

Corporate Governance and Financial Reporting Quality of German Firms

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Die vorliegende kumulative Dissertation besteht aus drei Beiträgen.

**Erste Studie: Consequences of Error Announcements on Industry Peers:
Capital Market Reactions and Financial Reporting Decisions**

Dieser Beitrag wurde gemeinsam mit Frau Dr. Stefanie Häfele (Freie Universität Berlin) erstellt. Der Anteil der beiden Autoren beträgt jeweils 50%.

**Zweite Studie: Supervisory Board Characteristics and Income Smoothing of
German Co-operative Banks**

Dieser Beitrag wurde ohne Koautoren erstellt.

**Dritte Studie: Supervisory board characteristics and earnings properties: Co-
operative firms versus private stock corporations**

Dieser Beitrag wurde gemeinsam mit Herrn Univ.-Prof. Dr. Jochen Bigus (Freie Universität Berlin) erstellt. Der Anteil der beiden Autoren beträgt jeweils 50%.

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List of Abbreviations

AAER	Accounting and Auditing Enforcement Releases
Adj.	adjusted
AG	Aktiengesellschaft (stock corporation)
AktG	Aktiengesetz (Stock Corporation Act)
Art.	Article
BaFin	Bundeanstalt für Finanzdienstleistungsaufsicht (Federal Financial Supervisory Authority)
Basle II	Basle 2 rules
Basle III	Basle 3 rules
BCBS	Basle Committee on Banking Supervision
BIS	Bank for International Settlements
BVR	Bundesverband der Deutschen Volksbanken und Raiffeisenbanken (National Association of German Co-operative Banks)
BigN	Audit firm with high market share
CDAX	Composite DAX
GenG	Genossenschaftsgesetz (co-operative law)
CEO	Chief Executive Officer
CESR	Committee of European Securities Regulators
CHF	Swiss Franc (Schweizer Franken)
Coeff.	Coefficient
CIFAR	Center for International Financial Analysis and Research
CRR	Capital Requirements Regulation
DAFNE	Name of a database by Bureau van Dijk
DAX	Deutscher Aktienindex (German Share Index)
DCGK	Deutscher Corporate Governance Kodex (German Corporate Governance Code)

DRS	Deutscher Rechnungslegungsstandard (German Accounting Standard)
DRSC	Deutsches Rechnungslegungs Standards Komitee e.V. (Accounting Standards Committee of Germany)
EBA	European Banking Authority
EBIT	Earnings before Interest and Taxes
EBITDA	Earnings before Interest, Taxes, Depreciation, and Amortization
ed.	Edition
eG	eingetragene Genossenschaft (legal form of the co-operative)
e. g.	exempli gratia
et al.	et alii
EL	expected loss
EU	European Union
EUR	Euro
F.	Framework (of IFRS)
FDICIA	Federal Depository Insurance Corporation Improvement Act
FMVStärkG	Gesetz zur Stärkung der Finanzmarkt- und Versicherungsaufsicht
FREP	Financial Reporting Enforcement Panel
FRQ	Financial Reporting Quality
F-Stat.	F-Statistic
GAAP	Generally Accepted Accounting Principles
GenG	Genossenschaftsgesetz
GICS	Global Industry Classification Standard
HGB	Handelsgesetzbuch (German Commercial Code)
IASB	International Accounting Standards Board
IFRS	International Financial Reporting Standards
IRBA	Internal Ratings Based Approach
JEL	Journal of Economic Literature

KPMG	Klynveld Peat Marwick Goerdeler (Big4 Auditing and Advisory Firm)
KSA	Kreditrisiko Standardansatz (credit risk standardized approach)
KWG	Kreditwesengesetz
LLP	loan loss provisions
MDAX	Mid-Cap-DAX
N	Number
NICS	North American Industry Classification System
NPV	Net Present Value
OLS	Ordinary Least Squares
PCAOB	Public Company Accounting Oversight Board
pp.	pages
Pred.	predicted
P&L	profit and loss
§	section (“Paragraph”)
RDC	Research Data Center
RechKredV	Rechnungslegungsverordnung der Kreditinstitute (accounting regulations for credit institutes)
SDAX	Small-Cap-DAX
Sec.	section
SEC	Securities and Exchange Commission
SIC	Standard Industrial Classification
SolvV	Solvabilitätsverordnung (German Solvency Regulation)
Stand. Dev.	standard deviation
S&P	Standard and Poors
TECDAX	TECDAX Stock Index
Tier1	Common Equity Tier 1 Capital (“Kernkapital”)
Tier2	Tier 2 Capital (“Ergänzungskapital”)

UK	United Kingdom
US	United States
USD	US-dollar
VIF	Variance Inflation Factor
vs.	versus
WZ	Wirtschaftszweig (German Classification of Economic Activities)

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1. Introduction

The financial market crisis revealed a loss of confidence in the credibility of the financial reporting of banks. Banks questioned the portfolio quality of other institutes and refused to grant loans, and depositors reclaimed their money, followed by a severe shortage of liquidity within the financial sector. Beside short term actions to restore credibility, such as state guarantees, the legislators felt compelled to improve the rules. As a consequence, the Basle Committee on Banking Supervision (BCBS) released its recommendations for strengthening the regulation and supervision of the banking sector, better known as Basle III. The reform aimed at strengthening the resilience of the banking sector. Two main reform measures relate to a) improving the risk management and institutes' internal governance structures and b) enhancing the banks' transparency and disclosure quality (EBA, 2017).

These actions taken by the legislator raise a set of questions that are at the same time the research questions for this doctoral thesis: How is the quality of financial reporting affected by an effective corporate governance structure, and derived from this, what is considered to be high quality financial reporting and what can be assumed about the attitude of an effective means of corporate governance (e.g. the members of a supervisory board) concerning the quality of financial reporting?

The German corporate governance codex provides a definition of the scope of corporate governance. According to this definition, corporate governance comprises rules and structures that ensure compliance with the law in combination with ethical behavior. An important means of the corporate governance structure of German corporations ('Kapitalgesellschaften') is the dual board management system, requiring a supervisory board that monitors the management, ensuring that the managements' decisions are in accordance with the law (DCGK, 2017).

The second definition which is crucial for the research questions relates to the quality of financial reporting. This construct is connected to the extent to which, relevant information about the firm's earnings is communicated to stakeholders. Within the accounting literature, reporting quality is closely related to the extent to which earnings are managed, since earnings management is often connected with the manipulation of earnings (Wagenhofer & Ewert, 2015). Taking into consideration this negative connotation, a definition of earnings management must clearly distinguish between fraud and the (legal) utilization of discretions

in the application of accounting standards which aims at positively influencing the perception of the firm (Wagenhofer & Ewert, 2015). In line with this definition, earnings management relates to discretions within the relevant accounting standards, leaving space for the management to exercise options and thus influence the presentation of earnings. Nevertheless, to make sure that as many different matters as possible can be depicted, the legislator has consciously decided to leave scope for management's discretion within the accounting rules. Insofar, it is the management's obligation to present earnings in accordance with the applicable law. The German commercial code ('HGB') requires the presentation of a true and fair view of the financial positions and performance of an entity (Sec. 264 Abs. 2 HGB). As a conclusion, earnings management aims at influencing the decisions of stakeholders by using options and discretions within the relevant accounting standards. Insofar, a higher quality of financial reporting is assumed if more information about the firm's financial performance is revealed.

The discourse within the economic literature reveals that the connection between earnings management and the quality of financial reporting is still an open question. Besides, it is highly dependent on the specific means of earnings management (Dechow et al., 2010). Insofar, discretionary accruals or loss avoidance have a rather negative connotation while income smoothing or conditional conservatism are also being related to enhanced transparency of financial reporting and therefore, assumed to improve the quality of reported earnings. Nevertheless, there is still too little empirical evidence that addresses the effect of earnings management on the quality of firm reporting to finally explain the connection.¹ Since this question is crucial for the discussion of the role of the corporate governance in mitigating earnings management, the following section provides a brief overview of the arguments in literature structured by means of earnings management.

An early definition within the accounting literature relates to income smoothing as "intentional dampening of fluctuations about some level of earnings that is currently considered to be normal for a firm" (Beidleman, 1973:653). Thus, variations in earnings are intended to be smoothed within the boundaries set by applicable accounting laws (Beidleman, 1973). Empirical research on bank income smoothing investigates the use of loan loss

¹ See Dechow et al. (2010) for a short overview of the relevant literature and the respective argumentative positions.

provisions to deflate income by higher loan loss provisions in years when earnings before credit valuation are high and understated loan loss provisions when income is low (Bouvatier et al., 2014).

Regardless of any industry relation, the literature on earnings management discusses two main reasons why firms smooth income: The first one relates to the information function of income smoothing and thereby to the presentation of long-term trends. The rationale is that continuous earnings are assumed to improve the predictability of future cash flows (Dechow et al., 2010). This argument is especially relevant for firms within the legal form of the co-operative insofar as their raising of equity capital is restricted. In contrast to corporations, co-operatives cannot issue equity instruments in high volumes since owners enter the co-operative with rather small amounts. Moreover, co-operatives shareholders can opt to terminate their shares with negative effects for the co-operatives equity ratio. Nevertheless, a reasonable equity ratio plays a major role for raising debt capital, too.

Beside that rather positive effect, income smoothing is discussed as being related to the agency problem arising from the separation of ownership and control (Jensen & Meckling, 1976). Interpreted as manipulation of earnings figures, income smoothing contradicts the objective of increasing the transparency of financial reporting. The rationale is that smoothing of earnings can hide or delay the disclosure of changes in firm performance, which might be relevant information for stakeholders (Dechow et al., 2010).

The literature on bank earnings management discusses another incentive that is derived from the regulatory capital requirements. Since banks have to fulfill minimum capital ratios, their decision to smooth income could be incentivized by the regulatory capital figures that should be reached within the respective period. This means should be characterized as earnings manipulation insofar as the institutes' financial situation is presented in a distorted manner in order to meet the required capital ratios.²

Conditional conservatism relates to the asymmetric timeliness within the recognition of future economic gains and losses (Basu, 1997). According to this approach, adverse effects on the firm value are presented earlier than positive ones within the annual results. Literature interprets financial reporting as being more informative if future economic losses are

² Chapter 3 provides more detailed explanations why capital management through the use of loan loss provisions can be expected to lose relevance under Basle III.

recognized earlier than future economic gains (Ball & Shivakumar, 2005). Thus, a higher quality of earnings is positively related to the extent of conditional conservatism. Asymmetric timeliness is interpreted as a signal to the markets, since firms risk to underestimate their earnings combined with negative consequences for the firm value.

As laid out above, the corporate governance aims at securing the fulfillment of legal requirements. Assumed that (most measures of) earnings management negatively influence the quality of financial reporting, thereby reducing the decision usefulness of firm reporting. Furthermore be assumed that the corporate governance is effective in influencing the accounting processes as well as reported earnings. Thus the amount of earnings management should be the lower the more effective the corporate governance is (and vice-versa).³

García Lara et al. (2009) present empirical evidence that „strong governance firms show significantly higher levels of conditional accounting conservatism” (Garcia Lara et al., 2009:161). This finding supports the thesis of a positive relation between conditional conservatism (Basu, 1997; Ball & Shivakumar, 2005) and the quality of financial reporting. In contrast to that finding, Cornett et al. (2009) report a negative relation between board independence and opportunistic earnings management, based on the assumption that discretionary components of valuation are used to reach bonus targets. Klein (2002) finds a negative relation between audit committee independence and abnormal accruals, supporting the assumption that an effective audit committee opposes abnormal accruals.

As a conclusion, existing literature reveals mixed evidence about the relation between the effectiveness of corporate governance and earnings management. Besides, results differ in accordance to the measures of earnings quality. The studies within this thesis contribute to the discourse by examining the effects of specific aspects of the corporate governance of German firms on their accounting choice.

As quoted above, this thesis aims at shedding light on the determinants that influence the transparency of the financial reporting of German firms. More specifically, it contributes to the discourse how the quality of financial reporting is affected by different means of earnings management. One main determinant within that context is the role of the supervisory board (as an important element of the corporate governance structure of a firm) and its influence

³ This assumption should only hold for measures of earnings management that are expected to negatively influence the quality of financial reporting.

on the quality of financial reporting. In that context, the thesis comprises three independent empirical studies that pursue the following research questions:

The first work on “*Consequences of Error Announcements on Industry Peers: Capital Market Reaction and Financial Reporting Decisions*” analyzes for a sample of industry peers (German CDAX[®]-listed firms) to restating firms after an error announcement as consequence of DPR-examinations:

- How capital market reacts as consequence of the accounting errors that have been revealed by industry peers‘.
- How the non-restating industry peers’ subsequent transparency of financial reporting is affected by the error announcement.

The second study “*Supervisory Board Characteristics and Income Smoothing of German Co-operative Banks*” examines for a sample of German co-operative banks the effect of the corporate governance on the transparency of financial reporting. More specific, it addresses the following research questions:

- How is the accounting choice of co-operative banks affect by the specific corporate governance structure (ie additional contribution in case of insolvency) and the information asymmetry between management and shareholders?
- What is the effect of specific supervisory board characteristics on income smoothing?
- How do strengthened regulatory capital requirements affect the accounting behavior of German co-operative banks?

The third work „*Supervisory board characteristics and earnings properties: Co-operative firms versus private stock corporations*“ compares the influence of the supervisory board for German non-listed corporations and co-operatives, addressing the subsequent research questions:

- How do differences within the legal form affect the transparency of financial reporting of industrial companies?
- How do different characteristics of the supervisory board of non-financial firms affect the accounting behavior?

The studies contribute to the research questions as outlined below:

The first study “*Consequences of Error Announcements on Industry Peers: Capital Market Reaction and Financial Reporting Decisions*” supports the thesis that conditional conservatism enhances the quality of financial reporting insofar as decision useful information is transported to the markets.⁴ On the contrary, the enhancement of the transparency of forecast reporting was not found as a means to restore credibility after an industry peer’s error announcement. This may be explained by the considerably higher costs which are related to the litigation risk in combination with stock price declines in case of falling short after presenting a detailed forecast. Proprietary costs may therefore explain why managers disclose losses more timely after the announcement of an accounting error by an industry peer, but do not simultaneously enhance the precision of forecast reporting.

The findings of the second study “*Supervisory Board Characteristics and Income Smoothing of German Co-operative Banks*” support the assumption that the supervisory boards of German co-operative banks aim at mitigating income smoothing through the use of loan loss provisions since more effective supervisory boards are negatively associated to income smoothing within most of the model specifications. This supports the conclusion that income smoothing is rather considered a manipulation of figures than a means to transfer further (decision useful) information to stakeholders. Nevertheless, for firm years before the release of the enhanced requirements concerning supervisory board effectiveness, the incremental effect of effective supervisory boards on income smoothing is positive, indicating that those boards supported bank income smoothing. This effect opposes after the release of the enhanced requirements. Thus, the high requirements concerning their individual suitability and expertise (BCBS, 2015; ‘Gesetz zur Stärkung der Finanzmarkt- und Versicherungsaufsicht’; Sec. 36 GenG), combined with the threat of being removed from their positions by the banking authority if estimated not to be suitable (Sec. 36 KWG), forces supervisory members not to be indulgent when examining annual reports as required by Sec. 38 Abs. 1 GenG. As a consequence, the discretion in valuation could be restricted since supervisory board members avoid the risk of a too broad interpretation of accounting rules.

The results of the third work „*Supervisory board characteristics and earnings properties: Co-operative firms versus private stock corporations*“ reveals that co-operative firms that

⁴ This is in line with the findings of García Lara (2007) and the literature review by Dechow et al. (2010) who summarize, that „asymmetric timeliness improves earnings quality“ (Dechow et al., 2010:364).

face less severe agency problems of equity in comparison to private stock corporations exhibit no significant timely loss recognition, smooth income more and avoid reporting small losses more often than corporations do. With highly-levered firms, when agency problems of debt add to those of equity, corporations increase income smoothing more and exhibit a higher propensity to avoid reporting small losses such that the quality of financial reporting becomes more comparable with that of co-operative firms. Further analyses regarding the effect of supervisory board effectiveness on the extent of earnings management reveal that some board characteristics of co-operative firms such as smaller board size, the existence of an audit committee and a higher frequency of board meetings are positively associated with timely loss recognition. On the contrary, a larger proportion of independent board members is negatively related to timely loss recognition. Those results suggest that timely loss recognition is assumed as a means to enhance the information content and thus the quality of financial reporting. This finding is in line with the findings of the first study and the work of García Lara (2007).

The remainder of this thesis is structured as follows: Chapter 2 presents the study “*Consequences of Error Announcements on Industry Peers: Capital Market Reaction and Financial Reporting Decisions*”. Chapter 3 comprises the empirical work on “*Supervisory Board Characteristics and Income Smoothing of German Co-operative Banks*”. Chapter 4 presents the study „*Supervisory board characteristics and earnings properties: Co-operative firms versus private stock corporations*“. The last Chapter draws a conclusion and summarizes the thesis.

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2. Consequences of Error Announcements on Industry Peers: Capital Market Reaction and Financial Reporting Decisions

Stefanie Häfele and Monika Riediger

Abstract

This paper analyzes the reactions of investors and managers when accounting error announcements are released in an industry. We investigate capital market reactions as well as changes in the financial reporting decisions for a sample of CDAX[®]-listed industry peers in Germany. The German institutional setting is special due to its two-tier enforcement mechanism. We find that industry peers suffer on average negative cumulative abnormal returns of -0.92% within the five day event window. More specifically, we show the contagion effect on the German context by analyzing industry peers of firms that reveal negative abnormal returns around the error announcement. Both findings can be interpreted as a loss of investors' confidence in the reliability of financial reporting within the respective industry. As a consequence of the error announcement, all industry peers may be motivated into regaining their reputation. For this reason, we also examine whether industry peers change the transparency of their financial reporting following the event. Our results reveal that industry peers present more informative financial reporting as measured by more timely loss recognition after the error announcements. Nevertheless, we find no evidence for an increase in the precision of forecast reporting caused by the event. Supplementary tests reveal no significant increase in auditor turnover after an industry peer's error announcement, suggesting that industry peers do not try to restore reliability of financial reporting by switching the auditor after the stock price decline.⁵

2.1 Introduction

Several reporting scandals involving well-known firms in recent decades have damaged public trust in financial reporting as well as the reputation of auditors. To secure the quality of financial reporting, the Committee of European Securities Regulators (CESR) has required that all EU Member States should implement an effective enforcement process. The German

⁵ We thank Jochen Bigus as well as seminar participants at the Freie Universität Berlin for their helpful comments. Further, we thank the Research Data Center (RDC) for giving us access to Datastream and Compustat. Moreover, the Deutsche Börse has provided us with the information on firms listed in CDAX[®].

enforcement system was initiated in 2005 and is special insofar as it consists of a two-stage process (FREP, 2005). Examinations of financial accounting are conducted by the German Financial Reporting Enforcement Panel (FREP), which is authorized by the Federal Financial Supervisory Authority (BaFin). Once an accounting error is revealed, the firm is required to publish an error announcement⁶ in the electronic Federal Gazette and at least one multiregional stock exchange gazette or an electronic information provider (Sec. 37q German Securities Trading Act).

This paper uses an event study approach to investigate capital market reactions as well as changes in the financial reporting decisions of CDAX[®]-listed industry peers of error firms within the German enforcement system. More specifically, we address the following research questions: (1) Do industry peers suffer (benefit) from negative (positive) cumulative abnormal returns after an error announcement within the industry? (2) Do industry peers change their financial accounting in terms of transparency after an error announcement within the industry?

The first research question addresses how the capital market reacts after the industry peers' error announcement. Hitz et al. (2012) refer to the consequences of the German enforcement process on firms that presented erroneous financial statements. The authors document on average negative cumulative abnormal returns after the error announcements; however, the results are weaker than for the US market. The negative capital market response indicates that the detection of erroneous financial reports causes both a reputational loss (Karpoff et al., 2008) and a decline in the reliability of firm disclosure. Extending the work of Hitz et al. (2012), we examine whether industry peers of error firms in Germany also suffer on average negative cumulative abnormal returns. The setting is special insofar as these peer firms are only affected indirectly by the actions of the FREP.

Previous research addressing the capital market responses for industry peers distinguishes between the contagion effect and the competition effect.⁷ Industry peers may benefit from the error announcement by gaining business lost by the error firm. This is called the

⁶ We follow Hitz et al. (2012) and refer to error announcements for the German context. Restatements in the US and error announcements in Germany differ in several aspects, e.g. the US penalty payments, supervisory bodies and the reasons to implement the process.

⁷ The contagion effect is also called spillover effect, see e.g. Goldman et al. (2012).

competition effect (Lang & Stulz, 1992). As a result of the contagion effect, there will be negative abnormal returns for firms in the same industry if the error announcing firm has negative abnormal returns (Gleason et al., 2008). These effects on industry peers have not yet been investigated in the European context. We expect and find negative capital market reactions for industry peers in Germany. The results of our event study indicate that they suffer on average negative cumulative abnormal returns of -0.92% within the five day event window. More precisely, we show the contagion effect for the German setting by analyzing industry peers of error firms that have negative abnormal returns. Both findings can be interpreted as a loss of investors' confidence in the reliability of financial reporting within the respective industry.

The second research question focuses on the consequences for industry peers' financial accounting decisions in terms of transparency. As stated above, industry peers suffer on average negative cumulative abnormal returns following the error announcement. Consequently, some of these firms will consider themselves as being undervalued. Such firms are therefore incentivized to regain their reputation in order to increase the market value of their shares. Managers may be tempted to disclose previously withheld information to the public if the disclosure is expected to have a positive effect on the firm's stock price (Verrecchia, 1983; Dye, 1985). It is assumed that industry peers increase the transparency of financial reporting if economic gains exceed the related direct and proprietary costs. To capture the transparency of firms' disclosure, we refer to the timeliness of loss recognition and the precision of forecast reporting in the annual reports. We find that industry peers recognize losses more timely after the error announcements which can be interpreted as more informative financial reporting. This finding remains robust after including control peers from Austria and Switzerland. Nevertheless, we find no evidence for an increase in the precision of reported forecasts as a consequence of the event. One explanation could be the risk of disappointing market expectations if the forecasts are not met. Supplementary tests reveal no significant increase in auditor turnover after an industry peer's error announcement. We also do not find significant evidence that peer firms switch to a Big 4 auditor after the event, suggesting that industry peers do not try to increase reliability of financial reporting by switching their auditors after a stock price decline.

To the best of our knowledge, this is the first study that examines the consequences of error announcements on industry peers' financial reporting decisions within the context of

accounting enforcement in Europe. The German setting is unique as its accounting oversight board (FREP) is relatively weak in comparison to the US Public Company Accounting Oversight Board (PCAOB). Previous studies have investigated industry peers' disclosure strategies after restatements in the US. Sletten (2012) focuses on the voluntary disclosure of management forecasts in the wake of restatements. She finds evidence that industry peers are more likely to voluntarily disclose firm value-related information after such a shock. The rationale behind is that this information is more favorable after a decrease in market value. Unlike Sletten (2012), we do not investigate management forecasts during the fiscal year, but instead, changes in the forecast reporting within the annual report as well as changes in accounting figures due to the error announcements. German accounting rules require capital market-oriented firms to disclose a management report that includes the forecast report as part of the annual reporting.

We add to the recent literature on the effectiveness and importance of the enforcement system (e.g. Christensen et al., 2013; Bischof et al., 2014). While Bischof et al. (2014) focus on enforcement in the banking sector, Christensen et al. (2013) emphasize the relevance of the enforcement system by analyzing capital market reactions in the context of the International Financial Reporting Standards (IFRS) adoption. We also contribute to German literature on enforcement by examining whether the enforcement process also affects the financial reporting decisions of industry peers. The findings suggest that error announcements which result from the German enforcement process enhance transparency of financial reporting.

The remainder of the paper is structured as follows: Section 2 reviews relevant literature on accounting error announcements in general as well as that which focuses on the effects of accounting error announcements on industry peers. Further, we develop our hypotheses. The research design is presented in Section 3. Sample selection and data set are described in Section 4. Section 5 contains the empirical results. Section 6 concludes the paper.

2.2 Literature Review and Hypotheses

2.2.1 Consequences of Restatements

Most empirical studies on the consequences of restatements investigate US firms. Unlike accounting and auditing enforcement releases (AAERs), which refer to firms against which

the Securities and Exchange Commission (SEC) has brought action, restatements can be identified by the SEC, the auditor or the firm itself (Dechow et al., 2010).⁸

Several studies examine the consequences of restatements. One strand of literature focuses on the effects of restatements on managers and directors. Srinivasan (2005) finds an increased probability of director turnover for restating firms as well as for interlocked firms where directors of restating firms have a seat on the board. In addition, the probability of turnover increases with the severity of restatements and the membership of directors in audit committees. Desai et al. (2006) also find a higher turnover of top managers from restating firms in comparison to control firms. Conversely, Agrawal et al. (1999) results do not reveal a greater likelihood of management turnover after the revelation of fraud. Focusing on the consequences of financial fraud lawsuits, Fich & Shivdasani (2007) do not detect a significant turnover of outside directors on the board of the indicted firm, but a significant reduction in other seats on the board. The latter depends on the severity of the fraud and the outside directors' responsibility for preventing it.

Another strand of literature investigates the short- and long-term market reactions to restatement announcements. Considering a two day event window, Palmrose et al. (2004) find negative average abnormal returns of -9% for restating firms. In addition, they document a higher level of analyst forecast dispersion when the restatement is announced. Further studies reveal negative abnormal returns after restatements (e.g. Hribar & Jenkins, 2004; Karpoff et al., 2008; Hitz et al., 2012). The findings of Hribar & Jenkins (2004) show higher costs of capital in the months after the announcements of restatements in the US. Moreover, Karpoff et al. (2008) measure the reputation loss for firms that have been a target to SEC actions. This loss is found to considerably exceed the sum of legal penalties. In contrast, Hitz et al. (2012) base their analysis on a sample of German firms that were required to publish their errors in the electronic Federal Gazette. They find on average cumulative abnormal returns of -1.154% for the three day event window. The extent of this effect is considerably smaller than those described in US studies.

A second paper that addresses German error firms is a working paper by Böcking et al. (2015). Their results show that levels of earnings management are higher for years in which

⁸ Further studies analyze the consequences of class-action lawsuits for outside directors; see e.g. Fich & Shivdasani (2007).

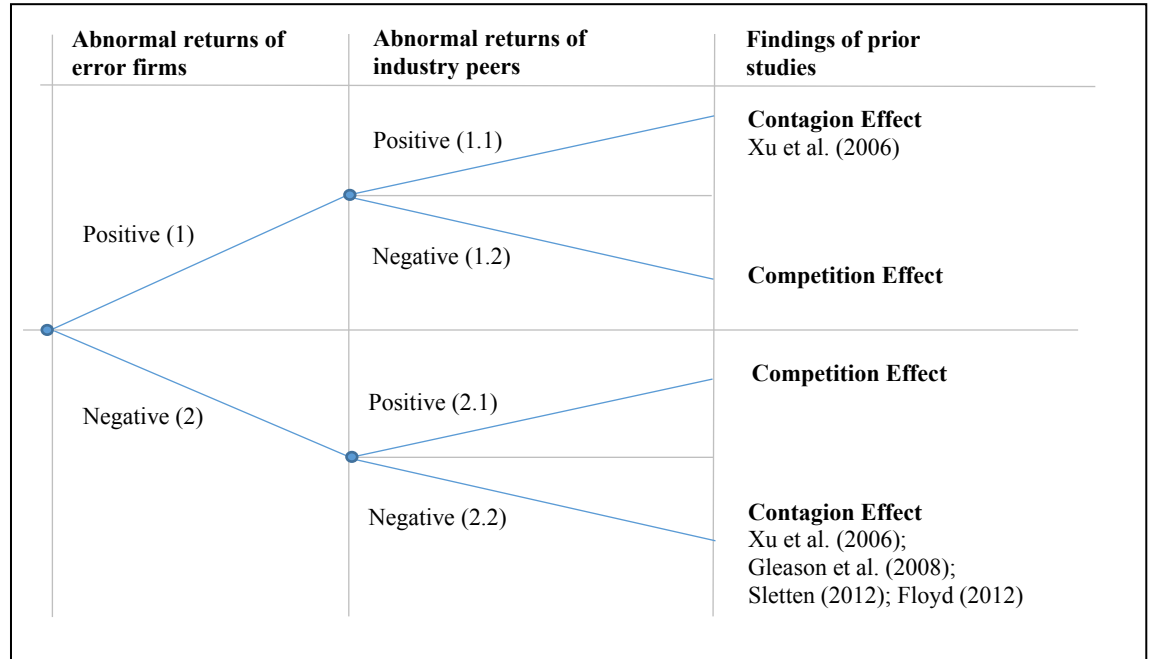
erroneous financial statements were made than in non-erroneous financial reports. Böcking et al. (2015) do not investigate the disclosure transparency of industry peers after error announcements.

2.2.2 Consequences for Industry Peers: Contagion Effect versus Competition Effect

Restatements do not only affect stock returns of restating firms, but also those of firms in the same industry. A stock price decline is found for companies in the same industry as restating firms (e.g. Sletten, 2012; Gleason et al., 2008; Xu et al., 2006); however, the effects are smaller in magnitude than those for restating firms.

There are two different hypotheses for the effects of an error announcement on industry peers. Both hypotheses have been observed before they were discussed in restating literature. One of the early explanations was put forward by Lang & Stulz (1992). The authors focus on stock market reactions of businesses in the same sector as those companies that have been declared insolvent. They distinguish between the contagion effect and the competition effect. Regarding the latter, they argue that the announcement of bankruptcy could result in a reduction in demand for the bankrupt firm. Firms in the same industry may benefit from gaining more customers and suppliers. This is called the competition effect. In contrast, there is no redistribution of wealth where the contagion effect occurs. When bankruptcy is announced, investors regard the bankrupt firms as being less profitable than expected. Furthermore, the bankrupt firm's competitors may also be faced with a negative valuation effect, especially if they have comparable cash flow characteristics. It remains an empirical question, which of the hypotheses dominates in practice.

Xu et al. (2006) assign these two effects to the context of restatements and the consequences for industry peers of restating firms. The authors further distinguish between two possible outcomes for restating firms: (1) positive abnormal returns and (2) negative abnormal returns. As mentioned above, most studies find on average negative cumulative abnormal returns for restating firms (e.g. Palmrose et al., 2004; Karpoff et al., 2008; Hitz et al., 2012). Figure 2-1 provides an illustration. Positive abnormal returns (1) after a restatement may occur if investors realize that these firms are more profitable than anticipated (Xu et al., 2006). Hence, abnormal returns are positive even though the firm published information that had to be corrected. For example, a restatement could reveal a positive net income instead of a loss.

Figure 2-1: Contagion and Competition Effect

Authors' illustration.

Consequently, abnormal returns may increase in response to positive news even though the firm's credibility declines because of the restatement.

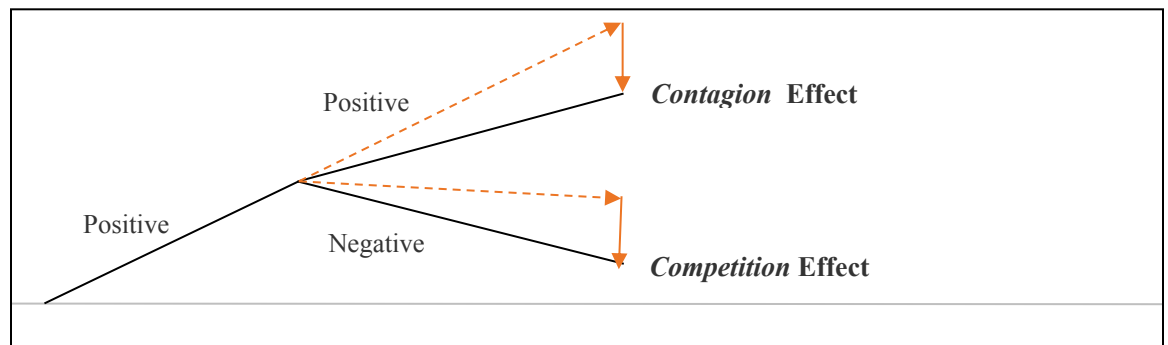
According to Xu et al. (2006), there should be positive abnormal returns for competitors in the same industry, if the contagion effect dominates (see Figure 2-1, effect 1.1). In this situation, investors revise their expectations and regard the whole industry as being more profitable than expected. In contrast, competitors' chances of becoming more profitable may be judged as less likely compared to the restating firm, resulting in a negative redistribution of wealth for competitors (competition effect, see Figure 2-1, effect 1.2).

Most empirical studies find on average negative cumulative abnormal returns for restating firms (see Figure 4.1, effect 2). Negative abnormal returns reflect the decline in market value after bad information is released as well as a decline in investors' trust in the credibility of other information released by the restating firm (Gleason et al., 2008). If restating firms have negative abnormal returns, the contagion effect will imply negative abnormal returns (see Figure 2-1, effect 2.2) for industry peers (Xu et al., 2006). Thus, contrary to their previous expectations, investors consider the whole industry as being less profitable and less reliable in terms of financial accounting. Consequently, there is a contagion effect resulting in negative abnormal returns for industry peers. Nevertheless, the stock prices of competitors

may increase if the competition effect dominates (see Figure 2-1, effect 2.1). In this case, industry peers benefit from the loss of reputation suffered by the restating firm. The latter may lose customers and suppliers as a result of the restatement. Hence, wealth is redistributed from the restating firm to other firms within the industry (Xu et al., 2006).

Beside these effects, we assume another driver for the market value of industry peers: as mentioned above, investors assume that intra-industry firm reporting will be less reliable after an error announcement. This reliability effect will cause negative effects for the cumulative abnormal returns of industry peers regardless whether the error firms' cumulative abnormal returns turn out to be positive or negative. This effect is empirically difficult to separate from the other effects discussed in this section. It is also an element of all four effects illustrated in figure 2-2. The positive contagion effect (see Figure 2-2, effect 1.1) would be positive due to the expectations of profitability in the industry. Simultaneously, the negative reliability effect reduces expectations insofar as investors do not fully believe in firm reporting released prior to the error announcement. Consequently, the positive contagion effect (see Figure 2-2, effect 1.1) is less positive than it might have been if investors had credible information about the situation of industry peers.

Figure 2-2: Reliability Effect



Authors' illustration.

The effects for industry peers have mainly been investigated within the US context. For example, Gleason et al. (2008) find negative abnormal returns for firms in the same industry as restating firms that suffer negative abnormal returns after the restatement. These findings indicate that the contagion effect dominates the competition effect; however, not all restatements have a negative effect on industry peers. The results of Xu et al. (2006) suggest

a significant contagion effect for firms featuring similar cash flow characteristics to the restating firm, but no competition effect.

Evidence for the German context is rare. To the best of our knowledge, there is only one working paper by Kläs & Werner (2014) that investigates the peer effects of financial reporting enforcement actions. The study of Kläs & Werner (2014) analyzes the capital market reaction for firms that engage the same external auditor as the error announcing firm. They find declines in market valuation around the error date. While that study focuses on other clients of the error firms' auditor, our study investigates industry peers to error announcing firms in general. Thus, we do not only expect a decline in credibility caused by the auditor, but also an industry contagion effect.

Against this background, we investigate the following hypothesis for a sample of German firms:

Hypothesis 1:

Industry peers suffer on average negative cumulative abnormal returns after an error announcement.

2.2.3 Industry Peers' Financial Reporting after the Error Announcement

These negative abnormal returns and the related decline in market value may encourage managers to reassess their practices concerning earnings and disclosure quality. In line with Sletten (2012) and Floyd (2012), we focus on the consequences of error announcements on the disclosure practices of industry peers. Sletten's results (2012) suggest that industry peers are more likely to voluntarily disclose good news after the error announcement. The rationale behind is that formerly unfavorable information becomes favorable after the stock price decline.

Independent of the observable stock price reaction, managers of industry peers face two main options for reacting to the decline in reliability and reputation. They can either do nothing or send positive signals to the markets. Positive signals may be used to rebuild reputation by publishing more transparent financial reports, indicating that they are "better" than their industry peers (error firms), and by avoiding having to announce errors of their own.

Managers of a firm naturally possess more information about the situation of the firm than investors. Thus, investors have to rely on firm disclosures if they are unable to access private

information from other channels (Jensen & Meckling, 1976). This information asymmetry makes financial reporting an important means of information transfer between the management and stakeholders outside the company. Managers of firms that have been negatively affected by an industry peer's error announcement may have an interest in disclosing previously withheld information to present their firm in a more favorable light than the present market expectation suggests (Sletten, 2012) or to publish more transparent financial reports. Based on the IFRS framework definition (F.46), we regard financial statements as being transparent if they reflect the firm's temporary economic situation in a true and fair way.

As the error announcement is assumed to damage the credibility of financial reporting within the affected industry (Gleason et al., 2008), some of these firms will consider themselves as being undervalued. In order to regain their reputation, industry peers may be motivated to present more transparent financial statements in their subsequent annual reports. Since greater transparency involves increased costs, the reaction of each industry peer depends on the direct and proprietary costs of providing more informative financial reports. An increase in disclosure transparency is expected if the related advantages (e.g. increase in reputation) compensate for the marginal costs. Direct costs arise from more complex preparation processes as well as additional audit fees. Besides, enhanced transparency surrounding future opportunities and risks may attract competitors, resulting in higher proprietary costs (Verrecchia, 1983). More precise reporting may also increase investors' expectations. This means that markets may be disappointed if these expectations are not met. Another source of indirect costs could arise from timely loss recognition, which could dampen reported earnings in the current period, reducing managers' bonuses.

The incentives described above are therefore inconclusive in shedding light on managerial financial reporting decisions following an industry peer's error announcement.

Hypothesis 2:

Industry peers change the transparency of their financial reporting following the announcement of an accounting error by a firm in that industry.

2.3 Research Design

2.3.1 Measuring the Capital Market Reaction

Concerning our first hypothesis, we conduct an event study to examine the stock market reactions to error announcements of industry peers listed in the regulated market segment of Deutsche Börse (CDAX[®])⁹. Stock market reactions are approximated by abnormal returns during the trading days around the error announcement. We calculate abnormal returns for the error firms as well as for their industry peers. Following the market model (e.g. Brown and Warner, 1980; MacKinlay, 1997; Corrado, 2011), we regress daily stock returns on daily returns of CDAX[®] Performance for the estimation period of 150 days before the event window (Hitz et al., 2012). This provides us with parameters to calculate the expected daily returns over the event window ([-2;+2]; [-1;+1]; [0]). Abnormal returns are the difference between observed and expected daily returns. Cumulative abnormal returns are the sum of abnormal returns throughout the event window. To test our first hypothesis, we calculate cumulative abnormal returns for all industry peers. Afterwards, we divide our sample of industry peers into two subsamples based on whether the cumulative abnormal returns of the firm announcing the error are positive or negative.

2.3.2 Measures for the Transparency of Financial Reporting

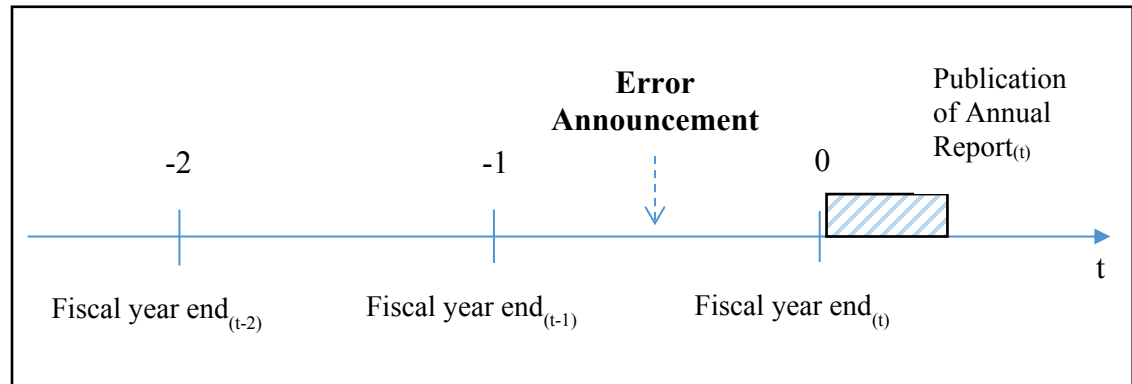
Referring to our second hypothesis, we intend to analyze whether industry peers change their financial statements to become more transparent following the announcement of an accounting error by a company in their industry. To do this, we have to measure the level of transparency before and after the announcement. Figure 2-3 depicts the relevant timeline. For the main analyses, we focus on $t=-2$ ¹⁰ (annual report *before* the error announcement) and $t=0$ (annual report *after* the error announcement). Since information about the error announcement may be available before the error is published in the Federal Gazette, we

⁹ CDAX[®] Performance is the value-weighted index of all firms listed in the Prime or General Standard of the Frankfurt stock exchange.

¹⁰ See Appendix 2.2 for the list of symbols.

decide to use $t=-2$ instead of $t=-1$.¹¹ Further, we shift $t=-2$ and $t=0$ if the year is in 2009 to eliminate the main year of the financial crisis.¹²

Figure 2-3: Timeline Pre and Post Error Announcement



Authors' illustration.

To address hypothesis 2, we capture the transparency of public periodical firm reporting using two proxies: precision of forecast reporting and timeliness of loss recognition. Annual reports are assumed to be more informative if forecast reports are more precise (Knauer & Wömpener, 2011) and if economic losses are recognized more timely than economic gains (Ball & Shivakumar, 2005). The following section explains our proxies in more detail.

Precision of Forecast Reporting (Report on Opportunities and Risks)

Existing literature analyzes management forecast reports to proxy disclosure quality (e.g. Sletten, 2012). Unlike US firms, German corporations are required to disclose forecasts as part of their audited annual reports. There is some research into German annual forecast reporting. This focuses on the disclosure quality of DAX firms (Quick and Reus, 2009); firms in the stock market indices DAX, MDAX, SDAX, TECDAX (Baetge et al., 2011; Barth & Beyhs, 2010; Barth & Beyhs, 2012) or the Prime Standard (Knauer & Wömpener, 2010). These studies either compare reported items to legal requirements (Quick & Reus, 2009), analyze changes over time (Barth & Beyhs, 2010; Barth & Beyhs, 2012) or between different indices (Barth & Beyhs, 2010; Knauer & Wömpener, 2010).

¹¹ Concerning timely loss recognition, we also consider $t=-1$ in robustness checks.

¹² For example, if $t=-2$ is in 2009, we analyze 2008 instead of 2009. Otherwise, if $t=0$ is in 2009, we refer to 2010 instead of 2009.

The German setting is unique since German firms are required to disclose a forecast report about major opportunities and risks affecting the company's future performance (Sec. 289 paragraph 1 (4), 315 paragraph 1 (5) German Commercial Code "HGB") as part of the annual and interim reports. This is special insofar as the IFRS contain no comparable requirements. Nevertheless, the International Accounting Standards Board (IASB) released the Practice Statement "Management Commentary" in December 2010 containing non-binding recommendations (IN 1) for the presentation of forward-looking statements (IASB, 2010). The obligations of the commercial code are further substantiated by DRS 15 (replaced by DRS 20 in 2012). Prior studies use quantitative measures such as page count or the amount of lines or words in the forecast report (Knauer & Wömpener, 2010). This approach is criticized in that the length of a report does not necessarily correlate with the quality of its content. Consequently, recent studies analyze the content of forecast reporting, using disclosure indices to evaluate the precision of the firm's disclosure. The indices are either developed by the researchers themselves or by analysts, such as the Center for International Financial Analysis and Research (CIFAR) index for international firms (Glaum et al., 2013). Consequently, our study begins with a self-constructed disclosure index which is mainly related to DRS 15. Items are weighted with lower values if forecast statements are qualitative or comparative in nature. We classify a firm's forecast reporting as being more precise if the company provides quantitative information on relevant topics. The rationale behind is that the risk of litigation as well as disappointment of capital markets are even higher if precise predictions are not met (Knauer & Wömpener, 2011).¹³ Further details about the construction of the forecast disclosure index are presented in Tables 2-12 and 2-13 in the Appendix.

We use the following regression model to investigate the effect on the precision of forecast reporting provided by industry peers:

$$DCI_{i,t} = \alpha_0 + \alpha_1 POST_{i,t} + \alpha_2 SIZE_{i,t} + \alpha_3 INDEX_{i,t} + \alpha_4 LEVERAGE_{i,t} + \alpha_5 GROWTH_{i,t} + \alpha_6 BIG_4_{i,t} + \varepsilon_{i,t} . \quad (1)$$

¹³ Another measure could cover the observer perspective, using scoring techniques such as CIFAR, S&P or ManagerMagazin data, counting words/sentences or the use of artificial intelligence (Grüning, 2011).

The disclosure measure (DCI) is an index variable with values that increase in line with the precision of forecast reporting.

$POST_{i,t}$ is a dummy variable with the value 1 if firm year $_{i,t}$ is after the error announcement and 0 otherwise. As outlined in Section 2.3, we assume that industry peers of error announcing firms may wish to avoid reputational risk and show that they are more reliable than their industry peers who announced the accounting error. An increase in quantitative firm disclosure may be a costly signal to the markets insofar as it raises the direct costs of disclosure (preparation of reports as well as audit fees). Against this background, we expect to find a positive coefficient α_1 , indicating that there is a greater precision of forecast reporting after the error announcement.

$SIZE_{i,t}$. Bigger firms have larger accounting departments, resulting in more comprehensive reports. Furthermore, the bigger the firm, the stronger the information asymmetry between management and owners, generating the need for more detailed reporting (Jensen & Meckling, 1976). We therefore expect a positive association between SIZE and the precision of forecasts (DCI).

$INDEX_{i,t}$. Firms listed in stock market indices face higher transparency requirements imposed by the stock exchange. Additionally, investors' expectations regarding firm disclosure depend on the respective stock index. We differentiate between CDAX[®]-firms listed in DAX, SDAX, MDAX or TECDAX and CDAX-firms that do not belong to any of these indices. Since previous studies show that DAX firms submit more informative forecast reporting (Barth, 2009), we expect to find a positive relation between INDEX and the disclosure measure.

$GROWTH_{i,t}$. Firms that grow rapidly may have an interest in protecting their competitive advantages by not revealing future business opportunities (Knauer & Wömpener, 2011). We therefore expect to find less precise forecasts for firms characterized by higher growth rates.

$LEVERAGE_{i,t}$. The higher the leverage ratio, the more severe the information asymmetries between management and creditors (Jensen & Meckling, 1976; Watts & Zimmerman, 1986). To reduce these information asymmetries, firms may reveal more precise forecasts. However, two studies investigating the German setting (Frings, 1975; Barth, 2009) find no significant association between the precision of forecast reporting and leverage. Thus, we have no clear prediction for whether the coefficient on leverage will be positive or negative.

$BIG_{4,i,t}$ is a dummy variable that takes the value 1 if the annual report is audited by one of the four biggest audit companies. The rationale supporting this is that big audit firms are expected to have more resources and, therefore, greater expertise (Becker et al., 1998; Hope et al., 2013). Hence, the Big 4 audit firms are assumed to be better at evaluating the quality of forecasts. However, auditors are expected to be conservative in nature and have to restrict their risk of not detecting serious mistakes (Sec. 317 II HGB). Forecast reports contain a certain risk insofar as firms report their future expectations, while auditors have to ensure that reported forecasts are realistic (Knauer & Wömpener, 2011). Therefore, the relation between forecast precision and auditor size remains an empirical question.

We control for time series trends and industry effects by adding year and industry dummies.

Table 2-1: Variables Definitions

Economic variable	Variable name	Description	Data source
Cumulative abnormal returns	CAR	Following the market model (e.g. MacKinlay (1997)), we regress daily stock returns on daily returns of CDAX® for the estimation period of 150 days before the event window. This provides us with the parameters required to calculate the expected daily returns throughout the event window ([-2; +2]; [-1; +1]; [0]). Abnormal returns are the difference between observed and expected daily returns. Cumulative abnormal returns are the sum of abnormal returns throughout the event window.	Datastream
Index on the precision of forecasts	DCI	Index variable that takes a higher value if the forecast reporting is more precise. For detailed information, see Appendix.	Annual Reports
Accruals	ACC	Net income minus cash flow from operations scaled by lagged total assets.	Datastream
Cash flow from operations	CFO	Cash flow from operations scaled by lagged total assets.	Datastream
Indicator for negative cash flow	DCFO	Dummy variable: 1 if cash flow from operations is negative and 0 otherwise.	Datastream
Indicator for years after the error announcement	POST	Dummy variable: 1 if the fiscal year-end of the firm year is after the error announcement and 0 otherwise.	Federal Gazette
Firm size	SIZE	Natural logarithm of current total assets.	Datastream
Index	INDEX	Dummy variable: 1 if the firm is listed in DAX, MADAX, SDAX or TECDAX and 0 otherwise.	Datastream
Leverage	LEVERA GE	Total liabilities divided by total assets.	Datastream
Growth	GROWTH	Sales growth changes in the current year's sales divided by lagged sales	Datastream
Auditor	BIG_4	Dummy variable: 1 if the firm is audited by PricewaterhouseCoopers, KPMG, Ernst and Young or Deloitte and Touche and 0 otherwise.	Datastream
Indicator for treatment and control firms	PEERS	Dummy variable: 1 if the firm is an industry peer listed in CDAX® and 0 otherwise.	Datastream, Deutsche Börse

Timeliness of Loss Recognition

The next measure is a proxy to capture timely loss recognition.¹⁴ We interpret financial reporting as being more informative if future economic losses are recognized earlier than future economic gains (e.g. Ball & Shivakumar, 2005). We adopt the model of Ball & Shivakumar (2005):

$$ACC_{i,t} = \alpha_0 + \alpha_1 DCF_{i,t} + \alpha_2 CFO_{i,t} + \alpha_3 DCF_{i,t} \times CFO_{i,t} + \varepsilon_{i,t}. \quad (2)$$

Accruals (ACC) are computed as net income minus cash flow from operations ($CFO_{i,t}$). We use the cash flow information from the cash flow statement, but in robustness checks we also calculate accruals based on the balance sheet approach. Accruals and cash flow from operations are both scaled by lagged total assets. $DCF_{i,t}$ is a dummy variable that takes the value 1 if the cash flow is negative, and 0 otherwise. Timely gain recognition is reflected by α_2 . This coefficient is expected to be negative. If accrued losses are more likely in negative cash flow years, the incremental coefficient α_3 should be positive (Ball & Shivakumar, 2005). A higher α_3 is related to more asymmetric timeliness of earnings. The sum of α_2 and α_3 indicates timely loss recognition.

We measure changes in timely loss recognition after the error announcements by using a pre- and post-design based on industry peers listed in CDAX[®]. To analyze the effect for these industry peers (same historical six-digit GICS code), we integrate a second dummy variable into the regression:

$$\begin{aligned} ACC_{i,t} = & \alpha_0 + \alpha_1 DCF_{i,t} + \alpha_2 CFO_{i,t} + \alpha_3 DCF_{i,t} \times CFO_{i,t} \\ & + \alpha_4 \mathbf{POST}_{i,t} + \alpha_5 \mathbf{POST}_{i,t} \times DCF_{i,t} \\ & + \alpha_6 \mathbf{POST}_{i,t} \times CFO_{i,t} + \alpha_7 \mathbf{POST}_{i,t} \times DCF_{i,t} \times CFO_{i,t} + \varepsilon_{i,t}. \end{aligned} \quad (3)$$

As mentioned above, $\mathbf{POST}_{i,t}$ is a dummy variable that takes the value 1 if firm i in year t is after the error announcement and 0 otherwise. The incremental coefficient of interest is α_7 because it reflects changes in the asymmetry of earnings after the error announcement.

¹⁴ Timely loss recognition is also termed as conditional conservatism. We only focus on conditional conservatism because it is regarded as news-related conservatism (Basu, 1997; Ball and Shivakumar, 2005).

According to hypothesis 2, we expect a positive coefficient α_7 , indicating that industry peers make their financial reporting more informative by increasing timely loss recognition.

In the next step, we extend our research design. Since we are unable to control for time trends in timely loss recognition by using the pre- and post-design, we adopt a difference-in-differences approach. Following the design of Brown et al. (2014), we attempt to capture the change in timely loss recognition after the error announcement relative to firms that are unlikely to be affected by the error announcements. For that reason, we focus on publicly listed firms from Austria and Switzerland. These countries are characterized by a similar enforcement system (Leuz, 2010) and are also regarded as code-law countries (Ball et al., 2000). We require these control firms to belong to the same industry (historical six-digit GICS code) as the error firms in the month in which the error was announced. Further, these firms must have adopted IFRS. We identified 60 firms from Switzerland and 20 firms from Austria that meet our requirements.¹⁵ The difference-in-differences design is as follows:

$$\begin{aligned}
ACC_{i,t} = & \beta_0 + \beta_1 DCFO_{i,t} + \beta_2 CFO_{i,t} + \beta_3 DCFO_{i,t} \times CFO_{i,t} \\
& + \beta_4 \mathbf{POST}_{i,t} + \beta_5 \mathbf{POST}_{i,t} \times DCFO_{i,t} + \beta_6 \mathbf{POST}_{i,t} \times CFO_{i,t} \\
& + \beta_7 \mathbf{POST}_{i,t} \times DCFO_{i,t} \times CFO_{i,t} \\
& + \beta_8 \mathbf{PEERS}_{i,t} + \beta_9 \mathbf{PEERS}_{i,t} \times DCFO_{i,t} + \beta_{10} \mathbf{PEERS}_{i,t} \times CFO_{i,t} \\
& + \beta_{11} \mathbf{PEERS}_{i,t} \times DCFO_{i,t} \times CFO_{i,t} \\
& + \beta_{12} \mathbf{PEERS}_{i,t} \times \mathbf{POST}_{i,t} + \beta_{13} \mathbf{PEERS}_{i,t} \times \mathbf{POST}_{i,t} \times DCFO_{i,t} \\
& + \beta_{14} \mathbf{PEERS}_{i,t} \times \mathbf{POST}_{i,t} \times CFO_{i,t} \\
& + \boxed{\beta_{15} \mathbf{PEERS}_{i,t} \times \mathbf{POST}_{i,t} \times DCFO_{i,t} \times CFO_{i,t}} + \varepsilon_{i,t}. \tag{4}
\end{aligned}$$

POST is defined as above. The dummy variable PEERS equals 1 if the firm is an industry peer listed in CDAX[®] and 0 if the firm belongs to the control group. Table 4.2 summarizes the timely loss recognition coefficients and the differences in coefficients. The sum of β_2

¹⁵ For the sample selection, see Table 2-3. Since some of the Swiss firms report in CHF or USD, we convert all of the relevant accounting data into EUR. We therefore use the corresponding official period-end exchange rates of Deutsche Bundesbank.

and β_3 captures timely loss recognition of control firms *before* the error announcement whereas the sum of $\beta_2 + \beta_3 + \beta_{10} + \beta_{11}$ measures timely loss recognition of industry peers (PEERS=1) *before* the error announcement. The coefficient β_{15} reflects the incremental change in the asymmetry of earnings for industry peers relative to the control firms *after* the error announcement. The sum of β_{14} and β_{15} indicates the change in timely loss recognition *after* the error announcement relative to the control firms. We expect that error announcements will induce industry peers to exhibit a higher level of timely loss recognition. For this reason, both β_{15} and the sum of β_{14} and β_{15} should be positive.

Table 2-2: Timely Loss Recognition Coefficients

	Pre error announcement (POST=0)	Post error announcement (POST=1)	Difference in coefficients
Equation 3 (Industry peers in Germany)	$\alpha_2 + \alpha_3$	$\alpha_2 + \alpha_3 + \alpha_6 + \alpha_7$	$\alpha_6 + \alpha_7$
Equation 4 (Control group => PEERS=0)	$\beta_2 + \beta_3$	$\beta_2 + \beta_3 + \beta_6 + \beta_7$	$\beta_6 + \beta_7$
Equation 4 (Industry peers in Germany => PEERS=1)	$\beta_2 + \beta_3 + \beta_{10} + \beta_{11}$	$\beta_2 + \beta_3 + \beta_6 + \beta_7 +$ $\beta_{10} + \beta_{11} + \beta_{14} + \beta_{15}$	$\beta_6 + \beta_7 +$ $\beta_{14} + \beta_{15}$
Difference in coefficients	$\beta_{10} + \beta_{11}$	$\beta_{10} + \beta_{11} + \beta_{14} + \beta_{15}$	$\beta_{14} + \beta_{15}$

See Brown et al. (2014) who adopt the difference-in-differences design by using the measure of Basu (1997). POST: dummy variable that equals 1 if the fiscal year-end of the firm year is after the error announcement and 0 otherwise. PEERS: dummy variable that equals 1 if the firm is an industry peer listed in CDAX[®] and 0 otherwise.

2.4 Sample Selection and Data Collection

The sample selection starts by taking all error announcements published in the electronic Federal Gazette since the implementation of the FREP/BaFin enforcement process in 2005. The electronic Federal Gazette is the obligatory medium for making error announcements public in Germany. We identify 187 releases for the period from 2005 through January 2013. 20 announcements are excluded because they are rephrases of earlier announcements or releases by the same firm on subsequent days. Another ten observations are eliminated because the error firms do not have stock traded shares. This leaves us with 157 observations. The sample selection is presented in Table 2-3.

Studies on the advantages of different industry classifications find that the Global Industry Classification Standard (GICS) outperforms other industry classification systems such as the North American Industry Classification System (NICS) or Standard Industrial Classification (SIC) because identified groups are more homogenous (Hrazdil et al., 2013; Hrazdil & Zhang, 2012). We collect industry data from Compustat Global. In a few cases, we were unable to find the historical industry data. This data is added manually, using historical segment reporting and historical WZ codes (German classification of economic activities).

In the next step, we search for the first error announcement within an industry.¹⁶ 47 error firms remain. Furthermore, we exclude four banks and insurances as well as seven insolvent firms. We are finally left with 36 error firms to analyze industry peers. To identify the industry peers, we select German firms with exchange traded equities, listed in the regulated market segment of Deutsche Börse (CDAX[®]). Industry peers are those with the same historical six-digit GICS code as the respective error announcing firm. Industry peers for the remaining 36 error announcements are identified by their historical six-digit GICS codes during the month of the announcement.

We then have to split our sample selection due to the different data requirements. The first sample consists of firms for which we estimate cumulative abnormal returns. Here we have to exclude eight firms that have confounding events during the event window [-2; +2].

¹⁶ To make sure that we have the correct error date, we also check whether firms have already published an ad hoc announcement about the error finding.

Table 2-3: Sample Selection

187 Error announcements	
- 20	Rephrases of earlier announcements or releases on subsequent days
- 10	No stock traded shares
=157	Error announcements
47 First error announcements in an industry	
- 4	Banks and insurances
- 7	Insolvency before error announcement or in subsequent months
=36	First error announcements in an industry
Sample for Estimating CAR	Sample for Transparency Measures
36 First error announcements	
-8	Confounding events (-2;+2)
28 Error firms for calculating CAR	
220 Industry peers	268 Industry peers
-4	Firms become error firms in subsequent years
-12	Mergers and insolvencies
-8	Data missing in Datastream
196 Industry peers (before excluding confounding events)	240 Industry peers
	-50 No IFRS, not listed in CDAX
	190 Industry peers
	-5 Negative equity
	-18 Variables are missing
	167 Industry peers
	Control Firms
	126 Control firms (Austria, Switzerland)
	-33 No IFRS
	93 Control firms
	-1 Negative equity
	-12 Variables are missing
	80 Control firms

There remain 28 error firms, and hence 220 industry peers for estimating cumulative abnormal returns. To ensure that no peer firm becomes an error firm in subsequent years, we eliminate four firms that publish error announcements in later years. We lose twelve firms due to mergers and insolvencies and eight firms because data is missing in Datastream. Finally, we have 196 industry peers before controlling for confounding events.

Regarding the measures for hypothesis 2, we do not exclude firms with confounding events in the event window. Based on the 36 first error announcements within one industry, we identify 268 industry peers based on six-digit GICS codes. We have to exclude five firms that become error firms in subsequent years, 15 firms due to mergers and insolvencies and eight firms because data is missing. Further, 50 firms do not report according to IFRS or are not listed in CDAX[®] for the relevant time period. Five firms are dropped due to negative equity and 18 firms due to missing variables. We are finally left with 167 industry peers (334 firm years) for the analyses of the timeliness of loss recognition.

Table 2-4: Distribution of Observations

	Industry peers		Control group	
	Frequency	Percent	Frequency	Percent
Year				
2005	53	15.9	33	20.63
2006	53	15.9	17	10.63
2007	80	24.0	46	28.75
2008	79	24.0	31	19.38
2010	57	17.1	28	17.50
2011	4	1.2	2	1.25
2012	8	2.4	3	1.88
Industry (GICS classification)				
Energy	4	1.2	2	1.25
Materials	28	8.38	20	12.50
Industrials	62	18.56	24	15.00
Consumer Discretionary	72	21.56	32	20.00
Consumer Staples	4	1.2	10	6.25
Health Care	44	13.17	20	12.50
Financials	8	2.4	24	15.00
Information Technology	106	31.74	22	13.75
Telecommunication Services	6	1.8	6	3.75
Total	334	100	160	100

We find 157 (314 firm years) firms for evaluating the precision of forecast reporting because a number of forecast reports are unavailable.

As described in Section 2.4, we identify 80 control firms, with 20 firms from Austria and 60 from Switzerland. We had to exclude 33 firms because IFRS has not been adopted. Further, we dropped 12 firms because of missing variables and one firm due to negative equity. See Table 2-4 for a more detailed distribution of industry peers and control group.

2.5 Empirical Results

2.5.1 Capital Market Reactions to Industry Peers' Error Announcements

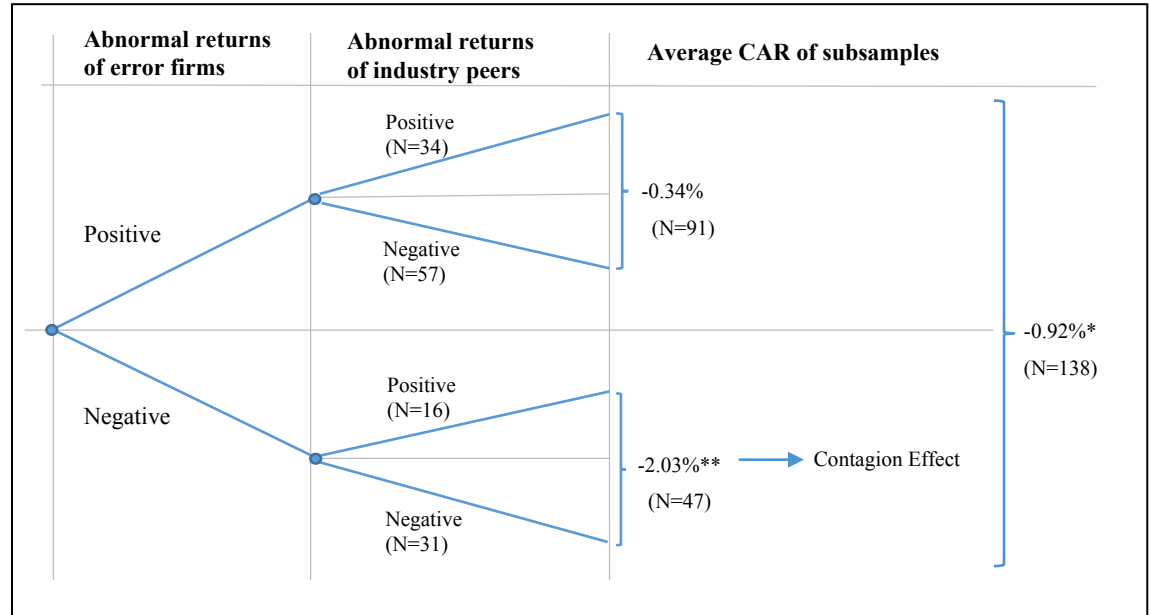
After controlling for confounding events, we estimate cumulative abnormal returns for 138 (150; 172) industry peers for the five (three; one) day event window.¹⁷ Our empirical results show that industry peers of error announcing firms suffer slightly negative cumulative abnormal returns within the five days surrounding the error announcement. We find on average cumulative abnormal returns of -0.92% within the five day event window and -0.80% within the three day event window.

Next, in accordance with Xu et al. (2006), we split our sample depending on the sign of the abnormal returns of the error announcing firms (see Figure 2-4). Xu et al. (2006) find that the peer portfolio experiences abnormal returns that follow the same trend as the restating firm. They conclude that the contagion effect dominates the competition effect. Our results are reported in Table 2-5.

The whole sample of industry peers suffers on average significantly negative cumulative abnormal returns of -0.92% from day -2 to day +2. After splitting the sample into whether the error firms' cumulative abnormal returns are positive or negative, industry peers of error firms with negative cumulative abnormal returns experience on average even more negative abnormal returns over the five day event window. For example, Xu et al. (2006) find on average negative cumulative abnormal returns of -0.76% whereas Gleason et al. (2008) report on average negative cumulative abnormal returns of -0.5% within the three day event window.

¹⁷The difference to the 196 industry peers explained in Section 2.4 results from confounding events of industry peers. We checked the respective event windows. See Table 2-5 for the remaining observations within the different event windows.

Figure 2-4: Cumulative Abnormal Returns within the Five Day Event Window



***, **, and * imply one-tailed statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.

Authors' illustration.

Thus, we find a significant contagion effect for industry peers of error firms with negative cumulative abnormal returns, but no unambiguous effect for industry peers of error firms with positive cumulative abnormal returns.

In line with Sletten (2012), we also use a two-sided t-test with clusters that controls for cross-sectional intra-industry correlation of returns within the event window. Even after that restriction, cumulative abnormal returns of industry peers to error firms with negative abnormal returns are significantly negative.

As mentioned above, the contagion effect is attributed to a loss in confidence in firm reporting. Stakeholders who used to rely on audited financial statements alter their perceptions to a certain extent. The resulting decline in a firm's value can be interpreted as a discount because financial reports within the respective industry are perceived to be less trustworthy.

Table 2-5: Cumulative Abnormal Returns (CAR) within Different Event Windows

CAR (in %)	All industry peers			Peers of error firms with neg. CAR			Peers of error firms with pos. CAR		
	[-2;2]	[-1;1]	[0]	[-2;2]	[-1;1]	[0]	[-2;2]	[-1;1]	[0]
Mean	-0.916%	-0.802%	-0.140%	-2.032%	-1.442%	0.310%	-0.339%	-0.463%	-0.381%
One-sided t-test	(-1.600)*	(-1.946)**	(-0.648)	(-2.063)**	(-2.022)**	(0.755)	(-0.485)	(-0.918)	(-1.538)*
Two-sided t-test with clusters	(-1.23)	(-1.63)	(-0.56)	(-2.06)*	(-2.12)*	(0.61)	(-0.38)	(-0.74)	(-1.39)
Median	-1.082%	-0.803%	-0.179%	-1.257%	-0.480%	-0.052%	-0.883%	-0.877%	-0.294%
Wilcoxon signed-rank test (z-statistic)	(-3.262)***	(-3.19)***	(-1.842)*	(-2.693)***	(-1.616)	(-0.114)	(-2.038)**	(-2.776)***	(-2.352)**
Standard deviation	6.721%	5.049%	2.839%	6.754%	5.142%	3.177%	6.668%	4.993%	2.624%
Test statistic following Brown/Warner (1985)	(-2.034)**	(-2.152)**	(-1.309)*	(-1.725)*	(-1.369)*	(-0.565)	(-1.199)	(-1.652)*	(-2.160)**
First quartile	-3.934%	-3.012%	-1.529%	-5.383%	-4.346%	-1.330%	-2.804%	-2.492%	-1.578%
Third quartile	0.943%	1.097%	0.811%	0.866%	1.373%	1.802%	1.118%	0.889%	0.510%
Number of observations	138	150	172	47	52	60	91	98	112

See Section 3.1 for a definition of CAR. ***, **, and * imply statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.

2.5.2 Effect on Industry Peers' Financial Reporting

Descriptive Statistics

Table 2-6 reports descriptive statistics. The average level of the measure on the precision of forecasts is 2.97. The median firm size is EUR 152.6 million total assets. On average, the firms have a leverage ratio of 47% and grow about 17.4%.

Table 2-6: Descriptive Statistics

	Firm years	Mean	Median	Standard deviation	p25	p75
DCI Analysis						
DCI	314	2.9707	2.8000	1.8908	1.4000	4.2000
POST	314	0.5000	0.5000	0.5008	0.0000	1.0000
SIZE	314	19.1474	18.8436	2.1212	17.6959	20.1211
in thousand EUR	314		152,641			
INDEX	314	0.2771	0.0000	0,4483	0.0000	1.0000
LEVERAGE	314	0.4699	0.4966	0.2071	0.3037	0.6412
GROWTH	314	0.1739	0.1065	0.2632	0.0172	0.2334
BIG_4	314	0.6592	1.0000	0.4747	0.0000	1.0000
Timeliness of Loss Recognition						
ACC	334	-0.0231	-0.0332	0.1269	-0.0867	0.0244
CFO	334	0.0750	0.0825	0.1437	0.0213	0.1334
DCFO	334	0.2010	0.0000	0.4010	0.0000	0.0000
POST	334	0.5000	0.5000	0.5008	0.0000	1.0000
SIZE	334	19.1411	18.8538	2.1006	17.6976	20.1211
LEVERAGE	334	0.4764	0.5041	0.2078	0.3038	0.6455
GROWTH	334	0.1731	0.1086	0.2657	0.0122	0.2363
BIG_4	334	0.6587	1.0000	0.4749	0.0000	1.0000
Control Group						
ACC	160	-0.0300	-0.0356	0.0773	-0.0718	0.0153
CFO	160	0.0967	0.0894	0.1051	0.0347	0.1501
POST	160	0.5000	0.5000	0.5016	0.0000	1.0000
SIZE	160	20.3484	20.4261	1.6083	19.1836	21.2548
LEVERAGE	160	0.4833	0.5187	0.1718	0.3652	0.6197
GROWTH	160	0.1699	0.1141	0.2436	0.0295	0.2148

See Table 2-1 for the definitions of variables. All variables are winsorized at the 1% and 99% percentiles. GROWTH is winsorized at the 5% and 95% percentiles due to extreme outliers. Note that results are robust if we winsorize GROWTH at the 1% and 99% percentiles.¹⁸

¹⁸ The sample size differs due to unavailable forecast reports.

Around 27.7% of firms are listed in DAX, MDAX, SDAX or TECDAX and 65.9% are audited by one of the Big 4 auditors. The mean values of control variables for the tests on timely loss recognition (N=334) are quite similar.

Effects on the Precision of Forecast Reporting (Report on Opportunities and Risks)

For our second hypothesis, we expect to find more precise forecasts after the error announcement. Table 2-7 presents the Pearson correlations, revealing a statistically significant association between the disclosure measure (DCI) and the POST variable. This finding suggests that the precision of forecasts increases after the error announcement. Further, DCI is significantly positively associated with firm size, leverage and membership of DAX, MDAX, SDAX or TECDAX. Firms that grow rapidly are less precise in their forecasts. Nevertheless, there is no significant correlation between DCI and BIG_4.

Table 2-7: Pearson Correlations (DCI Analysis, N= 314)

	DCI	POST	SIZE	LEVERAGE	GROWTH	BIG_4	INDEX
DCI	1.000						
POST	0.138** (0.01)	1.000					
SIZE	0.487*** (0.00)	0.046 (0.42)	1.000				
LEVERAGE	0.170*** (0.00)	-0.019 (0.74)	0.485*** (0.00)	1.000			
GROWTH	-0.111* (0.05)	-0.080 (0.16)	-0.010* (0.08)	-0.133** (0.02)	1.000		
BIG_4	0.087 (0.12)	0.020 (0.72)	0.398*** (0.00)	0.182** (0.00)	-0.134** (0.02)	1.000	
INDEX	0.416*** (0.00)	0.021 (0.71)	0.628*** (0.00)	0.193*** (0.00)	0.046 (0.41)	0.220*** (0.00)	1.000

See Table 2-1 for the definitions of variables. All variables are winsorized at the 1% and 99% percentiles. GROWTH is winsorized at the 5% and 95% percentiles due to extreme outliers. *, **, and *** imply significance at the 10%, 5%, and 1% level, using a two-tailed test.

First, we compare the difference in means of the DCI index before and after the error announcements. The results of a t-test strongly corroborate the assumption that the precision of forecasts increases after the error announcement (p-value=0.015). See Table 2-8 for the results.

Table 2-8: Two-sample t test with equal variances (DCI Analysis, N=314)

	Mean	Mean	Difference in means	T-statistic
	Pre error announcement (POST=0)	Post error announcement (POST=1)		(p-value)
DCI	2.711	3.231	-0.520	2.455
				(0.015)**
See Table 2-1 for the definitions of variables. ***, **, and * imply statistical two-tailed significance at the 0.01, 0.05, and 0.10 levels, respectively. All variables are winsorized at the 1% and 99% percentiles.				

However, no positive effect of POST on the precision of forecasts can be found in the multivariate regression analyses. Table 2-9 presents our findings. In line with Barth (2009) and Barth & Beyhs (2012), we find a strong year effect as well as an industry effect, both of which dominate the reaction to the error announcement. Further, we find that both firm size and membership of DAX, MDAX, TECDAX or SDAX play a major role in explaining the precision of forecasts. We find a significantly negative relation between DCI and engaging a Big 4 auditor. In contrast, Barth (2009) reveals no significant impact from a Big 4 auditor on the precision of forecast reporting. The coefficient on leverage is not significant, whereas growth is negatively associated with DCI.

Since the sample period covers the financial market crisis, the results may be distorted. To circumvent this, we exclude all firms that have the relevant year $t=-2$ or $t=0$ in 2009. The conclusions remain the same.

In further analyses, we also consider another disclosure index that comprises only earnings-related forecast items. The conclusions do not change since the coefficient on POST is still insignificant. The same holds true if we vary the weightings for the different categories of forecast precision.

Table 2-9: Effects on Precision of Forecast Reporting

Dependent Variable	Predicted Sign	DCI	DCI
POST	+	0.314 (0.306)	0.063 (0.807)
SIZE	+	0.384*** (0.000)	0.345*** (0.000)
LEVERAGE	?	-0.427 (0.422)	0.014 (0.978)
GROWTH	-	-0.767* (0.088)	-0.683* (0.065)
BIG_4	?	-0.522* (0.059)	-0.456** (0.047)
INDEX	+	0.823** (0.022)	0.843*** (0.007)
Constant		-4.411*** (0.007)	-2.972* (0.050)
Industry Dummies		-	Included
Year Dummies		Included	Included
Standard Errors clustered by		Industries	Firms
Firm years		314	314
Adj. R ²		0.293	0.322
F-Stat.		19.55	10.25

*, **, and *** imply significance at the 10%, 5%, and 1% level, using a two-tailed test. P-values are reported in brackets. Continuous variables are winsorized at the 1%- and 99% percentiles. GROWTH is winsorized at the 5% and 95% percentiles due to extreme outliers. See Table 2-1 for the definitions of variables. DCI: index variable that has a higher value if the forecast reporting is more precise; POST: dummy variable that equals 1 if the fiscal year-end of the firm year is after the error announcement and 0 otherwise.

Effects on Timely Loss Recognition

Based on the model of Ball & Shivakumar (2005), we test hypothesis 2, which states that industry peers of error firms change the level of timely loss recognition after the error announcement. In line with this hypothesis, we expect to find a positive incremental coefficient α_7 if there is more timely loss recognition after the event.

Table 2-10 presents the results. For firm years before an error announcement, we find that α_2 is negative and statistically significant. In contrast, the findings do not reveal a statistically significant α_3 . We are therefore unable to find a relation between accruals and cash flows that differs between negative cash flow years and positive cash flow years before the error announcement. Thus, there is no evidence for timely loss recognition.

When firm years after the error announcement of an industry peer are concerned, the coefficient α_6 is not significant. Therefore, in positive cash flow years after the error announcement, firms also offset the same percentage of cash flow by accruals. As expected, we find a positive incremental coefficient α_7 . Consistent with hypothesis 2, this reveals an increase in timely loss recognition in post error announcement years. More timely loss recognition indicates a higher information content of financial reporting for the sample of industry peers in the years after the error announcement.

In line with Peek et al. (2010), we also include control variables (size, leverage, growth and Big 4 auditor) in the regression.¹⁹ The coefficient α_7 becomes smaller, but remains significant. We cluster standard errors by industries in the main regressions (Table 2-10, columns 1-2). Clustering standard errors by firms does not change the conclusions (Table 2-10, columns 3-4). Moreover, we check another measure on cash flows and accruals by calculating the variables without using the cash flow statement.²⁰ Our results (not tabulated) remain robust. In additional tests, we include the year 2009. The results for the main regressions are still consistent, even though the coefficient α_7 decreases (Table 2-10, columns 5-8). The findings are similar if we fully delete all firms with relevant firm years in 2009.

In order to control for time trends in timely loss recognition, we adopt a difference-in-differences approach, including a control group based on firms from Switzerland and Austria in the analyses. As described in Section 2.3.2, we predict that error announcements induce industry peers (PEERS=1) to increase timely loss recognition to a higher extent relative to the control group. Therefore, β_{15} should be positive. Table 2-11 summarizes our findings. The coefficient β_{15} has the expected sign and is statistically significant. Note that the results have to be interpreted with caution, because the mean VIF varies between 11.6 and 12.1% and multicollinearity cannot be ruled out.

¹⁹ To avoid a high variance inflation factor (VIF), we do not interact the control variables.

²⁰ Accruals equal Δ current assets - Δ cash - Δ accounts payable - Δ provisions - depreciation and amortization.

Table 2-10: Effects on Timely Loss Recognition

Dependent Variable	Predicted Sign	Including 2009							
		ACC	ACC	ACC	ACC	ACC	ACC	ACC	ACC
DCFO (α_1)		0.019 (0.474)	0.017 (0.517)	0.016 (0.698)	0.019 (0.595)	0.016 (0.530)	0.012 (0.619)	0.014 (0.713)	0.015 (0.656)
CFO (α_2)	-	-0.419*** (0.006)	-0.506*** (0.000)	-0.373*** (0.001)	-0.469*** (0.000)	-0.420*** (0.006)	-0.502*** (0.000)	-0.372*** (0.001)	-0.466*** (0.000)
DCFOx CFO (α_3)	+	-0.250 (0.359)	-0.060 (0.797)	-0.285 (0.437)	-0.091 (0.760)	-0.239 (0.403)	-0.065 (0.798)	-0.270 (0.463)	-0.092 (0.765)
POST (α_4)		-0.011 (0.539)	-0.002 (0.901)	-0.016 (0.435)	-0.006 (0.753)	-0.013 (0.474)	-0.007 (0.651)	-0.020 (0.337)	-0.015 (0.430)
POSTx DCFO (α_5)		0.151*** (0.001)	0.127*** (0.005)	0.125** (0.039)	0.100* (0.058)	0.132*** (0.000)	0.122*** (0.002)	0.108** (0.042)	0.098** (0.044)
POSTx CFO (α_6)		0.005 (0.959)	-0.004 (0.968)	-0.0276 (0.822)	-0.0385 (0.750)	0.078 (0.426)	0.070 (0.552)	0.062 (0.636)	0.059 (0.640)
POSTx DCFOx CFO (α_7)	+	0.945** (0.014)	0.812** (0.036)	0.901** (0.025)	0.759** (0.038)	0.742** (0.045)	0.662* (0.077)	0.678* (0.079)	0.588* (0.097)
SIZE			0.007** (0.026)		0.007** (0.015)		0.006* (0.083)		0.006** (0.050)
LEVERAGE			-0.130** (0.022)		-0.176*** (0.000)		-0.112* (0.054)		-0.159*** (0.000)
GROWTH			0.096*** (0.001)		0.070*** (0.002)		0.099*** (0.002)		0.074*** (0.002)
BIG_4			-0.013 (0.443)		-0.015 (0.230)		-0.009 (0.570)		-0.010 (0.421)
Constant		-0.001 (0.936)	-0.067 (0.200)	-0.002 (0.919)	-0.031 (0.560)	-0.001 (0.972)	-0.051 (0.352)	-0.001 (0.964)	-0.023 (0.672)
Industry Dummies		-	-	Included	Included	-	-	Included	Included
Year Dummies		Included	Included	Included	Included	Included	Included	Included	Included
Standard Errors clustered by		Industries	Industries	Firms	Firms	Industries	Industries	Firms	Firms
Firm years		334	334	334	334	334	334	334	334
Adj. R ²		0.386	0.461	0.435	0.515	0.370	0.434	0.426	0.497
F-Stat.		4.671	12.77	24.51	72.33	8.293	14.59	16.14	31.85

$$ACC_{i,t} = \alpha_0 + \alpha_1 DCFO_{i,t} + \alpha_2 CFO_{i,t} + \alpha_3 DCFO_{i,t} \times CFO_{i,t} + \alpha_4 \times POST_{i,t} + \alpha_5 \times POST_{i,t} \times DCFO_{i,t} + \alpha_6 \times POST_{i,t} \times CFO_{i,t} + \alpha_7 \times POST_{i,t} \times DCFO_{i,t} \times CFO_{i,t} + \varepsilon_{i,t}$$

*, **, and *** imply significance at the 10%, 5%, and 1% level, using a two-tailed test. P-values are reported in brackets. Continuous variables are winsorized at the 1%- and 99% percentiles. GROWTH is winsorized at the 5% and 95% percentiles due to extreme outliers. See Table 2-1 for the definitions of variables. ACC: net income minus cash flow from operations scaled by lagged total assets; DCFO: dummy variable: 1 if cash flow from operations is negative and 0 otherwise; CFO: cash flow from operations scaled by lagged total assets; POST: dummy variable that equals 1 if the fiscal year-end of the firm year is after the error announcement and 0 otherwise.

Table 2-11: Effects on Timely Loss Recognition Including Control Group

Dependent Variable	Predicted Sign			Including 2009	
		ACC	ACC	ACC	ACC
DCFO (β_1)		0.0190 (0.537)	0.0247 (0.536)	0.0371 (0.284)	0.0369 (0.364)
CFO (β_2)	-	-0.402*** (0.001)	-0.241** (0.018)	-0.380*** (0.001)	-0.211** (0.038)
DCFOxCFO (β_3)		0.274 (0.684)	0.000 (1.000)	0.349 (0.640)	0.022 (0.975)
POST (β_4)		-0.005 (0.752)	-0.012 (0.498)	0.006 (0.697)	-0.002 (0.882)
POSTxDCFO (β_5)		-0.0666 (0.160)	-0.0626 (0.203)	-0.0916* (0.053)	-0.0828* (0.094)
POSTxCFO (β_6)		-0.019 (0.845)	-0.034 (0.775)	-0.058 (0.472)	-0.078 (0.490)
POSTxDCFOxCFO (β_7)		-0.930 (0.163)	-0.845 (0.184)	-0.938 (0.195)	-0.893 (0.192)
PEERS (β_8)		-0.000 (0.990)	0.024 (0.160)	0.001 (0.962)	0.027 (0.122)
PEERSxDCFO (β_9)		-0.001 (0.985)	-0.004 (0.941)	-0.027 (0.526)	-0.024 (0.655)
PEERSxCFO (β_{10})		-0.065 (0.683)	-0.206 (0.143)	-0.062 (0.704)	-0.211 (0.130)
PEERSxDCFOxCFO (β_{11})		-0.408 (0.542)	-0.151 (0.835)	-0.498 (0.490)	-0.183 (0.810)
PEERSxPOST (β_{12})		0.001 (0.952)	0.002 (0.916)	-0.018 (0.202)	-0.017 (0.449)
PEERSxPOSTxDCFO (β_{13})		0.200*** (0.009)	0.180** (0.014)	0.227*** (0.001)	0.199*** (0.003)
PEERSxPOSTxCFO (β_{14})		0.017 (0.860)	0.014 (0.936)	0.141 (0.216)	0.153 (0.356)
PEERSxPOSTxDCFOxCFO (β_{15})	+	1.805** (0.025)	1.664** (0.024)	1.632* (0.051)	1.516** (0.049)
Constant		-0.052 (0.175)	-0.031 (0.493)	-0.037 (0.346)	-0.019 (0.691)
Industry Dummies		-	Included	-	Included
Year Dummies		Included	Included	Included	Included
Control Variables		Included	Included	Included	Included
Standard Errors clustered by		Industries	Firms	Industries	Firms
Firm years		494	494	494	494
Adj. R ²		0.433	0.468	0.400	0.442
F-Stat.		97.55	29.82	295.9	18.30

*, **, and *** imply significance at the 10%, 5%, and 1% level, using a two-tailed test. P-values are reported in brackets. Continuous variables are winsorized at the 1%- and 99% percentiles. GROWTH is winsorized at the 5% and 95% percentiles due to extreme outliers. See Table 2-1 for the definitions of variables. ACC: net income minus cash flow from operations scaled by lagged total assets; DCFO: dummy variable that equals 1 if cash flow from operations is negative and 0 otherwise; CFO: cash flow from operations scaled by lagged total assets; POST: dummy variable that equals 1 if the fiscal year-end of the firm year is after the error announcement and 0 otherwise.

Further Analyses

Unreported analyses based on the McNemar test reveal no significant increase in auditor turnover after an industry peer's error announcement. Nor do we find any significant evidence that peer firms switch to a Big 4 auditor after the event. Switching auditor or changing to a Big 4 auditor may have been used as another positive signal to the markets. The results suggest that industry peers do not try to restore reliability of financial reporting by switching their auditors after a stock price decline.

Additionally, we check whether firms that have the most negative cumulative returns increase the transparency of financial reporting more than other firms. Therefore, we include a dummy variable (D_{negCAR}) taking the value 1 if the firm has a negative cumulative return (five-day event window) within the lowest quartile and 0 otherwise.

Referring to the analyses on the precision of forecasting reporting, we include the dummy variable (D_{negCAR}) as well as the interaction term $D_{negCAR} \times POST$ in the regressions presented in Table 2-9. The latter variable shows the incremental effect on the precision of forecasting reporting for the firms that have the most negative cumulative returns after the error announcement. Results are not tabulated. The coefficients of $D_{negCAR} \times POST$ are positive (0.681 if standard errors are clustered by industries and no industry dummies are included; 0.683 if standard errors are clustered by firms and industry dummies are included), but only significant at the 10% level/not significant (p-values: 0.100 and 0.133). This weakly indicates an increase in the precision of forecast reporting for industry peers that suffered most from the negative cumulative abnormal returns after the error announcement.

We also integrate the dummy variable D_{negCAR} in the analyses on timely loss recognition that was presented in Table 4.10. Since we have to interact D_{CARneg} with $POST$, CFO and $DCFO$, the variance inflation factor becomes extremely high (above 20 for some interaction terms). Thus, we have to skip these analyses due to problems of multi-collinearity.

2.6 Conclusion

This study investigates the intra-industry effects of accounting error announcements. We find that industry peers experience statistically significant stock price declines when an error is announced. This finding may be associated with changes in the investors' perception of the reliability of the firm's disclosure. We expect that the industry peer's error announcement may encourage managers to regain their firm's reputation by

presenting more transparent financial statements after the event. In line with that hypothesis, we find an increase in timely loss recognition in post error announcement years, indicating a greater information content in industry peers' financial statements after the error announcement. Nevertheless, our results show no evidence for more precise forecasts after the event. In line with prior studies, we find a strong time trend as well as an industry effect, both of which dominate the reaction to the error announcement.

The findings quoted above suggest that firms react to industry peers' error announcements by increasing the timeliness of loss recognition to signal that their accounts are reliable. Another means of restoring credibility could be more precise forecasts. Nevertheless, this could prove to be more costly insofar as quantitative forecasts could easily destroy a firm's value if market expectations are not met (Knauer & Wömpener, 2011). This risk is much lower for figures reported in the income statement since they show the previous year's business transactions. Besides, more transparent forecasts may be harmful to a firm even if the information is favorable insofar as competitors could glean information about future profitable business opportunities (Verrecchia, 1983). Proprietary costs may therefore explain why managers disclose losses more timely after the announcement of an accounting error by an industry peers, but do not simultaneously enhance the precision of forecast reporting.

Böcking et al. (2015) find that error firms exhibit the lowest level of earnings quality in the year of erroneous financial statements. We extend that literature by adding first insights into the disclosure choice of industry peers following an error announcement within the German Financial Reporting Enforcement process. We find that industry peers suffer on average negative cumulative abnormal returns around the time of the error announcement and that the timeliness of loss recognition increases in the next annual report. This may be interesting for the enforcement panel insofar as it indicates that the enforcement process has a sufficient deterrent effect on industry peers.

Our study may be subject to some limitations. Since the financial crisis may affect firms' financial reporting, future studies could investigate firms across a longer timescale so that the study is not affected in this way.

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Appendix 2.1: Forecast Disclosure Index

This section provides details about the construction of our disclosure index measuring the precision of forecast disclosures.

Unlike other studies that refer to DRS 15 (e.g. Quick & Reus, 2009; Barth, 2009; Knauer & Wömpener, 2010), we restrict our analysis to disclosure items concerning the firm's development. We thereby follow the argumentation in DRS 20 that statements regarding expected macroeconomic or industry developments are often quotes of assumptions of external institutions such as industry associations or research institutes (Quick & Reus, 2009). Therefore, the information given in those sections is not new to market participants. Thus, we restrict our analysis to forecasts provided by the actual firm. Table 2-12 presents the 16 forecast items that occur quite often in forecast statements and hence formed the basis of our analysis.

Table 2-12: Forecast Items

1.	Earnings forecast (e.g. earnings after tax)
2.	Earnings forecast (e.g. EBIT)
3.	Yield forecast (return on sales)
4.	Yield forecast (EBIT margin)
5.	Dividend forecast
6.	EPS forecast
7.	Sales forecast
8.	Order development
9.	Income forecast
10.	Expenses forecast
11.	Cost forecast
12.	Cash flow forecast
13.	Investment forecast
14.	Financial status forecast
15.	Balance sheet structure forecast
16.	Segment forecast

German commercial law requires holding companies to present group management reports comprising forecast statements (Section 315 HGB), but does not specify the contents in detail. Therefore, the starting point of our index construction is the recommendation by the German Accounting Standards Committee (DRSC), which

interprets the unspecific requirements, but is not legally binding. Within our sample period, DRS 15 was due. In 2012, the DRSC revised this standard and released DRS 20, due for firm years after 2012. One main change concerns the precision required for forecast statements. According to DRS 15, qualitative and comparative forecasts were recommended as well as qualified comparative, intervals or point forecasts (DRS 15). DRS 20 is stricter in that respect, allowing only qualified comparative, intervals or point forecasts. We refer to this by graded weightings for the different levels of precision. A maximum value of 1 is attributed to intervals or point forecasts. The weightings are presented in Table 2-13.

Table 2-13: Precision of Forecasts

Precision of forecasts	Weighting
Qualitative forecasts	0.2
Comparative forecasts	0.2
Qualified comparative forecasts	0.8
Interval forecasts	1.0
Point forecasts	1.0

This results in a maximum score of 16 for firms presenting interval or point forecasts concerning all items. We also considered different weightings (e. g. 0; 0; 0.7; 1; 1) in robustness checks.

Appendix 2.2: List of Symbols

*	statistical significance at the 0.10 level
**	statistical significance at the 0.05 level
***	statistical significance at the 0.01 level
%	percent
&	and
α	regression coefficient
β	regression coefficient
ε	residual term
ACC	variable for accruals
BIG_4	variable for Big 4 auditor
CAR	cumulative abnormal return
CFO	variable for cash flow from operations
DCFO	indicator variable for negative cash flow
DCI	Disclosure Index
D_negCAR	indicator variable for negative CAR within (five-day event window) within the lowest quartile
INDEX	variable for listing in a main index (DAX, MDAX, SDAX, TECDAX)
GROWTH	variable for sales growth
i	firm index
LEVERAGE	variable for leverage
p	percentile
p	p-value
PEERS	indicator variable for treatment and control firms

POST	indicator variable for firm years after the error announcement
R ²	empirical coefficient of determination
SIZE	variable for firm size
t	time index
<i>t</i>	t-value
<i>z</i>	z-statistic

3. Supervisory Board Characteristics and Income Smoothing of German Co-operative Banks

Abstract

This study investigates how the accounting behavior of German credit co-operatives is affected by specific characteristics of their corporate governance structures. Within that context, it analyzes the role of the supervisory board in restricting discretion in income smoothing.

The results support the hypothesis that German co-operative banks smooth income through the use of loan loss provisions. Nevertheless, results differ significantly before and after the announcement of the Basle III rules in December 2010.

The results concerning the role of the supervisory board in mitigating income smoothing suggest that the existence of an audit committee as well as a relatively large share of female representatives on the board contributes to a good performance in the mitigation of bank income smoothing.

Against the expectations, there is a (weak) negative relation between the information asymmetry between management and co-operative shareholders and the extent of income smoothing. Besides, the study finds no evidence that the additional contribution ratio positively affects income smoothing.

3.1 Introduction

As a consequence of the financial crisis, the Basle Committee on Banking Supervision released its recommendations concerning bank stability. The aim was to enhance the quality of bank monitoring through more detailed regulatory reporting combined with a higher quality of corporate governance and enhanced public disclosure (Basle Committee on Banking Supervision, 2010). “Effective corporate governance is critical to the proper functioning of the banking sector and the economy as a whole” (Basle Committee on Banking Supervision, 2015:3). Derived from the reinforced regulations concerning the effectiveness of the corporate governance, and more specifically the knowledge and suitability of supervisory board members, banks had to scrutinize the composition of their supervisory boards. Thus, changes within the board member structure became more likely after the Basle III announcement, as boards tried to comply with the new rules. Further changes within the bank regulatory framework relate to the required capital ratios and altered own-funds requirements. Thus, also the incentives for bank accounting changed as a consequence of the regulatory requirements.

This study investigates how German credit co-operatives use their discretion in credit valuation to smooth income through the use of loan loss provisions (LLP). It analyzes the effect of the unique corporate governance structure of German co-operative banks in mitigating income smoothing. As quoted above, the banking supervisory regulators aim at enhancing the effectiveness of bank supervisory boards. In that context, this study sheds light on the effect of different characteristics of the supervisory board in restricting income smoothing.

Co-operative banks play an important role for the German banking sector insofar as about half of the credit institutes in Germany are organized within the legal form of the co-operative (Deutsche Bundesbank, 2017). Besides, due to their specific business model, these institutes play an important role for lending to regional small and medium sized entities (SME). Derived from the corporate law particular to this legal, co-operative bank managers face unique incentives to manage earnings. Unlike the owners of commercial banks within the legal form of the corporation, co-operative shareholders are usually obliged to make further payments in the gone concern case (Sec. 6 and 105 GenG). Besides, only co-operative shareholders can terminate their shares (Sec. 65 GenG), resulting in a decline in subscribed capital and lower regulatory capital ratios. Therefore, bank managers could use income smoothing as a means to signalize stability and soundness to the owners.

Despite their relevance for the German economy, their unique corporate governance structure and the specific incentives for managers of co-operative banks to manage earnings, the literature on the accounting behavior of co-operative banks is rare. To the best of my knowledge, there are only two studies so far that include co-operatives into their samples for analyses of the accounting behavior of German credit institutes. Bornemann et al. (2012) relate to the hidden reserves built by banks in accordance with Section 340f HGB to provision against specific risks of the banking business. They show for a sample including co-operatives, savings banks and commercial banks for the years from 1997 through 2009 that German credit institutes have used hidden 340f reserves to manage earnings. Bornemann et al. (2014) investigate the use of visible 340g reserves for capital and earnings management from 1995 through 2010. They find that German banks from all sectors primarily use 340g reserves to manage their regulatory Tier 1 capital ratio, which is a key figure used by banks and supervisory authorities to control bank stability. None of these studies analyzes sample years after 2010 that are affected by the altered regulatory capital requirements under Basle III.

The first set of hypotheses investigates how income smoothing of German credit co-operatives is influenced by their specific corporate governance structure. The empirical results suggest that co-operative banks smooth income through the use of loan loss provisions. This effect is stronger for sample years before 2011. After the announcement of the Basle III rules in December 2010, the building of loan loss provisions declines in support of 340g reserves. The rationale is that those reserves are eligible as regulatory capital under Basle III while LLP are not accepted as own funds any longer. Furthermore, a relatively high information asymmetry between the management and co-operative shareholders, as approximated by a relatively high count of members, is found to negatively influence income smoothing. This may be due to the higher detection risk since more shareholders may scrutinize the accounting practices within the general assembly. The analyses reveal no statistically relevant results concerning the effect of the additional contribution in case of insolvency. This finding may be caused by the fact that the sample firms are quite far from financial distress.

The final research question relates to the supervisory board as one of the main means of corporate governance. It investigates the effectiveness of different supervisory board characteristics in mitigating bank income smoothing. The literature on earnings management discusses three main reasons why banks smooth income, namely to disclose formerly proprietary information about long term trends (Tucker & Zarowin, 2006), to manipulate financial figures (Fonseca & González, 2008) or to manage the bank's regulatory capital (Bornemann et al., 2014). Since LLP are no longer eligible as regulatory capital under the Basle III rules, the capital management argument is expected to become less pronounced. Nevertheless, co-operative banks are assumed to indirectly manage their capital ratios by smoothing income to indicate stability and thus avoid termination of equity. Against that background and the enhanced regulatory requirements concerning the expertise and personal suitability of bank supervisory board members, the supervisory boards face growing incentives to detect and mitigate manipulations of figures to avoid legal action.

Prior studies show negative relations between earnings management and effective supervisory boards. Nevertheless, most of the empirical evidence is based on US samples excluding the financial industries due to the specific accounting of financial firms. Moreover, many studies approximate earnings quality by the extent of discretionary accruals, a means which is more negatively connoted than income smoothing, a means which is also connected to enhanced information. Cornett et al. (2009) report

opportunistic earnings management to be less likely with more independent supervisory boards for a sample of publicly traded US commercial bank holding companies. Leventis & Dimitropoulos (2012) illustrate for a sample of US banks that better governed institutes engage less in aggressive earnings management. Altamuro & Beatty (2010) find increased loan loss provision validity and a decline in accounting conservatism for banks that enhanced their internal controls as a consequence of the Federal Depository Insurance Corporation Improvement Act in comparison to an unaffected control group.

The empirical results for the co-operative bank sample from 2007 through 2013 indicate that the existence of an audit committee as well as gender diverse supervisory boards mitigate bank income smoothing. In line with these findings, analyses using an index variable for supervisory board strength that comprises the partial aspects tested beforehand reveal a negative relation between an effective supervisory board and income smoothing for the late sample years between 2011 and 2013. On the contrary, the incremental effect of more effective supervisory boards is positive and statistically significant for the early sample years from 2007 through 2010, indicating that more effective supervisory boards support income smoothing.

To the best of my knowledge, there is no empirical study yet that investigates the role of the supervisory board in mitigating earnings management of German credit institutes. Furthermore, it is the first empirical work that addresses the effect of supervisory board gender distribution on bank accounting. This study contributes to the literature on bank earnings management and the influence of regulation and governance structures on accounting practices.

The remainder of this paper is structured as follows: Chapter 3.2 explains the specific setting of the study, namely relevant aspects of bank accounting and bank regulation. Chapter 3.2 reviews related literature, describes the unique legal and institutional setting of German co-operative banks and develops the hypotheses. The research design is presented in Chapter 3.4. Chapter 3.5 explains the sample selection and the data. Empirical results are presented in Chapter 3.6 and conclusions are drawn in Chapter 3.7.

3.2 Credit Co-operatives in Germany: Legal Form, Accounting, and Regulatory Reporting

This chapter outlines the specific institutional framework for credit co-operatives in Germany. Thus, it introduces specific aspects of the legal form, explains the subsequent measurement of loans and the appropriation of earnings under HGB, and addresses derived approaches for managing earnings as well as regulatory capital ratios.

3.2.1 Credit Co-operatives in Germany: Specific Aspects of the Legal Form

Co-operative banks in Germany have different ownership, governance, and financing structures from those of public or savings banks. They do not have access to public equity markets, and their financial statements are less likely to be widely distributed.

Nevertheless, co-operative banks play an important role for the German banking sector. The monthly banking statistics reveal that about half of the credit institutes in Germany are co-operatives (Deutsche Bundesbank, 2017).²¹ The large number of co-operative banks is to some extent a result of the regional principle combined with the specific business model. Since there is only one co-operative bank within one region, there is no competition between the co-operatives. Therefore, the deposit protection can be managed as an institution guarantee, which secures the survival of the bank in case of severe financial distress instead of just the customers' deposits. On the other hand, the regional orientation may explain the minor supra-regional concern about the institutes' financial reporting. Thus, the number of stakeholders is restricted and accessible via alternative communication channels such as membership magazines, notices or direct approaches within the branch offices. Furthermore, the co-operative members are known by name since they have to be entered into the list of members (Sec. 30 GenG). This is a main contrast to corporative shareholders of exchange-traded shares, as it enables the co-operative to directly get into contact with its members. Besides, there are further connections between the co-operative and its members due to business relations or participation in committees. The fluctuation of members is usually modest, thus membership is quite stable.

One specific property of the legal form is the additional contribution in case of insolvency (Sec. 105 GenG). Thus, co-operative members have an interest in the continuation and financial soundness of the firm to avoid financial obligations. Besides, they are interested in positive earnings since those are the basis for continuous dividend payments.

The co-operative is represented by the board of directors (Sec. 24 GenG). The appointment of a supervisory board is compulsory.²² It must consist of at least three members that are selected from within the general assembly (Sec. 36 I GenG). All members of the supervisory board must be familiar with the specific business if the co-

²¹ The legal form of the co-operative is regulated by the German co-operative law (GenG).

²² The appointment of a supervisory board might be dispensable only if the co-operative had less than twenty members. In that case, the general assembly would overtake the supervisory function (Sec. 9 I GenG).

operative is a bank as defined in Sec. 1 KWG and Article 4 No 1 par 1 CRR. Besides, at least one member of the co-operative bank's supervisory board must have extensive knowledge of accounting or auditing (Sec. 36 IV GenG). The expertise and personal suitability of supervisory board members are strictly supervised by the banking authority. The latter can remove supervisory board members that do not prove to be sufficiently reliable or do not have the necessary expertise (Sec. 36 KWG). One main responsibility of the supervisory board is to examine the annual report and the management's proposal for appropriation of the profits (Sec. 38 I GenG). The results of the examination are reported to the general assembly. Thus, bank supervisory board members face incentives to detect manipulations of figures since main misstatements that become public may question their suitability.

Against that background, it should be part of the supervisory board's responsibility to recognize and restrict discretionary components within the valuation of loans as well as within the appropriation of earnings.

3.2.2 Subsequent Measurement of Loans under HGB

The following section describes the means that banks are provided with by the German commercial law (HGB) to **provision for expected losses** within the credit portfolio as well as the effect of credit valuation on the annual profit.

Banks preparing balance sheets under the German commercial law evaluate their credit claims following Sec. 252-253 HGB. Assessment takes into consideration the individual default risk of each party. Credit valuation under HGB follows the expected loss principle, which means that impairments are indicated if the default risk becomes sufficiently likely (Gebhardt & Novotny-Farkas, 2011).

A specific valuation allowance ("Einzelwertberichtigung") is recognized if there is objective evidence that, taking into account any collateral, a specific loan will be wholly or partly uncollectible (Scharpf & Schaber, 2013). If there are indications that a group of similar claims which is measured as a portfolio for reasons of practicability is diminished in value, an impairment allowance calculated on a portfolio basis ("pauschalierte Einzelwertberichtigung") is created (Scharpf & Schaber, 2013). Furthermore, banks are allowed to build risk provisions for latent risks within the credit portfolio. This general allowance ("Pauschalwertberichtigung") is built for the remaining claims that do not show signs of diminished value. The calculation is based on historical defaults within the relevant risk category (Scharpf & Schaber, 2013). Country valuation allowances ("Länderwertberichtigungen") are built to address the latent risks in the foreign portfolio

(Scharpf & Schaber, 2013). If claims are no longer recoverable, they are completely written off (Scharpf & Schaber, 2013).

All kinds of impairments described above are expenses²³, which reduce the annual earnings. Higher expected losses therefore reduce earnings while lower expected losses result in higher earnings.

3.2.3 Credit Valuation, Appropriation of Earnings, and Regulatory Capital

LLP are recognized to protect against expected losses within the credit portfolio. In contrast to that, the regulatory capital is intended to buffer unexpected losses. The effect of loan loss provisions on regulatory capital ratios differs between banks using the internal ratings based approach (IRBA) and those that apply the standardized approach (KSA).

IRBA institutes recognize loan loss provisions within the valuation allowance comparison which calculates expected losses (EL) as assessed using internal risk valuation models against the loan loss provisions that were presented in the annual accounts. A valuation adjustment excess („Wertberichtigungsüberschuss“) results if the loan loss provisions exceed the expected losses. IRBA institutes are allowed to include valuation adjustment excesses in the supplementary capital (Art. 62d CRR) whereas value adjustment deficits are deducted in equal parts from the core and supplementary capital. Thus, if LLP are used to manage earnings, the regulatory capital may be affected reversely to the effect on earnings insofar as insufficient LLP may result in a value adjustment deficit and thus a decline in regulatory capital while earnings before tax are positively affected.

KSA institutes are not allowed to consider specific valuation allowances in the regulatory capital. On the contrary, general valuation allowances are eligible as supplementary capital. Thus, open Sec. 340f reserves and general allowance (“Pauschalwertberichtigung”) are accepted up to a maximum of 1.25% of the risk weighted amount of debits (Hartmann-Wendels et al., 2015).

An alternative to the individual valuation of claims to protect against the credit risk in general is provided by Sec. 340e to g HGB, which allows banks to build reserves against the general banking risk in the context of profit appropriation. Reserves are built out of the profit after tax. The main difference between 340f and 340g reserves is their traceability in the annual accounts (Bieg & Waschbusch, 2005). While Sec. 340g reserves are part of the equity capital, Sec. 340f reserves are intended to be hidden reserves (Bieg,

²³ Position 13 within the profit and loss statement under RechKredV.

2009). The original intention of German legislators was to provide banks with a means to hide natural fluctuations in credit valuations in order to avoid bank runs (Sittmann-Haury, 2003). Beside this macroeconomic argumentation, Sec. 340f reserves are criticized as a means of management discretion which is used to smooth earnings and thus guarantee stable dividend payments and accounting ratios (Bieg, 2009).

Even though banks are not forced to disclose their Sec. 340f reserves, many institutes opt to voluntarily disclose them. The rationale is that only publicly observable Sec. 340f reserves may be acknowledged (depending on their choice between IRBA and KSA to some extent) within the regulatory capital. The effect of Sec. 340g reserves on the regulatory capital is even more pronounced since those are fully acknowledged as core Tier 1 capital. Therefore, managers face incentives to switch between hidden Sec. 340f reserves and Sec. 340g reserves instead of simply disclosing Sec. 340f reserves as a consequence of the increased capital requirements (Walter, 2011). This option is observable within the notes and the P&L statement of many banks within the sample.²⁴

Another means for managing regulatory capital is the retention of earnings. Unlike the credit valuation behavior discussed above, appropriation of earnings is not in the bank management's discretion. Moreover, the management presents its proposal for the allocation of the net profit to the supervisory board and the shareholders at the annual meeting (Sec. 48 I S.1 in connection with Sec. 19-20 GenG). The latter have to approve the proposal in order for it to be implemented. Therefore, it is risky insofar as the shareholders might prefer dividend payments. Besides, the statutes may provide for earnings to be retained in the legal and other retained reserves. Furthermore, the statutes may authorize the management to retain up to half of the earnings in the revenue reserves (Sec. 20 GenG).²⁵ Nevertheless, revenue reserves are equally accepted as core Tier 1 capital under Basel II and III.

²⁴ E.g. Raiffeisenbank Strücklingen-Idafehn eG (2011): "Aufgrund der geplanten verschärften gesetzlichen Anforderungen zur Stärkung der Eigenkapitalbasis wurde ein Teilbetrag der Vorsorgereserven gemäß 340f HGB in Höhe von 1,5 Mio. EUR in den Fonds für allgemeine Bankrisiken gemäß Sec. 340g HGB eingestellt."

²⁵ There is no specific norm in banking law concerning the valuation of legal reserves as well as retained earnings and retained capital. Therefore, the specific requirements of the legal form are binding. Specific norms for co-operatives are stated in the third part of the third book of HGB (Sec. 336-339). Sec. 337 regulates specific balance sheet items of co-operatives.

3.3 Literature Review and Hypotheses

3.3.1 Bank Earnings Management

Earnings management by commercial banks has frequently been investigated for several countries using different measures such as conservatism (Leventis et al., 2013), income inflation (DeBoskey & Jiang, 2012; Kanagaretnam et al., 2010; Chi and Gupta, 2009) or income smoothing (Bouvatier et al., 2014; Gebhardt & Novotny-Farkas, 2011; Fonseca & González, 2008; Ahmed et al., 1999). The intention of this study is to investigate the **income smoothing** behavior of regional German credit co-operatives which prepare their financial statements in accordance with the provisions of the German Commercial Code (“HGB”). Furthermore, the study aims at analyzing the influence of specific legal factors of credit co-operatives as well as supervisory board characteristics on credit valuation.

Income smoothing is assumed when reported earnings are stable from one year to another even though the pre-tax results before credit valuation differ. Thus, earnings are managed if bank managers use their discretion in loan valuation to smooth reported earnings. In other words, if banks smooth earnings, loans loss provisions are expected to be significantly higher (lower) in years when the earnings before taxes and loan loss provisions are relatively high (low). Most empirical studies on bank income smoothing through loan loss provisions support this income smoothing hypothesis.

Another closely related hypothesis refers to the use of loan loss provisions to manage regulatory capital ratios. Thus, loan loss provisions are assumed to be relatively low (high) if the previous year’s regulatory capital ratios are high (low). Prior studies therefore assume a negative relation between loan loss provisions and regulatory capital ratios. This behavior should be observable in particular if the ratios are relatively low, compared to minimum requirements or competitors’ capital ratios.

Early studies such as Collins et al. (1995) find no evidence for capital management but a positive correlation between earnings and loan loss provisions, indicating income smoothing. Kim & Kross (1998) show that US banks with low capital ratios reduced their loan loss provisions after the regulatory reform of 1989 which created incentives to depress loan loss provisions (“Kreditrisikovorsorge”) and increase write-offs (“Direktabschreibungen”) (Kim & Kross, 1998). Ahmed et al. (1999) also investigate a sample of US banks, and find strong support for the capital management hypothesis but no evidence of earnings management via loan loss provisions. Based on the analysis of an international panel dataset from the years from 1995 through 2002, Fonseca & González (2008) find evidence for capital and earnings management using loan loss

provisions. Cornett et al. (2009) examine large US bank holding companies. They find evidence of earnings smoothing and capital management.

Gebhardt & Novotny-Farkas (2011) investigate the effect of the mandatory IFRS adoption on the accounting quality of European banks. They find evidence that the incurred loss approach under IAS 39 reduces income smoothing but demonstrate no significant relation between loan loss provisions and regulatory capital ratios. DeBoskey & Jiang (2012) analyze a panel dataset of US banks from 2002 through 2006 and present evidence for income smoothing and capital management via loan loss provisions. Additional tests reveal no significant relationship between the Tier 1 capital ratio (before loan loss reserves) and loan loss provisions (DeBoskey & Jiang, 2012). Bouvatier et al. (2014) investigate the income smoothing and capital management behavior of European commercial banks from 2004 through 2009. They find evidence that loan loss provisions are used to smooth income whereas capital management using discretion in the valuation of claims is not visible.

Nevertheless, evidence for the German context is rare. To the best of my knowledge, there are only three studies so far that investigate earnings management for German banks, and co-operatives are included into the samples of only two of them.²⁶ Bornemann et al. (2012) investigates how hidden Sec. 340f HGB reserves, which were originally intended to enable banks to provision against the special risks inherent in the banking business, were used for earnings management in the years from 1997 through 2009. They conduct analyses for a sample including co-operatives, savings banks and commercial banks and find that banks from all sectors use hidden Sec. 340f reserves to avoid negative net incomes, to avoid declines in net income over time or in comparison to a peer group, and to smooth income (Bornemann et al., 2012). Bornemann et al. (2014) investigate for the years from 1995 through 2010 how disclosed Sec. 340g HGB reserves are built and used for earnings and capital management. They find that banks from all sectors primarily use visible Sec. 340g reserves to manage their regulatory Tier 1 capital ratio. Furthermore, they show that the importance of visible Sec. 340g reserves has increased over the sample period (Bornemann et al., 2014). Bornemann et al. (2015) provide evidence that incoming CEOs of German savings banks reduce profits through discretionary expenses in their first year as CEO since the bad results might be attributed to their predecessors.

²⁶ There are further studies that include German credit institutes into international samples, e.g. Gebhardt & Novotny-Farkas (2011), but none of these international surveys investigates bank accounting in accordance with the German Commercial Code.

To the best of my knowledge, this is the first work that investigates earnings management through the use of loan loss provisions for a sample of German co-operative banks for firm years after 2010. Insofar, it provides first insights into the accounting behavior of German credit institutes against the background of the enhanced regulatory requirements of the Basle III rules.²⁷ Besides, this study contributes to the literature by analyzing how the accounting choice of German credit co-operatives is influenced by their unique corporate governance, namely different additional contribution ratios and alternative levels of information asymmetry.

3.3.2 Influence of the Supervisory Board on Bank Accounting

Early empirical studies on the influence of supervisory boards on accounting quality address the question whether an independent board or audit committee reduces the probability of fraud (Beasley, 1996; Abbott et al., 2000). They present evidence that firms are significantly less likely to be accused of fraud if they have a supervisory body which is independent from the management.

Later studies investigate whether different characteristics of the supervisory board or its committees have an impact on legal earnings management activities. Klein (2002) examines a sample of US non-financial firms. She reveals a negative relation between audit committee / supervisory board independence and abnormal accruals as a measure for earnings management. Xie et al. (2003) investigate a panel sample of listed US firms. They show that firms whose board and audit committee members have corporate or financial backgrounds engage less in earnings management. Furthermore, they find a negative link between the frequency of meetings and discretionary current accruals. Ebrahim (2007) presents similar findings. Beside the negative relation between board and audit committee independence, his results support the hypothesis that the more active independent audit committees are, the lower are abnormal accruals. Bédard et al. (2004) analyze the effect of audit committee expertise on aggressive earnings management. Comparing groups of US firms with relatively high and relatively low levels of abnormal accruals, they find a negative relation between aggressive earnings management and audit committees whose members have financial and governance expertise.

²⁷ The Basle III rules were released in December 2010. Even though they still had to be transposed into national law, banks prepared immediately for implementing the new rules since the regulatory capital ratios that were mainly affected are key figures used by banks and supervisory authorities to control bank stability.

Another strand of literature analyses the effect of female representation on the board. Adams & Ferreira (2009) present evidence that female directors positively influence the effectiveness of boards as well as firm outcomes. They show that gender-diverse boards perform better in monitoring. Based on these findings, Srinidhi et al. (2011) investigate whether the earnings quality of US firms is higher if boards are gender-diverse. Their findings suggest that the board's reporting discipline increases if female directors are included in the board. Bermig (2012) finds a negative effect of female supervisory board members on earnings management for a sample of German listed non-financial firms.

While all of the studies quoted above investigate non-financial firms and most of them focus on the US context, empirical work on the effect of supervisory board characteristics on the accounting quality of financial institutions is rare. To the best of my knowledge, there are only three empirical studies so far that investigate the influence of the supervisory body on the accounting behavior of bank managers, all of them using US samples. Cornett et al. (2009) analyze the relation between board independence and earnings management for a sample of large US bank holding companies. They observe that independent boards perform better in restricting earnings management. Leventis & Dimitropoulos (2012) illustrate for a sample of US banks that well-governed institutes engage less in aggressive earnings management. Altamuro & Beatty (2010) examine the financial reporting effects of the Federal Depository Insurance Corporation Improvement Act (FDICIA) which forces US banks with assets over USD 500 million to enhance their internal controls. They find increased loan loss provision validity as well as reduced accounting conservatism for affected banks in comparison to an unaffected peer group.

Other related studies investigate the effect of external auditors' expertise on the earnings management behavior of credit institutes. DeBoskey & Jiang (2012) present evidence that audit industry expertise is an effective means in reducing the management's discretion in earnings management using loan loss provisions. Pathan & Faff (2013) investigate the effect of board structure on bank performance for a panel of large US bank holding companies. Their results suggest that gender diversity improves bank performance. Furthermore, they show that the board structure is especially important for the smaller banks within their sample as well as banks with less market power. García-Meca et al. (2015) find a positive relation between gender diversity and bank performance for an international sample.

As a conclusion, prior studies suggest that independent supervisory bodies restrict discretion in accounting as well as fraud. The same can be assumed if board members

have a high degree of professional expertise, if an audit committee exists, and if the board is gender-diverse. Nevertheless, there are very few studies that analyze the effect of the supervisory body/ corporate governance on bank accounting. To the best of my knowledge, there is no empirical work yet that investigates the role of the supervisory board in mitigating earnings management of German credit institutions. Nevertheless, results for this specific setting may differ for several reasons: So far most studies are based on US data, even though the corporate governance structure is heavily affected by the one-tier board structure which differs significantly from the two-tier board structure of German banks. Besides, German accounting rules are more conservative than international accounting standards. This fact is expected to affect credit valuation. Even though firm size has been shown to be a main determinant of earnings management, most studies on bank accounting focus on large bank holding companies. The accounting choice of smaller banks has not been investigated so far.

This study aims at closing the gap in the empirical literature by analyzing how the accounting behavior of German credit co-operatives is influenced by the structure of the supervisory board. To the best of my knowledge, this study is the first one to address the effect of board gender-diversity on bank accounting. Furthermore, the effect of the additional contribution on the accounting behavior of German credit co-operatives is addressed.

3.3.3 Development of Hypotheses

This study aims at analyzing the effect of supervisory board effectiveness (and other specific characteristics of the governance structure) on bank income smoothing. Therefore, it seems to be appropriate to discuss first why firms smooth income and what might be the supervisory board's attitude towards income smoothing.

The literature on earnings management discusses two main strands of reasons why firms smooth income. The first argument, which is known as the **information function of income smoothing**, relates to the formerly private information of the management which is disclosed to stakeholders through stable earnings, closely related to the capability to pay continuous dividends (Wagenhofer & Ewert, 2015; Tucker & Zarowin, 2006). This argument has a positive connotation since earnings smoothing is seen as a means to transport further information to the stakeholders outside the firm and thus to minimize the information asymmetry between management and owners.

Besides, and more pronounced in literature, income smoothing is interpreted as an agency problem, deriving from the separation of ownership and control (Jensen & Meckling,

1976; Bouvatier et al., 2014). Thus, better informed managers (agents) face incentives to maximize their own utility at the cost of the owners (principal) and other stakeholders. Against that background, income smoothing may be interpreted as a **manipulation of financial figures** (Fonseca & González, 2008). These figures are considered to mirror the current year's financial outcome in an unfair way, which leaves space for risk-shifting and the hiding of weaker years' results behind the long term trend. Solutions to mitigate manipulative income smoothing refer to institutional factors such as external control instances (e.g. banking supervisory bodies or external auditors) and internal corporate governance mechanisms (e.g. the supervisory board) (Gebhardt & Novotny-Farkas, 2011).

Another reason for income smoothing which is especially related to bank accounting is the disclosure of continuous figures to fulfill bank regulatory capital ratios. Nevertheless, main changes in the regulatory regime may also imply altered accounting choices.

The information function of income smoothing

One of the main characteristics of co-operatives refers to the additional contributions in case of insolvency. Thus, co-operative shares bear a higher risk compared to ordinary shares since the maximum loss is not restricted to the capital invested, but covers further payments in the gone concern case (Sec. 6 and 105 GenG). As a consequence, co-operative shareholders are assumed to prefer stable earnings. Reported earnings at the previous year's level are considered an important means to indicate stability and satisfy the expectations of shareholders (Fonseca & González, 2008) who might otherwise fear financial distress and an enlarged liability risk. Besides, it is rational only for firms with good future prospects to smooth income since earnings cannot be presented against the trend for a long time (Tucker & Zarowin, 2006). Thus, smoothed income signals the management's expectations of a positive future development.

Hypothesis 1a: The higher the additional contribution in case of insolvency is, the more does the institute engage in income smoothing.

The co-operative shareholders' risk perception is the more pronounced, the less information about the financial soundness of the institute they are provided with. With other words, the higher the information asymmetry between management and co-operative shareholders, the more relevant are other information channels to confirm stability. Continuous annual results and, since these are interconnected with distributable earnings, smoothed dividend payments, are considered to be indicators of financial

soundness (Michaely & Roberts, 2012).²⁸ Therefore, income smoothing can be interpreted as a means to reduce the information gap between firm owners and management.

Hypothesis 1b: The higher the information asymmetry between management and shareholders is, the more does the institute engage in income smoothing.²⁹

Manipulative Income Smoothing

Existing literature on bank income smoothing mainly focuses on large commercial banks with exchange-traded shares and presents mixed evidence on the relation between capital market orientation and income smoothing (Beatty et al., 2002; Fonseca & González, 2008). The argument is that publicly traded banks have more external users of their financial statements which makes the signaling effect of smoothed figures more relevant (Beatty et al., 2002). Nevertheless, income smoothing is restricted since disclosed accounting outputs are subject to the strict control of the capital markets. In contrast, Fonseca & González (2008) argue that private banks face fewer opportunities to diversify their risk and thus have more incentives to cover risk-shifting behind smoothed income. Co-operative banks do not use equity markets which are associated with the assumption of lower market control of financial reporting and thus more opportunities to smooth income. Besides, they need to attract new investors to keep or even raise their regulatory capital ratios. Therefore, co-operative bank managers are assumed to try to avoid a decline in income and to smooth income (see Bornemann et al., 2012 for the preceding arguments).

The external control structures of co-operative banks also differ from those of international banks insofar as they are not evaluated as system-relevant and, as a consequence, face a lower intensity of supervision through banking supervisory bodies.

²⁸ This argument addresses the long-term perspective of shareholder incentives: Earnings per share and, derived from this figure, the potential distribution amount is expected to be relatively stable over time. The actual distribution to the shareholders may differ, e.g. due to the strengthening of capital reserves. Nevertheless, such actions are quite easily communicated to stakeholders due to the regulatory pressures to increase capital ratios. Those, on their behalf, increase the financial stability as well as business opportunities of the bank and thus make future dividend payments more likely, while the risk of financial distress is reduced.

²⁹ This hypothesis should especially hold for banks with low capital ratios or other indicators for financial distress such as negative results before tax.

Besides, they present less detailed reports to the banking authorities than big or systematically relevant institutes.³⁰

Another property of the control structure of co-operatives is related to the obligatory examination of accounts by an external auditor. Unlike other banks, co-operatives are not free to choose their auditor, but are mandated to be members of a certain auditing association [*“Prüfungsverband”*] (Sec. 54 GenG). The association auditors [*“Verbandsprüfer”*] have to be familiar with the specific characteristics of the legal form of the co-operative (Sec. 55 GenG) as well as the business of co-operative banks, and they examine many institutes each year. Therefore, industry specialization is expected, associated with the assumption of higher quality financial statements and less income smoothing (DeBoskey et al., 2012).

Prior studies on bank earnings management present mixed evidence on the effect of the concentration of the ownership structure on income smoothing. The findings of Bouvatier et al. (2014) suggest that institutes with a dispersed ownership structure are less likely to smooth income whereas Gebhardt & Novotny-Farkas (2011) report more income smoothing through LLP for banks with dispersed ownership. The members of the co-operative are usually invested with relatively small amounts and the count of shareholders is quite high.³¹ Thus, ownership is rather dispersed. Moreover, even if there should be a major shareholder (which is usually permitted by the statutes), the maximization of private benefits at the cost of minor shareholders would be mitigated through the “one-man-one-vote”-principle.³²

As a conclusion, the arguments discussed above reveal incentives for co-operative banks to smooth income. Therefore, the co-operative banks within the sample are assumed to engage in income smoothing through LLP. Nevertheless, changes in the regulatory environment may alter their accounting incentives. Since they are forced to fulfill higher equity ratios required by the capital adequacy regulations, banks must raise further regulatory capital or reduce their risk assets. LLP are not eligible any longer whereas

³⁰ In accordance with the solvency regulation, two approaches are offered to quantify credit risk. The credit risk standard approach is the easiest alternative to evaluate credit risk.

³¹ For the sample investigated within this study, the average amount invested by each co-operative shareholder is 561 EUR, and the average count of members is 11,511. See Appendix 3-1 for a more detailed analysis of the ownership structure of co-operative banks.

³² The “one-man-one-vote”-principle grants only one vote to each shareholder within the general assembly, independent of the count of shares held (Sec. 48, 43 GenG). This is one main difference from the corporate governance of corporations (*“Aktiengesellschaften”*) where the voting rights depend on the share of equity held by a shareholder.

340g reserves enlarge the amount of equity. The altered incentives banks face concerning LLP should be reflected in the accounting choice of affected banks.³³

Hypothesis 2: Banks have engaged less in income smoothing through LLP since the announcement of the Basle III rules in favor of 340g reserves.

Internal control structures such as supervisory boards play a pronounced role with regard to co-operative banks (Böhm et al., 2012). The independence of supervisory board members, which is emphasized in prior literature, is limited for co-operative banks since the representatives are elected from among the members of the co-operative. Therefore, board members have at least one connection to the institute beside their role as board member, since they are shareholders. This means that the independence of board members could be limited. Nevertheless, they may have deeper insights into the business of the institute than external supervisors (Armstrong et al., 2014). Prior literature emphasizes that boards which are more independent from the CEO perform better in monitoring accounting activities (Klein, 2002). Board members are qualified as being independent outsiders if their only connection to the firm is the supervisory board seat (Klein, 2002). In contrast to other members, the economic welfare of these members is not dependent on the firm performance. Employee representatives for example receive their wages from the firm, relatives to the CEO might neglect their responsibility due to family ties and directors that have significant transactions with the firm might fear financial disadvantages. A greater proportion of outsiders on the supervisory board/ the audit committee is insofar associated with an enhanced monitoring of internal processes and accounting decisions, resulting in lower levels of earnings management (Cornett et al., 2009).

As a consequence of the financial crisis, the requirements concerning the expertise of supervisory board members were enhanced for German credit institutes (Böhm et al., 2012). Co-operative banks are likely to be especially affected by these requirements since the group of potential board members is restricted. Prior studies find that committee members with financial and governance expertise perform better in restricting earnings management behavior (Xie et al., 2003).

³³ Since the funding of further regulatory capital cannot be easily achieved, banks had to raise their capital continually. Thus, the assumption should hold that banks altered their accounting and appropriation of earnings right after the announcement of the Basle III requirements.

Hypothesis 3a: The more effective the supervisory board is, the less does the institute use LLP for earnings smoothing.

Prior literature suggests that supervisory boards with audit committees perform better in mitigating earnings management (Marra et al., 2011). The rationale is that the formation of an audit committee aims at deepening the involvement with questions of auditing and internal control structures as well as accounting and financial reports. Besides, a higher expertise in terms of finance is assumed for members of the committee (since they are chosen as specialists) (Bédard et al., 2004). Finally, the additional meetings of the audit committee (in comparison to the supervisory board as a whole) result in a deeper understanding and analysis of accounting questions. Against this background, a more effective internal control structure is assumed for banks with audit committees.

Hypothesis 3b: Co-operative banks with audit committees engage less in manipulative income smoothing through the use of loan loss provisions.

The political discourse concerning female quotas as well as prior empirical results support the hypothesis that gender-diverse supervisory boards perform better in monitoring (Adams and Ferreira, 2009). Adams and Ferreira (2009) investigate the gender-specific behavior of board members and report improved board attendance for female members. Moreover, they observe better attendance behavior of male directors if women are on the board. Besides, Robinson & Dechant (1997) report a positive impact of female directors since gender diversity improves decision-making processes. Gul et al. (2011) find stock prices of firms with gender-diverse boards reflecting more firm-specific information. Moreover, they present evidence that this gender effect is even stronger for firms with otherwise weak governance mechanisms and thus derive that board gender diversity might be interpreted as a substitute for effective corporate governance (Gul et al., 2011). Finally, Srinidhi et al. (2011) show that firms with female directors on the board are associated with higher earnings quality. Even though all these results are found for non-financial US firms, they support the assumption that gender diversity might also enhance the quality of board monitoring of financial institutes.

Hypothesis 3c: The higher the proportion of women within the institute's supervisory board is, the less does the bank engage in income smoothing through the use of loan loss provisions.

3.4 Research Design

3.4.1 Transparency of Financial Reporting

The aim of this study is to examine how different aspects of the corporate governance structure of co-operative banks, especially the effectiveness of its supervisory board, affect its earnings management behavior.

The measure for bank income smoothing is related to the recent work of Bouvatier et al. (2014) and DeBoskey & Jiang (2012). The analysis takes loan loss provisions which are to some extent at the discretion of bank managers as a starting point.³⁴ I differentiate between discretionary and normal elements of the valuation of receivables.

Therefore, the baseline model is as follows:

$$\begin{aligned}
 LLP_{i,t} = & \alpha_0 + \alpha_1 EBTP_{i,t} + \alpha_2 TCAPR_{i,t-1} + \alpha_3 LLP_{i,t-1} + \alpha_4 LOAN_{i,t} + \alpha_5 DLOAN_{i,t} \\
 & + \alpha_6 SIZE_{i,t} + \alpha_7 TAX_{i,t} + \gamma z_t \\
 & + \varepsilon_{i,t}
 \end{aligned} \tag{1}$$

The variables within the model are defined in Table 3-1.

Table 3-1: Variables for the Regression Analysis on Bank Income Smoothing

Variable	Exp. Sign	Definition	Character
LLP		Loan loss provisions _t /total assets _t	
EBTP (α_1)	+	Earnings before taxes and LLP _t /total assets _t	Discretionary
TCAPR _{t-1} (α_2)	o/-	Total capital ratio _{t-1}	Discretionary
LLP _{t-1} (α_3)	+	Previous year's LLP	
LOAN (α_4)	+	Net loans divided by the current year's total assets	Normal
DLOAN (α_5)	o	Change in net loans divided by total assets	Normal
SIZE (α_6)	+	Natural logarithm of the current year's total assets	Normal
TAX (α_7)	-	Income tax _t /earnings before tax _t	Normal
z		Year dummies	

³⁴ Prior studies using LLP as dependent variable for bank income smoothing models either standardize LLP by prior year's total assets (DeBoskey & Jiang, 2012), average loans (Gebhardt & Novotny-Farkas, 2011) or current year's total assets (Bouvatier et al, 2014). This study uses current year's total assets for the following reasons: a) subsequent measurement of loans is merely expected within the second half of the year when the clients' annual reports are available. b) Income smoothing using LLP is part of the preparation of the bank's annual figures. Therefore, income smoothing activities are merely expected to take place after the 'normal' asset valuation and thus, presumably later within the process of the preparation of financial statements. c) Moreover, the sample size would be further diminished by using previous year's values.

This model has been used in prior studies to differentiate between discretionary and non-discretionary components of credit valuation (Bouvatier et al., 2014; Fonseca & González, 2008). The **normal or non-discretionary components** are the ones that should be naturally correlated to credit impairments such as the growth rate of credit portfolios (DLOAN), the net loans to total assets ratio (LOAN), the total assets (SIZE), or the income tax rate (TAX). If a bank extends its credit portfolio, assuming that the average probability of default is constant, higher loan write-offs as well as enhanced loan loss provisions are to be expected. Nevertheless, prior work merely reports small negative coefficients. These results are explained by managers' tendency to be more prudent when the demand for loans is high (Laeven & Majnoni, 2003). Insofar, the sign of the credit portfolio growth rate remains an empirical question.³⁵

Since income tax expenses are higher for higher pre-tax annual results, bank managers face incentives to build higher LLP in years with relatively high earnings before credit valuation to avoid the outflow of financial resources and thereby smooth the income. Nevertheless, the expected sign on TAX is negative since the variable has a negative sign for tax expenses and a positive one for tax returns. Beyond these normal accruals, another group of accruals exists that is highly at the discretion of the bank management. As quoted above, the German HGB follows the expected loss principle. Therefore, loan write-offs are allowed to the extent that claims are expected not to be recoverable (Scharpf & Schaber, 2013). The discretion may be used to support managers' objectives such as income smoothing or capital management. As I am interested in discovering those discretionary engagements, the main variables of interest are earnings before taxes and LLP (EBTP) and the total risk adjusted capital ratio (TCAPR).

If banks use loan loss provisions to smooth income, I would expect to see a positive coefficient α_1 , indicating that impairments on loans are more likely when reported earnings before taxes and LLP are relatively high (and vice versa). Banks might also use LLP to manage their regulatory capital. Since all sample firms calculate their capital ratios in accordance with the standardized approach ("KSA"), capital management via LLP should have very limited or no effects on the total risk-adjusted capital ratio.³⁶ Moreover,

³⁵ See Chapter 3.6.1 for a more detailed discussion on this effect, based on the findings of this study.

³⁶ See Chapter 3.3 for a short discussion of why it is very unlikely under Basel II and III to find capital management through the use of LLP.

banks face incentives to avoid LLP in order to raise regulatory capital ratios through the allocation of 340g reserves.

3.4.2 Additional Contribution, Information Asymmetry, and Income Smoothing

To test hypothesis 1a concerning the effect of the additional contribution on income smoothing, I calculate the relation between the additional contribution per share and the nominal value of shares (NP).

$$NP = \frac{\text{additional contribution per share}}{\text{nominal value of shares}}$$

The ratio serves as an indicator for the additional loss per share in case of insolvency of an institute, and thus, as proxy for the liability risk of co-operative members.³⁷ It is coded as a dummy variable (NPQ), taking the value 1 if the additional contribution ratio exceeds the 75% percentile.

The baseline model for testing income smoothing is extended by the interaction term $NPQ_{i,t} * EBTP_{i,t}$ which captures the incremental effect of a relatively high additional contribution ratio³⁸ on income smoothing.

Prior literature suggests that income smoothing is more likely if the information asymmetry between shareholders and management is higher (Jensen & Meckling, 1976). Therefore, the interaction term $INOASY_{i,t} * EBTP_{i,t}$ is added to regression model (1) to capture the incremental effect of higher information asymmetries on income smoothing. Within the scope of this study, a higher information asymmetry is expected if the count of members of the co-operative bank exceeds the 75% percentile. The rationale is that the more owners hold co-operative shares, the worse is their access to the management's private information. Therefore, the higher the count of members is, the more important are the numbers reported within the annual report for reducing the information gap between owners and management (Jensen & Meckling, 1976).

³⁷ The arrangement regarding the additional contribution in case of insolvency is a mandatory element of the statutes of a co-operative (Sec. 6 III GenG). Options range from no additional contribution over limited supplementary payments to unlimited payments. Limited payments must not fall below the value of the co-operative shares (Sec. 119 GenG).

³⁸ A relatively high NPQ is assumed if it exceeds the 75% percentile.

$$\begin{aligned}
LLP_{i,t} = & \alpha_0 + \alpha_1 EBTP_{i,t} + \alpha_2 NPQ_{i,t} * EBTP_{i,t} + \alpha_3 NPQ_{i,t} + \alpha_4 INFOASY_{i,t} \\
& * EBTP_{i,t} + \alpha_5 INFOASY_{i,t} + \alpha_6 TCAPR_{i,t-1} + \alpha_7 LLP_{i,t-1} \\
& + \alpha_8 LOAN_{i,t} + \alpha_9 DLOAN_{i,t} + \alpha_{10} SIZE_{i,t} + \alpha_{11} TAX_{i,t} + \gamma z_t \\
& + \varepsilon_{i,t} \qquad (2)
\end{aligned}$$

The variables within the model are defined as follows:

Table 3-2: Variables for the Regression Analysis on the Effect of the Additional Contribution and Information Asymmetry

Variable	Exp. Sign	Definition
LLP		Loan loss provisions _t /total assets _t
EBTP (α_1)	+	Earnings before taxes and LLP _t /total assets _t
NPQ*EBTP (α_2)	+	Interaction term
NPQ (α_3)		Liability: Indicator variable taking the value 1 if the additional contribution ratio exceeds the 75% percentile (≥ 3.0); 0 otherwise.
INFOASY*EBTP (α_4)	+	Interaction term
INFOASY (α_5)		Information asymmetry: Indicator variable taking the value 1 if the count of members exceeds the 75% percentile ($\geq 16,263$); 0 otherwise.
TCAPR _{t-1} (α_6)	o/-	Total capital ratio _{t-1}
LLP _{t-1} (α_7)	+	Previous year's LLP
LOAN (α_8)	+	Net loans divided by the current year's total assets
DLOAN (α_9)	o	Change in LOAN
TAX (α_{10})		Income tax _t /earnings before tax _t
z		Year dummies

Analogous to the baseline model for measuring bank income smoothing, I expect to find a positive and significant coefficient α_1 . If a relatively high additional contribution ratio results in more income smoothing, I assume to also find a positive and significant coefficient α_2 . The same holds if a higher information asymmetry enhances the level of income smoothing, resulting in a positive and significant coefficient α_4 . The total income smoothing effect of institutes with high additional contribution ratios and high information asymmetry between owners and management is the sum of $\alpha_1 + \alpha_2 + \alpha_4$.

3.4.3 Supervisory Board Characteristics and Income Smoothing

3.4.3.1 Measures for the Strength of the Supervisory Board

Related studies use different characteristics of the board composition to approximate the strength of the supervisory board. I evaluate several of them and create an indicator

variable. The variable takes the value 1 if a board characteristic has been shown by the empirical literature to restrict earnings management.

Prior studies find negative relations between the independence of the supervisory board and earnings management (Peasnell et al., 2005). One main proxy for independence is the percentage of board or audit committee members that are not economically dependent on the CEO (Klein, 2002). With reference to Klein (2002), the first measure for board independence is the **proportion of directors on the supervisory board** that are neither employees of the institute nor representatives of its main business partners. Since the supervisory board members of co-operatives are usually chosen among the shareholders of the co-operative, its co-operative shareholders are not classified as insiders.

The second proxy for board strength/effectiveness is the **total number of board members**. Bermig (2012) argues that larger boards are less effective in monitoring due to their internal processes (Bermig, 2012). In contrast to that, de Andres & Vallelado (2008) find that larger and less independent boards perform better in monitoring. One argument is that larger boards with internal members know more about the firm's business which facilitates the choice of relevant audit activities.

The pure **existence of an audit committee** is assumed to enhance the quality of CEO monitoring and thereby lead to higher earnings quality (Klein, 2002). Therefore, the third measure for board strength is the dummy variable AUDCOM, that takes the value 1 if an audit committee exists.

The higher the **expertise of board members**, the better is the supervisory board's ability to conduct its monitoring function (Bédard et al., 2004). Board members are classified as experts either by profession or by degrees. Expertise is assumed if board members are external auditors or tax advisors.

Finally, more **active boards** are shown to perform better in detecting and preventing earnings management. The proxy for board quality is the level of board activity, measured by the number of board meetings within one fiscal year (Abbott et al., 2000; Bédard et al., 2004).

Following prior studies that report effects of the board members' gender on the transparency of financial reporting, the proportion of female members on the supervisory board is added (Bermig, 2012; Srinidhi et al., 2011).

In order to investigate the impact of supervisory board effectiveness on bank income smoothing, the sample is separated into banks with more effective supervisory boards and

less effective ones. Table 3-3 summarizes the partial aspects that are used as proxies for board strength.

Table 3-3: Partial Aspects for Measuring Supervisory Board Effectiveness

Supervisory Board	
indep	Percentage of independent directors on the firm's supervisory board (members that are neither employees nor main business partners of the institute)
boardsize	Total number of board members
exp	Expertise of board members (Share of board members with financial/auditing expertise)
exp_e	Share of board members with extended financial expertise (namely: external auditors, tax advisors and master (craftsmen))
exp_wp	Share of board members that are external auditors
activ	Board Activity (number of meetings of the supervisory board within the fiscal year)
gender	Gender of board members (Share of female board members)
Audit Committee	
audcom	Existence of an audit committee (Indicator variable, taking the value of 1 if an audit committee exists; 0 otherwise)
Index Measure	
SARInd	Index variable defined as sum of the indicator variables quoted in Table 3-4 (except EXP_e).

For additional analyses on board effectiveness, the index variable SARInd is defined as the sum of the indicator variables on board effectiveness quoted in Table 3-4. In order not to overestimate the effect of expertise within the composite measure, the variable on the share of members with extended financial expertise (EXP_e) is excluded from the index. Nevertheless, the share of external auditors among the supervisory board members is included since those members are assumed to considerably expand the board's accounting knowledge. Therefore, the index variable SARInd is constructed as follows:

$$SARInd = \sum_{n=1}^7 SAR_{i,t}$$

Since the variables INDEP, BOARDSIZE, AUDCOM, EXP, EXP_wp, ACTIV and GENDER are indicator variables, the value of SARInd may range between 0 and 7.

Supervisory board effectiveness is classified using the nine measures explained above which were transformed into indicator variables as required by the regression model

described in Chapter 3.4.3.2. Table 3-4 summarizes the definitions and thresholds of each measure.

Table 3-4: Definition of Indicator Variables on Board Effectiveness

Variable	Definition/Threshold
INDEP	Indicator variable taking the value 1 if the percentage of independent members of the supervisory board exceeds 0.9167 (75% quartile), 0 else.
BOARDSIZE	Indicator variable taking the value 1 if the total number of board members exceeds 10.1 (75% quartile), 0 else.
AUDCOM	Indicator variable taking the value 1 if an audit committee exists, 0 else.
EXP	Indicator variable taking the value 1 if the share of members with financial expertise exceeds 0.9524 (75% quartile), 0 else.
EXP_e	Indicator variable taking the value 1 if the share of members with extended financial expertise exceeds 0.51 (75% quartile), 0 else.
EXP_wp	Indicator variable taking the value 1 if the share of members that are external auditors exceeds 0.167 (75% quartile), 0 else.
ACTIV	Indicator variable taking the value 1 if the count of supervisory board meetings within the fiscal year exceeds 11.1 (75% quartile), 0 else.
GENDER	Indicator variable taking the value 1 if the share of women on the supervisory board exceeds 0.167 (75% quartile), 0 else.
SAR_IND	Indicator variable taking the value 1 if the sum of the indicator variables quoted above (except EXP_e) exceeds 2 (75% quartile), 0 else.

3.4.3.2 The Influence of the Supervisory Board on Bank Earnings Management

The following analysis addresses the hypothesis that more effective supervisory boards perform better in restricting income smoothing behavior. To measure the incremental effect of the different supervisory board characteristics, the dummy variable $SAR_{i,t}$ and the interaction term $SAR_{i,t} * EBTP_{i,t}$ are added to regression model (2).

$$\begin{aligned}
 LLP_{i,t} = & \alpha_0 + \alpha_1 EBTP_{i,t} + \alpha_2 SAR_{i,t} * EBTP_{i,t} + \alpha_3 SAR_{i,t} + \alpha_4 NPQ_{i,t} * EBTP_{i,t} \\
 & + \alpha_5 NPQ_{i,t} + \alpha_6 INFOASY_{i,t} * EBTP_{i,t} + \alpha_7 INFOASY_{i,t} \\
 & + \alpha_8 TCAPR_{i,t-1} + \alpha_9 LLP_{i,t-1} + \alpha_{10} LOAN_{i,t} + \alpha_{11} DLOAN_{i,t} \\
 & + \alpha_{12} SIZE_{i,t} + \alpha_{13} TAX_{i,t} + \gamma z_t \\
 & + \varepsilon_{i,t}
 \end{aligned} \tag{3}$$

The variables within this model are defined in Table 3-5. The most relevant variables within this model are earnings before taxes and loan loss provisions (EBTP), and the

interaction term EBTP*SAR which captures the marginal effect of strong supervisory boards on income smoothing.

Analogous to the baseline model, a positive sign (α_1) is predicted for EBTP if income is smoothed via loan loss provisions. Since strong boards are expected to better restrict discretion in credit valuation, I expect to find a negative incremental effect of SAR*EBTP and thus a negative and significant coefficient α_2 .

Table 3-5: Variables for the Regression Analysis on Supervisory Board Effectiveness

Variable	Exp. Sign	Definition
LLP		Loan loss provisions _t /total assets _t
EBTP (α_1)	+	Earnings before taxes and LLP _t /total assets _t
SAR*EBTP (α_2)	-	Interaction term
SAR (α_3)		Indicator variable which equals 1 if the bank has an effective supervisory board in year i, 0 otherwise. See Table 3-4 for a more detailed description of the different measures for board effectiveness.
NPQ*EBTP (α_4)	+	Interaction term
NPQ (α_5)		Liability: Indicator variable taking the value 1 if the additional contribution ratio exceeds the 75% percentile (≥ 3.0); 0 otherwise.
INFOASY*EBTP (α_6)	+	Interaction term
INFOASY (α_7)		Information asymmetry: Dummy variable taking the value 1 if the count of members exceeds the 75% percentile ($\geq 16,263$); 0 otherwise.
TCAPR _{t-1} (α_8)	o/-	Previous year's total capital ratio
LLP _{t-1} (α_9)	+	Previous year's LLP
LOAN (α_{10})	+	Net loans divided by the current year's total assets
DLOAN (α_{11})	o	Change in LOAN
SIZE (α_{12})	+	Natural logarithm of the current year's total assets
TAX (α_{13})	-	Income tax _t /earnings before tax _t
z		Year dummies

3.5 Sample Selection and Data Collection

In order to investigate the influence of specific supervisory board characteristics of German co-operative banks on earnings quality, I use a subsample of 200 German co-operative banks. Those banks are randomly selected from the population of all 1,076 institutes reported by the National Association of German Co-operative Banks [*“Bundesverband der Deutschen Volksbanken und Raiffeisenbanken”*] (BVR) as of 31 December 2013. Annual reports are publicly available via the German Electronic Federal

Gazette (“*Elektronischer Bundesanzeiger*”). All data on balance sheet items and regulatory equity ratios are hand-collected from these reports. Since the analyses require time series data, institutes were deleted from the sample if annual reports are not provided continuously from 2006 through 2013.

Table 3-6: Sample Selection

year	/ta _(t)	/ta _(t-1)	FBN	d:JA	/ta _(t)	/ta _(t-1)	/ta _(t)	/ta _(t-1)
2007	244	-	46	45	40	-	41	-
2008	254	255	46	45	43	42	43	42
2009	263	266	46	45	44	43	44	43
2010	233	242	46	45	42	42	42	42
<i>2007-2010</i>	<i>994</i>	<i>763</i>	<i>184</i>	<i>180</i>	<i>169</i>	<i>127</i>	<i>170</i>	<i>127</i>
2011	233	242	170	167	131	130	41	40
2012	226	234	170	167	126	125	40	40
2013	160	170	170	167	123	123	40	40
<i>2011-2013</i>	<i>619</i>	<i>646</i>	<i>510</i>	<i>501</i>	<i>380</i>	<i>378</i>	<i>121</i>	<i>120</i>
firm years	1.613	1.409	694	681	549	505	291	247
	Income smoothing incl. controls without SAR-interactions		questionnaires available		at least one questionnaire available; all interactions and controls		both questionnaires available; all interactions and controls	

In order to test hypotheses 3 a) – c), data were required on certain supervisory board characteristics such as board composition, the frequency of meetings or the existence of an audit committee. As German co-operative banks are not required to disclose such information, the supervisory board data were collected by means of a questionnaire survey among all 1,076 co-operative banks in Germany.³⁹ The letters were sent out in December 2014 followed by a reminder in June 2015. Finally, 170 co-operative banks answered the questionnaire, resulting in a comparably high response rate of 15.8%. Since first analyses suggested that longer time series would improve the quality of the survey results, the sample period was enlarged from the years 2011 through 2013 that had been requested in the first questionnaire to the years 2007 through 2010 within the second inquiry. The total number of supervisory board firm year data is reported in Table 5, column 3. This number is slightly reduced since some banks do not provide annual reports publicly (see Table 3-6, column 4).

³⁹ See Appendix 3.1 for copies of the questionnaires.

3.6 Empirical Results

3.6.1 Transparency of Financial Reporting

This study analyzes the financial reporting behavior of German co-operative banks. The measure for financial reporting quality is income smoothing using LLP. The variable LLP is defined as the sum of impairments and write-ups, standardized by total assets. Therefore, a negative sign implies that the write-offs dominated while positive values indicate that impairments were overcompensated by write-offs.⁴⁰ The data are adjusted for extreme outliers by winsorizing at the 5% and 95% percentiles. Table 3-7 presents descriptive statistics for all dependent and independent variables used in the regression analyses.⁴¹

Table 3-7: Descriptive Statistics (2007-2013)

Variable	Mean	Standard deviation	25% quartile	Median	75% quartile
LLP	0.0024	0.0034	0.0005	0.0026	0.0048
EBTLLP	0.0100	0.0031	0.0078	0.0099	0.0121
$\Delta 340g$	0.0025	0.0036	0.0000	0.0005	0.0041
LLP_Kor340s	0.0050	0.0027	0.0030	0.0050	0.0068
L_LL	0.0035	0.0034	0.0014	0.0036	0.0057
L_TCAPR	0.1589	0.0412	0.1280	0.1490	0.1830
LOAN	0.6971	0.1008	0.6245	0.7074	0.7781
DLOAN	0.0317	0.0721	-0.0128	0.0318	0.0737
SIZE	19.4997	1.0267	18.6950	19.5548	20.2851
in EUR	294,179				
TAX	-0.3222	0.1378	-0.4117	-0.3235	-0.2455

LLP=loan loss provisions/total assets_t; EBTLLP=earnings before taxes and LLP/total assets_t; $\Delta 340g$ =change in 340g reserves; LLP_Kor340s=(loan loss provisions+change in 340g (1-s))/total assets_t; L_LL=total capital ratio_{t-1}; L_LL=loan loss provisions_{t-1}/total assets_{t-1}; LOAN=Net loans divided by the current year's total assets; DLOAN=Change in LOAN; SIZE=natural logarithm of the current year's total assets; TAX=income tax ratio=income tax expenses_t/EBT_t. All variables are winsorized at the 5% and 95% percentiles. The number of firm year observations is 1,613 for the full sample, covering firm years from 2007 through 2013.

Table 3-8: Descriptive Statistics (2007-2010; 2011-2013)

Variable	Mean	Standard deviation	25% quartile	Median	75% quartile
	2007-2010 (N=994)				
LLP	0.0036	0.0028	0.0020	0.0037	0.0055

⁴⁰ See Chapter 3.4.1 for the model specification and the definition of all variables used within the income smoothing model.

⁴¹ Sample size differs between the analyses due to the availability of data required within the different models.

EBTLLP	0.0098	0.0031	0.0073	0.0096	0.0119
$\Delta 340g$	0.0011	0.0022	0.0000	0.0000	0.0014
LLP_Kor340s	0.0048	0.0027	0.0028	0.0048	0.0067
L_LLTP	0.0045	0.0031	0.0026	0.0045	0.0066
L_TCAPR	0.1523	0.0394	0.1230	0.1430	0.1730
LOAN	0.7019	0.0987	0.6333	0.7135	0.7795
DLOAN	0.0297	0.0758	-0.0185	0.0292	0.0755
SIZE	19.4180	1.0199	18.5984	19.4589	20.1693
in thousand EUR	271,100				
TAX	-0.3412	0.1498	-0.4496	-0.3546	-0.2516
	2011-2013 (N=619)				
LLP	0.0003	0.0035	-0.0013	0.0008	0.0025
EBTLLP	0.0105	0.0029	0.0084	0.0105	0.0124
$\Delta 340g$	0.0049	0.0041	0.0016	0.0041	0.0072
LLP_Kor340s	0.0052	0.0028	0.0033	0.0052	0.0071
L_LLTP	0.0018	0.0032	0.0000	0.0020	0.0041
L_TCAPR	0.1697	0.0416	0.1370	0.1600	0.1970
LOAN	0.6894	0.1037	0.6104	0.6962	0.7751
DLOAN	0.0347	0.0657	-0.0039	0.0335	0.0722
SIZE	19.6309	1.0249	18.7848	19.7052	20.4387
in thousand EUR	355,422				
TAX	-0.2917	0.1094	-0.3544	-0.2957	-0.2280

LLP=loan loss provisions/total assets; **EBTLLP**=earnings before taxes and LLP/total assets_t; **$\Delta 340g$** =change in 340g reserves; **LLP_Kor340s**=(loan loss provisions+change in 340g (1-s))/total assets; **L_TCAPR**=total capital ratio_{t-1}; **L_LLTP**=loan loss provisions_{t-1}/total assets_{t-1}; **LOAN**=Net loans divided by the current year's total assets; **DLOAN**=Change in LOAN; **SIZE**=natural logarithm of the current year's total assets; **TAX**=income tax ratio=income tax expenses_t/EBT_t. All variables are winsorized at the 5% and 95% percentiles. The number of firm year observations is 1,613 for the full sample, covering firm years from 2007 through 2013. The subsample covering the early sample years includes 994 firm years. 619 firm years relate to the years 2011-2013.

The descriptive statistics in Table 3-7 cover the whole sample period from 2007 through 2013. Nevertheless, there are major differences between the earlier years within the sample (namely 2007-2010) and the later years (2011-2013). See Table 3-8 for descriptive statistics split into the two sample periods. The main differences are related to LLP, changes in 340g reserves and the total capital ratio. Since LLP and EBTP are the main variables of interest for the bank income smoothing model, the difference in means of the loan loss provisions between the two sample periods is analyzed in greater detail. The results for lagged and winsorized values are displayed in Table 3-9.

Table 3-9: Differences in Means (2007-2010; 2011-2013)

/ta	Mean 2007-2010	Mean 2011-2013	Difference in means	T-statistic
				(p-value)
LLP	0.0036	0.0003	0.0033	19.8537 (0.000)***
$\Delta 340g$	0.0011	0.0049	-0.0038	-21.3918 (0.000)***
LLP_Kor340s	0.0048	0.0052	-0.0004	-2.908 (0.002)***

LLP=loan loss provisions/total assets; **$\Delta 340g$** =allocations to the 340g-reserves divided by the current year's total assets; **LLP_Kor340s** =LLP adjusted in order to eliminate the allocations to the 340g-reserves after taxes divided by the current year's total assets. All variables are winsorized at the 5% and 95% percentiles.

In line with hypothesis 2, the results indicate that the loan loss provisions (LLP) have been significantly reduced after 2010. The strong decline in LLP could be either the consequence of lower expected losses within the portfolios of the sample institutes or a result of the cross compensation [“*Überkreuzkompensation*”] pursuant to Sec. 340f III HGB. Another plausible explanation is that the announcement of the Basel III requirements may have altered the credit co-operatives' incentives to build Sec. 340g reserves to strengthen their regulatory capital, since those are eligible as core Tier 1 capital under the new rules whereas LLP are not accepted as regulatory capital.⁴² Since the use of LLP, which is the dependent variable within the regression model for estimating bank income smoothing, changes significantly, the further analyses within this study control for sample years before and after 2010. This methodical specification seems rational since main changes in the accounting behavior are expected to influence the results of the regression analyses.

In line with the hypotheses and the results of prior studies on bank income smoothing, the correlation between LLP and EBLLP is positive and significant ($\rho=0.234^{***}$)⁴³, indicating a positive relation between the current year's expected credit losses and earnings before credit valuation. The correlations between the dependent variable LLP and further independent variables show the predicted sign.

⁴² See Chapter 3.2.3 for a more detailed description of the related rules.

⁴³ Spearman's rank correlation coefficient, see Table 3-10.

Table 3-10: Correlation Coefficients (Pearson/Spearman; N=1,613; 2007-2013)

Variables	LLP	EBTLLP	L_TCAPR	L_LL	LOAN	DLOAN	SIZE	TAX	INFOASY	NPQ
LLP	1	0.2340* (0.00)	-0.1692* (0.00)	0.4019* (0.00)	0.0521* (0.04)	-0.0128 (0.61)	-0.001 (0.97)	-0.3298* (0.00)	-0.0087 (0.73)	-0.0217 (0.38)
EBTLLP	0.1950* (0.00)	1	0.1566* (0.00)	0.0299 (0.23)	-0.0708* (0.00)	-0.0001 (1.00)	0.0522* (0.04)	-0.0436 (0.08)	-0.0347 (0.16)	-0.0483 (0.05)
L_TCAPR	-0.1370* (0.00)	0.1597* (0.00)	1	-0.1940* (0.00)	-0.2145* (0.00)	-0.1251* (0.00)	-0.2979* (0.00)	0.0826* (0.00)	-0.2250* (0.00)	0.1012* (0.00)
L_LL	0.3420* (0.00)	0.0078 (0.75)	-0.1774* (0.00)	1	0.0577* (0.02)	0.0714* (0.00)	-0.0089 (0.72)	-0.1869* (0.00)	-0.0097 (0.70)	0.0003 (0.99)
LOAN	0.0539* (0.03)	-0.0827* (0.00)	-0.2349* (0.00)	0.0658* (0.01)	1	0.2525* (0.00)	-0.1339* (0.00)	-0.0017 (0.95)	-0.0295 (0.24)	-0.0307 (0.22)
DLOAN	-0.0340 (0.17)	-0.0138 (0.58)	-0.1363* (0.00)	0.0663* (0.01)	0.2530* (0.00)	1	0.0111 (0.66)	0.0325 (0.19)	0.0103 (0.68)	0 (1.00)
SIZE	-0.0125 (0.62)	0.0621* (0.01)	-0.2991* (0.00)	-0.0157 (0.53)	-0.1222* (0.00)	0.0163 (0.51)	1	-0.0699* (0.01)	0.7120* (0.00)	-0.2299* (0.00)
TAX	-0.3209* (0.00)	-0.0639* (0.01)	0.0629* (0.01)	-0.1430* (0.00)	0.0162 (0.51)	0.0649* (0.01)	-0.0705* (0.00)	1	-0.0248 (0.32)	0.0074 (0.77)
INFOASY	-0.0134 (0.59)	-0.0322 (0.20)	-0.2140* (0.00)	-0.0113 (0.65)	-0.016 (0.52)	0.0035 (0.89)	0.6941* (0.00)	-0.0152 (0.54)	1	-0.1833* (0.00)
NPQ	-0.0154 (0.54)	-0.0509* (0.04)	0.0682* (0.01)	0.0071 (0.78)	-0.0353 (0.16)	-0.0028 (0.91)	-0.2285* (0.00)	0.0067 (0.79)	-0.1833* (0.00)	1

All variables are winsorized at the 5% and 95% percentiles. P-values below correlation values. * denotes significance at the 5% level or better. Spearman's rank coefficients above the diagonal, Pearson's pairwise correlation coefficients below. **LLP**=loan loss provisions/total assets; **EBTLLP**=earnings before taxes and LLP/total assets; **L_TCAPR**=total capital ratio_{t-1}; **L_LL**=loan loss provisions_{t-1}/total assets_{t-1}; **LOAN**=Net loans divided by the current year's total assets; **DLOAN**=Change in LOAN; **SIZE**=natural logarithm of the current year's total assets; **TAX**=income tax ratio=income tax expenses/EBT_t; **INFOASY**=indicator variable which equals 1 if the count of members exceeds the 75% percentile; **NPQ**=indicator variable which equals 1 if the additional contribution ratio exceeds the 75% percentile.

The correlation, as measured using Spearman's rank correlation coefficient, between the previous year's total capital ratio (L_TCAPR) is negative and significant ($\rho=-0.169^{***}$), supporting the capital management hypothesis. Furthermore, there is a weak positive correlation between LLP and the amount of loans ($\rho=0.052^{**}$). The correlation between LLP and TAX is negative and significant ($\rho=-0.330^{***}$), indicating that the more LLP are built, the lower is the income tax payment. This is comprehensible insofar as LLP are expenses and thus lower income.

The correlation coefficients in Table 3-10 show no strong correlations between independent variables except for the correlation between the count of co-operative members (INFOASY) and total assets (SIZE) which is positive and significant ($\rho=0.712^{***}$). As a consequence, the control variable SIZE is deleted from the regression model for all tests on the incremental effect of the information asymmetry on income smoothing (EBTP*INFOASY) to avoid multicollinearity (Backhaus et al., 2016). Further undisclosed analyses on the correlations between the different measures for supervisory board effectiveness and the variables correlated in Table 3-10 reveal no strong correlations between SAR and other independent variables.⁴⁴

As predicted, the sign of the income smoothing variable EBLLP is positive and significant for the full sample and all sample splits (see Table 3-11), indicating that bank managers use loan loss provisions to smooth income. Nevertheless, income smoothing through the use of LLP is less pronounced in firm years between 2011 and 2013 (see Table 3-11, column 4). This may be explained by the tendency of LLP to be more obscure since institutes have dissolved Sec. 340f and built Sec. 340g reserves out of the additional earnings to raise regulatory capital after the announcement of the Basle III requirements.⁴⁵ Since the reversal of Sec. 340f reserves is shown in the profit and loss-statement (P&L) within the same position as regular withdrawals from the LLP (Pos. 14 P&L; RechKredV) it remains obscure to external stakeholders (Bantleon & Gottmann, 2009). Besides, the LLP are no longer comparable with other banks or other annual reports of the same institute.

⁴⁴ The main variables of interest were LLP, EBTP, INFOASY and NPQ since these variables are crucial for the regression analyses quoted below. Since there are no high correlations, the assumption of multicollinearity is rejected.

⁴⁵ See the studies by Bornemann et al. (2012) and Bornemann et al. (2014) for a detailed analysis of visible and hidden reserves and the annual reports of credit institutes within the year 2010 and subsequent years for hints on the underlying accounting and related capital management practices.

Table 3-11: Income Smoothing Regression Results

VARIABLES	exp. sign	wLLP	wLLP	wLLP	wLLP
		random-effects 2007-2013	random-effects 2007-2013	random-effects 2007-2010	random-effects 2011-2013
EBTLLP	+	0.302*** (0)	0.162*** (5.07e-05)	0.416*** (0)	0.176*** (7.14e-05)
group			0.00104** (0.0345)		
groupxEBTLLP	+		0.158*** (0.00110)		
L_TCAPR	o/-	-0.00439** (0.0381)	-0.00487** (0.0133)	-0.00938*** (0.000631)	-0.000379 (0.898)
L_LLPLP	+	0.140*** (3.30e-07)	0.158*** (1.49e-09)	0.179*** (6.62e-10)	0.0477 (0.291)
LOAN	+	0.000976 (0.206)	0.00122 (0.100)	-4.23e-05 (0.964)	0.00215** (0.0486)
DLOAN	o	-0.00317*** (0.00471)	-0.00126 (0.227)	-0.00100 (0.367)	-0.00331 (0.131)
SIZE	+	-4.48e-05 (0.559)	-4.65e-05 (0.513)	-1.68e-05 (0.842)	-0.000322*** (0.00818)
TAX	-	-0.00627*** (0)	-0.00532*** (0)	-0.00126** (0.0458)	-0.0198*** (0)
Constant		-0.00118 (0.485)	-0.00225 (0.164)	0.000140 (0.943)	-0.00211 (0.488)
Yeardummies		included	-	included	included
Observations		1,613	1,613	994	619
Number of id		280	280	275	237
Overall R ² in %		37.7	35.7	27.2	42.4
Wald Chi ²		1075	1059	534.0	310.3

P-values in parentheses; *, **, and *** denote statistical significance at the 10%, 5% and 1% levels, using a two-tailed test. Robust standard errors are adjusted for heteroscedasticity and clustering at the firm level. **LLP**=loan loss provisions/total assets_t; **EBTLLP**=earnings before taxes and LLP/total assets; **group**=indicator variable which equals 1 for firm years between 2007-2010, 0 else; **L.TCAPR**=total capital ratio_{t-1}; **L_LLPLP**=loan loss provisions_{t-1}/total assets_{t-1}; **LOAN**=Net loans divided by the current year's total assets; **DLOAN**=Change in LOAN; **SIZE**=natural logarithm of the current year's total assets; **TAX**=income tax expenses/earnings before tax. All variables are winsorized at the 5% and 95% percentiles to adjust for extreme outliers.

To further analyze the changes in income smoothing through the use of LLP, the sample is split into early and late sample years by the indicator variable 'group' that takes the value 1 for early sample years. This variable is interacted with EBTLLP to capture the incremental effect of early sample years on bank income smoothing. The highly significant coefficient on the interaction term 'groupxEBTLLP' reveals significant differences in income smoothing using LLP for sample years before and after the Basle III announcement. Thus, the valuation of loans has mainly changed in preparation of the implementation of the new regulatory requirements. This result is in line with the

differences in means quoted in Table 3-9 which revealed that the importance of LLP has declined in favor of visible 340g reserves.⁴⁶

Most control variables show the predicted sign. The previous year's regulatory capital ratio is negatively related to LLP, but the coefficient is very small. These results are in line with prior studies on bank earnings management after the introduction of Basel I (Gebhardt & Novotny-Farkas, 2011; DeBoskey & Jiang, 2012). Prior studies on bank income smoothing usually predict a positive coefficient on DLOAN, indicating that loan loss provisions increase if the credit portfolio is extended (Gebhardt & Novotny-Farkas, 2011; Laeven & Majnoni, 2003; Bouvatier et al., 2014). Nevertheless, all these studies (including this one) find small negative and statistically significant coefficients on DLOAN. Laeven & Majnoni (2003) explain their findings by stating that managers increase the "amount of provisions during periods of positive profits, but at the same time, are more prudent during periods of rapid credit growth" (Laeven & Majnoni, 2003:189). Another - probably more convincing - argument is that during periods of credit growth, banks may grant new loans to customers with better rating classes and thus lower probabilities of default, resulting in lower LLP that are built to provision against expected risks resulting from the newly granted loans.

3.6.2 Additional Contribution, Information Asymmetry and Income Smoothing

The first research question takes into consideration the additional contribution in case of insolvency. Banks might smooth income to indicate stability. This is important insofar as financial distress would enlarge the liability risk for co-operative members.⁴⁷ Thus, hypothesis 1a addresses the question whether bank managers engage more in income smoothing if the additional contribution ratio is higher, resulting in higher expected losses for members in case of default. Furthermore, the effect on income smoothing is especially relevant for credit institutes in the legal form of the co-operative after the implementation of the Capital Requirements Regulation (CRR). The rationale is that the members' uncalled liability ("Haftsummenzuschlag") is no longer eligible as supplementary capital under Basle III, which may alter incentives to measure credit risks.⁴⁸

⁴⁶ The increasing importance of visible 340g reserves in bank accounting in accordance with the German Commercial Code (HGB) has been reported by Bornemann et al., 2014 for the years 1995 through 2010.

⁴⁷ This might result in a decline in subscribed capital (and thus core capital) as well as higher dividends to be received.

⁴⁸ Under the Basle II rules (SolvV) additional contributions were eligible as supplementary capital.

The distribution of additional contribution ratios (NP) within the sample is presented in Table 3-12. The average additional contribution ratio of institutes within the sample is 1.92. An additional contribution ratio of 1 indicates that members lose twice the value of their shares in case of insolvency. This is the lowest admissible value for additional contribution in case of limited liabilities for co-operative members (Sec. 6 III combined with Sec. 119 GenG). Nevertheless, many banks chose higher ratios. An explanation may be found within the SolvV (Basel II)-rules concerning the calculation of regulatory capital. Thus, the amount of uncalled liability was eligible as Class 2 Tier 2 capital (subordinated equity) [“*Ergänzungskapital 2. Klasse*”]. Therefore, the total capital ratio could be raised through higher additional contribution ratios.⁴⁹

Table 3-12: Distribution of Additional Contribution Ratios (NP)

NP	Freq.	Percent	Cum.
0-1	728	45.13	45.13
1-2	438	27.15	72.29
2-3	178	11.04	83.32
3-4	153	9.49	92.81
4-5	101	6.26	99.07
>5	15	0.93	100
Total	1.613	100	

Undisclosed panel statistics reveal that the additional contribution ratio (NP) is constant over time for most institutes within the sample.⁵⁰ Following Woolridge (2016), the coefficients for time-invariant variables cannot be estimated using fixed effects models. Even if there is only little variation over time, fixed effects models are recommended not to be used to estimate the effect of main explanatory variables since those estimates would be very imprecise (Woolridge, 2016). The random effects model allows for time-invariant explanatory variables. Nevertheless, unlike the fixed effects model, the random effects model requires the unobserved effect α_i and the explanatory variables to be uncorrelated (Woolridge, 2016). Since the random effects assumptions hold, the regression analysis is performed using random effects.⁵¹

⁴⁹ This is no longer possible under Basle II. The CRR does not accept limited liabilities as regulatory capital.

⁵⁰ The additional contribution ratio shows no within-sample variance for the years 2008 to 2010, indicating that no sample institute has changed its statutes concerning the members' funding obligations in case of distress within that period.

⁵¹ Woolridge (2016) suggests to also compute pooled OLS since the results help determining the estimation bias caused by leaving the unobserved effect α_i . However, the pooled OLS standard errors and test

Table 3-13: Effect of the Additional Contribution Ratio on Income Smoothing

VARIABLES	exp sign	wLLP	wLLP	wLLP
		random_eff lfd.Jahr 2007-2013	random_eff lfd.Jahr 2007-2010	random_eff lfd.Jahr 2011-2013
EBTLLP	+	0.313*** (0)	0.427*** (0)	0.167*** (0.00467)
NPQ		-0.000342 (0.563)	-0.000641 (0.227)	0.00126 (0.339)
NPQxEBTLLP	+	0.0337 (0.555)	0.0708 (0.229)	-0.113 (0.328)
INFOASY		0.000939 (0.140)	0.00129* (0.0752)	-0.00102 (0.311)
INFOASYxEBTLLP	+	-0.0835 (0.165)	-0.126* (0.0947)	0.0717 (0.443)
L_TCAPR	o/-	-0.00335 (0.122)	-0.00870*** (0.000846)	0.00161 (0.584)
L_LL	+	0.138*** (4.17e-07)	0.178*** (5.26e-10)	0.0459 (0.309)
LOAN	+	0.00120 (0.123)	0.000217 (0.817)	0.00259** (0.0142)
DLOAN	o	-0.00328*** (0.00344)	-0.00122 (0.267)	-0.00299 (0.172)
TAX	-	-0.00615*** (0)	-0.00127** (0.0427)	-0.0195*** (0)
Constant		-0.00242*** (0.00343)	-0.000593 (0.508)	-0.00879*** (0)
Yeardummies		included	included	included
Observations		1,613	994	619
Number of id		280	275	237
Overall R ² in %		37.7	27.5	41.8
Wald Chi ²		1043	599.4	337.0

P-values in parentheses; *, **, and *** denote statistical significance at the 10%, 5% and 1% levels, using a two-tailed test. Robust standard errors are adjusted for heteroscedasticity and clustering at the firm level. **LLP**=loan loss provisions/total assets; **EBTLLP**=earnings before taxes and LLP/total assets; **NPQ**=dummy variable which equals 1 if the additional contribution ratio exceeds the 75% percentile; **INFOASY**=dummy variable which equals 1 if the count of members exceeds the 75% percentile; **L.TCAPR**=total capital ratio_{t-1}; **L.LL**=loan loss provisions_{t-1}/total assets_{t-1}; **LOAN**=Net loans divided by the current year's total assets; **DLOAN**=Change in LOAN; **SIZE**=natural logarithm of the current year's total assets; **TAX**=income tax ratio=income tax expenses_t/EBT_t; all variables are winsorized at the 5% and 95% percentiles to adjust for extreme outliers.

Table 3-13 presents the results of the regression analysis using the LLP (standardized by current year's total assets) as a dependent variable. The coefficients on EBTLLP are again positive and highly significant for the whole sample period as well as for early and late

statistics are generally invalid because they ignore the serial correlation in the composite errors (Wooldridge, 2016).

sample years. These results are in line with the results of prior studies on bank income smoothing (e.g. Gebhardt & Novotny-Farkas, 2011 and Bouvatier et al., 2014).

The interaction Term NPQ*EBTLLP is not statistically significant. Thus, the results do not support hypothesis 1a which predicted a positive effect of high additional contributions in case of insolvency on the level of income smoothing. In contrast to hypothesis 1b, the coefficient on the interaction term INFOASY*EBTLLP (-0.13*) is negative and significant for the subsample covering firm years from 2007 through 2010 (see Table 3-13, column 2), suggesting that a higher level of information asymmetry between management and co-operative shareholders (as measured by the count of members) supports income smoothing. A possible explanation for the negative incremental effect of INFOASY*EBTLLP might be found within the corporate governance structure of co-operatives assuming that the information asymmetry before the general assembly is positively correlated with the count of members. Thus, the more members there are, the less information about the economic situation of the bank do they have beside the information given within the annual report. The management can use this information advantage and manipulate financial figures. Nevertheless, there is a risk that the owners find out about the manipulation within the general assembly, which is the main possibility for co-operative shareholders to directly address questions to the bank managers. The larger the co-operative, the higher the detection risk, since more shareholders could possibly scrutinize the accounting practices⁵². The risk is even higher for the managers of co-operatives with many shareholders insofar as they report to the representative assembly instead of the whole group of members (Sec. 43a GenG).⁵³ The elected members are assumed to have on average a higher expertise in financial questions, associated with a more informed debate on accounting matters.⁵⁴

⁵² See Appendix 3.2 for a more detailed analysis of the ownership structure of the banks within the sample.

⁵³ This finding could motivate further research on the role and sharpening of the general assembly as the main factor within the corporate governance structure of German co-operatives. It might be interesting to collect data on the existence of a representatives meeting or the share of members that actually takes part in the general assembly. Both aspects could further the understanding of the information asymmetry between co-operative shareholders and the firms' management.

⁵⁴ The argumentation is analogous to the one on members of the audit committee.

3.6.3 Supervisory Board Characteristics and Income Smoothing

The following section addresses the third research question, concerning the effects of the different supervisory board characteristics on income smoothing.⁵⁵ Prior literature on the role of supervisory boards in mitigating bank income smoothing suggests that more independent boards with higher financial expertise perform better in restricting earnings management (Cornett et al., 2009). The same is assumed for banks with an audit committee. Besides, non-bank studies suggest that gender-diverse boards perform better in monitoring managers' reporting (Srinidhi et al., 2011; Adams & Ferreira, 2009).

Table 3-14: Distribution of Supervisory Board Characteristics (2007-2013; N=549)

Variable	Mean	Standard deviation	25% quartile	Median	75% quartile
indep	0.462	0.435	0	0.464	1
boardsize	8.175	3.240	6	7	10
audcom	0.333	0.472	0	0	1
exp	0.736	0.219	0.556	0.750	1
exp_e	0.379	0.171	0.250	0.389	0.5
exp_wp	0.083	0.089	0	0.067	0.167
activ	8.183	2.822	6	8	11
gender	0.104	0.105	0	0.100	0.167

indep=percentage of board members which are neither employees, nor main business partners of the institute; **boardsize**=total number of board members; **audcom**=binary variable which equals 1 if an audit committee exists; **exp**=share of board members with financial/auditing expertise (in general); **exp_e**=share of board members that have a special financial expertise (WP, StB, Meister); **exp_wp**=share of board members that are auditors; **activ**=number of board meetings within the fiscal year; **gender**=share of female board members; sample size varies between 494 and 541 due to data availability for the different variables⁵⁶; all variables are winsorized at the 5% and 95% percentiles to adjust for extreme outliers.

Table 3-14 reports the distribution of supervisory board characteristics within the sample. Since some of these characteristics vary significantly over time, the descriptive statistics are presented separately for early and late sample years (see Table 3-15). Main changes relate to the independence of board members, the share of external auditors and the ratio of female participation on the supervisory board.

Undisclosed correlation analyses reveal no high correlations between any of these board effectiveness characteristics and other independent variables within the regression model.

⁵⁵ See Chapter 4.3.1 for the definitions of different board characteristics.

⁵⁶ The variance in sample size is due to data availability in questionnaires.

Table 3-15: Distribution of Supervisory Board Characteristics (2007-2010, N=170; 2011-2013, N=380)

Variable	Mean	Standard deviation	25% quartile	Median	75% quartile
2007-2010					
indep	0.538	0.453	0	0.667	1
boardsize	8.325	3.570	6	8	10
audcom	0.335	0.474	0	0	1
exp	0.722	0.231	0.556	0.742	1
exp_e	0.376	0.166	0.25	0.394	0.5
exp_wp	0.064	0.076	0	0	0.125
activ	8.218	2.825	6	8	10
gender	0.085	0.095	0	0.083	0.167
2011-2013					
indep	0.430	0.424	0	0.333	0.889
boardsize	8.108	3.085	6	7	10
audcom	0.332	0.472	0	0	1
exp	0.741	0.214	0.563	0.778	1
exp_e	0.380	0.173	0.25	0.380	0.5
exp_wp	0.091	0.092	0	0.083	0.167
activ	8.167	2.824	6	8	11
gender	0.112	0.109	0	0.111	0.182

indep=percentage of board members which are neither employees, nor main business partners of the institute; **boardsize**=total number of board members; **audcom**=binary variable which equals 1 if an audit committee exists; **exp**=share of board members with financial/auditing expertise (in general); **exp_e**=share of board members that have a special financial expertise (WP, StB, Meister); **exp_wp**=share of board members that are auditors; **activ**=number of board meetings within the fiscal year; **gender**=share of female board members; sample size varies between 494 and 541 due to data availability for the different variables; all variables are winsorized at the 5% and 95% percentiles to adjust for extreme outliers.

To analyze the incremental effect of different supervisory board characteristics on the extent of bank income smoothing, the baseline regression model used in Chapter 3.6.1 is extended by the interaction term SARxEBTLLP. For this purpose, all variables on board effectiveness are transformed into dummy variables. A highly effective supervisory board is assumed if the characteristic exceeds the 75% percentile.⁵⁷ Since more effective supervisory boards are expected to perform better in mitigating bank income smoothing, the coefficient (∂_2) is expected to be negative.

⁵⁷ See Chapter 4.3.1 for a more detailed description of the model variables.

Table 3-16: Effect of SAR on Income Smoothing (N=1,613; 2007-2013)

VARIABLES	exp sign	LLP	LLP	LLP	LLP	LLP	LLP	LLP	LLP
		random_eff lfd 2007-2013 INDEP	random_eff lfd 2007-2013 BOARDSIZE	random_eff lfd 2007-2013 AUDCOM	random_eff lfd 2007-2013 EXP	random_eff lfd 2007-2013 EXP_e	random_eff lfd 2007-2013 EXP_wp	random_eff lfd 2007-2013 ACTIV	random_eff lfd 2007-2013 GENDER
EBTLLP	+	0.234*** (8.49e-06)	0.243*** (2.90e-07)	0.324*** (0)	0.239*** (2.65e-05)	0.295*** (3.84e-08)	0.256*** (3.73e-07)	0.250*** (6.96e-08)	0.279*** (7.35e-09)
SARxEBTLLP	-	-0.0189 (0.881)	0.0511 (0.649)	-0.243** (0.0109)	0.102 (0.329)	-0.144 (0.259)	0.0247 (0.836)	0.0430 (0.756)	-0.195* (0.0879)
SAR		0.000256 (0.847)	-0.000491 (0.666)	0.00279*** (0.00497)	-0.000948 (0.361)	0.00157 (0.217)	1.42e-05 (0.992)	-0.000183 (0.892)	0.00225* (0.0632)
L_TCAPR	o/-	-0.00387 (0.334)	-0.00309 (0.405)	-0.00249 (0.462)	-0.00297 (0.436)	-0.00362 (0.351)	-0.00332 (0.382)	-0.00360 (0.337)	-0.00414 (0.251)
L_LLPL	+	0.0773 (0.134)	0.0883* (0.0649)	0.0849* (0.0723)	0.0794 (0.102)	0.0883* (0.0689)	0.0842* (0.0814)	0.0951** (0.0496)	0.0952** (0.0490)
LOAN	+	0.000697 (0.597)	0.00145 (0.252)	0.00178 (0.115)	0.00136 (0.262)	0.00155 (0.233)	0.00121 (0.344)	0.00144 (0.257)	0.00105 (0.395)
DLOAN	o	-0.00200 (0.410)	-0.00284 (0.197)	-0.00286 (0.135)	-0.00407** (0.0321)	-0.00429** (0.0296)	-0.00398** (0.0381)	-0.00319 (0.154)	-0.00211 (0.358)
SIZE	+	5.57e-05 (0.669)	7.88e-05 (0.523)	6.04e-06 (0.961)	7.52e-05 (0.561)	7.67e-05 (0.571)	7.43e-05 (0.572)	6.81e-05 (0.578)	5.10e-05 (0.675)
TAX	-	-0.0125*** (0)	-0.0121*** (0)	-0.0125*** (0)	-0.0125*** (0)	-0.0126*** (0)	-0.0125*** (0)	-0.0118*** (0)	-0.0122*** (0)
Constant		-0.00516* (0.0790)	-0.00597** (0.0453)	-0.00580** (0.0452)	-0.00582** (0.0488)	-0.00656** (0.0329)	-0.00586* (0.0552)	-0.00562* (0.0566)	-0.00550* (0.0617)
Yearummies		included	included	included	included	included	included	included	included
Observations		494	549	537	536	536	536	541	536
Number of id		128	138	135	135	135	135	137	135
Overall R ² in %		40.0	39.7	41.9	41.4	41.5	41.3	39.7	41.1
Wald Chi ²		348.3	362.0	346.7	420.8	391.4	388.4	347.1	405.4

P-values in parentheses; *, **, and *** denote statistical significance at the 10%, 5% and 1% levels, using a two-tailed test. Robust standard errors are adjusted for heteroscedasticity and clustering at the firm level. **LLP**=loan loss provisions/total assets; **EBTLLP**=earnings before taxes and LLP/total assets; **SAR**=dummy variable which equals 1 if the supervisory board variable exceeds the 75% percentile; **L_TCAPR**=total capital ratio_{t-1}; **L_LLPL**=loan loss provisions_{t-1}/total assets_{t-1}; **LOAN**=Net loans divided by the current year's total assets; **DLOAN**=Change in LOAN; **SIZE**=natural logarithm of the current year's total assets; **TAX**=income tax ratio=income tax expenses/EBT; all variables are winsorized at the 5% and 95% percentiles to adjust for extreme outliers.

Table 3-17: SAR-Interactions and Income Smoothing (N=1,613; 2007-2013)

VARIABLES	exp sign	LLP	LLP	LLP	LLP	LLP	LLP	LLP	LLP
		random_eff lfd 2007-2013 INDEP	random_eff lfd 2007-2013 BOARDSIZE	random_eff lfd 2007-2013 AUDCOM	random_eff lfd 2007-2013 EXP	random_eff lfd 2007-2013 EXP_e	random_eff lfd 2007-2013 EXP_wp	random_eff lfd 2007-2013 ACTIV	random_eff lfd 2007-2013 GENDER
EBTLLP	+	0.254*** (7.90e-05)	0.273*** (4.77e-06)	0.319*** (2.01e-09)	0.296*** (3.70e-06)	0.353*** (5.94e-09)	0.308*** (8.08e-07)	0.283*** (7.84e-07)	0.306*** (1.51e-07)
NPQxEBTLLP	+	0.0868 (0.506)	0.0650 (0.606)	0.0642 (0.626)	0.00547 (0.969)	0.0430 (0.737)	0.0497 (0.715)	0.0726 (0.573)	0.0769 (0.551)
NPQ		-0.000783 (0.616)	-0.000528 (0.725)	-0.000476 (0.757)	9.56e-05 (0.953)	-0.000184 (0.905)	-0.000318 (0.844)	-0.000613 (0.689)	-0.000715 (0.644)
INFOASYxEBTLLP	+	-0.128 (0.268)	-0.192** (0.0410)	-0.0342 (0.764)	-0.192* (0.0814)	-0.204* (0.0604)	-0.186* (0.0931)	-0.162 (0.118)	-0.147 (0.163)
INFOASY		0.00141 (0.262)	0.00210** (0.0457)	0.000396 (0.741)	0.00217* (0.0641)	0.00231** (0.0447)	0.00213* (0.0661)	0.00178 (0.112)	0.00155 (0.170)
SARxEBTLLP	-	-0.00359 (0.977)	0.113 (0.257)	-0.220** (0.0362)	0.0858 (0.440)	-0.178 (0.150)	-0.0116 (0.924)	0.0436 (0.736)	-0.188* (0.0899)
SAR		8.58e-05 (0.949)	-0.00109 (0.282)	0.00254** (0.0197)	-0.000750 (0.487)	0.00185 (0.127)	0.000410 (0.770)	-0.000172 (0.888)	0.00218* (0.0637)
L_TCAPR	o/-	-0.00366 (0.370)	-0.00253 (0.495)	-0.00241 (0.480)	-0.00218 (0.571)	-0.00282 (0.458)	-0.00252 (0.506)	-0.00318 (0.404)	-0.00382 (0.302)
L_LLQ	+	0.0801 (0.124)	0.0907* (0.0576)	0.0851* (0.0699)	0.0819* (0.0900)	0.0890* (0.0659)	0.0859* (0.0739)	0.0975** (0.0446)	0.0973** (0.0437)
LOAN	+	0.000844 (0.546)	0.00162 (0.196)	0.00180 (0.114)	0.00165 (0.167)	0.00196 (0.121)	0.00152 (0.226)	0.00161 (0.201)	0.00120 (0.354)
DLOAN	o	-0.00213 (0.389)	-0.00291 (0.191)	-0.00288 (0.136)	-0.00421** (0.0264)	-0.00447** (0.0212)	-0.00412** (0.0312)	-0.00330 (0.145)	-0.00223 (0.341)
TAX	-	-0.0127*** (0)	-0.0124*** (0)	-0.0125*** (0)	-0.0127*** (0)	-0.0128*** (0)	-0.0127*** (0)	-0.0120*** (0)	-0.0124*** (0)
Constant		-0.00453** (0.0235)	-0.00513*** (0.00214)	-0.00571*** (0.000420)	-0.00545*** (0.00162)	-0.00624*** (0.000555)	-0.00547*** (0.00210)	-0.00497*** (0.00390)	-0.00502*** (0.00481)
Yeardummies		included	included	included	included	included	included	included	included
Observations		494	549	537	536	536	536	541	536
Number of id		128	138	135	135	135	135	137	135
Overall R ² in %		40.3	40.2	42.0	41.8	42.1	41.8	40.1	41.4
Wald Chi ²		347.4	353.9	347.8	412.8	388.2	393.5	338.2	398.5

P-values in parentheses; *, **, and *** denote statistical significance at the 10%, 5% and 1% levels, using a two-tailed test. Robust standard errors are adjusted for heteroscedasticity and clustering at the firm level. **LLP**=loan loss provisions/total assets_t; **EBTLLP**=earnings before taxes and LLP/total assets_t; **SAR**=dummy variable which equals 1 if the supervisory board variable exceeds the 75% percentile; **L.TCAPR**=total capital ratio_{t-1}; **L.LLP**=loan loss provisions_{t-1}/total assets_{t-1}; **LOAN**=Net loans divided by the current year's total assets; **DLOAN**=Change in LOAN; **SIZE**=natural logarithm of the current year's total assets; **TAX**=income tax ratio=income tax expenses_t/EBT_t; all variables are winsorized at the 5% and 95% percentiles to adjust for extreme outliers.

Regression analysis results presented in Table 3-16 reveal negative and statistically significant coefficients for the board characteristics AUDCOM and GENDER. These findings are in line with the hypothesis that the existence of an audit committee as well as a relatively high proportion of female board members mitigate income smoothing. The results on control variables do not mainly change compared to the analyses quoted above.

After analyzing the incremental effect of different board characteristics on income smoothing, two additional interaction terms are added to the model. These terms have already been used to investigate the incremental effect of higher additional contribution ratios on income smoothing (see Table 3-13 and Chapter 3.6.2). In line with the analysis quoted above, the coefficient on NPQ*EBTP is not statistically significant either when supervisory board interaction is added to the baseline model (see Table 3-17). Thus, hypothesis 1a on the effect of a higher additional contribution ratio on bank income smoothing cannot be supported.

The coefficient on INFOASY*EBTP was assumed to be positive. The rationale was that the higher the information asymmetry between bank management and co-operative shareholders is, the more they engage in income smoothing to indicate stability and mask risk shifting. In contrast to hypothesis 1b, the coefficient is negative and statistically significant below the 10% percentile for banks with audit committees and supervisory boards with relatively high female representation (see Table 3-17). A comparable effect (-0.13**) had been presented in the baseline analysis for firm years from 2007 through 2010 (see Table 3-13).⁵⁸ The control variables show the predicted signs.

Since a relatively high proportion of female representation as well as the existence of an audit committee are found to mitigate bank income smoothing, these two parameters are investigated in greater detail in the following sections.

3.6.3.1 Effect of female participation on the board

The development of the average proportion of women on supervisory boards within the sample of this study is displayed in Table 3-18.⁵⁹ The time series reveals that the extent of female representation on supervisory boards is rather low, but increases continually

⁵⁸ See Chapter 3.6.2 for the discussion of the results on the information asymmetry for the income smoothing model before interaction of supervisory board characteristics.

⁵⁹ The data presented are based on the 46 banks that provided data on the board composition for all sample years. Furthermore, complete balance sheet data are required to ensure comparability with the multivariate analyses quoted within the following section.

over time. This result is in line with the simultaneous political debate⁶⁰ mandating higher female quotas for German boards.

Table 3-18: Time Series on Female Participation (Mean; N=536 firm years); Data winsorized (5/95%)

year	mean
2007	0.0626
2008	0.0859
2009	0.0923
2010	0.0995
2011	0.1007
2012	0.1127
2013	0.1242
2007-2013	0.1040

The mean test acknowledges that the female quota has significantly increased between the sample periods.⁶¹

Table 3-19: Differences in Means on Gender Quota (banks with gender data from 2007 through 2013); N=536 firm years

	Mean 2007-2010	Mean 2011-2013	Difference in means	T-statistic
				(p-value)
gender	0.08544	0.1122	0.0268	-2.874
				(0.002)***

gender=share of women on the supervisory board. The gender variable is winsorized at the 5% and 95% percentiles to adjust for extreme outliers. To ensure comparability, availability of all data used in Table 3-20 is required.

The regression analysis results presented in Table 3-23 reveal weak evidence that a relatively high proportion of female representation on the supervisory board mitigates income smoothing.⁶² This result is in line with prior studies which report improved earnings quality in gender diverse boards (Srinidhi et al., 2011) and enhanced board attendance for boards with female representation (Adams & Ferreira, 2009).

⁶⁰ On March 6, 2015, the German Bundestag agreed on a law which aims at enhancing the female quota for large and medium-sized German firms.

⁶¹ See the descriptive statistics in Chapter 3.6.3 for further information on the distribution of further model variables within the sample.

⁶² Further analyses tested settings where at least one woman was required on the supervisory board. These analyses did not reveal statistically relevant effects on income smoothing.

For the whole sample period from 2007 through 2013, the negative effect of gender diverse boards on income smoothing is statistically significant at the 10% level (see Table 3-20, column 1). The empirical results also reveal a weak gender effect for the later sample years (see Table 3-20, column 3). Nevertheless, the effect disappears for the early sample years (see Table 3-20, column 2) when income smoothing as a means of earnings management was still more pronounced.

Table 3-20: Gender Effect on Income Smoothing (Regression Analysis Results)

VARIABLES	exp sign	LLP	LLP	LLP
		random_eff lfd 2007-2013 GENDER	random_eff lfd 2007-2010 GENDER	random_eff lfd 2011-2013 GENDER
EBTLLP	+	0.279*** (7.35e-09)	0.420*** (7.83e-07)	0.227*** (4.31e-05)
SARxEBTLLP	-	-0.195* (0.0879)	-0.0756 (0.615)	-0.236* (0.0733)
SAR		0.00225* (0.0632)	0.00117 (0.414)	0.00261* (0.0606)
L_TCAPR	o/-	-0.00414 (0.251)	-0.0245*** (6.83e-05)	-0.000303 (0.939)
L_LLPL	+	0.0952** (0.0490)	0.178*** (0.00286)	0.0262 (0.631)
LOAN	+	0.00105 (0.395)	-0.00260 (0.289)	0.00265* (0.0538)
DLOAN	o	-0.00211 (0.358)	-0.00382 (0.194)	0.00129 (0.644)
SIZE	+	5.10e-05 (0.675)	-0.000134 (0.490)	-0.000181 (0.196)
TAX	-	-0.0122*** (0)	-0.00119 (0.487)	-0.0211*** (0)
Constant		-0.00550* (0.0617)	0.00623 (0.291)	-0.00636* (0.0535)
Yeardummies		included	included	included
Observations		536	165	371
Number of id		135	43	131
Overall R ² in %		41.1	30.0	47.2
Wald Chi ²		405.4	219.5	317.7

P-values in parentheses; *, **, and *** denote statistical significance at the 10%, 5% and 1% levels, using a two-tailed test. Robust standard errors are adjusted for heteroscedasticity and clustering at the firm level. **LLP**=loan loss provisions/total assets; **EBTLLP**=earnings before taxes and LLP/total assets; **SAR**=dummy variable which equals 1 if the supervisory board variable exceeds the 75% percentile; **L.TCAPR**=total capital ratio_{t-1}; **L.LLPL**=loan loss provisions_{t-1}/total assets_{t-1}; **LOAN**=Net loans divided by the current year's total assets; **DLOAN**=Change in LOAN; **SIZE**=natural logarithm of the current year's total assets; **TAX**=income tax ratio=income tax expenses/EBT_t; all variables are winsorized at the 5% and 95% percentiles to adjust for extreme outliers.

The results proved to be robust in further undisclosed analyses using alternative sample splits or divergent time periods. Besides, other levels for winsorizing the data generate comparable results. Furthermore, the data were standardized with previous years' total assets and alternative control variables were added or existing ones are removed. The empirical results quoted in this chapter support hypothesis 3c which predicts that female board participation might mitigate bank income smoothing.

3.6.3.2 Audit committee and income smoothing

The following statistics display the development of audit committee existence with the sample banks. Therefore, about one third of the sample banks have an audit committee. The share has been relatively stable over time.

Table 3-21: Time Series on Audit Committee Existence (N=537 firm years)

year	mean
2007	0.3250
2008	0.3415
2009	0.3333
2010	0.3415
2011	0.3203
2012	0.3306
2013	0.3471
2007-2013	0.3333

Moreover, mean tests reveal no significant differences in the existence of an audit committee throughout the sample years. Thus, most banks do not change their decision whether to install an audit committee over time.

Table 3-22: Differences in Means on Audit Committee Existence; N=537 firm years

	Mean 2007-2010	Mean 2011-2013	Difference in means	T-statistic (p-value)
audcom	0.3354	0.3324	0.0029	0.066 (0.473)
audcom =existence of an audit committee. The audcom variable is winsorized at the 5% and 95% percentiles to adjust for extreme outliers. To ensure comparability, availability of all data used in Table 3-20 is required.				

The regression analysis results reported in Table 3-23 reveal a negative and statistically significant effect of audit committee existence on bank income smoothing through LLP for the whole sample period from 2007 through 2013 (see Table 3-23, column 1). Analogous to the analysis on gender diverse supervisory boards, the results are robust for the late sample years (see Table 3-23, column 3) whereas they do not become apparent

for the early sample years (see Table 3-23, column 2). One possible explanation might be found in the relatively low sample size for firm years from 2007 through 2010. In line with hypothesis 3b, the empirical results support the thesis that the existence of an audit committee reduces bank income smoothing through the use of LLP. The overall R^2 is relatively high, indicating that the independent variables explain a good share of the variation of the dependent variable (LLP).

Table 3-23: Effect of Audit Committee Existence on Income Smoothing

VARIABLES	exp sign	LLP	LLP	LLP
		random_eff lfd 2007-2013 AUDCOM	random_eff lfd 2007-2010 AUDCOM	random_eff lfd 2011-2013 AUDCOM
EBTLLP	+	0.324*** (0)	0.459*** (0)	0.266*** (0.000123)
SARxEBTLLP	-	-0.243** (0.0109)	-0.155 (0.441)	-0.224** (0.0373)
SAR		0.00279*** (0.00497)	0.00181 (0.306)	0.00262** (0.0236)
L_TCAPR	o/-	-0.00249 (0.462)	-0.0229*** (0.000123)	0.000411 (0.915)
L_LLPLP	+	0.0849* (0.0723)	0.170*** (0.00244)	0.0119 (0.823)
LOAN	+	0.00178 (0.115)	-0.000799 (0.713)	0.00293** (0.0195)
DLOAN	o	-0.00286 (0.135)	-0.00497 (0.111)	0.000696 (0.773)
SIZE	+	6.04e-06 (0.961)	-7.25e-05 (0.692)	-0.000277* (0.0596)
TAX	-	-0.0125*** (0)	-0.00122 (0.509)	-0.0215*** (0)
Constant		-0.00580** (0.0452)	0.00318 (0.554)	-0.00545 (0.101)
Year dummies		included	included	included
Observations		537	164	373
Number of id		135	43	132
Overall R^2 in %		41.9	33.3	48.5
Wald χ^2		346.7	212.1	280.2

P-values in parentheses; *, **, and *** denote statistical significance at the 10%, 5% and 1% levels, using a two-tailed test. Robust standard errors are adjusted for heteroscedasticity and clustering at the firm level. **LLP**=loan loss provisions/total assets; **EBTLLP**=earnings before taxes and LLP/total assets; **SAR**=dummy variable which equals 1 if the supervisory board variable exceeds the 75% percentile; **L.TCAPR**=total capital ratio_{t-1}; **L.LLPLP**=loan loss provisions_{t-1}/total assets_{t-1}; **LOAN**=Net loans divided by the current year's total assets; **DLOAN**=Change in LOAN; **SIZE**=natural logarithm of the current year's total assets; **TAX**=income tax ratio=income tax expenses/EBT_t; all variables are winsorized at the 5% and 95% percentiles to adjust for extreme outliers.

These results proved to be robust in further undisclosed analyses using divergent time periods. Results do not change strongly when the data are winsorized at other levels, alternative sets of control variables are used or the data are standardized with the previous year's total assets.

3.6.3.3 Overall board effectiveness and income smoothing

The analyses quoted above support the thesis that the more effective the supervisory boards are, the less likely is the institute to smooth income through the use of LLP (see hypothesis 3a). Since all analyses have been run so far with partial measures of board effectiveness, the final analysis is conducted with a composite measure that captures the overall effectiveness of supervisory boards. For this purpose, an index variable is defined as the sum of the indicator variables used in the analyses of the partial aspects of supervisory board effectiveness.⁶³ Table 3-24 reports descriptive statistics for the index variable.

Table 3-24: Distribution of the Composite Measure on Supervisory Board Effectiveness

Variable	Mean	Standard deviation	25% quartile	Median	75% quartile
SARInd	1.653	1.082	1	2	2

SARInd=index variable defined as sum of the indicator variables for 7 partial aspects of supervisory board strength. See chapter 3.4.3.1 for a more detailed description of the composite measure.

This analysis is intended to further strengthen the understanding of the bank supervisory boards' attitude towards income smoothing. Assumed that the supervisory boards are effective, they should be able to prevent accounting practices they do not agree with.

Table 3-25: Differences in Means on the Board Effectiveness Index; N=455 firm years

	Mean	Mean	Difference in means	T-statistic
	2007-2010	2011-2013		(p-value)
SARInd	1.6269	1.6636	0.0367	0.330
				(0.371)

SARInd=index variable defined as sum of the indicator variables for 7 partial aspects of supervisory board strength. See chapter 3.4.3.1 for a more detailed description of the composite measure. To ensure comparability, availability of all data used in Table 3-25 is required.

The results of the regression analysis presented in Table 3-26 reveal no empirical results on the overall effect of an effective supervisory board for the whole sample period from 2007 through 2013. Nevertheless, when splitting the sample again into the early years

⁶³ See chapter 3.4.3.1 for the description of the index variable SAR_IND that is used for this analysis.

from 2007 through 2010 and the late sample years from 2011 through 2013, the statistics reveal opposing impacts of stronger boards for periods before and after the disclosure of the Basle III rules.

Table 3-26: Effect of Overall Board Effectiveness on Income Smoothing

VARIABLES	exp sign	LLP	LLP	LLP
		random_eff lfd 2007-2013 SAR_IND	random_eff lfd 2007-2010 SAR_IND	random_eff lfd 2011-2013 SAR_IND
EBTLLP	+	0.245*** (4.64e-06)	0.353*** (0.000300)	0.236*** (0.000488)
SARxEBTLLP	-	-0.0706 (0.610)	0.554*** (0.00859)	-0.251** (0.0447)
SAR		0.000873 (0.536)	-0.00378* (0.0521)	0.00257** (0.0476)
L_TCAPR	o/-	-0.00458 (0.241)	-0.0245*** (0.000862)	-0.00109 (0.814)
L_LLTP	+	0.0871* (0.0913)	0.185*** (0.00414)	0.00360 (0.949)
LOAN	+	0.000622 (0.649)	-0.00284 (0.357)	0.00270* (0.0577)
DLOAN	o	-0.00297 (0.181)	-0.00327 (0.390)	-0.000757 (0.767)
SIZE	+	5.95e-05 (0.672)	-6.47e-05 (0.787)	-0.000249 (0.130)
TAX	-	-0.0129*** (0)	-0.00200 (0.339)	-0.0210*** (0)
Constant		-0.00535 (0.107)	0.00522 (0.474)	-0.00483 (0.214)
Yearummies		incl	incl	incl
Observations		455	134	321
Number of id		118	35	114
Overall R2 in %		0.427	0.335	0.486
Wald-Chi2		361.7	218.4	256.9

P-values in parentheses; *, **, and *** denote statistical significance at the 10%, 5% and 1% levels, using a two-tailed test. Robust standard errors are adjusted for heteroscedasticity and clustering at the firm level. **LLP**=loan loss provisions/total assets; **EBTLLP**=earnings before taxes and LLP/total assets; **SAR**=dummy variable which equals 1 if the supervisory board variable exceeds the 75% percentile; **L.TCAPR**=total capital ratio_{t-1}; **L.LLTP**=loan loss provisions_{t-1}/total assets_{t-1}; **LOAN**=Net loans divided by the current year's total assets; **DLOAN**=Change in LOAN; **SIZE**=natural logarithm of the current year's total assets; **TAX**=income tax ratio=income tax expenses/EBT_t; all variables are winsorized at the 5% and 95% percentiles to adjust for extreme outliers.

In contrast to hypothesis 3a, the incremental effect of more effective supervisory boards on bank income smoothing is strongly positive and statistically significant (0.554**) under the Basle II rules, indicating that banks smooth income to a greater extent when they have a more effective supervisory board. This finding suggests that bank supervisory boards support income smoothing. On the contrary, the sign of the effect changes after

the announcement of the Basle III rules. More precisely, in the sample period from 2011 through 2013, the incremental effect of effective supervisory boards on bank income smoothing is negative (-0.251*) and weakly significant, indicating that banks with more effective supervisory boards mitigate income smoothing. This finding is in accordance with hypothesis 3a.

These results are in line with hypothesis 2 positing that banks engage less in income smoothing through LLP in order to meet the Basle III capital requirements. The capital management thesis is supported by the relatively weak, but statistically highly significant relation between LLP and the previous year's regulatory capital ratio. These findings are in accordance with the ones quoted in Table 3-11. Again, capital management through LLP is no longer relevant after the announcement of the Basle III rules since they are no longer accepted as capital components. Insofar, the empirical results support the assumption that supervisory capital requirements are one of the main indicators used to manage banks and to control bank stability.

3.7 Conclusion

This study investigated for a sample of German co-operative banks from 2007 through 2013 how income smoothing through the use of LLP is affected by the institutes' corporate governance. Beside aspects particular to the legal form of the governance structure, it sheds light on the role of the supervisory board in mitigating income smoothing.

Main results suggest that co-operative banks smooth income through the use of loan loss provisions. This effect is stronger for sample years before 2011. After the announcement of the Basle III rules (CRR/CRD IV) in December 2010, the building of LLP declines in support of Sec. 340g reserves. The rationale might be that these reserves are eligible as regulatory capital under Basle III. The continuous increase of the average total capital ratio within the sample period supports hypothesis 2 that banks may have changed their accounting practices due to the announced Basle III rules.

By contrast, the study reveals no clear results concerning the effect of the additional contribution ratio on income smoothing. This might be due to the relatively sound financial condition of the sample banks. The significance of results in relation to this question might be enhanced by using a sample with rather distressed banks (as approximated by relatively low regulatory capital ratios).

Against hypothesis 1b which predicts that higher information asymmetries between management and shareholders should result in more income smoothing, the results of the regression analysis indicate a negative relation between the extent of information asymmetry, approximated by a relatively high count of members with a co-operative bank, and the level of income smoothing. This finding may be caused by the specific governance structure of co-operatives. Assuming that the annual report is the main source of financial information for most of the co-operative shareholders, management could manipulate the figures presented within the report to indicate stability. Nevertheless, each shareholder may address questions to the management within the general assembly. The more shareholders a co-operative has, the higher is the detection risk since more shareholders may scrutinize the accounting practices. The risk is even higher for co-operatives with a higher number of members that elect representatives for the assembly, which are expected to be better informed and prepared than the whole group. The study contributes to the literature on the effect of the specific corporate governance of co-operative banks on these institutes' accounting behavior.

In line with prior studies, the analysis of the effect of different supervisory board characteristics on bank income smoothing supports the hypothesis that the existence of an audit committee (H3b) as well as gender diversity on the supervisory board (H3c) mitigates bank income smoothing. The use of an index measure composed of the partial measures tested before reveals that more effective supervisory boards perform better in mitigating income smoothing for sample years from 2011 through 2013. Against the hypothesis, the incremental effect of higher board effectiveness on income smoothing is positive for sample years from 2007 through 2010, indicating that more effective bank supervisory boards support income smoothing. One possible explanation for the reversal of the incremental effect may be found in the incentives deriving from the altered own funds requirements on bank accounting on the one hand and stricter regulations concerning the expertise and personal suitability of bank supervisory board members on the other hand.

To the best of my knowledge, this is the first study that analyzes the effect of board gender diversity on bank income smoothing for a sample of German credit institutes. Furthermore, it contributes to the literature by providing new insights into the accounting choice of banks within the legal form of the co-operative.

The results of this study may be interesting for legislators since it sheds light on the effects of the strengthened regulatory requirements under Basle III on the accounting choice of

German co-operative banks. Despite their on average relatively small size, these institutes present an important sector of the German banking market, as they are relevant for financing the German small and medium size companies. Beside the direct effects on the accounting of credit valuation, the study sheds light on the effects of enhanced requirements on the effectiveness of the corporate governance of credit institutes. The federation of co-operatives, association auditors and accountants within co-operative banks should be another target group of this work.

The study may be subject to some limitations. Since the data on supervisory board effectiveness are collected by questionnaires, the sample size is restricted to banks that opted to participate and thus provide us with data on their supervisory board structure. Beside the fact that the sample size for the corresponding analyses is restricted due to data availability, a selection bias might result. This aspect has been addressed by comparing descriptive statistics before and after reducing the sample by mean-tests. Furthermore, the regression analyses without supervisory board interactions are conducted with the reduced dataset. Both robustness tests do not reveal main differences in the sample composition for participating and non-participating banks.

Further research could extend the sample size by including extended time series. Besides, the understanding of the financial reporting of German non-listed banks could be further strengthened by extending the sample used in this study to savings banks which are similar in size, reporting requirements and customer structure, but differ in the legal form. Further research could also analyze the audit committee in greater detail.

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⁶⁴ A consultative version was published in October 2014.

Appendix 3.1: Questionnaires

Figure 3-1: Questionnaire 1 (December 2014)

Fragebogen



	Angabe	2011	2012	2013
1. Aufsichtsrat				
1.1 Gesamtanzahl der Mitglieder des Aufsichtsrates	Anzahl	<input type="text"/>	<input type="text"/>	<input type="text"/>
davon: Vertreter aus dem eigenen Institut (Arbeitnehmer)	Anzahl	<input type="text"/>	<input type="text"/>	<input type="text"/>
davon: Mitglieder mit wesentlichen Geschäftsbeziehungen zum Institut	Anzahl	<input type="text"/>	<input type="text"/>	<input type="text"/>
davon: Unternehmensexterne Mitglieder	Anzahl	<input type="text"/>	<input type="text"/>	<input type="text"/>
weibliche Mitglieder des AR	Anzahl	<input type="text"/>	<input type="text"/>	<input type="text"/>
männliche Mitglieder des AR	Anzahl	<input type="text"/>	<input type="text"/>	<input type="text"/>
Geschlecht des Vorsitzenden des AR	(m/w)	<input type="text"/>	<input type="text"/>	<input type="text"/>
1.2 Anzahl der Mitglieder des AR mit folgendem Bildungsabschluss:				
Bachelor/Master/Diplom/Staatsexamen	Anzahl	<input type="text"/>	<input type="text"/>	<input type="text"/>
Meisterabschluss	Anzahl	<input type="text"/>	<input type="text"/>	<input type="text"/>
Promotion	Anzahl	<input type="text"/>	<input type="text"/>	<input type="text"/>
Wirtschaftsprüfer/Steuerberater	Anzahl	<input type="text"/>	<input type="text"/>	<input type="text"/>
sonstige	Anzahl	<input type="text"/>	<input type="text"/>	<input type="text"/>
unbekannt	Anzahl	<input type="text"/>	<input type="text"/>	<input type="text"/>
1.3 Anzahl der Sitzungen des Aufsichtsrates im Kalenderjahr	Anzahl	<input type="text"/>	<input type="text"/>	<input type="text"/>
2. Prüfungsausschuss				
2.1 Existiert ein Prüfungsausschuss?	(ja/nein)	<input type="text"/>	<input type="text"/>	<input type="text"/>
2.2 Anzahl der Mitglieder des Prüfungsausschusses	Anzahl	<input type="text"/>	<input type="text"/>	<input type="text"/>
davon: Mitglieder mit expliziten Bilanzierungs-/Prüfungs-/ Risikocontrollingkenntnissen	Anzahl	<input type="text"/>	<input type="text"/>	<input type="text"/>
2.3 Verfügt der Ausschussvorsitzende über explizite Prüfungskennnisse?	(ja/nein)	<input type="text"/>	<input type="text"/>	<input type="text"/>
2.4 Anzahl der Sitzungen des Prüfungsausschusses im Kalenderjahr	Anzahl	<input type="text"/>	<input type="text"/>	<input type="text"/>

Figure 3-2: Questionnaire 2 (June 2015)



Fragebogen

	Angabe	2007	2008	2009	2010
1. Aufsichtsrat					
1.1 Gesamtanzahl der Mitglieder des Aufsichtsrates	Anzahl				
davon: Vertreter aus dem eigenen Institut (Arbeitnehmer)	Anzahl				
davon: Mitglieder mit wesentlichen Geschäftsbeziehungen zum Institut	Anzahl				
davon: Unternehmensexterne Mitglieder	Anzahl				
weibliche Mitglieder des AR	Anzahl				
männliche Mitglieder des AR	Anzahl				
Geschlecht des Vorsitzenden des AR	(m/w)				
1.2 Anzahl der Mitglieder des AR mit folgendem höchstem Bildungsabschluss:					
Bachelor/Master/Diplom/Staatsexamen	Anzahl				
Meisterabschluss	Anzahl				
Promotion	Anzahl				
Wirtschaftsprüfer/Steuerberater	Anzahl				
sonstige	Anzahl				
unbekannt	Anzahl				
1.3 Anzahl der Sitzungen des Aufsichtsrates im Kalenderjahr	Anzahl				
2. Prüfungsausschuss					
2.1 Existiert ein Prüfungsausschuss?	(ja/nein)				
2.2 Anzahl der Mitglieder des Prüfungsausschusses	Anzahl				
davon: Mitglieder mit expliziten Bilanzierungs-/Prüfungs- /Risikocontrollingkenntnissen	Anzahl				
2.3 Verfügt der Ausschussvorsitzende über explizite Prüfungskennnisse?	(ja/nein)				
2.4 Anzahl der Sitzungen des Prüfungsausschusses im Kalenderjahr	Anzahl				

Appendix 3.2: Analysis of the Ownership Structure of Co-operative Banks

Following prior works on the effect of corporate governance on earnings quality, the ownership structure plays a crucial role in mitigating earnings management. Bouvatier et al. (2014) report less earnings management in the absence of a large block holder, defined as a single shareholder that is controlling more than 75% of a firm's shares (Bouvatier et al., 2014).

Co-operative shareholders join the co-operative by signing one share (Sec. 15 GenG). Afterwards, they may sign further shares (Sec. 15b GenG), provided it is in accordance with the statutes (Sec. 7a (1) GenG). Membership had once been obligatory, especially for granting a loan. Nowadays, customers do not necessarily need to sign co-operative shares.

Thus, the assumption for the following analysis is that the ownership structure of German co-operative banks is quite dispersed.

Table 3-27: Descriptive Statistics on Ownership Structure

Variable	Mean	Standard deviation	25% quartile	Median	75% quartile
owner	11.511	11.300	3.056	7.116	16.541
volmitg	561	233	387	540	690
sig_cap	6.190.455	6.276.685	1.523.301	3.870.057	8.756.897
geschant	141	77	60	150	200

owner=count of members; **volmitg**=average capital invested by each shareholder of the co-operative; **sig_cap**=signed capital; **geschant**=face value of one co-operative share. All variables are winsorized at the 5% and 95% percentiles to adjust for extreme outliers.

The results presented in Table 3-27 reveal that co-operative shareholders invest on average approximately 560 EUR. The face value of a co-operative share, and thus the minimum amount to invest, is on average 141 EUR. The average signed capital of a co-operative bank is about 6.2 million EUR and each bank has on average 11,500 members. Based on the numbers reported, the assumption of a dispersed ownership structure appears to be reasonable.

Appendix 3.3: List of Symbols

*	statistical significance at the 0.10 level
**	statistical significance at the 0.05 level
***	statistical significance at the 0.01 level
%	percent
&	and
α	regression coefficient
β	regression coefficient
γ	regression coefficient
ε	residual term
ρ	Spearman correlation coefficient
activ	variable for the number of supervisory board meetings within the fiscal year
ACTIV	indicator variable for frequently meeting supervisory boards
audcom	indicator variable for the existence of an audit committee
AUDCOM	indicator variable for the existence of an audit committee
boardsize	variable for the number of supervisory board members
BOARDSIZE	indicator variable for large supervisory boards
DLOAN	variable for change in net loans
$\Delta 340g$	variable for change in 340g reserves
EBTP	variable for earnings before taxes and loan loss provisions

exp	variable for the share of supervisory board members with financial expertise
EXP	indicator variable for high share of supervisory board members with financial expertise
exp_e	variable for the share of supervisory board members that have extended financial expertise
EXP_e	indicator variable for high share of supervisory board members with extended financial expertise
exp_wp	variable for the share of supervisory board members that are external auditors
EXP_wp	indicator variable for high share of supervisory board members that are external auditors
gender	variable for the share of female members within the supervisory board
GENDER	indicator variable for supervisory boards with high gender quotas
geschant	variable for the face value of one co-operative share
i	firm index
indep	variable for the percentage of independent supervisory board members
INDEP	indicator variable for high percentage of independent supervisory board members
INFOASY	instrumental variable for high information asymmetry
LLP	variable for loan loss provisions
LLP_Kor340s	variable for loan loss provisions adjusted for changes in 340g reserves and taxes
LOAN	variable for net loans

n	index for the number of the partial aspect within the definition of the SAR-Index variable
NP	variable for additional contribution ratio
NPQ	instrumental variable for high additional contribution ratios
owner	variable for the count of members
p	percentile
p	p-value
R^2	empirical coefficient of determination
SAR	indicator variable for high supervisory board effectiveness
sig_cap	variable for signed capital
SIZE	variable for size
t	time index
t	t-value
ta	total assets
TAX	variable for the tax expense ratio
TCAPR	variable for total capital ratio
volmitg	variable for the amount of capital invested by each shareholder
Wald- χ^2	empirical coefficient of determination
z	year dummies
z	z-statistic

4. Supervisory board characteristics and earnings properties: Co-operative firms versus private stock corporations

Jochen Bigus and Monika Riediger

To the best of our knowledge, this paper is the first one analyzing earnings properties of German co-operative firms and how they are affected by characteristics of their supervisory boards. Both types of firms typically have a relative big number of owners but profit-maximizing is less important with co-operatives. A co-operative must be run by its owners while separation of ownership and control is allowed with stock corporations. Owners of co-operative firms typically can be held liable with their private assets but not shareholders of corporations. We therefore expect that agency problems of equity and of debt are less severe with co-operatives.

Accordingly, for low-levered firms we expect and find that co-operative firms exhibit lower financial reporting quality (FRQ) than corporations as measured by timely loss recognition, income smoothing and the propensity to avoid reporting small losses. However, high levels of debt urges stock corporations more than co-operatives to *additionally* target information needs of creditors and debt covenant requirements. We find that high-levered stock corporations increase income smoothing more and exhibit a higher propensity to avoid reporting small losses than low-levered stock corporations. High- and low-levered co-operative firms differ much less with regard to those earnings properties.

This paper also is the first one to provide descriptive statistics on the characteristics of the supervisory boards of co-operative firms and private stock corporations. On average, co-operative firms have significantly more board members than corporations (mean values: 7.3 vs. 5.2), a higher proportion of female board members (16.7% vs. 12.3%) and more board meetings per year (6.2 vs. 3.9), but co-operatives have a lower proportion of public accountants or auditors serving as board members (2.6% vs. 8.4%) and are less likely to have an audit committee (45% vs. 91%). The proportion of independent board members does not differ much (63% vs. 59%).

We find evidence that co-operative firms exhibit higher levels of timely loss recognition with smaller board size, the existence of an audit committee and a higher frequency of board meetings, and a higher proportion of female supervisory board members.

Overall, our study provides evidence that earnings properties and the characteristics of supervisory board characteristics differ between co-operative firms and stock corporations.

Keywords: Financial accounting of private firms, co-operative firms, corporations, supervisory board, agency problems of equity, agency problem of debt

JEL: M41, G32, G35, K34

4.1 Introduction

While more than 99% of empirical accounting studies target publicly listed firms, there is only limited evidence on private firms' accounting choices. Most of the literature on private firms looks at corporations only (e.g. Ball & Shivakumar 2005, Burgstahler et al. 2006, Goncharov & Zimmermann 2006, 2007, Garrod et al. 2008, Peek et al. 2010, Cano-Rodriguez 2010, Gassen & Fülbier 2015, Hope et al. 2013, Kosi & Valentincic 2013).

To the best of our knowledge, there is no quantitative empirical study on financial accounting choices of co-operative firms. Co-operative firms do not aim to maximize profits or shareholder value but to foster common economic, social, and cultural needs of their members (owners) through a jointly-owned enterprise (Sec. I on the law on co-operative firms (Genossenschaftsgesetz, briefly GenG). Similar to stock corporations, co-operative firms often have a relatively large number of owners. Different to stock corporations, agency problems of equity might be less severe since owners share common, often altruistic goals. Moreover, owners of a co-operative are expected to be less interested in the financial outcome of their share than owners of corporations are. In addition, a German co-operative firm must be run by one of the owners (Sec. 9 II GenG). Overall, we expect agency problems of equity to be less pronounced with co-operatives than with stock corporations. Consequently, there is less need to mitigate agency problems of equity by higher financial reporting quality (FRQ). We therefore expect lower FRQ with co-operatives than with stock corporations. We use three proxies of FRQ: timely loss recognition, income smoothing and the propensity to avoid reporting small losses.

With higher debt levels, agency problems of debt add to those of equity. Financial reporting choices now also have to address creditors' information needs according the firm's default risk, moreover, they will be affected by the goal not to violate debt covenant requirements, e.g., on interest coverage or debt to EBITDA (Dichev & Skinner 2002;

Nikolaev, 2010; Cascino et al., 2014).⁶⁵ Since owners of co-operative firms typically can be held liable with their private assets, we also expect agency problems of debt to be less severe than with corporations. Highly levered stock corporations are more likely to face a trade-off between providing high FRQ to owners on the one hand while meeting debt covenants on the other hand. Thus, with low levels of debt we expect stock corporations to exhibit higher FRQ than co-operative firms due to more pronounced agency problems of equity. With high levels of debt we expect FRQ to decrease but more so with stock corporations.

Based on up to 5,600 firm-year observations on German co-operatives and stock corporations, we find evidence that with *low-levered* firms, co-operative firms tend to exhibit lower FRQ than corporations do: co-operative firms exhibit no significant timely loss recognition, smooth income more and avoid reporting small losses more often than corporations do. We find that high-levered stock corporations increase income smoothing and exhibit a higher propensity to avoid reporting small losses than low-levered stock corporations. High- and low-levered co-operative firms differ much less with regard to those earnings properties.

We also provide larger-sample evidence on how the characteristics of supervisory boards differ between co-operatives and private corporations. The German corporation code requires supervisory boards for both corporations and co-operatives (Sec. 95 Aktiengesetz (AktG) and Sec. 36 Genossenschaftsgesetz (GenG), respectively). Since co-operatives and private corporations do not need to disclose information on supervisory boards, we sent out questionnaires (see appendix 1). We asked for several characteristics such as the number of board members, proportion of independent board members, share of female board members, the number of board members who are certified public accountants or auditors, the number of board meetings per year and the existence of an audit committee.

Board characteristics significantly differ between the two legal forms. Co-operatives have significantly more board members than corporations (mean values: 7.3 vs. 5.2), more women on board (16.7% vs. 12.3%), more board meetings (6.2 vs. 3.9); however, co-operatives are less likely to have an audit committee (45% vs. 91%) and exhibit a lower

⁶⁵ A 2009 survey involving 500 CFOs from German firms shows that 76% of bank lending contracts use covenants; interest coverage and the debt ratio are the most common financial covenants (Haghani et al., 2009).

proportion of public accountants or auditors serving as board members (2.6% vs. 8.4%). The proportion of independent supervisory board members does not differ much between the two legal forms (63% vs. 59%).

Finally, we investigate whether the single supervisory board characteristics affect FRQ with co-operatives differently than with corporations. We find evidence that co-operative firms exhibit higher levels of timely loss recognition with smaller board size, the existence of an audit committee and a higher frequency of board meetings, and a higher proportion of female supervisory board members. Surprisingly, a larger proportion of independent board members goes along with less timely loss recognition.

With stock corporations, a smaller board size and a larger proportion of independent supervisory board members or of members with financial expertise induce more timely loss recognition. Higher levels of members' independence or financial expertise also lower the propensity to avoid reporting small losses, but only with stock corporations. We generally do not find a significant marginal effect of supervisory board characteristics on the level of income smoothing, maybe due to limited sample size.

Overall, higher levels of supervisory board independence and expertise do not necessarily increase FRQ and might even lower FRQ with co-operative firms.

Our paper makes several contributions to the literature. First, to the best of our knowledge, it is the first paper analyzing earnings properties of co-operative firms and how they are affected by characteristics of their supervisory boards. Toms (2001) finds evidence that the earnings-stock price relation was stronger for late 19th century Lancashire co-operative cotton mills than for corporations listed at the New York Stock Exchange. He argues that in the absence of mandatory financial reporting the "democratic" one-shareholder-one-vote principle encouraged co-operatives more to voluntarily disclose value-relevant information (Toms, 1998). We contribute to this research by using different proxies of financial reporting quality in a mandatory financial reporting framework and by explicitly addressing how FRQ of co-operatives and corporations depends on both agency problems of equity and of debt. Moreover, we investigate the incremental effect of supervisory board characteristics on FRQ.

Second, the paper adds to the relatively small amount of literature that focuses purely on financial accounting choices made by private firms.⁶⁶ Garrod et al. (2008) and Kosi &

⁶⁶ There is also literature on the question of how financial accounting patterns differ *between* publicly listed firms and private firms. For instance, Burgstahler et al. (2006) show that income smoothing and loss

Valentincic (2013) find that asset write-offs by small private firms in Slovenia are mainly tax-driven and that asset write-offs are more likely with profitability and firm size. Szczesny & Valentincic (2013) show for a dataset of German private firms (corporations only) that asset write-offs are more likely and increase with profitability, leverage and dividend payments. Cano-Rodriguez (2010) demonstrates that Spanish private firms tend to exhibit higher levels of conditional conservatism when audited by a BigN auditor. Coppens & Peek (2005) find that private firms avoid losses less frequently in countries with high financial and tax accounting alignment (e.g. Belgium, France, Germany, Italy). Haw et al. (2014) report that private Korean firms increase the level of accounting conservatism once they issue public debt. Ding et al. (2016) find evidence for Chinese private firms that higher FRQ increases the access to debt financing and lowers the cost of debt. Gassen & Fülbier (2015) analyze a sample of European private firms and find that earnings smoothing reduces bankruptcy and debt contracting costs. Bigus & Hillebrand (2017) find evidence that German private firms with close lending relationships exhibit lower financial reporting quality. Bigus & Häfele (2017) demonstrate that German private firms with shareholder loans smooth income less. Hope, Thomas & Yvas (2017) find that accrual quality of US private firms increases when there is an increasing monitoring demand of shareholders, creditors and suppliers.

Clatworthy & Peel (2013) and Bigus et al. (2016) are more closely related to our paper. To the best of our knowledge, Clatworthy & Peel (2013) is the only other paper that investigates the link between board characteristics and financial accounting choices with private firms. More specifically, they examine how board size, financial expertise and gender balance of boards affect the likelihood of accounting errors of private UK firms. However, it is not clear which legal forms those private firms have which they analyze. We complement the study by Clatworthy & Peel (2013) by looking at a more diverse set of *supervisory* board characteristics of *co-operative firms*. We also explicitly address both

avoidance is more pronounced with private firms. Ball & Shivakumar (2005) and Peek et al. (2010) find that private firms exhibit significantly lower levels of conditional conservatism than public firms. Goncharov & Zimmermann (2006, 2007) look at the incentives of Russian private and public firms to reduce earnings and to avoid losses in order to save tax payments without deterring lenders. Hope et al. (2013) find that public firms generally have a higher accrual quality, and are more conservative. Instead of considering publicly listed firms, we compare accounting choices made by different types (legal forms) of private firms.

agency problems of equity and of debt of co-operative firms, how they differ to those of stock corporations and how this in turn affects different proxies of FRQ.

Bigus et al. (2016) also compare earnings properties of private firms across different legal forms. However, they compare corporations with unlimited liability firms both of which are usually profit-maximizing entities. Co-operative firms do not aim to maximize profits or shareholder value but to meet (their owners') common economic, social, and cultural needs (Toms, 1998, 2001). Thus, even though co-operative firms often have a relatively large number of owners, agency problems of equity might be less severe which in turn affects earnings properties. None of the above papers analyzes accounting choices of co-operatives and how they are incrementally influenced by supervisory board characteristics.

The paper is organized as follows. Section 4.2 develops the hypotheses and provides a description of the data and methodology used. Section 4.3 presents regressions on the financial reporting quality of co-operatives and of stock corporations ignoring supervisory board characteristics. The analyses in Section 4.4 add supervisory board characteristics. Section 4.5 presents the results of a matched sample using propensity score matching. Section 4.6 concludes.

4.2 Data and research design

4.2.1 Legal Provisions on Corporate Governance

According to Sec. 1 GenG co-operatives aim to foster common economic, social, and cultural needs of their members through a jointly-owned enterprise. Profit maximization is not the primary goal of a co-operative. There are some special legal provisions on the corporate governance of co-operatives:

- A co-operative firm must be run by its members (owners) (Sec. 9 II GenG).
- Each member (owner) generally has only one vote regardless of the capital paid-in („*one shareholder – one vote*“-principle (Toms, 2001), Sec. 43 III 1 GenG).
- Under certain conditions, members are able to call their paid-in capital (Sec. 65 GenG).
- Members are generally held liable with their private assets for liabilities of the co-operative firm, usually limited to a multiple of the paid-in capital which is specified in the statute (Sec. 105 GenG). However, the statute may also exclude any personal liability of the members (Sec. 105 I 1 GenG).

- A co-operative firm must have a supervisory board (Sec. 36 GenG) which should be monitoring the executive board (Sec. 38 I 1 GenG).

The corporate governance of stock corporations is determined by provisions in the stock corporation law (Aktiengesetz, briefly AktG). There are some differences in corporate governance as compared to co-operative firms. First, an executive board member does not need to be a shareholder (Sec. 76 AktG). Hence, a separation of ownership and control is possible. Second, the number of the shareholder's votes in the general assembly depends on the number of the shares she holds („*one share – one vote*“-principle, Sec. 12 AktG). Third, a shareholder cannot be held liable for the corporations' liabilities with her private assets given that she fully paid-in the capital (Sec. 1 I 2 AktG). Fourth, shares are not callable (Sec. 57 I AktG).

What stock corporations do have in common with co-operatives is that a supervisory board is required which is meant to monitor the executive board (Sec. 111 I AktG). Further, similar to stock corporations, co-operatives usually have many owners, sometimes hundreds or thousands.

4.2.2 Hypotheses

4.2.2.1 *Agency problems of equity and agency problems of debt*

Different to other legal forms, stock corporations and co-operative firms typically exhibit relatively dispersed ownership, often with hundreds or thousands owners. This typically implies significant information asymmetries between the management (executive board) and the owners and might imply considerable agency problems of equity. As a consequence, the management should be inclined to sufficiently reduce information asymmetries, especially by high quality financial reporting (e.g., Francis et al., 2004 and Burgstahler et al., 2006).

For three reasons, we think that the agency problems of equity generally might be less pronounced with co-operatives than with stock corporations. First, a German co-operative firm must be run by its owners (Sec. 9 II GenG) while there is no such requirement with stock corporations. Manager-owners are less inclined than other managers to use corporate resources for their own benefit (e.g., perk consumption), at the expense of the owners.

Second, agency problems of equity might be less severe with co-operative firms because owners share common, often altruistic goals. Thus, the management is less likely to pursue its own interest. Moreover, owners of a co-operative are expected to be less

interested in the *financial* outcome of their share than owners of corporations are. However, there is also literature arguing that agency problems of equity might be more severe with co-operative firms: Engels (1997) puts forward that the multidimensional and rather vague description of a co-operative's objective may leave more discretion to the co-operative's management, while the clear-cut objective of profit maximization puts pressure on the management of a stock corporation.

Third, the law on co-operatives offers an exit option to the owners since they are able to call their "share" (Sec. 65 GenG) while the shareholders of a stock corporation do not have a legal exit option (Sec. 57 I AktG). Neither do they have a real exit option since the shares of private corporations are not traded in a liquid secondary market. The owners' exit option puts pressure on the co-operative's management to sufficiently pursue the owners' interests.

Overall, we expect agency problems of equity to be less pronounced with co-operatives than with stock corporations. More severe agency problems of equity require more informative financial reporting (LaFond & Watts, 2008). Given that agency problems of debt are negligible with low-levered firms, we might expect the following:

Hypothesis 1: With low-levered firms, there is lower financial reporting quality with co-operative firms than with stock corporations.

With highly levered firms, agency problems of debt arise and financial reporting choices need to address creditors' concerns as well. There are two reasons why we expect highly levered stock corporations to more significantly adjust financial reporting choices than highly levered co-operatives (Bigus et al., 2016). First, due to the limited liability of their owners, corporations imply more severe agency problems of debt (Tirole, 2006). Bhimani et al. (2014) provide evidence that default probability is significantly higher with corporations than with unlimited liability firms. Consequently, there is more need to write debt contracts based on accounting data, e.g. covenants on debt to EBIT/EBITDA or interest coverage (Dichev & Skinner, 2002; Nikolaev, 2010; Christensen & Nikolaev, 2012). Financial accounting choices will rationally be driven by the objective not to violate such debt covenants because covenant violations may trigger certain contractual rights to creditors, for instance permitting them to require more collateral or a higher interest rate or even to recall the loan in order to reduce or to compensate for increasing default risk. Second, there is an information argument: With more severe agency problems of debt there is more need to smooth income in order to signal a low default

risk to creditors (Trueman & Titman, 1988; Tucker & Zarowin, 2006; Gassen et al., 2006).

Due to the personal liability of co-operative's owners, creditors have less need for both timely information on default risk and for debt covenants. Thus, there is less need to adjust financial accounting with co-operatives than with stock corporations. Such adjustments are likely to interfere with the goal to inform shareholders. For instance, avoiding to disclose a small loss by earnings management is helpful to meet respective covenants and to avoid closer scrutiny by creditors but will bias the net income figure from a shareholder's point of view. Overall, we expect that financial reporting choices of stock corporations will be more affected by agency problems of debt than financial reporting choices of co-operatives such that FRQ becomes more comparable between these two legal forms.

Hypothesis 2: With high-levered firms, financial reporting quality of stock corporations is more comparable with FRQ of co-operative firms.

4.2.2.2 The impact of supervisory board characteristics on FRQ of co-operative firms and stock corporations

Monitoring also helps to overcome agency problems (Jensen & Meckling, 1976). Both the law on co-operatives and the law on stock corporations require a mandatory supervisory board to be installed which is meant to supervise the executive board (Sec. 38 I 1 GenG and Sec. 111 I AktG). Even though agency problems seem to be less pronounced with co-operative firms than with stock corporations, the single owners' incentives to monitor the management are more distorted with co-operatives – due to the “one-shareholder-one-vote” principle. Owners in co-operatives that have many “shares” have the same voting rights as owners with only one share. In contrast, with stock corporations, majority shareholders have considerable voting power which allows them to put pressure on the executive board. This makes the monitoring role of the supervisory boards more important with co-operatives – given that agency problems of equity are comparable.

We were unable to find studies that address supervisory boards of co-operatives and how they affect financial reporting quality. However, there are studies on the link between financial reporting quality and the characteristics of non-executive board members / supervisory board members for listed stock corporations – mostly using US samples. In a one-tier board system, which we find, e.g. in the US and in Switzerland, non-executive board members are supposed to monitor executive board members. Thus, non-executive

board members serve a similar role as the supervisory board in a two-tier system like in Germany.

There is a relatively large empirical literature on the link between the characteristics of non-executive board or audit committee members for publicly listed US firms. Beasley (1996) find that stock corporations with a higher proportion of non-executive (independent) board members are less likely to conduct accounting fraud. Klein (2002) documents that stock corporations with a higher proportion of non-executive audit committee members exhibit lower levels of earnings management. Peasnell et al. (2005) report similar evidence for listed firms in the UK. Thus, the level of board independence seems to be positively associated with financial reporting quality. Further, Xie et al. (2003) find, that financial accounting expertise of non-executive board members and a higher frequency of board meetings mitigate earnings management. Bédard et al. (2004) and Dhaliwal et al. (2010) confirm a negative association between audit committee's financial accounting expertise and (aggressive) earnings management. Vafeas (2005) find that more frequent board meetings come along with less earnings management, but Bédard et al. (2004) cannot support this relationship. There is mixed evidence on how the *size* of the audit committee affects earnings management. Karamanou & Vafeas (2005) and Ghosh et al. (2010) suggest a negative relationship while Xie et al. (2003) and Vafeas (2005) do not find a significant association. With regard to female board members there is only a few studies. Gul et al. (2011) find that a higher proportion of female board members increases the informativeness of stock prices.

Since US audit committees have been mandatory in the sample periods of the above papers (Securities and Exchange Commission, Exchange Act Rule 10A-3), Albersmann & Hohenfels (2017) take advantage of the fact that audit committees were voluntary in Germany during the sample period 2005-2009 of their study. They find that the existence of an audit committee is related to less earnings management which matches the evidence found by Piot & Rémi (2007) in France while Peasnell et al. (2005) are unable to find a significant association in the UK. Moreover, Albersmann & Hohenfels (2017) report that earnings management decreases with a higher meeting frequency and a higher proportion of members with financial expertise. They cannot confirm that audit committee size is significantly related to earnings management but suggest that neither too small nor too large audit committees are sufficiently effective to fulfill their duties.

With regard to private firms, we only were able to find the study by Clatworthy & Peel (2013). They find that a larger board size and a higher proportion of female directors in

the board comes along with higher financial accounting accuracy while board director's financial expertise does not show a significant effect. Considering the above evidence we expect the following:

Hypothesis 3: A higher level of the co-operative firm's supervisory board independence or expertise is positively associated with higher financial reporting quality.

Note that we expect strong supervisory board independence/expertise to increase FRQ independent from low or high leverage. The empirical evidence quoted above does not suggest that the link between board independence/expertise and FRQ depends on leverage.

Since agency problems of equity are considered to be less severe but owners' monitoring incentives are more distorted with co-operative firms we do not postulate that the association between supervisory board characteristics and FRQ is different between co-operative firms and stock corporations.

4.2.3 Data

The sample consists of all German co-operatives (eG) and stock corporations (AG) that were available in the DAFNE database, provided by Bureau van Dijk. DAFNE includes financial accounting and basic corporate governance data on German private and publicly listed firms. We excluded insolvent firms and listed stock corporations. Further, we require that firms publish *unconsolidated* financial statements only and that the income statement is available for all years from 2006 through 2012. With consolidated statements, financial accounting choices are likely to be influenced by group companies such as the parent company. We needed data from 2006-2012 because of our analyses on income smoothing. Due to different financial reporting rules and reporting incentives, we excluded firms from the financial industry. In order to mitigate the effect from the fact that co-operative firms or stock corporations concentrate on certain industries we also excluded industries where there were either no co-operatives (mining, water supply and waste disposal and art, entertainment and leisure) or no stock corporations (public administration), according to the WZ 2008 codes of the German statistics agency.⁶⁷ Moreover, we excluded extra-territorial organizations.

⁶⁷ See

<https://www.destatis.de/DE/Methoden/Klassifikationen/GueterWirtschaftsklassifikationen/Content75/KlassifikationWZ08.html>.

Table 4-1: Sample Selection

Selection criteria for DAFNE Database	Number of co-operatives	Number of stock corporations
Number of co-operatives and stock corporations in DAFNE	7,007	12,202
Solvent firms	6,337	12,202
Solvent firms with unconsolidated statements only	6,291	10,740
Solvent firms with unconsolidated statements only and income statements available for each of the years 2006-2012	813	830
Solvent, not publicly listed firms with unconsolidated statements only and income statements available for each of the years 2006-2012	813	753
	Number of firm years for co-operatives	Number of firm years for stock corporations
Initial sample for timely loss recognition ⁶⁸	2,007	3,568
Initial sample for income smoothing (SMTH3)	957	756
Initial sample for income smoothing (SMTH6)	753	432
Initial sample for loss avoidance (LA1 & LA2)	4,308	2,580

Thus, the initial sample for hypothesis 1 consists of 1,566 firms in total and 10,962 firm-year observations.

In order to test hypothesis 3, we need data on the characteristics of supervisory boards. German private firms are not required to disclose this kind of data. Thus, in December 2015 we sent out a questionnaire to the above 1,566 firms followed by a reminder in January 2016. We explicitly kept the questionnaire simple (see appendix) to increase the response rate. Overall, we received 284 responses implying a relatively high response rate of 18.1%, 182 from co-operatives and 102 from stock corporations. We did not receive questionnaires from stock corporations in the industries “education” and “other services”, thus, we had to exclude those industries from the sample.

⁶⁸ Sample sizes vary due to data availability for the different models.

4.2.4 Measurement of Financial Reporting Quality, and of Independence and Expertise of Supervisory Boards

Our most important measure for financial reporting quality (FRQ) is timely loss recognition. We also use (the lack of) income smoothing and the (missing) propensity to avoid reporting small losses as proxies for FRQ.

Timely loss recognition

Timely loss recognition is a fundamental component of conditional conservatism. Conditional conservatism implies that economic losses are recognized more quickly in financial accounts than economic gains (Basu, 1997, Ball & Shivakumar, 2005). Timely loss recognition can be interpreted as the differential propensity with which economic losses are recognized more quickly than economic gains. Timely loss recognition counterbalances the upward bias incentives of managers and speeds up the recognition of losses which allows to detect and stop projects with negative NPV at an earlier point of time (LaFond & Watts, 2008). Managers may intentionally want to increase net income by earnings management when bonus payments increase with net income even without increasing shareholder value (Watts 2003). Upward biasing may also enable manager to realize or continue projects that serve the manager's empire building incentives even when they have negative net present value (e.g. too expensive take-overs). Managers may even non-intentionally overestimate the prospects of assets in impairment tests when they are subject to overconfidence and consequently, delay loss recognition (Ahmed & Duellman, 2013). Overall, timely loss recognition is considered to improve FRQ (Ball & Shivakumar, 2005, Lafond & Watts, 2008; Louis & Urcan, 2015).

The literature suggests that there are different ways to measure accounting conservatism and timely loss recognition (Watts, 2003). Since we focus on private firms, we cannot use methods that require market price data, such as the market-to-book ratio of equity (Beaver & Ryan, 2000) or the method by Basu (1997). Instead, we require a method to measure accounting conservatism that is applicable to *private* firms. We therefore follow Ball & Shivakumar (2005) and estimate timely loss recognition by the differential propensity of loss reversals:

$$(1) \Delta NI_{i,t} = \partial_0 + \partial_1 D\Delta NI_{i,t-1} + \partial_2 \Delta NI_{i,t-1} + \partial_3 D\Delta NI_{i,t-1} * \Delta NI_{i,t-1} + \rho v_i + \gamma z_t + \varepsilon_{i,t}$$

The variables are defined as follows: $\Delta NI_{i,t}$ is the change in net income of firm i from fiscal year $t-1$ to t , scaled by the beginning book value of total assets. $D\Delta NI_{i,t}$ is an indicator variable that takes the value 1 if the change in net income is negative and zero otherwise. Untimely recognition of economic gains, i.e. recognition when cash flow occurs, implies that gains are a “persistent” positive component of accounting income that tend not to reverse (Ball & Shivakumar, 2005). We should then expect $\hat{\partial}_2 = 0$. If there is timely recognition of gains, there is a “transitory” increase in income that tends to reverse, implying $\hat{\partial}_2 < 0$. Analogously, timely recognition of losses implies a transitory decrease in income that tends to reverse, thus $\hat{\partial}_2 + \hat{\partial}_3 < 0$. Timely loss recognition implies that economic losses are recognized more rapidly than economic gains, that is $\hat{\partial}_3 < 0$ (Ball & Shivakumar, 2005).

We control for year-fixed and firm-fixed effects, denoted by v_i and z_t , respectively. As is common in this literature, do not include firm-specific control variables because then we would have to interact *each* control variable with the terms $D\Delta NI_{i,t}$, $\Delta NI_{i,t}$ and $D\Delta NI_{i,t} * \Delta NI_{i,t}$. This causes significant multicollinearity problems resulting in very high variance inflation factors (see Ball & Shivakumar, 2005 and Peek et al., 2010).

For robustness reasons, we proxy financial reporting quality by income smoothing and the (missing) propensity to avoid reporting small losses (see Tucker & Zarowin, 2006 and Burgstahler et al., 2006).

Income smoothing

Income smoothing is often used as a metric for earnings management, e.g. by Burgstahler et al., 2006; Van Tendeloo & Vanstraelen, 2008).⁶⁹ Income smoothing indeed increases discretionary accruals in order to disclose a relatively stable net income. This, however, might be useful to mitigate creditors’ concerns about the firm’s default risk. Moreover, income smoothing can be useful in debt contracting (see Dou et al., 2013, Gassen & Fülbier, 2015 and Bigus & Häfele, 2017) since it reduces the probability of violating debt covenants that are based on net income such as covenants on debt to EBIT/EBITDA or interest coverage (Dichev & Skinner, 2002; Nikolaev, 2010; Christensen & Nikolaev, 2012).

Overall, we expect income smoothing to impair financial reporting quality from a shareholder’s point of view. We also expect that there is more need for income smoothing

⁶⁹ There is also literature supporting the view that income smoothing is informative for investors, see, e.g., Tucker & Zarowin (2006).

from a creditors' perspective with higher leverage. Different to conditional conservatism, income smoothing does not induce a bias into earnings, implying that there is no asymmetry such as reporting future losses more timely than future gains. This said, we may not necessarily expect similar results as with conditional conservatism and timely loss recognition.

We measure earnings smoothing by dividing the variability of earnings over time by the variability of performance in economic terms, that is, the variability of cash flow from operations (e.g. Leuz et al., 2003; Bao & Bao 2004; Burgstahler et al., 2006):

$$(2) \quad SMTH_{i,t} = \frac{SD\left(\frac{net\ income_{i,t}}{total\ assets_{i,t-1}}\right)}{SD\left(\frac{operating\ cash\ flow_{i,t}}{total\ assets_{i,t-1}}\right)} \cdot (-1)$$

Net income is measured before income tax. SD stands for standard deviation which is computed on the basis of financial data for three fiscal years in order to mitigate the effect of abnormally high or low values on earnings or cash flow from operations. We scale by lagged total assets (LaFond et al., 2007; Leuz et al., 2003). Cash flow from operations is defined as the difference between net income and total accruals (Daske et al., 2006). Total accruals equal: $\Delta inventory - \Delta(\text{current liabilities} - \text{short-term debt}) - \Delta \text{provisions} - \text{depreciation and amortization expenses}$. The date t defines a three-year period. We multiply by -1 so that higher values correspond to more earnings smoothing (Burgstahler et al., 2006). The regression model is as follows:

$$(3) \quad SMTH_{i,t} = \partial_0 + \partial_1 CO_OP_{i,t} + \partial_2 HIGH_DEBT_{i,t} + \partial_3 CO_OP * HIGH_DEBT_{i,t} \\ + Controls_{i,t} + \gamma Z_t + \varepsilon_{i,t}$$

With low levered firms, we expect co-operatives to exhibit higher levels of income smoothing, thus $\partial_1 > 0$. With highly-levered firms there are generally stronger incentives for income smoothing, thus $\partial_2 > 0$, however, we believe them to be stronger for stock corporations, such that we expect $\partial_3 < 0$. In the basic regression, we measure income smoothing and the control variables over six years (2007-2012) such that we have a cross-section. In a robustness test, we employ a non-overlapping panel with three-years measures of income smoothing and control variables.

We control for industry-fixed effects⁷⁰ and include firm-specific control variables that are likely to affect income smoothing (Leuz et al., 2003; Francis et al., 2004; Burgstahler et al., 2006; LaFond et al., 2007; Dou et al., 2013; Chen et al., 2014; Gassen & Fülbier, 2015; Bigus & Häfele, 2017). We use SIZE, DEBT, GROWTH, LOSS, ROA and RISKSALLES as control variables but measure them all over six years (three years, respectively).⁷¹

Larger firms may exhibit higher levels of income smoothing because they are expected to have a wider array of discretionary expenditures. On the other hand, larger firms may have better risk diversification opportunities, reducing creditors' default risk and the need for income smoothing and conservatism. Thus, the expected sign on SIZE is not clear.

We expect that higher DEBT levels imply more income smoothing. Agency problems of debt become more severe with more debt such that there is a greater need for income smoothing and conservatism. As argued above, personal liability of co-operatives' owners work against this association. On the other hand, co-operatives are likely to exhibit lower financial reporting quality. Overall, the sign of CO_OP may depend on the debt level.

⁷⁰ We do not account for year-fixed effects when measuring all variables over six years. We have a cross-section then.

⁷¹ We do not consider whether financial statements are audited because prior studies show that the audit variable has no significant effect in Germany (Bigus et al., 2016 and Bigus & Häfele, 2017). This might be due to very lenient auditor liability in Germany (Gietzmann & Quick, 1998).

Table 4-2: Control variables for income smoothing and loss avoidance regressions

	Predicted sign for income smoothing	Predicted sign for propensity of reporting small profits	Definition
Control variables for income smoothing regressions			
SIZE	-/+	-	Natural logarithm of total assets
DEBT	+		Financial debt divided by total assets,
HIGH_DEBT	+	+	Dummy variable: 1 if the firm has a relatively high debt ratio equal to or exceeding the 3rd quartil, and 0 otherwise.
CO_OP	-/+	-/+	Dummy variable: 1 if the firm is a co-operative, if it is a private stock corporation.
GROWTH	+	-/+	Sales growth changes in the current year's sales scaled by lagged sales, averaged over three years.
LOSS	-		Dummy variable: 1 if the firm reports a net loss in the current year or in at least one of the two preceding years, and 0 otherwise.
ROA	-		(EBIT + extraordinary income) divided by lagged total assets, averaged over three years.
RISKSALLES	+	-/+	Standard deviation of sales divided by lagged total assets, computed over three years.
TAX	+	-/+	Ratio of income tax expenses divided by net income before income tax.
Additional control variables for loss avoidance regressions			
CFO		-	CFO is cash flow operations divided by total assets. Cash flow from operations is defined as the difference between net income and total accruals. Total accruals equal: $\Delta\text{inventory} - \Delta(\text{current liabilities} - \text{short-term debt}) - \Delta\text{provisions} - \text{depreciation and amortization expenses}$.
PRIOR		+	Dummy variable: 1, if no negative net income was disclosed in the previous period and 0 otherwise.

Burgstahler et al. (2006) argue that high growth firms exhibit higher levels of operating risk, implying a greater need for income smoothing. They also usually have higher accruals, e.g. due to higher investment levels, and more discretion for income smoothing. We therefore expect a positive sign of the GROWTH variable.

Firms that are unable to avoid reporting losses may already have suffered reputation damage such that there is less need for income smoothing. We therefore expect a negative sign for the LOSS variable. We also expect a negative sign for ROA because firms with good performance have less need to signal low default risk and to disclose high financial reporting quality.

Higher operating risk as measured by RISKSALES is associated with a greater need for income smoothing in order to smooth dividend payouts. Thus we expect a positive association. For a similar reason, income smoothing helps to smooth tax obligations which becomes more important for higher effective tax rates. Thus, for both RISKSALES and TAX we expect a positive sign.

Propensity to avoid losses

A third measure is the propensity to avoid losses which we call loss avoidance in short. Following the literature (Beatty et al., 2002, Philipps et al., 2003), we define loss avoidance as a dummy variable LA1 with a value of 1 if the following ratio ROA_2 ($= \frac{\text{net income}_{i,t}}{\text{total assets}_{i,t-1}}$) is non-negative but below 0.2%, and with value 0 otherwise. We do not employ the original ROA variable, because the EBIT is rarely negative. More importantly, a negative net income will already indicate problems to the investors. The alternative variable LA2 has a value of 1 if ROA_2 is non-negative but below 0.5%, and value 0 otherwise.

A higher propensity to avoid losses is considered as a form of earnings management and tends to reduce financial reporting quality (Burgstahler et al., 2006). The loss avoidance regression is depicted by (4):

$$(4) \quad \text{LA}_{i,t} = \alpha_0 + \alpha_1 \text{CO_OP}_{i,t} + \alpha_2 \text{HIGH_DEBT}_{i,t} + \alpha_3 \text{CO_OP} * \text{HIGH_DEBT}_{i,t} \\ + \text{Controls}_{i,t} + \rho v_t + \gamma z_t + \varepsilon_{i,t}.$$

Analogously to income smoothing, we expect low-levered co-operatives to have a higher propensity to avoid reporting losses, thus $a_1 > 0$. For high-levered firms, we expect the incremental effect on LA to be stronger with stock corporations, thus, $a_3 < 0$. Highly levered corporations should have a generally higher propensity to avoid disclosing losses than low-levered corporations, thus $a_2 > 0$.

All variables are defined for one period; however, we require that firms have the same industry classification and legal form for two subsequent years. Following earlier literature (Beatty et al., 2002; Philipps et al., 2003; Burgstahler et al., 2006), we take as control variables firm size, growth, operating risk, effective tax rate (all defined as above), and cash flow from operations (CFO) and whether negative net income was disclosed in the previous period (PRIOR_{i,t}). We had to drop variables ROA and LOSS because of the

mechanical correlation with the loss avoidance variable. We again control for industry and year-fixed effects.

We expect that a higher cash flow of operations makes it less necessary to avoid reporting small losses. Thus, we expect a negative sign with the variable CFO. If losses were disclosed in the previous period, there was already a reputation loss such that the disclosure of current losses does not matter too much anymore. On the other hand, those firms may have an even stronger incentive to restore confidence by not disclosing losses again. Thus, both a positive and negative sign of the PRIOR variable can be justified. Based on the arguments mentioned above, we expect a positive sign for HIGH_DEBT, but cannot derive a clear prediction for the other variables. With CO_OP we expect the sign to depend on whether the firms are highly levered or not.

4.2.5 Measurement of the Independence and Expertise of Supervisory Boards

The tests on hypothesis 3 require proxies for the independence and expertise of supervisory boards. Table 4-3 provides an overview of the measures used.⁷²

Table 4-3: Measures on the independence and expertise of supervisory boards

INDEP	Dummy variable with value of 1, if proportion of independent members on the firm's supervisory board (members that are neither employees nor main business partners of the firm) equals or exceeds the 75% percentile, and with value 0 otherwise.
BOARDSIZE	Dummy variable with value of 1, if the number of the firm's supervisory board members equals or exceeds the 75% percentile, and with value 0 otherwise.
AUDCOM	Dummy variable with value of 1 if an audit committee exists and 0 otherwise.
EXP	Dummy variable with value of 1, if proportion of supervisory board members with financial accounting or auditing expertise equals or exceeds the 75% percentile, and with value 0 otherwise.
EXP_AUD	Dummy variable with value of 1, if proportion of supervisory board members that are external auditors, equals or exceeds the 75% percentile, and with value 0 otherwise.
#MEET	Dummy variable with value of 1, if number of meetings of the supervisory board within the fiscal year equals or exceeds the 75% percentile, and with value 0 otherwise.
FEM	Dummy variable with value of 1, if proportion of female supervisory board members equals or exceeds the 75% percentile, and with value 0 otherwise.

⁷² We expect that the existence of an audit committee improves the supervisory board's expertise in financial accounting.

We expect that a higher proportion of independent members on the firm's supervisory board will strengthen the monitoring role and improve financial reporting quality (Klein, 2002, Bédard et al, 2004, Peasnell et al., 2005). Smaller board size may increase the effectiveness of board decisions and by that, may improve monitoring and FRQ; however, there is also evidence suggesting an opposite sign (Albersmann & Hohenfels, 2017). There is literature suggesting that women strengthen the monitoring activities of boards (Clatworthy & Peel, 2013).

Further, we expect higher FRQ with a larger proportion of board members that have a financial accounting or auditing expertise (Bédard et al., 2004). A higher frequency of meetings and the existence of an audit committee are considered to improve FRQ (Xie et al., 2003; Albersmann & Hohenfels, 2017).

Due to multicollinearity problems, we do not simultaneously consider two or more characteristics of supervisory board independence/expertise. For instance, for the variable INDEP, the regression on timely loss recognition is reflected by (5):

$$(5) \Delta NI_{i,t} = \partial_0 + \partial_1 D\Delta NI_{i,t-1} + \partial_2 \Delta NI_{i,t-1} + \partial_3 D\Delta NI_{i,t-1} * \Delta NI_{i,t-1} + \\ \partial_4 INDEP_{i,t} + \partial_5 INDEP_{i,t} * D\Delta NI_{i,t-1} + \partial_6 INDEP_{i,t} * \Delta NI_{i,t-1} + \\ \partial_7 INDEP_{i,t} * D\Delta NI_{i,t-1} * \Delta NI_{i,t-1} + Controls + \rho v_t + \gamma z_t + \varepsilon_{i,t}.$$

The coefficient ∂_7 represents the incremental effect of the supervisory board characteristic, INDEP, on timely loss recognition. We expect that higher supervisory board independence / expertise will improve FRQ; with regard to (5) in the sense that it increases timely loss recognition, thus $\partial_7 < 0$.

4.3 Financial Reporting Quality of Co-operatives versus Private Stock Corporations

4.3.1 Descriptive Statistics (Timely Loss Recognition Regression)

Table 4-4 describes the sample distribution across time and industries. Table 4-5 reports descriptive statistics. Panel A in Table 4-4 shows that the annual distribution of sample firms is relatively stable across time. Panel B in Table 4-4 suggests that stock corporations and co-operative firms focus on different industries even though the main industries are similar. Co-operative firms mainly operate in real estate, trade, manufacturing and agriculture. Stock corporations are mainly found in the manufacturing or trade business, but also perform scientific and technical services and operate in real estate.

Table 4-4: Sample distribution across time and industries (timely loss recognition regression)

Panel A: Annual distribution of sample firm observations					
(2006)-2008	(2007)-2009	(2008)-2010	(2009)-2011	(2010)-2012	Total
1,151	1,100	1,100	1,112	1,112	5,575

Panel B: Distribution of sample firm observations across industries			
	Stock corporations	Co-operative firms	Total
A: Agriculture and Fishing	15	222	237
C: Manufacturing	434	232	666
D: Energy supply	240	18	258
F: Construction	93	107	200
G: Trade and garages	299	794	1,093
H: Transportation	86	29	115
J: Information and communication	212	15	227
L: Real estate	189	1,975	2,164
M: Freelance work, scientific and technical services	276	58	334
N: Other business services	90	40	130
P: Education	10	18	28
Q: Health and welfare services	30	15	45
S: Other services	33	45	78
Total	2,007	3,568	5,575

Table 4-5 reports that roughly 44% of net income changes are negative. 64% of the firms in the sample are co-operatives. The mean debt ratio is 48.2% (median: 50.7%). For German firms, Burgstahler et al. (2006) report a median of 52.6% for a leverage definition excluding current liabilities but including provisions; Gassen & Fülber (2015) reported a mean of 62.3% for a leverage definition including provisions. The median firm size⁷³ is rather small (EUR 29.4 million total assets). The mean return on assets is 2.9%; however, the median ROA is 0.6% due to the fact that 64% of the firms in our sample are non-profit maximizing co-operatives. Approximately 16% of all firm-year observations exhibit a net loss in the current or at least one of the two preceding years. The effective income tax rate is 17.3% on average.

⁷³ Burgstahler et al. (2006) report a median size of USD 0.56 million; with Gassen & Fülber (2015) it is €38.2 million.

Table 4-5: Descriptive statistics (timely loss recognition regression)

Variable	N	Mean	Stand. Dev.	1 st Quartile	Median	3 rd Quartile
ΔNI	5,575	0.0025	0.0471	-0.0062	0.0003	0.0096
$D\Delta NI$	5,575	0.4382	0.4962	0	0	1
CO_OP	5,575	0.6400	0.4800	0	1	1
SIZE	5,575	17.1949	1.5053	16.1330	17.1584	18.2855
in thousand EUR		29,354		10,150	28,300	87,352
DEBT	5,575	0.4815	0.2241	0.3036	0.5073	0.6533
GROWTH	5,575	0.0183	0.1428	-0.0133	0.0192	0.0710
LOSS	5,575	0.1595	0.3661	0	0	0
ROA	5,575	0.0289	0.0833	-0.0128	0.0062	0.0446
RISKSALES	5,575	0.2195	0.3490	0.0040	0.0569	0.2786
TAX	5,575	0.1728	0.2200	0	0.0654	0.2956

$\Delta NI_{i,t}$ is the change in net income of firm i from fiscal year $t-1$ to t , scaled by the beginning book value of total assets. $D\Delta NI_{i,t}$ is an indicator variable that takes the value 1 if the change in net income is negative and zero otherwise. CO_OP is an indicator variable with value 1 if the firm is a co-operative and with value 0 if it is a stock corporation. For a definition of other variables, see Table 2. GROWTH and RISKSALES are winsorized at the 5% and 95% percentiles, all other continuous variables are winsorized at the 1% and 99% percentiles.

Table 4-6 reports Pearson univariate correlation coefficients (Spearman correlations are similar). The correlation coefficients do not indicate a multicollinearity problem; the maximum coefficients are 0.44 between ROA and ΔNI and -0.51 between $D\Delta NI$ and ΔNI .

Table 4-6: Pearson correlation coefficients (N = 5,575)

	Δ NI	D Δ NI	CO_OP	SIZE	DEBT	GROWTH	LOSS	ROA	RISK-SALES	TAX
Δ NI	1									
D Δ NI	-0.51*** (0.000)	1								
CO_OP	-0.03* (0.010)	0.04*** (0.001)	1							
SIZE	-0.02 (0.108)	-0.06*** (0.000)	0.14*** (0.000)	1						
DEBT	-0.03** (0.013)	-0.00 (0.750)	0.16*** (0.000)	0.21*** (0.000)	1					
GROWTH	0.22*** (0.000)	-0.17*** (0.000)	0.01 (0.375)	0.02 (0.162)	0.05*** (0.000)	1				
LOSS	0.16*** (0.000)	-0.09*** (0.000)	-0.05*** (0.000)	-0.06*** (0.000)	0.09*** (0.000)	-0.03** (0.039)	1			
ROA	0.44*** (0.000)	-0.20*** (0.000)	-0.32*** (0.000)	-0.23*** (0.000)	-0.40*** (0.000)	0.15*** (0.000)	-0.19*** (0.000)	1		
RISKSALES	0.01 (0.547)	0.02 (0.175)	-0.27*** (0.000)	-0.37*** (0.000)	0.01 (0.556)	-0.11*** (0.000)	-0.01 (0.431)	0.25*** (0.000)	1	
TAX	-0.01 (0.602)	-0.06*** (0.000)	-0.34*** (0.000)	-0.06*** (0.001)	-0.07*** (0.000)	0.06*** (0.000)	-0.15*** (0.000)	0.19*** (0.000)	0.22*** (0.000)	1

***/**/* indicate significance at the 1%, 5% and 10% level (two-tailed test). Δ NI_{*i,t*} is the change in net income of firm *i* from fiscal year t-1 to t, scaled by the beginning book value of total assets. D Δ NI_{*i,t*} is an indicator variable that takes the value 1 if the change in net income is negative and zero otherwise. CO_OP is an indicator variable with value 1 if the firm is a co-operative and with value 0 if it is a stock corporation. For a definition of other variables, see Table 2. GROWTH and RISKSALLES are winsorized at the 5% and 95% percentiles, all other continuous variables are winsorized at the 1% and 99% percentiles.

4.3.2 Multiple Regression Results (Timely Loss Recognition)

Table 4-7 depicts the results of the basic regression analysis on timely loss recognition. We separate the sample into low- and highly levered firms since there is evidence that timely loss recognition is important in debt financing (see e.g., Watts, 2003; Wittenberg-Moerman, 2008; Garcia Lara et al., 2009; Peek et al., 2010)

Column 1 to column 4 depict the results with low-levered firms. With co-operatives, about 24% (∂_2) of income increases and 42% ($\partial_2 + \partial_3$, with ∂_3 not being significant in the pooled OLS regression) of income decreases are transitory, indicating a higher reversal of income decreases. With low-levered stock corporations, about 20% of income increases and 46% of income decreases are transitory with ∂_3 being significant at the 0.1% level regardless of whether we employ a pooled OLS regression or a random effects model.⁷⁴ Since with stock corporations the coefficient ∂_3 is larger and highly significant regardless of the econometric specification, we conclude that in the absence of agency problems of debt, stock corporations exhibit more timely loss recognition and thus, exhibit more FRQ. This finding supports hypothesis 1.

With highly levered corporations the extent of timely loss recognition even increases. With co-operatives, about 20% (∂_2) of income increases and 75% ($\partial_2 + \partial_3$) of income decreases are transitory, with stock corporations it is 7% and 43-44%, respectively. Thus, with financial distress, co-operative firms tend to exhibit higher levels of timely loss recognition as denoted by the coefficient ∂_3 , even though this coefficient is only significant with the random effects specification. Different than we expected, agency problems of debt seem to improve FRQ as measured by timely loss recognition, more so with co-operative firms. This finding does not support hypothesis 2.

⁷⁴ A fixed effects regression is not feasible since there is no firm-level variation on legal form (CO_OP).

Table 4-7: Timely loss recognition with co-operative firms and with stock corporations, dependent variable: change in net income

Pred. sign	$\Delta NI_{i,t}$ Coeff. (p-value)				$\Delta NI_{i,t}$ Coeff. (p-value)				
	Low-levered firms (Debt ratio is lower than 75% percentile \approx 65%)				Highly levered firms only (Debt ratio equals to or exceeds 75% percentile)				
	Pooled OLS		Random effects		Pooled OLS		Random effects		
	(1) co-operatives	(2) stock corporations	(3) co-operatives	(4) stock corporations	(5) co-operatives	(6) stock corporations	(7) co-operatives	(8) stock corporations	
$D\Delta NI_{t-1}$ (∂_1)	-0.001 (0.350)	-0.005 (0.194)	-0.001 (0.275)	-0.005 (0.238)	0.000 (0.993)	0.005 (0.348)	0.000 (0.993)	0.005 (0.491)	
ΔNI_{t-1} (∂_2)	0/-	-0.235*** (0.000)	-0.200*** (0.001)	-0.235*** (0.000)	-0.200*** (0.000)	-0.201 (0.371)	-0.067 (0.438)	-0.201*** (0.000)	-0.069 (0.391)
$D\Delta NI_{t-1} * \Delta NI_{t-1}$ (∂_3)	-	-0.185 (0.119)	-0.259** (0.011)	-0.185*** (0.000)	-0.259*** (0.000)	-0.546 (0.170)	-0.363* (0.051)	-0.546*** (0.000)	-0.374*** (0.004)
Constant	-0.004 (0.160)	0.012 (0.392)	-0.004* (0.010)	0.012 (0.492)	-0.006 (0.333)	-0.019 (0.114)	-0.006 (0.271)	-0.020* (0.063)	
Industry fixed effects	included	included	included	included	included	included	included	included	
Year fixed effects	included	included	included	included	included	included	included	included	
N =	2,605	1,547	2,605	1,547	940	398	940	398	
Adj. R^2 / overall R^2 in %	12.8	10.8	13.5	11.9	23.7	8.8	24.7	11.7	
F-Stat / Wald Chi R^2	8.2	8.2	401.8	205.7	7.6	3.0	304.1	52.6	

*, ** and *** indicate significance at the 10%, 5% and 1% levels, using a two-tailed test. With OLS regressions, standard errors are clustered at the firm level. All variables are winsorized at the 1% and 99% percentiles. $\Delta NI_{i,t}$ is change in net income of firm i from fiscal year $t-1$ to t , scaled by the beginning book value of total assets. $D\Delta NI_{i,t}$ is an indicator variable taking the value 1 if the change in net income was negative, and value 0 otherwise. With the subsample of highly levered firms, we had to delete 85 observations on the industries A, D, H, J, P and Q (see Table 4) because there are less than three observations on either stock corporations or co-operative firms, otherwise the F-statistics is not disclosed.

4.3.3 Multiple Regression Results (Income Smoothing and Loss Avoidance)

Table 4-8 shows the descriptive statistics for the income smoothing and the loss avoidance measures and additional control variables which are used in the loss avoidance regression (CFO and PRIOR). In order to reduce redundancy we do not present the descriptive statistics of other control variables also because they are similar to those of the timely loss recognition sample.

The variable SMTH6 indicates that, on average, the standard deviation of scaled net income is almost 58% of the standard deviation of scaled operating cash flows. This implies that firms, on average, remove 42% of cash flow volatility. This finding is in line with prior evidence. Burgstahler et al. (2006) and Bigus & Häfele (2017) have reported that German private firms remove 53% and 42%, respectively, of cash flow volatility, while it is 46% for a sample of European firms with Gassen & Fülbier (2015). Burgstahler et al. (2006) and Gassen & Fülbier (2015) use a five-year smoothing measure, Bigus & Häfele (2017) employ a three-year smoothing measure. However, our three-years measure on income smoothing implies more volatility than SMTH6.

Table 4-8: Descriptive statistics (income smoothing and loss avoidance sample)

Variable	N	Mean	Stand. Dev.	1 st Quartile	Median	3 rd Quartile
SMTH6	1,185	-0.5653	0.4850	-0.7759	-0.4495	-0.2148
SMTH3	1,713	-0.5990	1.0210	-0.7441	-0.3359	-0.1320
LA1	6,888	0.0528	0.2237	0	0	0
LA2	6,888	0.1293	0.3356	0	0	0
CFO (with LA1)	6,888	0.0656	0.1203	0.0225	0.0443	0.1028
PRIOR (with LA1)	6,888	0.8850	0.3190	1	1	1
CO_OP (with SMTH6)	1,185	0.6354	0.4815	0	1	1
CO_OP (with LA1)	6,888	0.6254	0.4840	0	1	1

SMTH 6 (SMTH) is measured as the ratio of the standard deviation of net income over the standard deviation of cash flow over six (three) years. LA1 (LA2) is a dummy variable with value of 1 if the return on assets (= net income / total assets) is non-negative but below 0.2% (0.5%), and with value 0 otherwise. CO_OP is an indicator variable with value 1 if the firm is a co-operative and with value 0 if it is a stock corporation.

5.3% (12.9%) of the firm-year observations in our sample report small profits indicating a positive ratio of net earnings to lagged total assets below 0.2% (below 0.5%, respectively). Bigus et al. (2016) report a higher frequency of reporting small profits, 6.2% and 22.2%, respectively. Their sample includes corporations, but also unlimited-

liability firms and one-man businesses in Germany. 88.5% of the firm-year observations disclose a non-negative net income in the period before.

Table 4-9 shows the results for the income smoothing regressions. Accordingly, all control variables have been averaged over six years. The findings suggest that the level of income smoothing tends to be higher for co-operative firms than for stock corporations, given that they are financially sound. In five out of six specifications, the positive sign of the CO_OP variable is statistically significant, mostly at the 8%-level. Overall, there is some support for hypothesis 1.

Within highly levered firms, co-operatives firms exhibit *similar* levels of income smoothing, as indicated by the sum of the coefficients of the CO_OP and CO_OP*HIGH_DEBT variable. However, CO_OP*HIGH_DEBT is weakly significant only with the 6-years measure of income smoothing. Still, there is some support for the consideration that with highly levered firms, stock corporations find it more necessary to signal a stable income path because the owners of stock corporations cannot be held liable with their private assets. Moreover, stable earnings make it less likely to violate debt covenants based on financial ratios, e.g., on interest coverage or debt to EBITDA (Dichev & Skinner 2002; Nikolaev, 2010; Christensen & Nikolaev, 2012; Cascino et al., 2014).⁷⁵ Note that the HIGH_DEBT variable is highly significantly associated with more income smoothing. Overall, there is weak support for hypothesis 2.

⁷⁵ We were unable to find evidence on the use of debt covenants with respect to co-operatives. A 2009 survey involving 500 CFOs from German firms (mostly corporations) shows that 76% of bank lending contracts use covenants; interest coverage and the debt ratio are the most common financial covenants (Haghani et al., 2009).

Table 4-9: Income smoothing with co-operative firms and with stock corporations, dependent variable: SMTH6 and SMTH3

	Pred. sign	SMTH6		SMTH3		SMTH3	
		Coeff. (p-value)	Coeff. (p-value)	Coeff. (p-value)	Coeff. (p-value)	Coeff. (p-value)	Coeff. (p-value)
		6 years, OLS		3 years, non-overlapping, Pooled OLS		3 years, non-overlapping, Random effects	
CO_OP	+	0.074* (0.075)	0.027 (0.504)	0.122*** (0.009)	0.086* (0.079)	0.118** (0.014)	0.087* (0.082)
HIGH_DEBT	+	0.195*** (0.000)	0.151*** (0.004)	0.228*** (0.000)	0.152** (0.012)	0.213*** (0.000)	0.144** (0.019)
CO_OP*HIGH_DEBT	-	-0.121* (0.059)	-0.103* (0.090)	-0.110 (0.147)	-0.080 (0.275)	-0.096 (0.206)	-0.071 (0.348)
SIZE	+/-		0.004 (0.673)		-0.004 (0.738)		-0.004 (0.764)
GROWTH	+		0.061 (0.597)		0.137 (0.271)		0.117 (0.344)
LOSS	-		-0.280*** (0.000)		-0.227** (0.020)		-0.205*** (0.000)
ROA	-		-0.856*** (0.002)		-1.085*** (0.000)		-1.037*** (0.000)
RISKSALLES	+		0.040*** (0.000)		0.032 (0.459)		0.026 (0.550)
TAX	+		0.181*** (0.000)		0.049*** (0.001)		0.048*** (0.000)
Constant		-0.816*** (0.000)	-0.805*** (0.000)	-0.918*** (0.000)	-0.611** (0.009)	-0.915*** (0.000)	-0.625*** (0.008)
Industry fixed effects		included	included	included	included	included	included
Year fixed effects		not included	not included	included	included	included	included
N =		1,185	1,185	1,713	1,760	1,713	1,760
Adj. R ² / Overall R ² in %		8.5	14.5	5.5	9.2	6.3	10.3
F-Stat. / Wald-Chi ² in %		10.7	12.5	9.6	10.9	100.6	172.6

*, ** and *** indicate significance at the 10%, 5% and 1% levels, using a two-tailed test. Standard errors are clustered at the firm level. CO_OP is an indicator variable with value 1 if the firm is a co-operative and with value 0 if it is a stock corporation. HIGH_DEBT is an indicator variable with value 1 if the debt ratio equals to or exceeds the 75% and with value 0 otherwise. GROWTH and RISKSALLES are winsorized at the 5% and 95% percentiles. All other continuous variables are winsorized at the 1% and 99% percentiles. For a definition of other variables, see Tables 4-2 and 4-8.

Table 4-10 depicts the results for the loss avoidance regressions. The findings strongly support both hypotheses 1 and 2. With low leverage, co-operative firms are significantly more likely to report small profits than stock corporations indicated by the positive sign of the variable CO_OP (always at the 0.1%-level). With high leverage, co-operative firms are still more likely to report small profits than stock corporations, however, the difference between the two legal forms is smaller than with low debt levels (see negative sign of the interaction term CO_OP*HIGH_DEBT). Moreover, highly levered firms are generally more likely to disclose small profits (see positive sign of HIGH_DEBT).

Table 4-10: Loss avoidance with co-operative firms and with stock corporations, dependent variable: LA1, LA2

	Pred. sign	LA1		LA2	
		Coeff. (p-value)	Coeff. (p-value)	Coeff. (p-value)	Coeff. (p-value)
		Probit		Probit	
CO_OP	+	1.022*** (0.000)	1.112*** (0.000)	0.813*** (0.000)	0.802*** (0.000)
HIGH_DEBT	+	0.504*** (0.000)	0.365** (0.021)	0.596*** (0.000)	0.507*** (0.000)
CO_OP*HIGH_DEBT	-	-0.384** (0.021)	-0.311* (0.085)	-0.312** (0.030)	-0.249 (0.103)
SIZE	+/-		0.054* (0.081)		0.026 (0.320)
GROWTH	+		-0.318* (0.082)		-0.441*** (0.003)
CFO	-		-1.737*** (0.000)		-1.656*** (0.000)
PRIOR	+/-		-0.155* (0.067)		0.018 (0.791)
RISKSALES	?		-0.059 (0.632)		-0.189* (0.061)
TAX	?		0.720*** (0.000)		0.320** (0.013)
Constant		-2.762*** (0.000)	-3.610*** (0.000)	-2.150*** (0.000)	-2.471*** (0.000)
Industry and year fixed effects		included	included	included	included
N =		6,888	6,888	6,888	6,888
Pseudo R ² in %		7.9	11.6	6.3	8.1
Wald Chi ²		92.3	139.6	149.6	184.4

*, ** and *** indicate significance at the 10%, 5% and 1% levels, using a two-tailed test. Standard errors are clustered at the firm level. CO_OP is an indicator variable with value 1 if the firm is a co-operative and with value 0 if it is a stock corporation. HIGH_DEBT is an indicator variable with value 1 if the debt ratio equals to or exceeds the 75% and with value 0 otherwise. GROWTH and RISKSALES are winsorized at the 5% and 95% percentiles. All other continuous variables are winsorized at the 1% and 99% percentiles. For a definition of other variables, see Tables 4-2 and 4-8.

4.4 Characteristic of the Supervisory Board and Financial Reporting Quality

4.4.1 Descriptive Statistics

We send out questionnaires on supervisory board characteristics to all the firms of the basic sample. Consequently, sample size decreases to the subset of responding firms. By that, we lost more than 80% of the observations. Table 4-11 provides information on the annual distribution of firm observations and on the distribution across industries.

Table 4-11: Sample distribution across time and industries (timely loss recognition regression)

Panel A: Annual distribution of sample firm observations					
(2006)-2008	(2007)-2009	(2008)-2010	(2009)-2011	(2010)-2012	Total
267	258	258	257	263	1,303

Panel B: Distribution of sample firm observations across industries			
	Stock corporations (response rate)	Co-operative firms (response rate)	Total
A: Agriculture and Fishing	0 (0%)	77 (35%)	77
C: Manufacturing	42 (10%)	20 (9%)	62
D: Energy supply	18 (8%)	10 (56%)	28
F: Construction	38 (41%)	20 (19%)	58
G: Trade and garages	57 (19%)	190 (24%)	247
H: Transportation	14 (16%)	5 (17%)	19
J: Information and communication	44 (21%)	10 (67%)	54
L: Real estate	61 (32%)	626 (32%)	687
M: Freelance work, scientific and technical services	56 (20%)	0 (0%)	56
N: Other business services	10 (11%)	5 (13%)	15
Total	340 (16.9%)	963 (27.0%)	1,303 (23.4%)

Panel A in Table 4-11 shows that the annual distribution of sample firms remains stable across time. Panel B suggests that in our reduced sample still the main industries co-operative firms are operating in, are real estate, trade and agriculture. With stock corporations, the main industries remain real estate, trade, scientific and technical services. However, response rates vary significantly across industries, partly also due to the small number of firms in some industries. The response rate for co-operatives is generally higher than for stock corporations. Table 4-12 reports descriptive statistics of the sample of firms that filled out the questionnaire.

Table 4-12: Descriptive statistics (timely loss recognition sample with supervisory board characteristics)

Variable	N	Mean	Stand. Dev.	1 st Quartile	Median	3 rd Quartile
ΔNI	1,303	0.0021	0.0376	-0.0050	0.0005	0.0077
$D\Delta NI$	1,303	0.4382	0.4963	0	0	1
CO_OP	1,303	0.7391	0.4393	0	1	1
SIZE	1,303	17.2797	1.3926	16.2446	17.3107	18.4094
in thousand EUR		31,951		11,349	32,956	98,876
DEBT	1,303	0.5035	0.2045	0.3534	0.5326	0.6603
GROWTH	1,303	0.0266	0.1202	-0.0016	0.0216	0.0555
LOSS	1,303	0.1205	0.3257	0	0	0
ROA	1,303	0.0235	0.0737	-0.0129	0.0043	0.0340
RISKSALLES	1,303	0.1595	0.2963	0.0028	0.0153	0.1869
TAX	1,303	0.1440	0.2203	0	0.0326	0.2864
INDEP	1,243	0.6229	0.4313	0	0.8333	1
BOARDSIZE	1,303	6.7045	3.3121	4	6	9
FEM	1,298	0.1549	0.1645	0	0.1339	0.2857
EXP	1,264	0.6712	0.3224	0.4444	0.6833	1
EXP_AUD	1,264	0.0427	0.1005	0	0	0
#MEET	1,172	5.5666	2.9365	4	5	7
AUDCOM	1,262	0.5650	0.4960	0	1	1

For a definition of variables, see Tables 4-2, 4-3 and 4-4. GROWTH and RISKSALLES are winsorized at the 5% and 95% percentiles, all other continuous variables are winsorized at the 1% and 99% percentiles.

Descriptive statistics are similar to those of the basic regression. Again, roughly 44% of net income changes are negative. The proportion of co-operatives is larger (74% versus 64% in the basic analysis) also because relatively more co-operatives sent back the questionnaire. The mean financial debt ratio is 50% (versus 48% in the basic analysis). The median firm size is rather bigger as well (EUR 32.0 versus EUR 29.4 million total assets in the basic analysis), because rather larger firms sent back the questionnaire. The mean return on assets and the volatility of sales are lower than in the basic regression (2.4% vs. 2.9% and 16% vs. 22%, respectively). About 12% of all firm-year observations exhibit a net loss in the current or at least one of the two preceding years while it was

almost 16% in the basic regression. Overall, in the smaller sample we have larger, less profitable but also less risky firms with a bigger proportion of co-operative firms.

The more interesting descriptive statistics is on the supervisory board characteristics. The number of observations varies across board characteristics because some questionnaires did not provide answers to all the questions. Independent from the legal form, we have the lowest number of answers with regard to the number of meetings. With regard to supervisory board size and the proportion of female board members we get the most answers, again, this holds for both co-operative firms and stock corporations.

Table 4-13: Supervisory board characteristics: co-operatives (n = 868-963) versus stock corporations (n = 304-340)

Variable	Mean		Mean difference (t-value, unequal variances)	Median	
	Co-operative firms	Stock corporations		Co- operative firms	Stock corporations
INDEP	0.6335	0.5936	0.0398* (1.55)	1	0.6667
BOARDSIZE	7.2783	5.0794	2.1989*** (10.54)	6	3
FEM	0.1667	0.1214	0.0453*** (3.97)	0.1667	0
EXP	0.6609	0.6999	-0.0390** (-1.88)	0.7	0.6667
EXP_AUD	0.0263	0.0883	-0.0620*** (7.30)	0	0
#MEET	6.1578	3.8783	2.2795*** (14.31)	6	4
AUDCOM	0.4453	0.9030	-0.4578*** (-19.86)	0	1

*, ** and *** indicate significance at the 10%, 5% and 1% levels, using a two-tailed test. For a definition of other variables, see Table 4-3.

There seem to be significant differences between co-operative firms and stock corporations (see Table 4-13). Co-operative firms have significantly larger supervisory boards (median values: 6 versus 3), despite the fact that the regulation is very similar with both legal forms. With either legal form, the law requires 3 members at least and leaves it to the company's statute to have more members on the supervisory board (Sec. 95 AktG and Sec. 36 GenG).

On average, co-operative firms have significantly more female supervisory board members than stock corporations but less often members with extended financial

accounting expertise such as auditors. The supervisory boards of co-operatives have more meetings per year than those of stock corporations (median values: 6 versus 4) and are significantly more likely to have an audit committee (91% versus 45%). Overall, one cannot say that the supervisory boards exhibit higher levels of independence or expertise with stock corporations or with co-operative firms.

4.4.2 Multiple Regression Results (Timely Loss Recognition)

We interacted each supervisory board characteristic within the timely loss recognition regression in order to filter out the incremental effect of the board characteristic on timely loss recognition. Since we use interaction terms, we need to code the above board characteristics in a binary way. Thus, we assign the value 1 if the respective board characteristics equals to or exceeds the 75% percentile and assign the value zero otherwise. Table 4-14 depicts the results of the regression analyses on timely loss recognition. Due to the panel data, we use a random effects model; a fixed-effects model would be unsuitable since some variables, especially the variable on legal form, do not vary across time.

Even hypothesis 3 addresses co-operative firms, Table 4-14 also displays the results for stock corporations. The coefficient ∂_7 reflects the incremental impact of a high value (equal to or more than 75% percentile) of the respective supervisory board characteristic on timely loss recognition. If $\partial_7 < 0$, the board characteristic enhances timely loss recognition, if $\partial_7 > 0$, there is less timely loss recognition.

It transpires that co-operative firms exhibit marginally statistically higher levels of timely loss recognition with smaller board size, the existence of an audit committee and a higher frequency of board meetings, all interaction terms are significant at the 0.1%-level. A higher proportion of female supervisory board members is also significantly associated with more timely loss recognition (p-value: 8.4%). Surprisingly, a higher proportion of independent board members tends to reduce timely loss recognition with co-operatives. Overall, we are able to support hypothesis 3 dependent on the supervisory board characteristic chosen.

In contrast, with stock corporations, the proportion of independent board members is aligned with more timely loss recognition. Smaller board size and a higher proportion of members with financial expertise go along with more timely loss recognition. Table 4-14 provides an overview about the differences between co-operative firms and stock corporations.

Table 4-14: Supervisory board characteristics and timely loss recognition

Association with timely loss recognition		Co-operative firms		
		Positive association	No significant association	Negative association
Stock corporations	Positive association	smaller BOARDSIZE	financial expertise (EXP)	proportion of independent members (INDEP)
	No significant association	existence of audit committee (AUDCOM) meeting frequency (#MEET)	Audit expertise (EXP_AUD)	--
	Negative association	proportion of female members (INDEP)	--	--

Table 4-15: Timely loss recognition with co-operative firms and with stock corporations dependent on supervisory board characteristics (BOARD_CHAR), dependent variable: change in net income

BOARD_CHAR =	Pred. sign	$\Delta NI_{i,t}$ Coeff. (p-value)				$\Delta NI_{i,t}$ Coeff. (p-value)			
		Random effects INDEP		Random effects BOARDSIZE		Random effects AUDCOM		Random effects FEM	
		(1) co-operatives	(2) stock corporations	(3) co-operatives	(4) stock corporations	(5) co-operatives	(6) stock corporations	(7) co-operatives	(8) stock corporations
$D\Delta NI_{t-1}$ (∂_1)		-0.004* (0.097)	0.001 (0.943)	-0.002 (0.268)	-0.002 (0.852)	0.003 (0.102)	-0.004 (0.884)	0.002 (0.202)	-0.002 (0.797)
ΔNI_{t-1} (∂_2)	0/-	-0.177*** (0.000)	-0.291*** (0.004)	-0.168*** (0.000)	-0.129 (0.125)	-0.113 (0.158)	1.325 (0.289)	-0.051 (0.273)	-0.207** (0.016)
$D\Delta NI_{t-1} * \Delta NI_{t-1}$ (∂_3)	-	-0.375*** (0.000)	0.110 (0.535)	-0.490*** (0.000)	-0.299** (0.042)	0.201* (0.064)	-1.155 (0.560)	-0.039 (0.610)	-0.202 (0.186)
$BOARD_CHAR_t$ (∂_4)		-0.000 (0.943)	-0.009 (0.436)	0.004* (0.087)	0.014 (0.266)	0.000 (0.964)	0.007 (0.714)	0.002 (0.398)	0.002 (0.846)
$BOARD_CHAR_t * D\Delta NI_{t-1}$ (∂_5)		0.005 (0.159)	-0.026 (0.168)	0.001 (0.740)	-0.015 (0.435)	-0.009*** (0.008)	-0.002 (0.952)	-0.009*** (0.004)	-0.014 (0.481)
$BOARD_CHAR_t * \Delta NI_{t-1}$ (∂_6)		-0.268* (0.060)	0.206 (0.201)	-0.292* (0.053)	-0.942*** (0.002)	-0.092 (0.331)	-1.534 (0.220)	-0.635*** (0.000)	0.016 (0.943)
$BOARD_CHAR_t * D\Delta NI_{t-1} * \Delta NI_{t-1}$ (∂_7)	-(+)	0.690*** (0.000)	-0.855*** (0.004)	1.050*** (0.000)	1.374*** (0.004)	-0.760*** (0.000)	0.972 (0.625)	-0.221* (0.084)	0.133 (0.731)
Constant		0.000 (0.977)	0.006 (0.637)	-0.001 (0.701)	-0.007 (0.585)	-0.001 (0.817)	-0.011 (0.630)	0.000 (0.952)	-0.001 (0.918)
Industry fixed effects		included	included	included	included	included	included	included	included
Year fixed effects		included	included	included	included	included	included	included	included
N =		913	330	963	340	932	330	958	340
Overall R ² in %		16.0	13.7	19.9	14.1	21.7	11.8	26.4	11.7
Wald Chi ²		169.7	49.4	234.4	52.4	253.2	41.4	336.1	42.3

*, ** and *** indicate significance at the 10%, 5% and 1% levels, using a two-tailed test. All variables are winsorized at the 1% and 99% percentiles. $\Delta NI_{i,t}$ is change in net income of firm i from fiscal year $t-1$ to t , scaled by the beginning book value of total assets. $D\Delta NI_{i,t}$ is an indicator variable taking the value 1 if the change in net income was negative, and value 0 otherwise. For the definition of supervisory board characteristics see Table 4-3.

Table 4-15: continued.

	Pred. sign	$\Delta NI_{i,t}$ Coeff. (p-value)					
BOARD_CHAR =		Random effects					
		#MEET		EXP		EXP_AUD	
		(9) co-operatives	(10) stock corporations	(11) co-operatives	(12) stock corporations	(13) co-operatives	(14) stock corporations
$D\Delta NI_{t-1}$ (∂_1)		0.002 (0.377)	0.001 (0.944)	0.002 (0.240)	-0.019* (0.098)	0.000 (0.852)	-0.007 (0.473)
ΔNI_{t-1} (∂_2)	0/-	-0.202*** (0.000)	-0.256*** (0.004)	-0.134** (0.016)	-0.389*** (0.001)	-0.205*** (0.000)	-0.208** (0.048)
$D\Delta NI_{t-1} * \Delta NI_{t-1}$ (∂_3)	-	0.027 (0.749)	-0.013 (0.932)	-0.127 (0.178)	0.106 (0.616)	-0.184** (0.021)	-0.091 (0.628)
BOARD_CHAR _t (∂_4)		0.001 (0.643)	0.000 (0.997)	-0.000 (0.929)	-0.015 (0.197)	0.000 (0.950)	0.006 (0.668)
BOARD_CHAR _t * $D\Delta NI_{t-1}$ (∂_5)		-0.005 (0.178)	-0.007 (0.878)	-0.009*** (0.010)	0.031* (0.071)	-0.007 (0.142)	0.002 (0.902)
BOARD_CHAR _t * ΔNI_{t-1} (∂_6)		0.071 (0.579)	-0.597 (0.864)	-0.224** (0.011)	0.335** (0.037)	-0.085 (0.794)	-0.022 (0.895)
BOARD_CHAR _t * $D\Delta NI_{t-1}$ * ΔNI_{t-1} (∂_7)	-(+)	-0.526*** (0.001)	0.595 (0.924)	-0.066* (0.611)	-0.521* (0.063)	-0.006 (0.985)	-0.189 (0.515)
Constant		0.001 (0.796)	0.000 (0.979)	0.001 (0.687)	0.007 (0.592)	0.001 (0.878)	-0.004 (0.746)
Industry fixed effects		included	included	included	included	included	included
Year fixed effects		included	included	included	included	included	included
N =		868	304	929	335	929	335
Overall R ² in %		13.3	11.6	16.3	13.6	14.6	11.9
Wald Chi ²		130.7	37.2	177.4	49.6	156.0	42.7

*, ** and *** indicate significance at the 10%, 5% and 1% levels, using a two-tailed test. All variables are winsorized at the 1% and 99% percentiles. $\Delta NI_{i,t}$ is change in net income of firm i from fiscal year $t-1$ to t , scaled by the beginning book value of total assets. $D\Delta NI_{i,t}$ is an indicator variable taking the value 1 if the change in net income was negative, and value 0 otherwise. For the definition of supervisory board characteristics see Table 4-3.

4.4.3 Multiple Regression Results with Income Smoothing and Loss Avoidance: the Role of Supervisory Board Characteristics

Due to the fact that the initial sample shrinks by about 80%, we need to measure income smoothing over three years (SMTH3). We employ LA1 to measure the propensity to avoid reporting small losses. LA1 addresses very small net profits up to 0.2% of lagged total assets, whereas the threshold is 0.5% with LA2. Therefore, LA1 seems more suitable to address a firm's effort to avoid reporting losses.

Descriptive statistics of control variables are quite similar to those of the timely loss recognition sample in Table 4-12. Those firms which provided information about supervisory characteristics are generally larger (not reported) and are more likely to be a co-operative firm compared to the basic sample. Table 4-16 indicates that the level of income smoothing is similar to that in the basic sample (mean and median in the basic sample: -0.5789 and -0.4495, respectively, see Table 4-8). There is a smaller propensity of disclosing small losses than in the basic sample (5.3% in the basic sample, see Table 4-8).

Table 4-16: Descriptive statistics (income smoothing sample with supervisory board characteristics)

Variable	N	Mean	Stand. Dev.	1 st Quartile	Median	3 rd Quartile
SMTH3	263	-0.5230	0.5991	-0.7619	-0.2946	-0.1250
LA1	1,141	0.0359	0.1862	0	0	0
CO_OP (SMTH3)	263	0.7871	0.4102	1	1	1
CO_OP (LA1)	1,141	0.8659	0.3409	1	1	1

SMTH 3 is measured as the ratio of the standard deviation of net income over the standard deviation of cash flow over three years. LA1 is a dummy variable with value of 1 if the return on assets (=net income / total assets) is non-negative but below 0.2% (0.5%), and with value 0 otherwise. CO_OP is an indicator variable with value 1 if the firm is a co-operative and with value 0 if it is a stock corporation.

Table 4-17 reports the incremental impact of several board characteristics on the level of income smoothing. Sample size varies across supervisory board characteristics. One reason is that we had to exclude observations from industries where no co-operative firm exhibits a value of 1 for a supervisory board characteristic such that the sign of the interaction term CO_OP*BOARD_CHAR is not representative. For instance, only co-operative firms in a few industries have an auditor as a member of the supervisory board. Neither the board characteristics nor their interaction with the legal form are significant (see Table 4-17), regardless of the supervisory board characteristic employed. Results are

qualitatively similar when we run pooled OLS regressions or when we restrict the analysis to low-levered firms. This implies that a high level of independence or expertise does not significantly change the level of income smoothing and that there are no considerable differences between co-operatives and stock corporations. Even though those results might be partly affected by relatively small sample size, we do not find evidence supporting hypothesis 3.

Table 4-18 shows that only the proportion of independent supervisory board members and the proportion of members with financial expertise are associated with a lower propensity to avoid reporting small losses, but only with stock corporations (indicated by BOARD_CHAR). With co-operative firms, there is an opposite effect as the highly significant negative sign of the interaction term CO_OP*BOARD_CHAR shows. All other supervisory board characteristics are not significant. When we analyze low-levered firms only, we obtain similar results (not tabulated).

Thus, with both the income smoothing and loss avoidance regressions we do not find evidence that co-operative firms' supervisory board independence or expertise increases financial reporting quality. We therefore have to reject hypothesis 3.

Table 4-17: Income smoothing, legal form and supervisory board characteristics, 2006-2012

		Dependent variable: SMTH3, 3 years, non-overlapping, random effects						
	Pred. sign				Coeff. (p-value)			
BOARD_CHAR =		INDEP	BOARDSIZE	AUDCOM	EXP	EXP_AUD	#MEET	FEM
BOARD_CHAR	-/+	-0.051 (0.786)	0.139 (0.461)	0.322 (0.214)	0.194 (0.251)	-0.075 (0.651)	0.020 (0.932)	-0.207 (0.194)
CO_OP	+	-0.093 (0.463)	-0.067 (0.596)	0.271 (0.302)	-0.053 (0.667)	-0.052 (0.645)	-0.089 (0.479)	-0.166 (0.176)
CO_OP*BOARD_CHAR	-	-0.026 (0.907)	-0.010 (0.961)	-0.375 (0.168)	-0.088 (0.638)	-0.144 (0.489)	-0.069 (0.786)	0.274 (0.145)
DEBT	+	0.355 (0.129)	0.367* (0.077)	0.502** (0.022)	0.431* (0.056)	0.282 (0.201)	0.301 (0.190)	0.442** (0.049)
Constant		-0.395 (0.541)	-0.619 (0.291)	-1.094* (0.092)	-0.802 (0.208)	-1.062* (0.092)	-0.783 (0.221)	-0.656 (0.298)
Controls		included						
Industry fixed effects		included						
Year fixed effects		included						
N =		263	355	322	312	302	278	321
Overall R ² in %		17.3	16.0	17.3	17.4	16.5	14.7	16.8
Wald Chi ²		47.4	58.1	59.5	58.0	47.4	42.2	57.1

*, ** and *** indicate significance at the 10%, 5% and 1% levels, using a two-tailed test. Robust standard errors are adjusted for heteroscedasticity and clustering at the firm level. For a definition of variables, see Table 4-2.

Table 4-18: Propensity to avoid losses, legal form and supervisory board characteristics, 2006-2012

BOARD_CHAR =	Pred. sign	Dependent variable: LA1, Probit						FEM
		INDEP	BOARDSIZE	AUDCOM	EXP	EXP_AUD	#MEET	
BOARD_CHAR	-/+	-3.097*** (0.000)	0.604 (0.283)	-0.579 (0.337)	-4.111*** (0.000)	-0.015 (0.980)	0.344 (0.517)	-0.442 (0.437)
CO_OP	-	0.458* (0.099)	0.872 (0.110)	-0.111 (0.831)	0.054 (0.837)	0.294 (0.363)	0.124 (0.684)	0.199 (0.541)
CO_OP*BOARD_CHAR		2.537*** (0.000)	-1.010 (0.114)	0.938 (0.137)	4.482*** (0.000)	0.122 (0.844)	-0.215 (0.705)	0.380 (0.527)
DEBT		1.005* (0.093)	1.172* (0.053)	1.163* (0.052)	1.294** (0.038)	1.077* (0.070)	0.704 (0.175)	1.157** (0.040)
Constant		-4.935* (0.006)	-6.106*** (0.002)	-5.210*** (0.004)	-5.320*** (0.002)	-5.491*** (0.002)	-4.203** (0.011)	-5.353*** (0.002)
Controls		included						
Industry fixed effects		included						
Year fixed effects		included						
N =		1,081	1,141	1,103	1,100	1,100	873 ⁷⁶	1,135
Pseudo R ² in %		16.7	16.8	17.6	16.8	15.1	10.9	15.4
Wald-Chi ²		436.6	143.1	120.7	385.7	145.2	40.4	150.0

*, ** and *** indicate significance at the 10%, 5% and 1% levels, using a two-tailed test. LA1 is a dummy variable with value 1 if the ratio of net income to lagged total assets (ROA) is non-negative but below 0.2%, and value 0 otherwise. For a definition of variables, see Table 4-2.

⁷⁶ The number of observations with the #MEET regression is lower, since there were no co-operative firms disclosing a ratio of net income to total assets between 0% and 0.2% in the year 2011. We therefore deleted observations from 2011.

4.5 Propensity Score Matching

4.5.1 The Idea of Propensity Score Matching

Table 4-19 below suggests that co-operative firms exhibit different characteristics than corporations. Financial accounting decisions may be influenced by these firm characteristics. Ideally, an experiment would be run with pairs of matched firms that differ only with regard to whether there is a co-operative firm or a stock corporation. The observed difference in financial reporting quality measure would then be a robust estimate of the effect of the legal form on the FRQ measure. However, such an experiment is not feasible.

Yet, there is an econometric technique to match samples based on observable characteristics, namely propensity score matching (Heckman et al., 1997, 1998). This technique estimates the predicted conditional probability of group membership based on observable characteristics using a logit model, such as the conditional probability of the legal form.

The dependent variable of the logit model is the dummy $CO_OP_{i,t}$ with the value 1 if the firm is a co-operative, and 0 if it is a stock corporation. The independent variables are SIZE, ROA, RISKSALLES and industry dummies all of which may affect the legal form.

The matching has limits. First, stock corporations and co-operatives operate in quite different industries. Second, matching via a profitability measure such as ROA is likely to reduce, but not to eliminate significant differences in profitability between the legal forms in the matched sample since co-operatives by definition do not pursue a profit-maximizing objective. The main motivation to set up a co-operative might be to which extent the owners' objective function includes altruistic motives. But this piece of information, of course, is not observable; moreover, it will be impossible to sensibly aggregate the individual owners' objective functions on a firm level.

Based on the criteria SIZE, ROA, RISKSALLES and industry, we obtain propensity scores that we use for a 1:1 nearest neighbor matching within a caliper, following Heckman et al. (1997, 1998), Bharath et al. (2011) and Hope et al. (2013). We set a caliper size of $\varepsilon < 0.1$ (Rosenbaum & Rubin, 1985).

4.5.2 Matching Results

We assess the matching quality as follows: first, the groups of co-operative and of stock corporations should have similar characteristics with regard to industry, size, profitability and risk meaning that the differences in those firm characteristics are statistically insignificant. Second, we aim to minimize the standardized percentage bias after matching.⁷⁷ Table 4-19 shows that the group differences considering each of the above firm characteristics are statistically no longer significant. The t-test based on firm characteristics after matching indicates no differences at conventional significance levels. Further, the standardized percentage mean bias is lower than 5% which suggests a good match. The matched sample has 1,956 observations, thus, about 65% of observations were dropped from the initial sample. Table 4-19 summarizes the effect of propensity score matching on sample selection and mean values.

4.5.3 Analysis of Hypotheses 1 and 2 with Matched Sample

We then pooled the group of co-operative firms and the matched group of stock corporations to rerun the regression for Hypothesis 1. Table 4-20 presents the results for the full sample and for the sample of low-levered firms. We are unable to test Hypothesis 2 directly by the subsample of highly levered firms. This subsample would be too small because in some industries there are too little observations on either stock corporations or co-operative firms, such that we would have to delete those industries which decreases sample size even more.

⁷⁷ The standardized percentage bias is calculated according to the formulae by Rosenbaum and Rubin (1985).

Table 4-19: Characteristics of matched timely loss recognition sample

Panel A: Distribution of sample firm observations across industries before and after matching

Industry	Before matching			After matching		
	Stock corporations	Co-operative firms	Total	Stock corporations	Co-operative firms	Total
A: Agriculture and Fishing	15	222	237	15	18	33
C: Manufacturing	434	232	666	211	226	437
D: Energy supply	240	18	258	18	18	36
F: Construction	93	107	200	62	80	142
G: Trade and garages	299	794	1,093	272	271	543
H: Transportation	86	29	115	31	29	60
J: Information and communication	212	15	227	20	15	35
L: Real estate	189	1,975	2,164	186	158	344
M: Freelance work, scientific and technical services	276	58	334	61	58	119
N: Other business services	90	40	130	37	40	77
P: Education	10	18	28	7	5	12
Q: Health and welfare services	30	15	45	16	15	31
S: Other services	33	45	78	25	27	52
Total	2,007	3,568	5,575	978	978	1,956

Panel B: Mean value before and after matching

Variable	Mean with cooperatives (n = 3,568)	Mean with stock corporations (n = 2,007)	Mean difference (t-value)	Mean with cooperatives (n = 978)	Mean with stock corporations (n = 978)	Mean difference (t-value)
	before propensity score matching			after propensity score matching		
				Mean (median) bias of matched sample in %: 2.5 (1.8)		
				T-test based on firm characteristics after matching: no significant differences		
SIZE	17.3454	16.9162	0.4292 (10.33)***	16.8744	16.8937	-0.0193 (-0.28)
ROA	0.0087	0.0647	-0.0560 (-25.46)***	0.0291	0.0273	0.0018 (0.47)
RISKSALES	0.1498	0.3462	-0.1964 (-21.10)***	0.3227	0.3164	0.0064 (0.35)

*, ** and *** indicate significance at the 10%, 5%, and 1% levels, using a two-tailed test. Before matching, SIZE and ROA were winsorized at the 1% and 99% percentiles, RISKSALES at the 5% and 95% percentiles. For a definition of variables, see Table 4-2.

Table 4-20: Propensity score matching: Timely loss recognition with co-operative firms and with stock corporations, dependent variable: change in net income

Pred. sign	$\Delta NI_{i,t}$ Coeff. (p-value)				$\Delta NI_{i,t}$ Coeff. (p-value)			
	Low-levered firms (Debt ratio is lower than 75% percentile \approx 65%)				Full sample			
	Pooled OLS		Random effects		Pooled OLS		Random effects	
	(1) co-operatives	(2) stock corporations	(3) co-operatives	(4) stock corporations	(5) co-operatives	(6) stock corporations	(7) co-operatives	(8) stock corporations
$D\Delta NI_{t-1}$ (∂_1)	0.001 (0.775)	-0.005 (0.441)	0.001 (0.790)	-0.005 (0.501)	0.003 (0.280)	-0.001 (0.789)	0.003 (0.312)	-0.001 (0.823)
ΔNI_{t-1} (∂_2)	0/- -0.097 (0.381)	-0.279*** (0.004)	-0.097** (0.047)	-0.279*** (0.000)	-0.051 (0.616)	-0.246*** (0.001)	-0.051 (0.246)	-0.246*** (0.000)
$D\Delta NI_{t-1} * \Delta NI_{t-1}$ (∂_3)	- -0.345* (0.072)	-0.234 (0.129)	-0.345*** (0.000)	-0.234** (0.016)	-0.442* (0.012)	-0.233* (0.072)	-0.442*** (0.000)	-0.233*** (0.002)
Constant	-0.008 (0.576)	0.010 (0.507)	-0.008 (0.411)	0.010 (0.577)	-0.012 (0.357)	0.002 (0.876)	-0.012 (0.183)	0.002 (0.893)
Industry fixed effects	included	included	included	included	included	included	included	included
Year fixed effects	included	included	included	included	included	included	included	included
N =	749	637	749	637	960	961	960	961
Adj. R^2 / overall R^2 in %	10.7	17.0	13.0	19.4	13.3	14.2	15.0	15.9
F-Stat / Wald Chi R^2	4.1	4.9	108.8	148.9	5.4	6.3	166.3	178.5

*, ** and *** indicate significance at the 10%, 5% and 1% levels, using a two-tailed test. With OLS regressions, standard errors are clustered at the firm level. All variables are winsorized at the 1% and 99% percentiles. $\Delta NI_{i,t}$ is change in net income of firm i from fiscal year $t-1$ to t , scaled by the beginning book value of total assets. $D\Delta NI_{i,t}$ is an indicator variable taking the value 1 if the change in net income was negative, and value 0 otherwise.

Table 4-20 shows the results of the regression analysis on timely loss recognition after propensity score matching. Since the sample of highly levered firms would have been too small, we run the analysis with the full sample and with the sample of low-levered firms only.

Column 1 to column 4 depict the results with low-levered firms. With co-operatives, about 10% of income increases ($\hat{\partial}_2$, not being significant in the pooled OLS regression) and 44% of income decreases are transitory ($\hat{\partial}_2 + \hat{\partial}_3$), indicating significant timely loss recognition. With low-levered stock corporations, about 28% of income increases and 51% of income decreases are transitory. Since the coefficient $\hat{\partial}_3$ is higher with co-operative firms, they exhibit a higher level of timely loss recognition than stock corporations. This result stands in contrast to the one obtained in Section 4.3.2 and does not support hypothesis 1.

For the full sample including highly levered firms, we obtain similar results. Compared to the analysis with low-levered firms, the stock corporations' level of timely loss recognition does not change ($\hat{\partial}_3 = 23\%$ versus 23% with low-levered firms) while it increases with co-operative firms ($\hat{\partial}_3 = 44\%$ vs. 35% with low-levered co-operatives). This implies, that higher leverage implies more timely loss recognition with co-operative firms, but not with stock corporations. This result does not support hypothesis 2.

4.5.4 Analysis of Hypothesis 3 with Matched Sample

We also employed propensity score matching for those observations where we obtained information on supervisory board characteristics. Table 4-21 reports the results on timely loss recognition. It transpires that similar to the results in Section 4.2, co-operative firms exhibit marginally statistically higher levels of timely loss recognition with smaller board size, the existence of an audit committee and a higher frequency of board meetings. Different to the results in Section 4.2, a higher proportion of female supervisory board members is not significantly associated with timely loss recognition. Surprisingly and in line with the results in Section 4.2, a higher proportion of independent board members is associated with less timely loss recognition. Overall, we find support for hypothesis 3 for the following board characteristics: (smaller) board size, the existence of an audit committee and a higher frequency of board meetings.

Table 4-21: Propensity score matching: Timely loss recognition with co-operative firms and with stock corporations dependent on supervisory board characteristics (BOARD_CHAR), dependent variable: change in net income

BOARD_CHAR =	Pred. sign	$\Delta NI_{i,t}$ Coeff. (p-value)				$\Delta NI_{i,t}$ Coeff. (p-value)			
		Random effects INDEP		Random effects BOARDSIZE		Random effects AUDCOM		Random effects FEM	
		(1) co-operatives	(2) stock corporations	(3) co-operatives	(4) stock corporations	(5) co-operatives	(6) stock corporations	(7) co-operatives	(8) stock corporations
$D\Delta NI_{t-1}$ (∂_1)		-0.006 (0.326)	0.003 (0.723)	0.001 (0.865)	0.006 (0.511)	-0.026* (0.060)	0.019 (0.587)	0.001 (0.857)	0.003 (0.702)
ΔNI_{t-1} (∂_2)	0/-	-0.249** (0.037)	0.096 (0.464)	-0.288** (0.019)	-0.036 (0.753)	-1.070*** (0.002)	-0.116 (0.982)	-0.275** (0.019)	0.003 (0.982)
$D\Delta NI_{t-1} * \Delta NI_{t-1}$ (∂_3)	-	-0.564*** (0.003)	-0.389* (0.067)	-0.326* (0.080)	-0.461** (0.013)	-1.100** (0.021)	0.462 (0.931)	0.045 (0.810)	-0.543*** (0.006)
$BOARD_CHAR_t$ (∂_4)		0.002 (0.854)	0.018 (0.206)	0.013 (0.137)	0.015 (0.392)	-0.007 (0.301)	0.003 (0.928)	0.010 (0.429)	0.017 (0.201)
$BOARD_CHAR_t * D\Delta NI_{t-1}$ (∂_5)		-0.003 (0.787)	-0.011 (0.549)	-0.005 (0.590)	-0.006 (0.774)	0.017** (0.045)	-0.016 (0.608)	-0.018 (0.203)	-0.007 (0.645)
$BOARD_CHAR_t * \Delta NI_{t-1}$ (∂_6)		-1.069 (0.157)	-0.510** (0.024)	-0.564 (0.164)	-0.135 (0.930)	0.619*** (0.004)	0.070 (0.989)	-1.429** (0.026)	-0.532 (0.104)
$BOARD_CHAR_t * D\Delta NI_{t-1} * \Delta NI_{t-1}$ (∂_7)	-(+)	1.865** (0.019)	-0.109 (0.768)	1.295** (0.012)	1.307 (0.670)	0.506* (0.088)	-0.921 (0.863)	0.569 (0.399)	0.770 (0.128)
Constant		0.024 (0.148)	-0.022 (0.112)	0.023 (0.179)	-0.024 (0.120)	0.039** (0.022)	-0.026 (0.418)	0.044*** (0.009)	-0.025* (0.094)
Industry fixed effects		included	included	included	included	included	included	included	included
Year fixed effects		included	included	included	included	included	included	included	included
N =		186	181	192	188	186	182	192	188
Overall R ² in %		34.0	23.3	28.3	15.9	48.3	16.0	37.7	15.7
Wald Chi ²		77.0	49.0	70.1	31.5	128.6	29.0	90.2	33.7

*, ** and *** indicate significance at the 10%, 5% and 1% levels, using a two-tailed test. All variables are winsorized at the 1% and 99% percentiles. $\Delta NI_{i,t}$ is change in net income of firm i from fiscal year $t-1$ to t , scaled by the beginning book value of total assets. $D\Delta NI_{i,t}$ is an indicator variable taking the value 1 if the change in net income was negative, and value 0 otherwise. For the definition of supervisory board characteristics see Table 4-3.

Table 4-21: continued.

	Pred. sign	$\Delta NI_{i,t}$ Coeff. (p-value)					
BOARD_CHAR =		Random effects					
		#MEET		EXP		EXP_AUD	
		(9) co-operatives	(10) stock corporations	(11) co-operatives	(12) stock corporations	(13) co-operatives	(14) stock corporations
$D\Delta NI_{t-1}$ (∂_1)		0.005 (0.360)	0.005 (0.557)	0.004 (0.475)	-0.003 (0.740)	-0.001 (0.791)	-0.007 (0.398)
ΔNI_{t-1} (∂_2)	0/-	-0.229 (0.142)	-0.290** (0.019)	-0.241* (0.053)	-0.049 (0.756)	-0.379*** (0.002)	-0.344* (0.076)
$D\Delta NI_{t-1} * \Delta NI_{t-1}$ (∂_3)	-	0.218 (0.457)	-0.126 (0.517)	0.047 (0.822)	-0.380 (0.155)	-0.029 (0.906)	-0.574** (0.044)
$BOARD_CHAR_t$ (∂_4)		0.007 (0.428)	0.001 (0.956)	0.002 (0.853)	-0.007 (0.607)	0.004 (0.794)	-0.001 (0.950)
$BOARD_CHAR_t * D\Delta NI_{t-1}$ (∂_5)		-0.002 (0.852)	-0.010 (0.747)	-0.027*** (0.007)	0.017 (0.308)	-0.003 (0.828)	0.010 (0.589)
$BOARD_CHAR_t * \Delta NI_{t-1}$ (∂_6)		0.548 (0.287)	-0.581 (0.806)	-0.2841*** (0.010)	-0.019 (0.929)	0.045 (0.7948)	0.344 (0.136)
$BOARD_CHAR_t * D\Delta NI_{t-1} * \Delta NI_{t-1}$ (∂_7)	-(+)	-1.113* (0.055)	0.478 (0.916)	0.051 (0.897)	-0.085 (0.809)	-0.204 (0.783)	0.502 (0.173)
Constant		0.002 (0.159)	-0.006 (0.702)	0.025 (0.116)	-0.019 (0.213)	0.026 (0.147)	-0.014 (0.338)
Industry fixed effects		included	included	included	included	included	included
Year fixed effects		included	included	included	included	included	included
N =		179	171	191	187	191	187
Overall R ² in %		23.6	21.1	36.1	17.8	25.8	24.9
Wald Chi ²		43.5	42.0	89.1	34.1	57.8	53.3

*, ** and *** indicate significance at the 10%, 5% and 1% levels, using a two-tailed test. All variables are winsorized at the 1% and 99% percentiles. $\Delta NI_{i,t}$ is change in net income of firm i from fiscal year $t-1$ to t , scaled by the beginning book value of total assets. $D\Delta NI_{i,t}$ is an indicator variable taking the value 1 if the change in net income was negative, and value 0 otherwise. For the definition of supervisory board characteristics see Table 4-3.

In contrast, with stock corporations, there is no board characteristic exhibiting a significant association with timely loss recognition. In Section 4.2, we found smaller board size and a higher proportion of members with financial expertise to go along with more timely loss recognition. Table 4-22 provides an overview about the differences between co-operative firms and stock corporations.

Overall, supervisory board expertise and independence seem to affect timely loss recognition rather with co-operative firms than with stock corporations. It is hard to find a convincing explanation for this finding which in addition is based on relatively small sample size and needs to be cautiously interpreted.

Table 4-22: Supervisory board characteristics and timely loss recognition with the propensity score matched sample

Association with timely loss recognition		Co-operative firms		
		Positive association	No significant association	Negative association
	Positive association	--	--	--
Stock corporations	No significant association	smaller BOARDSIZE existence of audit committee (AUDCOM) meeting frequency (#MEET)	financial expertise (EXP) Audit expertise (EXP_AUD) proportion of female members (INDEP)	proportion of independent members (INDEP)
	Negative association	--	--	--

4.6 Conclusion

We investigate financial reporting quality (FRQ) of co-operative firms and compare it to that of non-listed stock corporations. We mainly measure FRQ by timely loss recognition, but use (the lack of) income smoothing and the propensity to avoid reporting small losses for robustness checks. Due to less severe agency problems of equity we expect and find lower FRQ with co-operative firms than with stock corporations: co-operative firms exhibit no significant timely loss recognition, smooth income more and avoid reporting small losses more often than corporations do. With highly-levered firms, when agency problems of debt add to those of equity, corporations increase income smoothing more and exhibit a higher propensity to avoid reporting small losses such that FRQ become more comparable with that of co-operative firms. We employed propensity score matching especially to account for the fact that co-operatives differ from stock corporations with regard to size, profitability and industry classification. After propensity score matching, we find that co-operatives exhibit higher levels of timely loss recognition.

We also collected data on supervisory board characteristics for firms of both legal forms. Even though legal requirements are similar with both types of firms, board characteristics differ significantly. Co-operatives have more board members, more women on board, more board meetings; but are less likely to have an audit committee and exhibit a lower proportion of public accountants or auditors serving as board members. The proportion of independent supervisory board members does not differ much between the two legal forms.

We find that some board characteristics of co-operative firms are positively associated with timely loss recognition such as smaller board size, the existence of an audit committee and a higher frequency of board meetings. Surprisingly, a larger proportion of independent board members goes along with less timely loss recognition.

There are also limitations to mention. First of all, co-operative firms and stock corporations operate in very different industries. Moreover, the owners of co-operatives often receive a non-monetary utility while shareholders might be rather interested in profit maximization. Even though we control for industry and profitability in different ways, partly by propensity score matching, the two legal forms are limitedly comparable. Still, if we want to learn something about co-operative firms, a non-listed stock corporation seems to be the best legal form to compare with. Second, since the analysis on supervisory board characteristics is based on questionnaires it might suffer from self-selection bias. However, larger, less profitable and less risky stock corporations *and* co-operatives returned the questionnaire indicating that the selection basis may not severely affect the *comparison* of the two legal forms. Third, the sample size of some analyses is limited and the results need to be interpreted with caution. Future research may extend the analysis to a European setting and take into account the varying legal and institutional framework of co-operative firms.

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Appendix 4.1: Questionnaire

Figure 4-1: Questionnaire

	Angabe	2007	2008	2009	2010	2011	2012
1. Aufsichtsrat							
1.1 Gesamtanzahl der Mitglieder des Aufsichtsrates	Anzahl	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
davon: Vertreter aus dem eigenen Unternehmen							
1.1.1 (Arbeitnehmer)	Anzahl	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
1.1.2 davon: Mitglieder mit wesentlichen Geschäftsbeziehungen zum Unternehmen	Anzahl	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
1.1.3 davon: Unternehmensexterne Mitglieder	Anzahl	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
1.2 Geschlecht der Mitglieder des Aufsichtsrates							
1.2.1 weibliche Mitglieder des AR	Anzahl	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
1.2.2 männliche Mitglieder des AR	Anzahl	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
1.2.3 Geschlecht des Vorsitzenden des AR	(m/w)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
1.3 Anzahl der Mitglieder des AR mit folgendem höchstem Bildungsabschluss:							
1.3.1 Bachelor/Master/Diplom/Staatsexamen	Anzahl	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
1.3.2 Meisterabschluss	Anzahl	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
1.3.3 Promotion	Anzahl	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
1.3.4 Wirtschaftsprüfer/Steuerberater	Anzahl	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
1.3.5 sonstige	Anzahl	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
1.3.6 unbekannt	Anzahl	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
1.4 Anzahl der Sitzungen des Aufsichtsrates im Kalenderjahr	Anzahl	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
2. Prüfungsausschuss							
2.1 Existiert ein Prüfungsausschuss?	(ja/nein)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
2.2 Anzahl der Mitglieder des Prüfungsausschusses	Anzahl	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

2.2.1 davon: Mitglieder mit expliziten Bilanzierungs-/Prüfungs-
/Risikocontrollingkenntnissen
**2.3 Verfügt der Ausschussvorsitzende über explizite
Prüfungskennntnisse?**
2.4 Anzahl der Sitzungen des Prüfungsausschusses im Kalenderjahr

Anzahl	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
(ja/nein)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Anzahl	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Erläuterungen:

Zeile:	Inhalt:	Erläuterung:
1.1.1	davon: Vertreter aus dem eigenen Unternehmen (Arbeitnehmer)	Anzahl der Mitglieder des Aufsichtsrates, die zugleich Arbeitnehmer des betreffenden Unternehmens sind.
1.1.2	davon: Mitglieder mit wesentlichen Geschäftsbeziehungen zum Unternehmen	Anzahl der Mitglieder des Aufsichtsrates, die wesentliche Geschäftsbeziehungen zu diesem Unternehmen unterhalten.
1.1.3	davon: Unternehmensexterne Mitglieder	Anzahl der Mitglieder des Aufsichtsrates, die weder Arbeitnehmer des betreffenden Unternehmens sind, noch wesentliche Geschäftsbeziehungen zu diesem Unternehmen unterhalten.
1.3	Anzahl der Mitglieder des AR mit folgendem höchstem Bildungsabschluss	Bei den nachfolgenden Fragen ist jeweils nur der höchste Bildungsabschluss eines Aufsichtsratsmitgliedes zu werten (Beispiel: Promovierte Wirtschaftsprüfer werden in Zeile 1.3.4 gewertet).
2.1	Existiert ein Prüfungsausschuss?	Sofern diese Frage mit nein beantwortet wird, entfallen die nachfolgenden Fragen.

Appendix 4.2: List of Symbols

*	statistical significance at the 0.10 level
**	statistical significance at the 0.05 level
***	statistical significance at the 0.01 level
%	percent
&	and
α	regression coefficient
β	regression coefficient
γ	regression coefficient
δ	regression coefficient
ε	residual term
AUDCOM	indicator variable for the existence of an audit committee
BOARD_CHAR	indicator variable for supervisory board characteristics
BOARDSIZE	indicator variable for large supervisory boards
CFO	variable for cash flow from operations
CO_OP	indicator variable for a co-operative firm
D Δ NI	indicator variable that takes the value 1 if the change in net income is negative and zero otherwise
DEBT	variable for the leverage ratio
Δ NI	variable for the change in net income
EXP	indicator variable for high share of supervisory board members with financial expertise
EXP_AUD	indicator variable for high share of supervisory board members that are external auditors

FEM	indicator variable for high share of female supervisory board members
GROWTH	variable for sales growth changes
#MEET	indicator variable for frequently meeting supervisory boards
HIGH_DEBT	indicator variable for high debt ratio
i	firm index
INDEP	indicator variable for high percentage of independent supervisory board members
LA	variable for loss avoidance
LOSS	variable for net loss in the current year or in at least one of the two preceding years
PRIOR	indicator variable that equals 1 if no negative net income was disclosed in the previous period
R ²	empirical coefficient of determination
RISKSALES	variable for standard deviation of sales
ROA	variable for the ratio of net income to lagged total assets
SD	standard deviation
SIZE	variable for firm size
SMTH	variable for income smoothing
TAX	variable for the tax expense ratio
t	time index
v	variable for year-fixed effects
Wald-Chi ²	empirical coefficient of determination
z	variable for firm-fixed effects

Summary in English

The present thesis „*Corporate Governance and Financial Reporting Quality of German Firms*“ investigates how the financial reporting quality of German firms is affected by the firms' internal and external control structures. It extends prior work that revealed a negative effect of effective corporate governance on the extent of earnings management.

The first study („*Consequences of Error Announcements on Industry Peers: Capital Market Reaction and Financial Market Decisions*“) analyzes the impact of accounting errors on industry peers to restating firms. The sample consists of CDAX[®]-listed industry peers to firms that announced accounting errors within the German Financial Reporting Enforcement process from 2005 through January 2013. We find that industry peers suffer on average negative cumulative abnormal returns of -0.92% within the five day event window. More precisely, we show the contagion effect for the German context by analyzing industry peers of error firms that experienced negative abnormal returns around their error announcement. This finding is interpreted as a loss of investors' confidence in the reliability of financial reporting within the respective industry. Thus, we assume that industry peers may be motivated into regaining their reputation. Based on the relatively strong capital market reaction we examine whether industry peers change the transparency of financial reporting following the event. Our results reveal that industry peers present more informative financial reporting as measured by more timely loss recognition after the error announcements. Nevertheless, we find no evidence for an increase in the precision of forecast reporting caused by the event. Supplementary tests reveal no significant increase in auditor turnover after an industry peer's error announcement, suggesting that industry peers do not try to restore reliability of financial reporting by switching the auditor after the stock price decline.

The second study („*Supervisory Board Characteristics and Income Smoothing of German Co-operative Banks*“) analyzes for a sample of German co-operative banks for the years from 2007 through 2013 how income smoothing through the loan loss provisions is affected by effective corporate governance structures. Beside legal form specific governance aspects, the role of the composition of the supervisory board and the existence of an audit committee are in the scope of this study. The results suggest that the existence of an audit committee negatively affects income smoothing. Besides, this study reveals weak evidence that a relatively high proportion of women on the supervisory board supports the mitigation of income smoothing.

Main results suggest that co-operative banks smooth income through the use of loan loss provisions. This effect is stronger for sample years before 2011. After the announcement of the Basle III rules (CRR/CRD IV), the building of LLP declines in support of visible Sec. 340g reserves. The rationale might be that these reserves are eligible as regulatory capital under Basle III whereas LLP are no longer accepted as own funds. The analyses reveal that regulatory capital ratios increased significantly over the sample period. This finding is in line with the enhanced regulatory capital requirements. Against the literature and the hypothesis which predicts that higher information asymmetries between management and shareholders should result in more income smoothing, the results of the regression analysis indicate a negative relation between the extent of information asymmetry, approximated by a relatively high count of members with a co-operative bank, and the level of income smoothing. This finding may be caused by the specific governance structure of co-operatives. Assuming that the annual report is the main source of financial information for most of the co-operative shareholders, management could manipulate the figures presented within the report to indicate stability. Nevertheless, each shareholder may address questions to the management within the general assembly. The more shareholders a co-operative has, the higher is the detection risk since more shareholders may scrutinize the accounting practices. The risk is even higher for co-operatives with a higher number of members that elect representatives for the assembly, which are expected to be better informed and prepared than the whole group. The study contributes to the literature on the effect of the specific corporate governance of co-operative banks on these institutes' accounting behavior.

The third study „*Supervisory board characteristics and earnings properties: Co-operative firms versus private stock corporations*“ investigates the financial reporting quality (FRQ) of co-operative firms in comparison to that of non-listed stock corporations. The main measure of FRQ is timely loss recognition, but (the lack of) income smoothing and the propensity to avoid reporting small losses are included for robustness checks. Due to less severe agency problems of equity we expect and find lower FRQ with co-operative firms than with stock corporations: co-operative firms exhibit no significant timely loss recognition, smooth income more and avoid reporting small losses more often than corporations do. With highly-levered firms, when agency problems of debt add to those of equity, corporations increase income smoothing more and exhibit a higher propensity to avoid reporting small losses such that FRQ become more comparable with that of co-operative firms.

We also collected data on co-operatives supervisory board characteristics. Even though legal requirements are similar with both types of firms, board characteristics differ significantly. Co-operatives have more board members, more women on board, more board meetings; but are less likely to have an audit committee and exhibit a lower proportion of public accountants or auditors serving as board members. The proportion of independent supervisory board members does not differ much between the two legal forms.

We find that some board characteristics of co-operative firms are positively associated with timely loss recognition such as smaller board size, the existence of an audit committee and a higher frequency of board meetings. Surprisingly, a larger proportion of independent board members goes along with less timely loss recognition.

Summary in German

Die vorliegende Arbeit „*Corporate Governance and Financial Reporting Quality of German Firms*“ untersucht, wie die Finanzberichterstattung deutscher Unternehmen durch bestimmte Aspekte der internen und externen Kontrollstrukturen beeinflusst wird. Frühere Studien zum Bilanzierungsverhalten von Unternehmen konnten zeigen, dass effektive Kontrollstrukturen das Ausmaß der Bilanzpolitik negativ beeinflussen.

Die erste Studie („*Consequences of Error Announcements on Industry Peers: Capital Market Reaction and Financial Market Decisions*“) untersucht den Ausstrahlungseffekt von Bilanzierungsfehlern börsennotierter deutscher Unternehmen auf vergleichbare Unternehmen innerhalb derselben Branche. Zu diesem Zweck werden zunächst die Unternehmen mit Fehlerfeststellungen der Deutschen Prüfstelle für Rechnungslegung zusammengetragen sowie deren im CDAX[®] notierte Branchenpeers für den betreffenden Ereignisstichtag ermittelt. Für ein Zeitfenster von je 2 Handelstagen vor und nach der Fehlerbekanntgabe werden nach Bereinigung für sonstige Ereignisse, die im Verdacht stehen, die Kurse wesentlich beeinflussen zu können, die Kapitalmarktreaktionen für die selbst nicht fehlerveröffentlichenden Unternehmen der Vergleichsgruppe ermittelt. Es zeigt sich eine durchschnittliche negative kumulierte abnormale Rendite von -0,92% im fünf Handelstage umfassenden Ereignisfenster. Aufgrund dieser relativ starken beobachteten Reaktion am Kapitalmarkt wird schließlich die Hypothese untersucht, inwiefern die Branchenpeers durch eine transparentere Finanzberichterstattung in den Folgeperioden versuchen, das Vertrauen des Kapitalmarktes in ihre Berichterstattung wiederherzustellen.

Die Ergebnisse der Studie weisen darauf hin, dass Branchenpeers auf die Fehlerveröffentlichung reagieren, indem sie Verluste zeitnaher realisieren. Eine mögliche Erklärung könnte darin liegen, dass sie bemüht sind, zu signalisieren, dass ihre Berichterstattung vertrauenswürdig ist. Der ebenfalls im Rahmen der Studie untersuchte Effekt auf die Transparenz der Prognoseberichterstattung lässt keinen signifikanten Anstieg der Präzision der Prognosen im Zusammenhang mit Fehlerveröffentlichungen innerhalb der Branche erkennen. Dieses Ergebnis könnte darauf zurückzuführen sein, dass eine Erhöhung der Präzision von Prognosen mit höheren marginalen Kosten verbunden ist als die zeitnähere Verlustrealisierung. Dies könnte einerseits damit erklärt werden, dass zukunftsgerichtete Aussagen Erwartungen am Markt wecken, welche bei Nichterfüllung zu Unternehmenswertverlusten führen. Dieser Effekt könnte durch

präzisere Aussagen verstärkt werden. Ferner könnten präzisere Prognosen potentielle Wettbewerber auf Marktchancen hinweisen.

Die zweite Studie („*Supervisory Board Characteristics and Income Smoothing of German Co-operative Banks*“) untersucht für eine Stichprobe von deutschen Genossenschaftsbanken für die Jahre 2007 bis 2013 die Frage, wie sich ein effektives Aufsichtsgremium auf das Ausmaß der Gewinnglättung durch die Kreditrisikovorsorge im Jahresabschluss von Banken auswirkt. Besonderes Augenmerk liegt dabei auf der Zusammensetzung des Aufsichtsrates sowie der Existenz eines Prüfungsausschusses. Die Ergebnisse der Studie weisen darauf hin, dass die Bildung eines Prüfungsausschusses das Ausmaß der Gewinnglättung durch die Kreditrisikovorsorge negativ beeinflusst. Ferner finden sich (schwache) Hinweise drauf, dass ein relativ hoher Frauenanteil im Aufsichtsrat von Banken das Ausmaß der Gewinnglättung negativ beeinflusst.

Weiterhin zeigt sich, dass die Bedeutung der Kreditrisikovorsorge in den untersuchten Banken nach 2010 deutlich zugunsten der Bildung von offenen 340g Reserven zurückgeht. Eine mögliche Erklärung könnte sich in den Ende 2010 bekannt gewordenen Kapitalanforderungen nach Basel III finden. Gemäß der *Capital Requirements Directive* (CRR/CRD IV) können Genossenschaftsbanken, die ihre aufsichtsrechtlichen Kennzahlen nach dem Kreditrisikostandardansatz erstellen, Kapitalrücklagen nach § 340g HGB im Ergänzungskapital anrechnen, während die Kreditrisikovorsorge keine Berücksichtigung mehr findet. Gleichzeitig ist ein deutlicher Anstieg der Gesamtkapitalkennziffern zu beobachten. Dies steht im Einklang mit den gestiegenen Eigenmittelanforderungen der Bankenaufsicht.

Entgegen der allgemeinen Erwartung in der Literatur sowie der formulierten Hypothese finden sich Hinweise darauf, dass größere Informationsasymmetrien zwischen Management und Anteilseignern zu einem geringeren Ausmaß der Gewinnglättung führen. Dies könnte darauf zurückzuführen sein, dass das Management zwar aufgrund der mit zunehmender Unternehmensgröße und steigender Mitgliederzahl wachsenden Informationsasymmetrie die Möglichkeit hat, die Finanzdaten zugunsten geglätteter Jahresergebnisse zu manipulieren. Weiterhin sei angenommen, dass das Management hierzu auch Anreize hätte, da geglättete Ergebnisse als Zeichen finanzieller Stabilität positive Auswirkungen etwa auf die Kapitalausstattung der Genossenschaft hätten. Andererseits wächst mit zunehmender Mitgliederzahl die Gefahr, dass in der Generalversammlung die Zahlen hinterfragt und die Manipulation aufgedeckt würde. Insofern sollten Banken umso eher auf gewinnglättende Bilanzpolitik verzichten, je mehr

Mitglieder sie hat. Dieses Argument sollte umso stärker für Genossenschaftsbanken gelten, die aufgrund ihrer Größe an eine Vertreterversammlung berichten, da hier noch stärkere finanzielle Expertise auf Seiten der gewählten Vertreter angenommen werden kann.

Schließlich kann entgegen der Erwartung kein Zusammenhang zwischen der Höhe der Nachschusspflicht und dem Ausmaß an Gewinnglättung gezeigt werden. Beide Ergebnisse deuten darauf hin, dass die Gewinnglättung nicht zur Erhöhung der Information genutzt wird.

Die dritte Studie „*Supervisory board characteristics and earnings properties: Co-operative firms versus private stock corporations*“ beleuchtet das Bilanzierungsverhalten von Genossenschaften und nicht-börsennotierten Aktiengesellschaften. Das zentrale Maß für die Qualität der Finanzberichterstattung ist die bedingt vorsichtige Bilanzierung (‘timely loss recognition’), wonach Aufwendungen tendenziell früher ergebniswirksam werden als Erträge. Darüber hinaus werden die Gewinnglättung sowie die Vermeidung des Ausweises kleiner negativer Jahresergebnisse als Robustheitstests geprüft. Da bei Genossenschaften weniger starke Agenturprobleme des Eigenkapitals angenommen werden, erwarten wir bei dieser Rechtsform im Vergleich zu nicht-börsennotierten Aktiengesellschaften eine geringere Qualität der Finanzberichterstattung. Entgegen der Hypothese finden wir, bei Genossenschaften keine signifikante bedingt vorsichtige Bilanzierung. Allerdings glätten Genossenschaften Gewinne stärker als nicht-börsennotierte Aktiengesellschaften und vermeiden es vergleichsweise stärker, kleine negative Jahresergebnisse auszuweisen. Bei Beschränkung der Stichprobe auf stärker verschuldete Unternehmen, wenn also neben die Agenturprobleme des Eigenkapitals jene des Fremdkapitals treten, nähern sich die Ergebnisse über beide Rechtsformen hinweg an. Nicht-börsennotierte Aktiengesellschaften glätten Gewinne in dieser Konstellation stärker als in der Gesamtstichprobe und vermeiden mit größerer Wahrscheinlichkeit den Ausweis kleiner Verluste.

Die Auswertung erhobener Aufsichtsratsmerkmale für Unternehmen beider Rechtsformen zeigt, dass sich die Ausgestaltung der Gremien trotz vergleichbarer gesetzlicher Anforderungen erheblich unterscheidet. Die Aufsichtsräte von Genossenschaften haben mehr Mitglieder, einen größeren Anteil weiblicher Mitglieder und tagen häufiger. Ferner bilden sie seltener Prüfungsausschüsse und verfügen über weniger Mitglieder, die Wirtschaftsprüfer oder Steuerberater sind. Der Anteil unabhängiger Mitglieder unterscheidet sich nicht wesentlich zwischen den Rechtsformen.

Empirische Analysen zeigen, für einige Aufsichtsratsmerkmale einen positiven Zusammenhang zur bedingt vorsichtigen Bilanzierung. Dies zeigt sich insbesondere für Aufsichtsräte mit einer geringeren Anzahl an Mitgliedern, bei Existenz eines Prüfungsausschusses und häufigeren Sitzungen des Aufsichtsrates. Überraschenderweise führt ein größerer Anteil unabhängiger Mitglieder des Aufsichtsrates zu einem geringeren Ausmaß an bedingt vorsichtiger Bilanzierung.

Prior Publications**Vorveröffentlichungen**

The first study “*Consequences of Error Announcements on Industry Peers: Capital Market Reaction and Financial Reporting Decisions*” has been published at SSRN on January 1, 2015.

Häfele, S. & Riediger, M. (2015): Consequences of Error Announcements on Industry Peers: Capital Market Reaction and Financial Reporting Decisions (January 1, 2015). Available at: <https://doi.org/10.2139/ssrn.2541903>.

Declaration of Honor**Ehrenwörtliche Erklärung**

Hiermit erkläre ich, dass ich mich noch keinem Promotionsverfahren unterzogen oder um Zulassung zu einem solchen beworben habe, und die Dissertation in der gleichen oder einer anderen Fassung bzw. Überarbeitung einer anderen Fakultät, einem Prüfungsausschuss oder einem Fachvertreter an einer anderen Hochschule nicht bereits zur Überprüfung vorgelegen hat.

Hiermit erkläre ich, dass ich für die Dissertation folgende Hilfsmittel und Hilfen verwendet habe:

Alle Hilfsmittel sind in den betreffenden Studien angegeben. Dies betrifft insbesondere Datenbanken mit Unternehmensdaten, welche an der Freien Universität öffentlich bzw. über das RDC zugänglich sind. Hier sind insbesondere die DAFNE[®] Datenbank, DATASTREAM[®] sowie COMPUSTAT[®] zu nennen. Darüber hinaus wurden für die erste Studie Daten von der Deutschen Börse erworben. Weitere Datenquelle war der elektronische Bundesanzeiger, der ebenfalls öffentlich zugänglich ist. Statistische Auswertungen erfolgten mit der Software STATA[®].

Auf dieser Grundlage habe ich die Arbeit selbstständig verfasst.

Berlin, den 21.10.2017

Monika Riediger