE</i>	681	0.420	0.185	3934	0.657	0.190	3.596	0.000	3.547	0.000
<i>EPS_growth</i>	681	0.095	0.020	3934	0.146	0.027	2.530	0.011	4.656	0.000
<i>Sales_growth</i>	681	0.188	0.138	3934	0.097	0.063	12.726	0.000	14.056	0.000
<i>Book-to-market</i>	681	0.451	0.342	3934	0.419	0.396	1.292	0.197	1.916	0.055

All continuous variables are winzorized, absolute values are winzorized at a 0 and 98% level, all other at a 1 and 99% level. The variables are explained in the method section. A short overview can be found in Appendix A. Fields shaded in grey represent a significance on at least a 10% level. Variables based on the standard deviation require at least two analysts in the consensus forecast. Therefore, the number of these observations is below the number in the case of the remaining variables.

In principle, the percentage difference as well as the absolute value of the percentage difference in the number of analysts (*Percent_ΔFollow*), the mean of the consensus forecast (*Percent_absolute_ΔMean_Forecast*), the median of the consensus forecast (*Percent_absolute_ΔMedian_Forecast*), and the standard deviation (*Percent_ΔSD_Forecast*) behave in the same way as the unmodified variables. It is worth noting the percentage difference in the standard deviation (*Percent_ΔSD_Forecast*). The mean value of 2.809 signals an increase in the standard deviation between the last consensus forecast before the publication of the annual report and the first one after by around 281%. The median, with an increase of 150% is similarly clear. This supports the interpretation that the dispersion among analysts increases as a consequence of the annual report and the surrounding information.

The size (variable *Size*) is measured as the logarithm of the total assets. Due to the logarithm, the distribution is smooth. In addition, the number of segments (variable *Number of segments*) are measured as the logarithm of the number of segments. Without the logarithm, the mean and median would be around 3 segments. The variable *Numest* reflects the number of analysts who are part of the first consensus forecast after the annual report was published. Judging by the median, which has the value of two, it can be concluded that the majority of the firms only have a very few analysts providing forecasts shortly after the annual report is published. However, as shown by a mean of above 4 as well as above 6 in the 75th percentile, there are also many firms with several analysts following them.

The standard deviation of the return on equity (*SD_ROE*) shows a higher mean than median value. The mean is even higher than the 75th percentile. This can be interpreted as a signal that only a few very high values influence the mean while the median remains relatively unaffected. A similar phenomenon can be seen at the *EPS_growth*. Here the mean value is also higher than the median and the 75th percentile. The mean and median values of the *Sales_growth* as well as the *Book-to-market* ratio also signal that there could be a few very high values influencing the result. However, the mean values clearly remain beyond the 75th percentile. Thus, the phenomenon is less strong for these two variables.

In *Table 3 Panel B* and *Panel C*, only those cases are included where the annual report is misrepresented (*Panel B*) or non-misrepresented (*Panel C*). This is also the reason for a reduction in the number of observations. *Table 3 Panel B* already provides a glimpses into the results of the following regressions. The variable *ΔMean_Forecast* indicating the difference in the mean estimate before and after the disclosure of the misrepresented annual report, is larger compared to the same variable in *Panel A*. This suggests a larger increase in the analysts' forecasts of misrepresenting annual reports compared to the control sample. The same is true for the variable *ΔMedian_Forecast*. The standard deviation (*ΔSD_Forecast*) does not differ much compared to the

previous Panel. In addition, the change in the number of analysts following ($\Delta Follow$) is only slightly higher in *Panel B*. However, it needs to be noted that the value is not scaled and the number of analysts following during the misrepresented period is lower compared to the control sample (variable *Numest*). Hence, it might be that the differences are insignificant (a test is provided in Panel D and discussed at the bottom of this page).

The remaining variables indicate that the firms, during their misrepresenting period, are roughly equal in size and complexity (*Size* and *Number of segments*) compared to *Panel A* (or *C*) but differ in the standard deviation of the return on equity (*SD_ROE*). The latter is remarkable since it represents the standard deviation across all available returns on equity and the sample consists of the same firm, once during a period with a misrepresented annual report and once in a period without.

The results of *Table 3 Panel C* reflect the data based on all non-misrepresented annual reports of the firms in the sample. The number of non-misrepresented annual reports exceeds by far the number of misrepresented ones. Thus, it is probably less surprising that the results of *Panel C* coincide largely with those of *Panel A* (all observations pooled). Therefore, an extensive discussion about *Panel C* is not necessary (see discussion for *Panel A*).

Table 3 Panel D contains a comparison of the sample containing only misrepresented firm years as well as the sample containing only non-misrepresented firm years (control sample). Moreover, the results of tests for statistical significance in the difference between the two samples is presented. The difference is one time calculated as mean difference (t-test) and one time as median difference (ranksum test). Areas shaded in grey signal a statistically significant difference at least on a 10% level.

The results show for almost all variables a statistically significant difference in its mean and median. The exceptions are *Percent $\Delta SD_Forecast$* with only a significant difference in the mean, *Size* and *Book-to-market* with only a significant difference in the median, and $\Delta Follow$, *Percent $\Delta Follow$* , and *Numest* with no significant differences at all. The overwhelming number of significantly different variables shows how different the misrepresented firm years are compared to the non-misrepresented ones. It signals that firms differ in their misrepresented firm year compared to their non-misrepresented firm years. Interesting is probably that the values for the variables $\Delta Mean_Forecast$ and $\Delta Median_Forecast$ are for the misrepresented firm years significantly above the values for the non-misrepresented ones. It would imply that the consensus forecast for these firms increases around the disclosure of the misrepresented annual report more than around a non-misrepresented one.

Main Results

The study approaches the impact of low earnings quality on sell-side financial analysts. The aim of the research question is to identify how analysts are affected by the low earnings quality. We are relying hereby on a misrepresentation as a proxy for a low earnings quality. A major question is thereby to which extent the misrepresentation is observable for an analyst since misrepresentations typically become public knowledge months after the disclosure of the misrepresented annual report. However, there could be several indicators that are related to earnings quality such as an exceptionally high number of discretionary accruals in the annual report already (Ettredge et al. 2010). Thus, it is possible for analysts to detect the low earnings quality but not the extent of it. Nevertheless, we consider it possible for analysts to identify a low earnings quality and react accordingly.

We took multiple perspectives to measure the impact of the low earnings quality on sell-side financial analysts. First, we determined the change in the mean and median consensus forecasts due to low earnings quality, second, the change in the standard deviation of the consensus forecast, and third, we determined the change in the number of analysts following the firm. The results are presented in *Table 4*. It should be noted that in each case the industry and the year fixed effects are included. It should also be noted that all standard errors are robust and clustered at the firm level. The explanatory power of the models as reflected by the R-squares lies between 12% and 23%. Since the aim of the paper is to identify how analysts are affected by a misrepresentation and not to fully explain the behavior of analysts, the R-squares and consequently the explanatory power is sufficiently high allowing reasonable conclusions to be made based on the model.

The results for the change in the mean of the consensus forecast is presented in *Table 4* column 1. These results indicate that the mean consensus forecast increases as a result of the misrepresentation. Similarly, as shown in column 2, the median forecast increases. Both results support the view that the majority of the firms not only successfully disguised the misrepresentation but were also able to mislead the analysts. They could even successfully convince the analysts to revise up their forecasts. The results are not solely affected by the misrepresented annual report as there are multiple further events taking place around the disclosure of the annual report which may have an impact on the analyst reports, for example, conference calls. However, it can be safely said that the majority of the analysts were unsuspecting or at least did not indicate their suspicion in their forecasts. There is (to the best of our knowledge) no prior literature investigating the change in the consensus forecast and consequently no comparison for our results.

Table 4 Main Results

	(1)	(2)	(3)	(4)
Dependent Variable	$\Delta Mean_Forecast$	$\Delta Median_Forecast$	$\Delta SD_Forecast$	$\Delta Follow$
<i>Misrepresent</i>	0.260*** (3.082)	0.190*** (3.248)	0.002 (0.137)	0.819*** (2.170)
<i>Size</i>	-0.001 (-0.085)	0.000 (-0.041)	0.004 (0.902)	-1.321*** (-10.056)
<i>Number of segments</i>	0.071 (1.282)	0.042 (1.172)	0.0271*** (3.243)	0.053 (0.190)
<i>Numest</i>	0.000 (0.044)	-0.001 (-0.451)	0.002 (1.597)	
<i>SD_ROE</i>	0.0559** (2.136)	0.0315** (2.056)	0.00885* (1.875)	0.158* (1.882)
<i>EPS_growth</i>	0.083 (-1.608)	-0.047 (-1.092)	0.000 (-0.011)	0.376 (1.539)
<i>Sales_growth</i>	-0.206 (-1.363)	0.159 (1.579)	0.004 (0.195)	-2.650*** (-2.881)
<i>Book-to-market</i>	-0.087 (-1.533)	-0.046 (-1.220)	-0.010 (-0.871)	0.703** (1.992)
<i>Constant</i>	0.035 (0.135)	0.124 (0.570)	-0.020 (-0.334)	7.683*** (6.040)
<i>Year and Industry FE</i>	yes	yes	yes	yes
Observations	4,615	4,615	2,431	4,615
R-squared	0.124	0.116	0.231	0.205
Robust t-statistics in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				

All continuous variables are winzorized, absolute values are winzorized at a 0 and 98% level, all other at a 1 and 99% level. Standard errors are robust and clustered at the firm-level. The variables are explained in the method section. A short overview of the variables can be found in Appendix A.

The control variables for the regressions in *Table 4* column 1 and 2 show almost identical results. Therefore, we have combined the discussion about these results. Moreover, we will do an in depth discussion of the control variables for these two columns and only discuss major points in the other two. The first control variable is the variable for size. *Size* is here measured as the log of total assets. Size is used here to measure the complexity of a firm since one would assume that a larger firm is more complex. The coefficient of the variable *Size* is (almost) zero. Hence, the variable has

no impact on the dependent variable $\Delta Mean_Forecast$. Another variable for complexity is the *Number of segments*. The *Number of segments* is here measured as the log of the number of segments that a firm has. The logic is that more segments signal more complexity of the firm. The coefficient for this variable is positive but insignificant. Thus, one can say that the complexity of the firm has no impact on the difference in the mean consensus forecast.

The next control variable *Numest* reflects the number of analysts following the firm after the (misrepresented) annual report was published. The variable is included in the regression to control for the information environment since having many analysts reports provide various kinds of information to take into consideration. The control variable *SD_ROE* is included to control for the difficulty to predict earnings. A low value means that earnings are easy to predict since they are relatively stable while a high value means that they are harder to predict due to their volatility (Lang and Lundholm 1996; Bhandari et al. 2018). That a high value and consequently a high volatility in earnings leads to a higher difference in the earnings forecasts (as the results suggest) is then probably less surprising. Therefore the level of difficulty for analysts to make a prediction is increased.

The control variable *EPS_growth* measures to what extent the earnings of a certain period surprised the analysts. Since this variable does not show any significance, it can be inferred that these surprises in earnings (reflected by the variable) do not lead to a difference in the mean consensus forecast. The control variable *Sales_growth* is used as a proxy for the overall growth of the firm. The idea is that a high growth firm is more difficult to forecast due to the rapid changes in the firm. The coefficient for this control variable is insignificant indicating that the overall growth of the firm has no impact on the change in the mean consensus forecast.

The prior literature has shown that the ratio of the book value of equity to the market value of equity is a measure of the difficulty to make accurate forecasts (Huddart and Ke 2007; Donnelly 2014). It is therefore a different difficulty compared to sales growth since sales growth requires the analyst to evaluate the economic conditions and combine them with the firm's characteristics (Lee et al. 2019). The book-to-market ratio rather mirrors internal factors like brand value or research achievements that are not included in book value of equity (Beaver and Ryan 2000). Consequently, we included the variable *Book-to-market* as a proxy for the firm-internal difficulty for analysts making forecasts. The results for the control variable *Book-to-market* does not show any significance indicating that the difficulty to make accurate forecasts is not impacting the difference in the mean consensus forecast.

The results for the change in the standard deviation of the consensus forecast is shown in *Table 4* column 3. The standard deviation shows to what extent the analysts forecasts deviate from each other. Thus, the lower the standard deviation the lesser

the amount of dispersion among the analysts. A major difference to the previous models is that there must be at least two analysts providing a forecast since otherwise a standard deviation would not exist by definition. Hence, the sample size decreases to 2431. With regard to the interpretation, the variable *Misrepresent* is not significant. Thus, the standard deviation (and with it the dispersion among analysts) is not impacted by the low earnings quality in the misrepresented annual report. Consequently, there seems to be the same level of consensus between analysts reacting to misrepresented or to non-misrepresented annual reports.

When looking at the control variables in *Table 4* column 3, only the *Number of segments* and the *SD_ROE* show significant differences to zero. A high number of segments as well as a high volatility in earnings increases the dispersion among analysts. In both cases, the variables reflect the difficulty of the analysts to make an accurate forecast. Consequently, it can be inferred that the difficulty to make an accurate forecast increases the dispersion among analysts. However, a problematic question remains as to why these two proxies for a difficulty to make an accurate forecast are significant while others (e.g. *Size*) are insignificant. We cannot provide a conclusive answer. It needs to be noted that the dependent variable only captures the difference in the standard deviation. Thus, it can well be that a control variable has a major impact on the dispersion among analysts. However, since the dispersion remains on the same high level, it does not have an effect in our regression.

One might think that analysts stop following a firm when they are suspicious of a misrepresentation. This is contrary to the survey results of Brown et al. (2015) who find that analysts rather revise their EPS-forecast downwards than stop following a misrepresenting firm. Nevertheless, we tested for the change in the number of analysts $\Delta Follow$ as well. The results for our test is disclosed in *Table 4* column 4. The regression result shows that the number of analysts following increases for misrepresented firm years compared to non-misrepresented ones. Thus, analysts are rather attracted by the low information quality of the report and do not stop following the firm. Although our design differs, our findings are in line with Lobo et al. (2012). We both could identify an increase in the number of analysts following firms whose annual report earnings quality is low. Probably, the demand for an analyst report is higher for such firms. Lobo et al. (2012) rely on a cross-sectional analysis while we focus on a time-series analysis. Moreover, the result is important since it shows that analysts are not dropping the firm since they detect a low earnings quality (or even a misrepresentation). In the contrary, analysts are attracted by such an environment.

The control variable for firm size is negative and significant. Thus, the number of analysts decreases more for larger firms than for smaller ones. A possible explanation could be the short time frame. Since we focus on the first consensus forecast after the disclosure of the annual report, an analyst might lack the time to prepare an in-depth

analysis of the firm in the case of a large firm size. However, this explanation does not coincide with the other measures of firm complexity: The number of segments as an alternative proxy for firm complexity does not show any significant results. Thus, our conclusions are indecisive based on the two measures and thus must assume that whether the complexity has an impact on the number of analysts following a firm cannot be made.

The extent to which earnings are easy to predict for analysts is measured with the variable *SD_ROE*. Since the variable shows significant results, it can be inferred that an increase in the standard deviation of the return on equity results in more analysts following a firm. Hence, more analysts follow a firm when their earnings are harder to predict. The variable *EPS_growth* is insignificant and can therefore be neglected.

The variable *Sales_growth* is negative and significant. Thus, it can be inferred that the number of analysts decreases more for firms with a high growth. An explanation could be similar to that given earlier for the firm size: An analyst may simply need more time to prepare a full-scale report for such a difficult case as a high growth firm.

The results for the control variable *Book-to-market* suggest that the book-to-market ratio has a positive impact on the number of analysts following a firm. The book-to-market ratio is a measure for the information asymmetry between the disclosed value of the firm and the value including hidden reserves (Huddart and Ke 2007; Donnelly 2014). As closer the book-to-market value is to 1²⁹ (book value of equity equals market value of equity) as easier it is for analysts to prepare their earnings forecast since the information asymmetry is smallest. Hence, our results indicate that more analysts stay as easier it is to make forecasts. Thus, as before, the result might be a reflection of analysts in the need of more time for preparing a report for firms with a low book-to-market value presumably due to its increased complexity.

To answer the first research question about the effect of the misrepresentation on sell-side financial analysts, the results of *Table 4* columns 1-4 combined lead to a depiction of analysts who are not only unaware of the low earnings quality of the misrepresented annual report, they even seem to have been misled. The analysts reach this conclusion without much deviation among each other. Especially when considering the background of the survey conducted by Brown et al. (2015), the results are surprising since a decline in the EPS-forecasts as a consequence of the misrepresentation would be in line with the survey. However, one has to keep in mind that it is not the main task of analysts to detect misrepresentations. Moreover, misrepresentations are a relatively rare event. One explanation could be that the analysts were not considering that the figures provided could be wrong. However, in

²⁹ We know from the descriptive statistics (*Table 3*) that the values for the variable *Book-to-market* lays in our dataset between 0 and 1.

such a case, there should not be any significant results regarding *Misrepresent*. Analysts of misrepresenting firms would have to behave like those of non-misrepresenting ones.

Another possible explanation could be that misrepresenting firms have been very supportive towards their analysts in order to attract them and have an influence on obtaining a positive report from them. This could be because these firms provide a multitude of analyst guidance or other supportive elements in and surrounding their annual report. However, in such a case one would expect the dispersion to decrease since making an accurate forecast becomes easier. What one can say is that the overly optimistic analyst reports may lead to problems with their role of overcoming the information asymmetry between firms and (potential) shareholders. Thus, one can question whether these reports help allocating capital efficiently.

We are carrying some caveats with our results. Most notably, we are not looking at the level of individual analysts but on an aggregate level. So, it is theoretically possible that entirely other analysts are following a firm after the misrepresented annual report is disclosed compared to before. Such a move would lead to questions about why an analyst should start following a firm that all the peers just left. A further caveat is that we focus only on a very short time-frame around the publication of the misrepresented annual report. This design-choice is needed to mitigate the impact of other factors influencing the analysts' forecasts. However, it might not give analysts sufficient time to detect the red flag hinting towards a misrepresentation.

Additional Tests

We analyzed multiple variations of our original research design in order to scrutinize our main results reported and their potential sensitivity to modifications in some variables. Among these analyses are the variations presented in *Table 5*. Compared to *Table 4* we altered only the dependent variables. In *Table 5* column 1 the results are presented for the deviation of the difference in the mean estimate.

The dependent variable *Percent_absolute_ΔMean_Forecast* reflects the absolute value of the percentage difference between the mean consensus forecast before and after the (misrepresented) annual report was published. It needs to be noted that there are no negative values due to the absolute values. Thus, the test for significance becomes a one-sided test since testing from a negative side is not feasible. The one-sided test needs to be taken into account when interpreting the results. Consequently, the t-value of the variable *Misrepresent* is significant at the 10%-level. This result is in line with the result in *Table 4* column 1. Hence, the conclusion remains that the misrepresentation rather increases the mean consensus forecast than decreases it. The same logic and similar results apply to the median consensus forecast (results in *Table 5* column 2).

Table 5 Additional Tests

	(1)	(2)	(3)	(4)
Dependent Variable	<i>Percent_absolute_ΔMean_Forecast</i>	<i>Percent_absolute_ΔMedian_Forecast</i>	<i>Percent_ΔSD_Forecast</i>	<i>Percent_ΔFollow</i>
<i>Misrepresent</i>	0.188* (1.665)	0.186* (1.680)	0.475 (1.623)	0.069* (1.734)
<i>Size</i>	-0.0856*** (-3.511)	-0.0846*** (-3.498)	-0.154* (-1.826)	-0.030*** (-3.156)
<i>Number of segments</i>	0.035 (0.553)	0.023 (0.346)	0.356** (2.11)	0.023 (1.056)
<i>Numest</i>	0.002 (0.548)	0.003 (0.706)	0.00471 (0.306)	
<i>SD_ROE</i>	0.0848*** (3.516)	0.0890*** (3.658)	-0.0279 (-0.586)	0.008 (1.349)
<i>EPS_growth</i>	0.059 (0.751)	0.015 (0.193)	0.215 (0.951)	0.0118 (0.550)
<i>Sales_growth</i>	0.382 (1.508)	0.367 (1.470)	-0.703 (-1.405)	-0.0106 (-0.157)
<i>Book-to-market</i>	0.009 (0.140)	0.026 (0.420)	-0.0149 (-0.0688)	0.046 (2.151)
<i>Constant</i>	1.053** (2.344)	1.023** (2.341)	12.66*** (14.29)	0.162 (1.417)
<i>Year and Industry FE</i>	yes	yes	yes	yes
Observations	4,609	4,610	2,289	4,615
R-squared	0.099	0.099	0.093	0.095
Robust t-statistics in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				

All continuous variables are winzorized, absolute values are winzorized at a 0 and 98% level, all other at a 1 and 99% level. Standard errors are robust and clustered at the firm-level. The variables are explained in the method section. A short overview of the variables can be found in Appendix A.

We also modified the dependent variable measuring the difference in the standard deviation *Percent_ΔSD_Forecast*. In this case, however, we did not take the absolute value since a negative change in the standard deviation would lead to a particularly different interpretation than a positive one. The results are presented in *Table 5* column 3. Since the variable *Misrepresent* does not show any significance at least on

a 10% level, the interpretation remains that the misrepresentation does not increase the dispersion of the analysts' forecasts.

Table 5 column 4 displays the results for the change in the number of analysts between the last consensus forecast before and the first consensus forecast after the disclosure of the (misrepresented) annual report *Percent_ΔFollow*. The alteration in this case is the use of the percentage change as dependent variable. However, there is still a significant increase in the number of analysts following firms in the vicinity of the misrepresentation and hence there is no change in the interpretation of the results due to the use of the percentage values.

Robustness Tests

A relevant question is whether only a certain type of analysts chooses to carry on following the misrepresenting firm. This could be e.g. due to the more optimistic analysts. To overcome the concern, we split the sample and added one interaction term for the original models presented in *Table 4* columns 1-3. The splitting was based on the number of analysts following after the (misrepresented) annual report was published. Specifically, besides running the expanded regression with the whole sample we run regressions separately for the less actively and the more actively followed firms. Regarding the interaction term, we extended the original model by including interaction variable $\Delta Follow \times Misrepresent$ for the regressions reported in *Table 4* columns 1-3.

In addition, we excluded *Numest* variable from the extended model due to the close resemblance with the number of analysts following that was already employed for the splitting of the data. The interaction term was aimed to capture how the mean (median) consensus forecast is influenced by the analysts deciding to carry on following the firm. The results of the robustness test regarding the analysts following are disclosed in *Table 6* below.

Table 6 Robustness Test

	(1)	(2)	(3)
Dependent Variable	$\Delta Mean_Forecast$	$\Delta Mean_Forecast$	$\Delta Mean_Forecast$
	All analysts	<10 analysts	>9 analysts
<i>Misrepresent</i>	0.339***	0.287***	0.471**
	(3.241)	(2.843)	(2.330)
$\Delta Follow$	0.00414	0.00403	0.00817
	(1.353)	(1.192)	(0.825)
$\Delta Follow \times$ <i>Misrepresent</i>	0.0156**	0.00998	0.0568**
	(2.347)	(1.483)	(2.528)
<i>Size</i>	0.00671	0.00528	0.0544
	(0.426)	(0.326)	(1.189)
<i>Number of segments</i>	0.0614	0.0569	0.0337
	(1.096)	(1.028)	(0.407)
<i>SD_ROE</i>	0.0545**	0.0433*	0.204**
	(2.074)	(1.888)	(2.083)
<i>EPS_growth</i>	-0.0839	-0.0834	-0.208
	(-1.605)	(-1.588)	(-1.561)
<i>Sales_growth</i>	0.221	0.194	0.482
	(1.487)	(1.282)	(1.094)
<i>Book-to-market</i>	-0.0960*	-0.0722	-0.427***
	(-1.689)	(-1.302)	(-3.389)
<i>Constant</i>	1.019***	0.994***	0.707
	(3.529)	(3.582)	(1.191)
<i>Year and Industry FE</i>	yes	yes	yes
Observations	4,615	3,974	641
R-squared	0.126	0.142	0.159
Robust t-statistics in parentheses			
*** p<0.01, ** p<0.05, * p<0.1			

All continuous variables are winzorized at a 1 and 99% level. Standard errors are robust and clustered at the firm-level. The variables are explained in the method section. A short overview can be found in Appendix A. The regression in (2) is limited to less than 10 analysts following the firm after the disclosure of the (misrepresented) annual report, in (3) it is more than 9

In Table 6 column 1, the results are presented for the dependent variable $\Delta Mean_Forecast$ and the full dataset. In column 2, the dataset is limited to all

observations with less than 10 analysts³⁰ following in the first consensus forecast after the annual report was published, in column 3 the dataset is limited to more than 9 analyst following. The coefficient of the main independent variable *Misrepresent* remains in all cases similar to *Table 4* positive and significant. Hence, the impact of the changes in the control variable are minimal on the main independent variable. The interaction term provides a significantly positive coefficient in column 1. However, in column 2 and 3, the significance is driven by firms with many analysts following. In the clear majority of observations, no significant differences between columns 1 and 3 are observable indicating that the main results are not driven by only few analysts following (column 2). The results with the dependent variable $\Delta Median_Forecast$ are qualitatively the same than with $\Delta Mean_Forecast$ and therefore not disclosed here.

Moreover, we did the same test for the dependent variable $\Delta SD_Forecast$. We were focussing on a similar logic as before. The aim is to identify whether certain analyst behaviour or certain analysts forecast tendencies have an impact on the standard deviation of analysts' forecasts. Therefore, we included the independent variables $\Delta Follow$ and $\Delta Mean_Forecast$ as well as the interaction terms between $\Delta Follow$ and *Misrepresent* and $\Delta Mean_Forecast$ and *Misrepresent*.

The results for the standard deviation (dependent variable $\Delta SD_Forecast$) is not disclosed. However, the coefficient of the main independent variable *Misrepresent* does not change much. Moreover, the added independent variables as well as the interaction terms remain insignificant indicating that the impact of the change in analysts and the impact of the mean consensus forecast is neglectable.

Firms choose for themselves whether they misrepresent or not. Hence, firms decide themselves whether they are part of the sample consisting of cases around misrepresented annual reports or if they are part of the control sample. This can be seen as a self-selection bias in our setting. To overcome the issue, we redid the analysis using the Heckman two-stage regression (Heckman 1979). The Heckman two-stage regression consists of two parts (stages): The main regression and the selection model. The selection model is in essence a prediction model identifying the likelihood of a firm being erroneously in the control sample. With this likelihood, the main regression is adjusted to also include unobserved misrepresented annual reports.

When choosing suitable variables for the selection model, we relied on the prediction model of Dechow et al. (2011) since these variables had proven to be good

³⁰ The number of 10 analysts is chosen since results for the interaction term remain insignificant when limiting the number of analysts following after the publication of the annual report to 9, 8, 7, 6, 5, 4, 3, 2, or 1. However, they become significant when including 10 analysts following.

predictors of a misrepresentations. The variables are described in *Appendix B*. The results of the Heckman two-stage regression are presented in *Table 7*. This table consists first of the main regression (stage 2) and then the selection model (stage 1). The results indicate that there are no qualitative changes to the results of our main variable *Misrepresent* in our main regression in *Table 4*, except for the change in the significance level of the number of analysts following which decreased to mildly significant. Moreover, some changes in the control variables occurred. This includes most notably the *Number of segments* and the *Book-to-market* variable. An explanation for this phenomenon can be the change in the sample compared to *Table 4* due to further data restrictions originating from the data requirements of the selection model.

Table 7 Heckmann-two-stage Regression as Robustness Check for the Main Results

	(1)	(2)	(3)	(4)
Dependent Variable	$\Delta Mean_Forecast$	$\Delta Median_Forecast$	$\Delta SD_Forecast$	$\Delta Follow$
Main regression				
<i>Misrepresent</i>	0.370*** (2.957)	0.364*** (2.951)	0.00232 (0.0509)	0.780* (1.839)
<i>Size</i>	-0.0391 (-1.429)	-0.0363 (-1.341)	-0.0101 (-0.875)	-1.792*** (-10.47)
<i>Number of segments</i>	0.0306 (0.320)	0.0234 (0.242)	0.0372 (1.573)	0.635** (2.095)
<i>Numest</i>	-0.0049 (-0.621)	-0.00511 (-0.645)	0.00202 (0.662)	
<i>SD_ROE</i>	0.0594* (1.827)	0.0619* (1.839)	0.0158 (1.639)	0.156* (1.792)
<i>EPS_growth</i>	-0.085 (-1.474)	-0.0917* (-1.707)	-0.0102 (-0.375)	0.469* (1.651)
<i>Sales_growth</i>	-0.108 (-0.383)	-0.0858 (-0.313)	0.0961 (1.587)	-1.229 (-1.425)
<i>Book-to-market</i>	-0.253*** (-2.602)	-0.238** (-2.480)	-0.0712 (-1.403)	1.786*** (4.684)
<i>Constant</i>	0.774* (1.705)	0.755 (1.641)	0.283 (1.510)	6.644*** (5.072)
<i>Year and Industry FE</i>	yes	yes	yes	yes

Selection model				
<i>Rsst_acc</i>	0.158	0.158	-0.0207	0.183
	(0.795)	(0.794)	(-0.160)	(0.948)
<i>Ch_rec</i>	0.744	0.746	0.0814	0.782
	(0.938)	(0.939)	(0.153)	(1.004)
<i>Ch_inv</i>	-0.0195	-0.0195	-0.589	-0.194
	(-0.0193)	(-0.0194)	(-1.005)	(-0.195)
<i>Soft_assets</i>	-0.519	-0.518	-0.00583	-0.560
	(-1.070)	(-1.069)	(-0.0278)	(-1.153)
<i>Ch_roa</i>	0.00228	0.00405	-0.167	0.013
	(0.0126)	(0.0223)	(-0.914)	(0.0716)
<i>Ch_cs</i>	0.257*	0.256*	-0.0117	0.255*
	(1.838)	(1.834)	(-0.281)	(1.901)
<i>Issue</i>	-0.441***	-0.441***	0.126**	-0.435***
	(-2.727)	(-2.726)	(1.965)	(-2.737)
<i>Constant</i>	0.785**	0.784**	-0.151	0.805**
	(2.285)	(2.285)	(-1.260)	(2.375)
<i>athrho</i>	0.088**	0.087**	-0.974**	0.318***
	(2.078)	(2.064)	(-2.555)	(2.590)
<i>Insigma</i>	0.615*	0.601*	-0.761***	1.742***
	(1.807)	(1.792)	(-2.806)	(28.030)
Observations	3,774	3,774	2,050	3,774
Robust z-statistics in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				

All continuous variables are winzorized, absolute values are winzorized at a 0 and 98% level, all other at a 1 and 99% level. Standard errors are robust and clustered at the firm-level. The variables are explained in the method section. A short overview can be found in Appendix A.

The quality of the model is explained by the parameters athrho^{31} and Insigma^{32} . In this study, the lack of significance of athrho parameters indicates that the standard errors of the selection and the regression are uncorrelated. Furthermore, the significance of Insigma indicates that the regression is not efficient at explaining the independent variable. However, this is not a new matter when considering the R-

³¹ "athrho" is the inverse hyperbolic tangent of ρ . ρ stands hereby for the correlation between errors of selection model and regression model.

³² "Insigma" stands for $\ln(\sigma)$. The σ represents hereby the error variance of the regression model.

squares of *Table 4*. The aim of the regression is not to explain the phenomenon reflected in the independent variable but rather to demonstrate a linkage between the independent and one of the dependent variables. Thus, the low R-squares (significant Insignia) have little importance to the interpretation of the results.

Additionally, one could argue that using the same firm might not be a good control sample since firms may change significantly during the whole period in our dataset. Therefore, we create a control sample by employing propensity score matching (PSM). For a detailed explanation of the matching method, we refer readers to Shipman et al. (2017). At first, we run a probit regression to identify the underlying propensity scores. Therefore, we rely on the control variables as described in the Method section (also in Appendix A). Furthermore, we use the variables of Dechow et al. (2011) since they have been proven to be good predictors of misrepresentations. Hence, choosing these variables allows us to select a matched sample based on firms that have similar characteristics compared with misrepresenting firms. The variables for Dechow et al. (2011) are explained in Appendix B.

Table 8 Propensity Score Matching as a Robustness Check for the Main Results

	(1)	(2)	(3)	(4)
Dependent Variable	$\Delta Mean_Forecast$	$\Delta Median_Forecast$	$\Delta SD_Forecast$	$\Delta Follow$
Misrepresenting group	0.2542	0.2543	0.0413	-5.7489
Control group	0.1378	0.1394	0.0614	-5.9928
Difference (=ATT)	0.1163***	0.1149***	-0.0201	0.2440
t-statistic	2.97	2.94	-1.33	0.91
Observations	6646	6646	4671	6646
*** p < 0.01, ** p < 0.05, * p < 0.1				

To derive the matched sample, we first estimate a probit model of *misrepresentation* with the independent variables – namely *size*, *number of segments*, *number (only for 1–3)*, *SD_ROE*, *EPS_growth*, *Sales_growth*, *book-to-market*, *Rsst_acc*, *Ch_rec*, *Ch_invt*, *Soft_assets*, *Ch_roa*, *Ch_cs*, and *issue*. All variables are explained in Appendices A and B. Moreover, we include year- and industry-fixed effects as well as cluster the robust standard errors at the firm level. Using the probit model, we calculate the misrepresentation propensity score for each observation in the sample. We then match each sample in the misrepresented dataset to the 20 observations in the control sample that have the closest matches.

With the results of the probit regression, we estimate the propensity score for each observation that is based on a misrepresented annual report. We then identify for each of these observations the 20³³ observations that are based on non-misrepresented firm

³³ Using other numbers of matched observations, such as 15 or 25, does not lead to any different interpretations of the results.

years and are closest in their propensity score to the observation of the main sample. The 20 observations per observation of our main sample are our control sample.

Table 9 Robustness Test with Forecast Accuracy

	(1)	(2)	(3)	(4)
Dependent Variable	$\Delta Mean_Forecast$	$\Delta Median_Forecast$	$\Delta SD_Forecast$	$\Delta Follow$
<i>Misrepresent</i>	0.155** (2.395)	0.133*** (2.703)	0.0146 (0.618)	0.588** (2.069)
<i>For_acc_median</i>	0.671*** (10.67)	0.361*** (6.746)	0.00321 (0.183)	0.532*** (4.812)
<i>Size</i>	-0.00906 (-0.906)	-0.00565 (-0.700)	0.00698 (1.109)	-1.293*** (-22.87)
<i>Number of segments</i>	0.0692* (1.684)	0.0393 (1.378)	0.0317*** (2.654)	0.134 (0.831)
<i>Numest</i>	0.00434 (1.412)	0.00128 (0.545)	0.00143 (1.001)	
<i>SD_ROE</i>	0.0168* (1.855)	0.0109 (1.467)	0.0172** (2.489)	0.131** (2.022)
<i>EPS_growth</i>	-0.121** (-2.379)	-0.0675* (-1.815)	0.00471 (0.187)	0.305 (1.455)
<i>Sales_growth</i>	-0.00524 (-0.0420)	0.0444 (0.523)	0.0185 (0.548)	-3.076*** (-5.178)
<i>Book-to-market</i>	-0.120** (-2.482)	-0.0642** (-2.016)	-0.0035 (-0.139)	0.816*** (4.814)
<i>Constant</i>	0.16 (0.605)	0.581*** (2.753)	-0.0167 (-0.238)	7.133 (1.121)
Year and Industry FE	yes	yes	yes	yes
Observations	4,612	4,612	2,431	4,612
R-squared	0.331	0.268	0.523	0.211
Robust t-statistics in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				

All continuous variables are winzorized, absolute values are winzorized at a 0 and 98% level, all other at a 1 and 99% level. Standard errors are robust and clustered at the firm-level. The variable *For_acc_median* represents the difference between the last median EPS forecast before the publication of the annual report and the actual reported (misrepresented) EPS. All further variables are explained in the method section. A short overview can be found in Appendix A.

Next, we compare the mean statistics of our main variables of interest ($\Delta Mean_Forecast$, $\Delta Median_Forecast$, $\Delta SD_Forecast$, and $\Delta Follow$) for the case of the misrepresented firm year and for the matched sample. The results are disclosed in *Table 8*, which indicates once the coefficient for the variable of interest is in the case of the main sample (misrepresenting group) and once the value is for the PSM-matched control group. Additionally, the difference is presented as well as its significance.

The results indicate that the change in the mean and median consensus forecasts remains significantly more positive in the case of a misrepresented annual report compared with a non-misrepresented one. Moreover, the results for the standard deviation are nonsignificant. These three results are similar to the results in *Table 4* and thus confirm them. However, the number of analysts following differs only nonsignificantly in *Table 8*. A reason for this deviation in comparison with *Table 4* could be the different sample due to the higher requirements of the dataset, since we include the variables of Dechow et al. (2011) or the different control sample. However, since the results suggests that analysts are not dropping their coverage due to the misrepresentation, the impact on our interpretation is neglectable.

One could argue that analysts of misrepresenting firms are surprised positively by the misrepresented annual report especially when it exceeds their expectations. Thus, they will revise their forecasts upwards as a consequence. To overcome this potential argument, we redid the analysis of *Table 4* and included a variable capturing the forecast accuracy of the last median consensus forecast (median consensus EPS-forecast minus actual (misrepresented) EPS). The newly added variable has the name *For_acc_median*. The results are presented in the following *Table 9*:

Similar to *Table 4*, in *Table 9 Column 1* the results for the dependent variable $\Delta Mean_Forecast$ are shown. In *Column 2*, the results for the dependent variable $\Delta Median_Forecast$, in *Column 3* the results for the dependent variable $\Delta SD_Forecast$, and in *Column 4* the results for the dependent $\Delta Follow$. In general, the results become lesser strong when including the forecast accuracy. However, the changes are not enough to alter the interpretation of the results. It remains that the misrepresented annual report leads to an increase in the consensus forecast. The dispersion among analysts remains unaffected by the misrepresentation as the lack of significance of the variable $\Delta SD_Forecast$, shows. Moreover, the number of analysts following a firm is positively influenced by the misrepresentation as the variable $\Delta Follow$ suggests.

We estimated a multitude of further additional robustness test to verify our results. However, to maintain readability, we did not disclose all the results in detail. Instead, we will go through the most important tests and results in the following. As a control sample we employed all non-misrepresented firm years irrespective of whether the non-misrepresented firm year occurred before or after the misrepresented one(s). One

could argue that the knowledge about the previous misrepresentation is pertinent to the analysts' recommendations and estimates. More specifically, it might cause analysts to become more cautious. Therefore, we ran the same analysis with only non-misrepresented control-firm years before the misrepresentation period started. The interpretation of the results (not presented here) does not differ from the interpretation of the main results.³⁴

Moreover, one could argue that only the first misrepresented firm year should be considered since analysts who compare the annual report with the previous year's annual report would only, in such a case, be comparing a non-misrepresented annual report with a misrepresented one. We adjusted our dataset to test whether this argumentation might hold true. More specifically, we only included the first misrepresented firm year of firms who misrepresented multiple years in a row. Running the regression with the reduced dataset (results not presented here) does not change the interpretation.

A further question might arise since we used the last consensus forecast before the publication of the misrepresented annual report and the first consensus forecast after the publication. This question is whether it is theoretically possible that the last consensus forecast before the publication originates from 11 months back in time. This would mean that there were forecasts immediately after the publication of an annual report, then 11 months with no analyst forecasts, and ultimately the publication of the annual report. The same in a mirror image could occur after the misrepresented annual report was published. Thus, the maximum period between the last consensus forecast before and the first after the publication of the misrepresented annual report is 22 months (assuming the same publication month each year). Since this might be a very long time where multiple events could occur, we limited our sample to observations where this difference between the last consensus forecast before the misrepresented annual report was published and the first one after the publication is a maximum of 6 months. The number of observations is barely affected by the change and consequently the results including its interpretation are hardly affected.

Another issue that we addressed in our robustness checks arises from the fact that the dependent variable is a variable reflecting the change in the variables between two points in time. However, unlike the dependent variable, the control variables do not reflect the change between two points in time. This difference in the formula structure of the dependent and control variable might lead to questions about the suitability of the control variables. We would argue that most of the control variables are rather

³⁴ For completeness: We did the same analysis with only non-misrepresented control-firm years after the misrepresentation period as a control group. The interpretation of the results remained unaffected.

stable across multiple years. Thus, there would not be a large difference if a control variable was chosen that reflected the change in the respective variable. Our opinion here can be illustrated with the example of the size variable. *Size* is measured as the log of total assets. Hence, measuring a major change in the size variable would mean that there is a major change in total assets either as an increase or decrease. Such events are rare in our dataset. The same logic applies to the *Number of segments*, the *EPS growth*, and the *Book-to-market* rate. Furthermore, we used control variables based on multiple prior firm years. Consequently, the impact of the last annual report on the control variable is mitigated. An example is the *Sales growth*. This variable is defined as the compound average growth rate over the prior three to five fiscal years (depending on the availability). Due to the usage of multiple years to compute the variable, the impact of a single year is mitigated. Subsequently, there is typically no great difference between the *Sales growth* of one period compared to its previous period. The same logic applies to the variable *SD_ROE*. This leaves us with only the change in the number of analysts following a firm as the applicable difference variable. To test the impact of using this difference in analysts following a firm instead of the number of analysts (variable *Numest*), we used the variable $\Delta Follow$ as a control variable. For an obvious reason, we did not run the regression which has $\Delta Follow$ as a dependent variable. However, we repeated the regressions in the other cases with this adjustment. The results (not presented here) do not suggest a different interpretation.

The prior literature expresses the special role of auditors in identifying and preventing misrepresentations (e.g. Palmrose et al. 2004; Francis et al. 2013; Hennes et al. 2014). Consequently, the question might arise as to whether the audit quality or the auditor's opinion provide a signal to analysts of a potential misrepresentation. In case this is true, it could potentially influence the analysts' behavior. We included two variables in our regression with the aim of measuring the audit quality and the signals of auditors. The first of the two variables reflects whether the annual report was audited by one of the largest auditing firms during this period (Big-X). Today this would be one of the big 4 auditing firms (KPMG, EY, PwC, Deloitte) but in the time period of our sample there were some different firms. The second of the two variables reflects the auditor's opinion. The definition of the variables is based on the differentiation of the auditors' opinions in COMPUSTAT. In this database, the auditors' opinion is classified from 0 to 5. Only 2 of these classifications are of relevance for us since the remaining classifications contain (almost) no observations. These two classifications are unqualified opinions without explanatory language (COMPUSTAT number 1) and with explanatory language (COMPUSTAT number 4). Thus, we created an indicator variable reflecting each of the two classifications. The results indicate that both the difference in the number of analysts following a firm

and the difference in the mean and median consensus forecast remain significant, while the difference in the standard deviation remains insignificant. Thus, the interpretation of the results does not differ from the interpretation of the results presented in *Table 4*.

Conclusion

The aim of our research is to investigate how analysts are impacted by the context of a low earnings quality. We have endeavored to contribute to the literature about sell-side financial analysts by shedding light on their acts under such circumstances. Hence, sell-side analysts serve as a proxy for dedicated financial market actors for two main reasons: First, due to the better availability of data for research purposes e.g. compared to buy-side analysts and second, because sell-side analysts are typically considered to be sophisticated capital market actors (Block 1999, Maber et al. 2021). Thus, they are suitable as proxies for other groups of sophisticated capital market actors such as certain funds or banks. Since the misrepresenting firms have deliberately violated the GAAP, such firms perfectly fulfil the definition of an extremely low earnings quality firm because their earnings are not faithfully reported. We take advantage of this *ex post* knowledge when analyzing how analysts are affected by low earnings quality.

We were expecting that the analysts either detect the low earnings quality (misrepresentation) and react accordingly (e.g. by discontinuing their coverage) or that the analysts do not detect the low earnings quality (misrepresentation). In the latter case, analysts would continue treating the misrepresenting firm as a non-misrepresenting one in their forecasting activity. Hence, we would not see any significant results separating these two groups of cases (misrepresenting and non-misrepresenting) from each other. However, our results imply that neither of these two options is feasible. Instead, our results indicate that more often the analysts continue to follow misrepresenting firms. Despite the mean and the median consensus forecast being positively affected by the misrepresentation, the dispersion among analysts remains unaffected by the misrepresentation. Our results suggest that analysts are deceived by cases of extremely low earnings quality. This finding causes questions about analysts and their role in overcoming the information asymmetry between firms with low earnings quality (proxied by the misrepresentation) and shareholders and thus enhancing efficient capital allocation on the capital market.

We were only able to marginally explore a small insight into the world of analysts and extremely low earnings quality. We took the perspective of the analyst's earnings forecasts as well as the number of analysts following a firm. As a result, our time window was rather narrow with the first consensus forecast before and the first one after publication of the annual report. Whether a longer window would result in the

same results is something for future research. Another option for future research would be an investigation of other possible perspectives like earnings calls. Moreover, we were not able to answer questions about “why” we obtained the results we did. For example: Why does it seem like analysts are deceived by the firms? Or Why does it seem as if no analyst is able or cognizant to detect a misrepresentation? In addition, we treated analysts as a monolithic group. However, in practice there are different analyst characteristics (e.g. industry specialization, age, education, gender). It would be possible to test whether our results differ depending on these and other characteristics. Finally, it would be fruitful to study analysts’ behavior when the misrepresentation transpires. There are studies explaining analysts’ selection of the firms they follow but there is a shortage of studies focusing on analysts’ decisions on coverage and other professional activities regarding firms whose misrepresentations are revealed.

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Appendix A Overview of the Variables

Variable name	Description
<i>Misrepresent</i>	Indicator variable showing 1 if the financial report of firm i is misrepresented and 0 else
<i>Follow</i>	Number of analysts following firm i
<i>Forecast</i>	The EPS forecast for firm i of the analyst j for period t
<i>SD_Forecast</i>	The standard deviation of the analyst forecasts for firm i and forecast period t
$\Delta Follow$	Difference in the variable <i>Follow</i> between before and after the disclosure of the annual report (after minus before)
$\Delta Mean_Forecast$	Difference in the mean consensus forecast before and after the disclosure of the annual report (after minus before)
$\Delta Median_Forecast$	Difference in the median consensus forecast before and after the disclosure of the annual report (after minus before)
$\Delta SD_Forecast$	Difference in the standard deviation before and after the disclosure of the annual report (after minus before).
<i>Percent_ΔFollow</i>	Change in percentages of the variable <i>Follow</i> before and after the disclosure of the annual report (after minus before divided by after)
<i>Percent_absolute_ΔMean_Forecast</i>	Absolute value of the difference of the mean consensus forecast before and after the disclosure of the annual report in percent (after minus before divided by after)
<i>Percent_absolute_ΔMedian_Forecast</i>	Absolute value of the difference of the median consensus forecast before and after the disclosure of the annual report in percent (after minus before divided by after)
<i>Percent_ΔSD_Forecast</i>	Difference in the standard deviation before and after the disclosure of the annual report in percent (after minus before divided by after)
<i>Size</i>	log(total assets)
<i>Number of segments</i>	log(no. of segments)
<i>Numest</i>	Number of analyst reports after the (misrepresented) annual report was published
<i>SD_ROE</i>	Standard deviation of past years' return on equity
<i>EPS_growth</i>	Difference between prior year's EPS and current years EPS
<i>Sales_growth</i>	Compound average growth rate over the prior three to five fiscal years
<i>Book-to-market</i>	Book value of equity/market value of equity

Appendix B Variable description according to Dechow et al. (2011) for the selection model of Heckman-two-stage regression

Variable	Abbreviation	Calculation
<i>Rsst accruals</i>	<i>Rsst_acc</i>	$(\Delta(\text{Current Assets}-\text{Cash and short-term Investments}-\text{Current Liabilities}-\text{Debt in Current Liabilities})+\Delta(\text{Total Assets}-\text{Current Assets}-\text{Investments and Advances}-\text{Total Liabilities}+\text{Current Liabilities}+\text{Long-term Debt})+\Delta(\text{Short-term Investments}+\text{Long-term Investments}-\text{Long-term Debt}-\text{Debt in Current Liabilities}-\text{Preferred Stock}))/\text{Average total assets}$
<i>Change in receivables</i>	<i>Ch_rec</i>	$\Delta\text{Accounts Receivable}/\text{Average total assets}$
<i>Change in inventory</i>	<i>Ch_inv</i>	$\Delta\text{Inventory}/\text{Average total assets}$
<i>%soft assets</i>	<i>Soft_assets</i>	$(\text{Total Assets}-\text{PP\&E}-\text{Cash and Cash Equivalent})/\text{Total Assets}$
<i>Change in return on assets</i>	<i>Ch_roa</i>	$(\text{earnings}_t/\text{average total assets}_t)-(\text{earnings}_{t-1}/\text{average total assets}_{t-1})$
<i>Change in cash sales</i>	<i>Ch_cs</i>	Percentage change in cash sales where cash sales is: Sales- $\Delta\text{Accounts Receivable}$
<i>Actual issuance</i>	<i>Issue</i>	Indicator variable showing 1 if the firm issued securities during year t.



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