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Are banks using hidden reserves to beat earnings benchmarks? Evidence from Germany

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Abstract

Section 340f of the German Commercial Code allows banks to provision against the special risks inherent to the banking business by building hidden reserves. Beyond risk provisioning, these reserves are implicitly accepted as an earnings management device. By analyzing financial statements of German banks for the period 1995 through 2009, we see these hidden reserves being used to (1) avoid a negative net income, (2) avoid a drop in net income compared to the previous year, (3) avoid a shortfall in net income compared to a peer group, and (4) reduce the variability of banks' net income over time. We (5) find a diminished relevance of avoiding a drop in net income as well as a shortfall relative to the peer group during the financial crisis. Finally, we are (6) unable to confirm any differences in the relevance of hidden reserves for earnings management between listed and non-listed banks.

Keywords: Earnings management, Income smoothing, Hidden reserves, Prospect theory, Financial institution.

JEL classification: C23, G21, M41.

Non-technical summary

Section 340f of the German Commercial Code (*Handelsgesetzbuch*) allows banks to provision against the special risks inherent to the banking business by building hidden reserves (henceforth: 340f reserves). They are built by understating the value of certain types of assets (customer and interbank loans, fixed-income securities, securities bearing variable interest and stocks) designated to the so-called "liquidity reserve". The amount of 340f reserves must not exceed 4% of the understated items' original value. They are referred to as "hidden", because no information on the level of (or changes in) these reserves is visible from banks' financial statements. The decision to create such reserves is the responsibility of the bank management. Beyond their risk provisioning function, 340f reserves are implicitly accepted as an earnings management device, enabling bank representatives to manage net income and earnings.

In our study, in which we analyze financial statements of German banks for the period 1995 through 2009, we investigate to what extent discretion is exerted by bank managers when using 340f reserves. In more detail, we examine whether 340f reserves are managed to reach certain income targets derived from prospect theory. Our results are as follows.

- Banks with a negative net income pre-340f release 340f reserves to a larger extent than other banks. Thus, managers try to avoid presenting a negative net income in the financial statements of their banks.
- Banks with a pre-340f net income below their own previous year's level release 340f reserves to a larger extent than other banks. Thus, managers try to avoid presenting a drop in net income in the financial statements of their banks.
- Banks with a pre-340f net income below the level of their peer group release 340f reserves to a larger extent than other banks. Thus, managers try to avoid presenting a drop in net income compared to their peers in the financial statements of their bank.
- Banks with a high (low) non-discretionary income release 340f reserves to a lower (larger) extent. Thus, managers over time try to reduce the variability of net income as presented in the financial statements of their banks.
- The relevance of using 340f reserves to reach the own previous year's as well as the peer group's income level diminishes during the financial crisis of 2007 to 2009.

Nichttechnische Zusammenfassung

Kreditinstituten ist nach § 340f Handelsgesetzbuch die Bildung einer "Vorsorge für allgemeine Bankrisiken" (im Folgenden: 340f-Reserven) durch Unterbewertung bestimmter Vermögensgegenstände (Kunden- und Interbankenkredite, Schuldverschreibungen, andere festverzinsliche Wertpapiere, Aktien sowie variabel verzinsliche Wertpapiere) der Liquiditätsreserve gestattet. Die Höhe dieser Reserven darf 4% des ursprünglichen Wertes der unterbewerteten Vermögensgegenstände nicht überschreiten. 340f-Reserven sind "still", da dem Jahresabschluss keinerlei Informationen über deren Existenz entnommen werden können. Dem Bankmanagement, dem allein die Entscheidung über die Bildung dieser Reserven obliegt, eröffnen sie Möglichkeiten zur gezielten Steuerung des Jahresüberschusses.

In unserer Studie, durchgeführt auf Basis der Jahresabschlüsse deutscher Banken im Zeitraum 1995 bis 2009, untersuchen wir das Ausmaß der Ausnutzung diskretionärer Spielräume im Hinblick auf 340f-Reserven durch das Bankmanagement. Im Detail analysieren wir, ob diese Reserven zur Erreichung bestimmter Ziele hinsichtlich des Jahresüberschusses, abgeleitet aus der Neuen Erwartungstheorie, eingesetzt werden. Unsere Ergebnisse sind wie folgt:

- Banken mit einem negativen Jahresüberschuss vor 340f lösen in stärkerem Maße 340f-Reserven auf als andere Banken. Offenbar versuchen Bankmanager, den Ausweis eines negativen Jahresüberschusses zu vermeiden.
- Banken mit einem Jahresüberschuss vor 340f unterhalb des eigenen Vorjahresniveaus lösen 340f-Reserven in stärkerem Maße auf als andere Banken. Offenbar versuchen Bankmanager, den Ausweis eines gegenüber dem Vorjahr verringerten Jahresüberschusses zu vermeiden.
- Banken mit einem Jahresüberschuss unterhalb des Niveaus ihrer direkten Mitbewerber lösen in stärkerem Maße 340f-Reserven auf als andere Banken. Offenbar versuchen Bankmanager, den Ausweis eines Jahresüberschusses unterhalb des Niveaus der Mitbewerber zu vermeiden.
- Banken mit einem hohen (niedrigen) nicht-diskretionären Jahresüberschuss lösen in geringerem (höherem) Maße 340f-Reserven auf als andere Banken. Offenbar versuchen Bankmanager, so die Variabilität der Jahresüberschüsse ihrer Banken im Zeitablauf zu verringern.
- Die Relevanz der Nutzung von 340f-Reserven zur Erreichung der genannten Ziele hinsichtlich des Jahresüberschusses verringert sich in Zeiten der Finanzkrise spürbar.

Contents

Are Banks Using Hidden Reserves to Beat Earnings Benchmarks? Evidence from Germany*

1. Introduction

Earnings (also referred to as net income here) are key determinants for evaluating the performance of financial institutions (JPMorgan Chase & Co. (2006), p. 7; Deutsche Postbank AG (2007), pp. 4-5). It is therefore worthwhile to investigate whether bank managers shape income figures for earnings management or income smoothing,[1] which is in accordance with Leung and Zhao (2001) defined here as the "purposeful intervention in [...] reporting earnings [...] to achieve a target level".

In our study, we take advantage of the opportunity for banks to build hidden reserves according to section 340f of the German Commercial Code (henceforth: "340f reserves") to examine whether managers of financial institutions exhibit (benchmark-beating) earnings management behavior. More specifically, we investigate whether bank managers use 340f reserves to reach[2] zero earnings, zero earnings changes or a peer group earnings level as well as to reduce earnings variability over time.

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[1] Income smoothing (i. e. the reduction in the fluctuation of an income stream over time) simply denotes a special form of earnings management (Trueman and Titman (1988)).

[2] Managers may certainly be interested in exceeding each benchmark rather than merely reaching it. Nevertheless, to be consistent with the literature we refer to "reaching" each target throughout the paper.

340f reserves are meant to allow provisioning against specific risks inherent to the banking business. They are supposed to sustain depositors' confidence in the whole banking system by helping banks to conceal from the public abrupt leaps in net income and present a stable income stream instead. Besides being hidden, the fact that they are subject to only few legal restrictions is the second characteristic of 340f reserves with primary relevance to our study.

Based on a panel of 3,643 German banks derived from the BAKIS database of the Deutsche Bundesbank for the period from 1995 through 2009, we see that bank managers use 340f reserves to (1) avoid a negative net income, (2) avoid a drop in net income compared to the previous year, (3) avoid a shortfall in net income compared to a peer group, and (4) reduce the variability of banks' net income over time. We (5) find a diminished relevance of avoiding a drop in net income as well as a shortfall relative to the peer group during the financial crisis. Finally, we are (6) unable to confirm any differences in the relevance of hidden reserves for earnings management between listed and non-listed banks.

With respect to the investigated instrument, our study is closely related to Leung and Zhao (2001), who analyze consequences of the elimination of so-called inner reserves (which have quite similar characteristics to 340f reserves) from banking legislation in Hong Kong in 1994. Being the first to investigate the use of 340f reserves in banks, our study helps regulators in evaluating the role of 340f reserves in making banks less risky.

From an accounting researcher's perspective, our investigation adds fruitful insights to the existing literature in very different respects. McNichols *et al.* (1988) as well as McNichols (2000) point out the importance of correctly isolating the discretionary from the non-discretionary component of major accruals when examining their use for earnings management in banks. Several studies (Wahlen (1994); Liu *et al.* (1997); Ahmed *et al.* (1999); Lobo and Yang (2001); Anandarajan *et al.* (2007); Kanagaretnam *et al.* (2009, 2010)) try to adequately model these two

components with respect to loan loss provisions (LLP). As detailed regulations on building 340f reserves are lacking, this still unresolved issue can be circumvented here. Thus, 340f reserves provide a nearly experimental setting to examine how managerial discretion is exerted in banks. Accordingly, as the first contribution to the literature our study may help to shed light on separating the discretionary from the non-discretionary component of banks' major accruals.

In early studies (Trueman and Titman (1988); Degeorge *et al.* (1999)), motives behind earnings management behavior are mostly examined theoretically. Following up, several authors reveal the existence of incentives to meet or beat certain earnings benchmarks by looking at the distributions of net income across a large number of firms and identifying certain threshold values (Hayn (1995); Burgstahler and Dichev (1997); Matsunaga and Park (2001); McVay (2006)). This idea has been transferred to the banking industry by Shen and Chih (2005), who find that bank managers aim at reaching (at least) zero earnings or zero earnings changes relative to the previous year. As the second contribution to the existing literature, we add an additional benchmark that has been completely neglected so far by revealing that bank managers also aim at reaching a peer group's earnings level.

Most studies investigating the relevance of earnings benchmarks exclusively ask why (i. e. with what objective) earnings are managed. By contrast, the vast majority of studies on earnings management via LLP in the banking industry (as introduced above) merely address the issue how (i. e. by means of what instrument) earnings are managed. As our third contribution to the literature, we simultaneously shed light on the questions of why *and* how earnings are managed by investigating a specific instrument and focusing on certain earnings benchmarks at the same time. Adding to the literature in a fourth way, we exploit the vast dominance of non-listed banks in the German banking market and thus enhance understanding of earnings management incentives in not publicly-held firms (Beatty *et al.* (2002)). Finally, we join Alali and Jaggi (2010)

by being among the first to provide evidence on changes in earnings management behavior of banks brought about by the turmoil of the recent financial crisis.

We proceed by introducing the institutional background to our study in Section 2. The empirical hypotheses are derived in Section 3. Section 4 contains the empirical analysis, starting with the data and variable description (4.1) and followed by descriptive statistics (4.2) as well as the multivariate analysis (4.3). We provide some concluding remarks in Section 5.

2. Institutional background

2.1. Characteristics of 340f reserves

One of several peculiarities in the German financial accounting regulations for banks is the opportunity to build hidden (so-called) 340f reserves. They were introduced into German law by means of section 340f German Commercial Code ("HGB") in 1993 as a transformation of the 1986 European Commission Bank Accounts Directive. Since this directive aimed at harmonizing banks' financial reporting and increasing its transparency throughout the European Community (EC), several member states called for the withdrawal of the permission to create hidden reserves (previously established by section 26a of the German Banking Act) throughout Europe. However, largely due to German tenacity, the permission was finally retained (encompassing slightly stronger restrictions). As part of this compromise, it had to be accompanied by allowance for banks to build visible "Reserves for General Banking Risks". Thus, both the hidden and the visible way to provision against specific banking risks currently coexist in Germany. Neither IFRS nor US-GAAP contain similar regulations.

Bieg (1999) and others in favor of these reserves argue that hidden 340f reserves were particularly appropriate in provisioning against these bank-specific risks, because they provide the chance to conceal abrupt leaps in net income from uninformed depositors. Those might otherwise call the economic soundness of single banks or – at worst – the whole banking system into question. Thus, the drawback of hidden 340f reserves being potentially used as an earnings management device is accepted mainly to promote financial stability.

Being a major accrual in German banks (see Figure 2 in Section 4.3.1), 340f reserves are built by understating the value of customer and interbank loans as well as bonds, other fixed-income securities, shares and securities bearing variable interest that are designated to the "liquidity reserve" (as a special asset category for banks). However, in contrast to LLP these reserves do not have to be linked to the risks inherent in the assets they are built upon.

As the only major restriction, the level of existing 340f reserves must not exceed 4% of the sum of the understated items' original value (henceforth called the valuation basis). To ensure the hidden character of 340f reserves, banks are given permission to cross-compensate certain parts of their P&L that relate to income or expenses from (i) depreciation and (ii) appreciation of customer and interbank loans as well as (iii) depreciation and (iv) appreciation of securities of the liquidity reserve. Consequently, German banks widely report a single income (or expense) figure potentially reflecting success or failure in two very different lines of business of major importance to banks. Since 340f reserves may be built by undervaluing one or more positions of the valuation basis, their changes cannot be traced from the P&L and their current level is not visible on the balance sheets either. Banks also do not have to disclose information on these reserves either in the notes or the management report.[3] It has solely to be provided to auditors and supervisors, who also monitor compliance with the mentioned 4% limit. However,

[3] Following Krumnow *et al.* (2004), disclosure needs arise if a true and fair view on the actual economic situation of a bank is extremely distorted. In our panel, a vanishingly low share of banks discloses such information.

as long as this is met, managers by no means have to justify their decisions regarding 340f reserves. They are not tax-deductible, meaning that a bank's income is changed by exactly the change in these reserves. However, tax statements are not publicly available, and therefore depositors and investors are unable to use those for revealing information on 340f reserves. It is worth noting that the permission to create these hidden reserves exists in addition to (and not as a compensation for) that for building general and specific LLP. Finally, the fact that 340f reserves are acknowledged as tier 2 capital is of minor importance to our study, which is mainly concerned with their use for earnings management.

To sum up, depositors and investors are completely unaware of the extent to which 340f reserves exist and what they are used for. Adding to this the fact that they are subject to only few legal restrictions emphasizes the tremendous amount of managerial discretion contained therein. As already mentioned, we will mainly examine this discretion with respect to earnings management. Even though our results may be statistically significant in indicating the use of 340f reserves also for regulatory capital management, we do not deem this to be relevant because these reserves are only acknowledged as tier 2 capital, whose amount is trimmed by the level of existing tier 1 capital.

2.2. Earnings management incentives in German banks

According to Fudenberg and Tirole (1995), concerns about the management's job security, which largely depends on bank performance, are the primary earnings management motive. Most existing empirical studies assume bank performance to be merely relevant in a capital market-dominated setting for the following reasons. A stable and smooth income stream is supposed to favorably affect share prices, which in turn is the key measure of management performance and has compensation closely tied to it. Earnings management thus fosters the managers' positions

and increases their personal income as well. As these consequences only arise if banks are listed, the existence of earnings management incentives in non-listed institutions is frequently questioned (Beatty *et al.* (2002)). The German banking market, with its vast dominance of non-listed institutions, differs considerably in this regard from the one in the U.S. Therefore, this section explains the key characteristics of the German banking market and explains why earnings management is relevant in this setting nevertheless.

The vast majority of banks in Germany, which are usually grouped into three categories mainly with respect to their legal status, are universal banks. Regarding the number of existing institutions, the largest category is made up of credit cooperatives (henceforth: *Coops*). 1,157 *Coops* at year-end 2009 held cumulative total assets of about 690 billion euro.[4] The major source of core equity of those rather small and locally operating banks are cooperative shares held by their members. These are entitled to receive a cooperative dividend, which is, similar to credit unions in the U.S., not considered to be the main motive for acquiring a cooperative share. As the most important characteristic with respect to earnings management incentives, shares of *Coops* are not exchange-traded and they can only be returned to the bank in exchange for their face value. Accordingly, members do not participate in any increase in the company's value. *Coops* are not active on equity capital markets and most of their debt capital is provided by depositors. They prepare their financial statements according to HGB rather than IAS/IFRS. Following several mergers throughout the years, currently two cooperative central institutions (holding cumulative total assets of 249 billion euro at year-end 2009) are left to service small *Coops* in their business with large clients or support German firms in their foreign activities. Being public banks purely regarding the legal form, their shares are exclusively held by the local *Coops*. Even though they are much larger in size and very different with respect to their business model, they are, due to their strong orientation towards this category, frequently assigned to *Coops*. This is how we categorize them in our empirical analysis.

[4] For all data in this section, see Deutsche Bundesbank (2010), pp. 10-15.

In numbers, the second-largest category of banks in Germany are savings banks (henceforth: *Savings Banks*), of which the existing 431 institutions held cumulative total assets of about 1,073 billion euro at year-end 2009. Being on average larger than an average *Coop*, each *Savings Bank* is still rather small on an absolute scale. They are also mainly active in their home region, with a focus on traditional lending and borrowing. A major difference to *Coops* arises from the fact that *Savings Banks* are usually owned by only a small group of cities and counties in their region. Their debt capital is largely provided by depositors. The vast majority of *Savings Banks* also reports according to HGB. At year-end 2009, ten so-called "Landesbanken" (holding 1,458 billion euro of cumulative total assets) service *Savings Banks* in their business with large clients or support German firms in their foreign activities. In terms of their business model, these banks are somewhat similar to the cooperative central institutions. "Landesbanken" are usually partly owned by the *Savings Banks* in their region and partly by the government of the federal state they are located in. This and the banks' strong orientation towards institutions in this category makes us assign them to *Savings Banks* (as frequently done in other studies as well). It is important to note that maintenance obligation ("Anstaltslast") and guarantee obligation ("Gewährträgerhaftung"), which had to be abolished owing to incompatibilities with European competition regulation at the end of 2005, had until then been shielding savings banks as well as "Landesbanken" against insolvency. In the event of financial distress, the government would have had to step in and secure a struggling bank's survival.

The third category of banks in the German banking market, *Commercials*, comprises rather heterogeneous institutions. On the one hand, there are privately held as well as regional banks. They are mostly somewhat small in size, with an operating area restricted to their home region. At year-end 2009, 170 of those banks held cumulative total assets of 717 billion euro. They are partly manager-owned and partly listed institutions. In addition, we assign the four German money-center banks (holding 1,292 billion euro of cumulative total assets at year-end 2009) to this category. The fact that they are listed yields a widely spread (institutional and private)

ownership, and they are also much more active on debt capital markets compared to the local banks in this and the other categories.

In contrast to (many) *Commercials*, neither *Coops* nor *Savings Banks* are followed by analysts' forecasts. Nor do they give precise announcements on their future performance themselves. Moreover, performance-based compensation is of secondary importance to them. Adding to this the fact that they are generally not listed casts doubt on the existence of earnings management incentives within those categories. However, at least three reasons give strong support to conjecture that earnings management is also relevant in those two categories. First, a questionable performance will – certainly in the long run – lead to interference by the owners and, ultimately, dismissal of the management also in *Coops* and *Savings Banks*. Second, following a bad bank performance both the central organization of the cooperative banking group (for *Coops*) and the German Savings Banks Association (for *Savings Banks*) may take action against a bank's managers as one way to protect the reputation of their organizations. Third, managers are likely to try to establish a positive personal track record with respect to the performance of banks under their stewardship, as acquisition of successful managers by larger banks (in particular within the same category) is quite common. Thus, earnings management incentives should be spread throughout banks in all three categories of the German banking market.[5] To corroborate this (economic) line of argument, we pre-empt our empirical analysis by looking at Figure 1. It displays the distribution of net income (as the bottom line of the P&L) as percent of total assets across all banks in our sample.

It reveals a tremendous discontinuity in the income distribution for all negative values of net income, with only 175 (out of 20,439) observations presenting a negative net income at all. It is highly unlikely that such a distribution occurs without exertion of managerial discretion on

[5] Since we exclude special institutions (such as home loan banks, mortgage banks, securities trading banks and subsidiaries of foreign banks) from our samples due to their different nature, we refrain from presenting their characteristics in more detail.

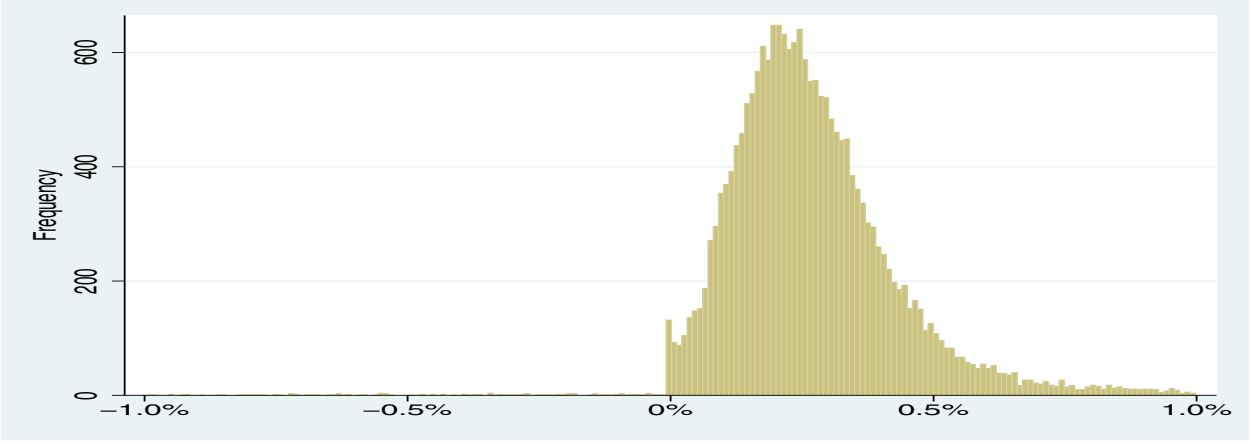

Figure 1: Net income as % of total assets.

Note: The distribution interval width is chosen as 0.02%. "Frequency" refers to the number of observations in each interval. 175 observations exhibit a negative net income, 110 observations show a zero net income, and the remaining 20,154 observations have a positive net income on the bottom line of the income statement.

the banks' non-discretionary income stream. This strong (albeit preliminary) evidence supports our economic reasoning of earnings management taking place also in a setting dominated by non-publicly held banks.

3. Hypotheses

Existing empirical evidence reveals that managers apply earnings management techniques to achieve predefined income targets (Burgstahler and Dichev (1997); DeFond and Park (1997); Degeorge *et al.* (1999)). The rationale for such behavior is provided by Kahneman and Tversky (1979) in their prospect theory, which shows that individuals' value functions are S-shaped, i. e. convex in losses and concave in gains. Accordingly, a decrease in value is greatest when switching from a gain to a loss relative to a reference point (also called target). The validity of these key findings for the banking industry was first examined by Shen and Chih (2005). In their context, which is closely related to ours, the individuals are depositors and investors, who evaluate bank performance by looking at income numbers and their development over time.

As the first and most intuitive income target, managers wish to avoid a negative net income (i. e. reach zero net income) in the financial statements. We will henceforth also refer to this as the incentive to reach the "zero earnings target". From a macroeconomic perspective, presenting a negative net income raises questions concerning the economic soundness of banks, ultimately leading to an increased demand for regulation in the public. From a microeconomic perspective, owners may want to exert increased influence on the bank's business following the presentation of a loss. Both restrict managerial freedom of decision-making. We therefore follow Shen and Chih (2005) in arguing that managers have strong incentives to preserve stakeholders' confidence in their bank by preventing presentation of a negative net income. Therefore, we hypothesize:

Hypothesis 1 (*H1*). *Having a negative net income pre-340f*[6] *is positively correlated with the extent of a release of 340f reserves.*

Achieving income targets other than zero is certainly relevant to bank managers, too. These may be set by management announcements or analysts' reports on the expected future performance of a bank (McVay (2006)). However, since neither *Savings Banks* nor *Coops* are followed by financial analysts or give precise future earnings announcements, we do not investigate the effects of explicit announcements any further. A more relevant earnings target is set by the bank's performance in the previous accounting period. Accordingly, managers have incentives for avoiding a drop in net income, which we henceforth also refer to as the incentive to reach the "zero earnings changes target". Being mainly relevant to listed German banks, investors interpret perennial slight increases in net income – particularly if transferred into moderately rising annual dividends – as a sign of the management's confidence in future earnings prospects (Lintner (1956), Benartzi *et al.* (1997)). Stock prices and thus also the bank's value are likely to rise following a consecutive dividend increase. This, in turn, strengthens the management's position. By contrast, falling short of the previous period's earnings level induces investors

[6] Henceforth, "*net income pre-340f*" refers to net income before consideration of the yearly change in 340f reserves, whereas "*net income post-340f*" denotes net income as the bottom line of the P&L.

(depositors) to turn away from the bank in search of a more profitable (secure) alternative. For non-listed banks, the rationale for reaching the zero earnings changes target holds for another reason. As noted by DeFond and Park (1997), achieving at least the previous year's earnings level reduces the threat of dismissal or interference by owners, regulators and other stakeholders. Accordingly, we hypothesize:

Hypothesis 2 (*H2*). *Having a net income pre-340f below its own previous year's income level is positively correlated with the extent of a release of 340f reserves.*

Both the zero earnings and the zero earnings changes targets have been examined extensively in the past. As one major contribution of this study to the literature, we define (and test) a third income target by interpreting the prospect theory in a broader sense. Therefore, we substitute the presented (company-specific) zero earnings changes target by a combination of an industry with a regional benchmark. In addition to evaluating bank performance with respect to the previous period's earnings of the same bank, we believe that stakeholders also take into account the performance relative to a peer group of banks in the same region (Kanagaretnam *et al.* (2003)). Therefore, managers are inclined to avoid a shortfall in net income compared to a peer group, which we will henceforth also refer to as the "peer group earnings target".[7] Thus, we hypothesize:

Hypothesis 3 (*H3*). *Having a net income pre-340f below the previous year's income level of its peer group is positively correlated with the level of a release of 340f reserves.*

The final motive to be investigated in this study is not related to reaching any specific income target. Rather, it refers to earnings management behavior in the course of time. The managerial objective to present a stable income stream, besides achieving particularly the zero earnings target, also involves avoiding extremely high levels of net income in years of outstanding economic

[7] Details on our way of defining the peer group performance are described in Section 4.1.

well-being. Accordingly, managers consider both current and expected future performance in terms of unmanaged or non-discretionary income (i. e. income before reserve creation, provisions and taxes). For instance, if current unmanaged income is relatively low (high), but future unmanaged income is predicted to be relatively high (low), managers may release (build) 340f reserves. Thus, in times of economic prosperity they "save" income by building 340f reserves to be able to "consume" it during periods of bad performance. Accordingly, managers are inclined to reduce the variability of the net income of their banks over time. Doing so is supposed to lower the cost of capital as well as the perceived probability of bankruptcy of financial institutions (Barth *et al.* (1995); Kanagaretnam *et al.* (2004)). Thus, finally, we hypothesize:

Hypothesis 4 (*H4*). *A bank's non-discretionary income is negatively correlated with the extent of a release of 340f reserves.*

4. Empirical analysis

4.1. Data and variables

For our empirical analysis, we use data from the Deutsche Bundesbank's prudential database BAKIS for the years 1994 through 2009. BAKIS is the information system on bank-specific data which is jointly operated by the Deutsche Bundesbank and the German Financial Supervisory Authority (Memmel and Stein (2008)). The database contains information on the financial statements and supervisory reports of individual German banks, and is therefore unique. Our initial sample consists of 40,870 observations from 5,377 banks[8] for the years 1994 through 2009. Due to a lack of values in important variables used in our analysis, we lose 10,351 observations.

[8] This figure is higher than the actual number of existing banks because, in the case of (frequently occurring) mergers, we, technically speaking, created a new bank independent of the merging ones. This new bank starts operating in the year of the merger.

Moreover, due to first differencing of some of the variables and using second lags of our variables in our dynamic panel data estimations requires us to neglect a further 10,080 observations. Therefore, our final panel dataset consists of 20,439 observations of 3,643 banks.

We analyze unconsolidated accounts prepared according to HGB, which is appropriate because the vast majority of banks in our sample (primarily referring to *Savings Banks* and *Coops*) do not prepare consolidated accounts at all, and the unconsolidated ones are used to evaluate management performance as well as to determine managerial compensation.

In most parts of our analysis we divide the German banking market into three different categories: *Coops*, *Savings Banks* and *Commercials*. We exclude other types of financial institutions such as home loan banks, mortgage banks or securities trading banks because they either do not meet the definition of a bank according to section 1 of the German Banking Act or they do not conduct core banking business such as lending and borrowing.

Table 1 gives detailed information on the number of banks observed in our final panel and the split between bank categories by year. Our sample is clearly dominated by *Coops*, whereas *Savings Banks* and particularly *Commercials* are – in terms of numbers – of only minor importance. The fact that the number of observations in each category is considerably smaller at the end than at the beginning of our sample period reflects persistently high numbers of mergers (particularly within *Savings Banks* and *Coops*) in the German banking market.

Table 2 reveals the number of banks using 340f reserves and how this use changes over time. "Use" in this context means that an observation either holds a positive level of 340f reserves at year-end, or it released its total amount of 340f reserves that existed at the beginning of the year. The main conclusions to be drawn from Table 2 are threefold. First, more than 99% of banks in our sample make use of 340f reserves. Second, those using them much more often increase or leave the level of existing reserves unchanged rather than releasing it. Third, the

	Coops		*Savings Banks*		*Commercials*		Total	
Year	No.	Row%	No.	Row%	No.	Row%	No.	Col.%
1997	1,750	76.19	513	22.33	34	1.48	2,297	11.24
1998	1,637	74.21	536	24.30	33	1.50	2,206	10.79
1999	1,421	71.91	525	26.57	30	1.52	1,976	9.67
2000	1,131	67.77	501	30.02	37	2.22	1,669	8.17
2001	989	66.29	462	30.97	41	2.75	1,492	7.30
2002	917	65.64	434	31.07	46	3.29	1,397	6.83
2003	886	67.33	391	29.71	39	2.96	1,316	6.44
2004	915	68.85	375	28.22	39	2.93	1,329	6.50
2005	957	70.99	359	26.63	32	2.37	1,348	6.60
2006	1,001	71.60	363	25.97	34	2.43	1,398	6.84
2007	1,020	73.07	342	24.50	34	2.44	1,396	6.83
2008	1,006	73.11	339	24.64	31	2.25	1,376	6.73
2009	936	75.54	276	22.28	27	2.18	1,239	6.06
Total	14,566	71.27	5,416	26.50	457	2.24	20,439	100.00

Table 1: Number of observations in the panel by bank category and year.

Note: *Savings Banks* (*Coops*) contains local savings as well as "Landesbanken" (local cooperative banks and cooperative central institutions). *Commercials* comprises privately held and regional banks as well as the German money-center banks. "No." gives the number of observations in our panel by category and year. "Row%" reveals the share of each bank category on the overall number of observations in our panel by year. "Total No." displays the overall number of observations by year. "Total Col.%" gives the share of observations by year on the overall number of observations in our panel by year.

share of banks releasing 340f reserves reaches peaks in 2000 and, in particular, in 2008. The latter peak is conclusively explained by banks trying to counterbalance adverse effects on their returns caused by the financial crisis. However, the peak in 2000 is somewhat surprising and potentially due to early reactions to the turmoil caused by the bursting of the dotcom bubble at the turn of the millennium.

To analyze earnings management behavior by means of 340f reserves, we use $REL\_340f_{i,t}^{RES}$, which is the release of 340f reserves of bank i at the end of year t as percent of their beginning-of-year t level, as the dependent variable in all our regression models. Scaling by the beginning-of-year level of these reserves (rather than by total assets as used for many other variables) is most appropriate to clearly capture the strengths of underlying earnings management incentives. A negative value of this variable means that a bank has built (instead of released) 340f reserves in

		of which		of which					
		Use of 340f		Release		Increase		No change	
Year	Obs.	No.	Row. %	No.	Row. %	No.	Row. %	No.	Row. %
1997	2,297	2,285	99.48	165	7.22	1,563	68.40	557	24.38
1998	2,206	2,189	99.23	163	7.45	1,461	66.74	565	25.81
1999	1,976	1,968	99.60	218	11.08	1,256	63.82	494	25.10
2000	1,669	1,657	99.28	229	13.82	1,037	62.58	391	23.60
2001	1,492	1,479	99.13	173	11.70	1,064	71.94	242	16.36
2002	1,397	1,385	99.14	153	11.05	1,070	77.25	162	11.70
2003	1,316	1,310	99.54	126	9.62	1,015	77.48	169	12.90
2004	1,329	1,322	99.47	63	4.77	1,133	85.70	126	9.53
2005	1,348	1,341	99.48	45	3.36	1,160	86.50	136	10.14
2006	1,398	1,392	99.57	54	3.88	1,217	87.43	121	8.69
2007	1,396	1,394	99.86	129	9.25	988	70.88	277	19.87
2008	1,376	1,374	99.85	298	21.69	809	58.88	267	19.43
2009	1,239	1,235	99.68	26	2.10	1,130	91.50	79	6.40
Total	20,439	20,331	99.47	1,842	9.06	14,903	73.30	3,571	17.64

Table 2: Activities regarding 340f reserves over time.

Note: "Obs." contains the overall number of observations in our panel by year. "Use of 340f" reveals the number of observations ("No.") as well as the percentage in relation to the overall number of observations in our panel ("%") that use 340f reserves by year. "Use" in this context means that an observation is either holding a positive level of 340f reserves at year-end, or it released its total amount of 340f reserves existing at the beginning of the year. "Release" gives the number of observations that release 340f reserves by year as well as the percentage of observations doing so. Please note that this and the following percentages are calculated in relation to the observations using 340f reserves (rather than to the overall number of observations) by year. "Increase" reports the number (as well as the percentage) of observations that increase their level of 340f reserves by year. "No change" gives the number (as well as the percentage) of observations that did not change their level of 340f reserves by year.

the corresponding year. If, by contrast, $REL\_340f_{i,t}^{RES}$ has a positive value, the binary variable $D\_REL\_340f_{i,t}$ equals 1, and 0 otherwise.

Regarding *H1* (referring to the zero earnings target), $D\_LOSS_{i,t}$ is a binary variable which equals 1 if bank i in year t has a negative net income pre-340f, and 0 otherwise. It is worth noting that all target-related binary variables equal 1 if the target is achieved, but not exceeded. Accordingly, $D\_LOSS_{i,t}$ is 1 if net income pre-340f < 0 and 0 if net income pre-340f ≥ 0.

Regarding *H2* (addressing the zero earnings changes target), $D\_PREV_{i,t}$ is a binary variable which equals 1 if bank i in year t has a net income pre-340f below its own previous year's level, and 0 otherwise.

With respect to *H3* (referring to the peer group earnings target), $D\_PEER_{i,t}$ equals 1 if bank i in year t has a net income pre-340f (as percent of total assets) below the average previous year's level (scaled by mean total assets) of its peer group, and 0 otherwise. We use the previous period's peer group income as the best available estimate of current performance, since contemporaneous information on the performance of peer group banks is not usually available to a competitor's management. We define the relevant peer group differently for different categories of banks in our sample. For *Coops* and *Savings Banks*, we consider the peer group as being all banks located in the same administrative district ("Regierungsbezirk"), regardless of which of the two categories an observation belongs to. Using this definition also for *Commercials* would (probably) not adequately capture their relevant peer groups, because these banks frequently operate nationwide. Therefore, we determine the peer group for *Commercials* as being all banks in this category. We are aware that both ways of defining a peer group can only crudely capture actual managerial behavior, because managers presumably take the precise income levels of one or two close-by banks rather than the average income level of all banks in their peer group as

their relevant benchmark. However, from our point of view the approach taken here is the best way to proxy existing peer group pressure.

With respect to *H4* (addressing a reduction in the income variability over time), $NIBRPT_{i,t}^{TA}$ is defined as the non-discretionary income (i. e. income before reserves' creation, provisions and taxes)[9] of bank i at the end of year t as percent of its beginning-of-year t total assets.[10]

We take into account a potential use of 340f reserves for regulatory capital management in two alternative ways. First, banks may release 340f reserves to indirectly enhance their following period's tier 1 capital ratio. Releasing these reserves increases net income, which in turn raises the following period's equity, particularly if large parts of net income are retained rather than distributed to the owners in the corresponding year. Since equity is acknowledged as tier 1 capital, the corresponding ratio rises. Second, banks may try to directly enhance their tier 2 capital by increasing 340f reserves. We use $CHTIER1_{i,t}$ ($CHTIER2_{i,t}$) as the change in the level of tier 1 (tier 2) capital of bank i from year $t-1$ to t as percent of its beginning-of-year t risk-weighted assets to account for both effects,[11] and we expect to see a negative (positive) correlation with $REL\_340f_{i,t}^{RES}$.

Besides variables necessary for detecting managerial discretion, we have to take into account the risk provisioning function of 340f reserves. We follow Lobo and Yang (2001) and others in using a broad set of risk-related variables. We include $CHCL_{i,t}^{TA}$, which is the change in the ratio of customer loans to total assets of bank i from year $t-1$ to t as percent of beginning-of-year t total assets. This variable measures changes in credit risk arising from an expansion of the loan portfolio. Therefore, we expect to see a negative association with a release in 340f reserves.

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9 A similar definition of non-discretionary income is commonly used. However, since 340f reserves are not tax-deductible, taxes in our case could arguably be added to this non-discretionary income number.

10 In line with most previous studies, we consistently scale all flow variables by the beginning-of-year value of the corresponding denominator, whereas for all stock variables the end-of-year value of the corresponding year is used. This prevents potential problems of endogeneity.

11 The yearly change in 340f reserves is excluded from tier 2 capital to prevent endogeneity.

$LLA^{TA}_{i,t-1}$ is the level of the loan loss allowance of bank i at the end of year $t-1$ as percent of its end-of-year $t-1$ total assets. The loan loss allowance (as the accumulation of LLP of the preceding periods) represents ex-post credit risks, for which provisions ideally have already been built. Therefore, most studies on the use of LLP assume a negative correlation between this variable and risk provisions. However, the fact that 340f reserves are meant to account for risks more generally than LLP may cause the correlation with $REL\_340f^{RES}_{i,t}$ to be negligible.

Moreover, we include $LLP^{TA}_{i,t}$, which is the amount of specific LLP built by bank i throughout year t as percent of its beginning-of-year t total assets. The use of LLP for earnings management revealed in many previous studies gives rise to simultaneity concerns between $LLP^{TA}_{i,t}$ and $REL\_340f^{RES}_{i,t}$. To adequately address these, we apply a dynamic generalized method of moments estimation technique (Blundell and Bond (1998)) with Windmeijer (2005) correction. Doing so enables us to instrument the association between $LLP^{TA}_{i,t}$ and $REL\_340f^{RES}_{i,t}$ with the help of an exogenous variable. A "good" instrument should be relevant and valid at the same time (Baum *et al.* (2003)), meaning that it should be correlated with the endogenous regressor ($LLP^{TA}_{i,t}$), while being orthogonal to the residuals of the regression. Whereas the former condition is easily verifiable by looking at the correlation between the endogenous and the instrument variable, the latter is subject to thoughtful economic considerations.

We are confident that $CHNPL_{i,t}$, which is the change in the non-performing loans of bank i from year $t-1$ to t as percent of its beginning-of-year t volume of customer loans,[12] satisfies both conditions for being an adequate instrument. First, the correlation of this NPL ratio with LLP is usually found to be strong (Kanagaretnam *et al.* (2004); Adams *et al.* (2009)), since LLP are built for each loan that is classified as non-performing. Table 6 confirms this for our sample at a considerable level of 0.4415. If banks already react to changes in non-performing loans by adjusting their LLP, there is no need to further provision for these by means of 340f

[12] Loans are non-performing if the payment of principal or interest is overdue by at least 90 days.

reserves. Therefore, we quite reasonably believe the orthogonality condition between $CHNPL_{i,t}$ and $REL\_340f_{i,t}^{RES}$ to hold.[13]

To account for 340f reserves potentially being used as provisions for market risk exposure, we include $CHOBS_{i,t}^{TA}$, which is the change in off-balance sheet activities of bank i from year $t-1$ to t as percent of its beginning-of-year t total assets.

As a measure not directly related to any of the risk types, we add $ZSCORE_{i,t}$ to our regression models. This z-score is calculated as the ratio of capital and profits of bank i at the end of year t to the standard deviation of profits of bank i over time, each position measured relative to total assets of bank i (Boyd *et al.* (1993)).[14] A higher z-score implies that the bank is more stable, i. e. the bank is further from insolvency. It is frequently used as a general measure of future default risk for banks (e. g. Onali (2010)). It is particularly appealing in our setting because it relies solely on accounting measures without requiring stock return data.

As the level of 340f reserves is restricted to 4% of the valuation basis, we include $LIM_{i,t}^{BASIS}$, which is the amount of existing 340f reserves of bank i at the end of year t (before considering the yearly change therein) as percent of its beginning-of-year t valuation basis. For banks close to the limit, a release decision may primarily be driven by the aim of retaining managerial freedom of decision-making with respect to 340f reserves in the future. $LNTA_{i,t}$ is the natural logarithm of total assets of bank i at the end of year t. This variable is included since it is used as a control in many earnings management studies, and partly found to be significant (Alali and Jaggi (2010)). Finally, we add $CRGDP_t$, which is the aggregate volume of bank lending

[13] Any indirect association between those two variables (e. g. through the relation between $LLP_{i,t}^{TA}$ and $LLA_{i,t-1}^{TA}$) does not impair this orthogonality condition and thus the validity of the instrument.

[14] Its quality largely depends on the availability of a long time series in the panel dataset from which the standard deviation of profits is derived. Due to our unbalanced panel, we limit the calculation of the standard deviation of ROA in the denominator of the z-score to the 1st and 99th percentile for all banks. The calculation of the bounds is done by bank category (*Savings Banks*, *Coops* and *Commercials*) and only banks for which a time series of at least seven years is available are taken into account.

to the economy (in real terms) in year t as percent of real gross domestic product in year t. This is also known as the "credit over GDP" ratio and it is meant to control for the state of the business cycle and its effects on our dependent variable. We provide comprehensive variable descriptions in Table 3.

A relatively moderate outlier treatment is applied to the dataset. We winsorize all non-binary variables (that have not been winsorized in other ways) at the 0.5% and 99.5% quantile. Table 4 provides descriptive statistics for all non-binary variables.

4.2. Descriptive statistics

As part of our descriptive statistics, we have in Figure 1 already provided evidence of the existence of earnings management in the German banking market, which is dominated by non-listed institutions. We proceed by graphically revealing the relevance of 340f reserves in German banks. Therefore, Figure 2 shows a histogram of the level of 340f reserves as percent of the valuation basis. Apparently, the majority of observations holds 340f reserves at about 1% of the valuation basis. However, a large number exceeds this level by far, with roughly 100 observations reaching the upper limit of 4%. Considering that an average (German) bank holds equity at about 5% of total assets, this corroborates the importance of 340f reserves for German banks already revealed in Table 2.

Figure 3 displays a histogram of $REL\_340f_{i,t}^{RES}$, for reasons of visibility excluding those 3,586 (115) observations with a zero change in 340f reserves (a value of a release smaller than -200%). It supports Table 2 in revealing that building 340f reserves occurs more frequently (and to a larger extent) than releases therein.

Variable	Description
$REL\_340f^{RES}_{i,t}$	Release of 340f reserves of bank i at the end of year t as % of their beginning-of-year t level.
$REL\_340f^{RES}_{i,t-1}$	Release of 340f reserves of bank i at the end of year $t-1$ as % of their beginning-of-year $t-1$ level.
$REL\_340f^{RES}_{i,t-2}$	Release of 340f reserves of bank i at the end of year $t-2$ as % of their beginning-of-year $t-2$ level.
$D\_REL\_340f_{i,t}$	Binary variable equaling 1 if bank i in year t has a releease in 340f reserves, and 0 otherwise.
$D\_NOLOSS_{i,t}$	Binary variable equaling 1 if bank i in year t has a positive net income pre-340f, and 0 otherwise.
$D\_LOSS_{i,t}$	Binary variable equaling 1 if bank i in year t has a negative net income pre-340f, and 0 otherwise.
$D\_LOSS-_{i,t}$	Binary variable equaling 1 if bank i in year t has a negative net income pre-340f, and is unable to reach the zero net income post-340f even by releasing all of its 340f reserves, and 0 otherwise.
$D\_LOSS+_{i,t}$	Binary variable equaling 1 if bank i in year t has a negative net income pre-340f, but is able to reach zero net income post-340f by releasing its 340f reserves, and 0 otherwise.
$D\_NOPREV_{i,t}$	Binary variable equaling 1 if bank i in year t has a net income pre-340f above its own previous year's net income level post-340f, and 0 otherwise.
$D\_PREV_{i,t}$	Binary variable equaling 1 if bank i in year t has a net income pre-340f below its own previous year's net income level post-340f, and 0 otherwise.
$D\_PREV-_{i,t}$	Binary variable equaling 1 if bank i in year t has a net income pre-340f below its own previous year's net income post-340f, and is unable to reach zero net income changes post-340f even by releasing all of its 340f reserves, and 0 otherwise.
$D\_PREV+_{i,t}$	Binary variable equaling 1 if bank i in year t has a pre-340f net income below its own previous year's net income (post-340f), but is able to reach zero net income changes post-340f by releasing its 340f reserves, and 0 otherwise.
$D\_NOPEER_{i,t}$	Binary variable equaling 1 if bank i in year t has a net income pre-340f (as % of its beginning-of-year t total assets) above the average previous year's post-340f income level of its peer group (as % of mean total assets), and 0 otherwise.
$D\_PEER_{i,t}$	Binary variable equaling 1 if bank i in year t has a net income pre-340f (as % of its beginning-of-year t total assets) below the average previous year's post-340f income level of its peer group (as % of mean total assets), and 0 otherwise.
$D\_PEER-_{i,t}$	Binary variable equaling 1 if bank i in year t has a net income pre-340f (as % of its beginning-of-year t total assets) below the average previous year's post-340f income level of its peer group (as % of mean beginning-of-year $t-1$ total assets), and is unable to reach the peer group income level post-340f even by releasing all of its 340f reserves, and 0 otherwise.
$D\_PEER+_{i,t}$	Binary variable equaling 1 if bank i in year t has a net income pre-340f (as % of its beginning-of-year t total assets), but is able to reach the peer group income level post-340f by releasing its 340f reserves, and 0 otherwise.
$NIBRPT^{TA}_{i,t}$	Non-discretionary income (i. e. income before reserves' creation, provisions, and taxes) of bank i in year t as % of its beginning-of-year t total assets.
$CHTIER1^{RWA}_{i,t}$	Change in the level of tier 1 capital of bank i from year $t-1$ to t as % of its beginning-of-year t risk-weighted assets.
$CHTIER2^{RWA}_{i,t}$	Change in the level of tier 2 capital of bank i from year $t-1$ to t (net of changes in 340f reserves) as % of its beginning-of-year t risk-weighted assets.
$CHCL^{TA}_{i,t}$	Change in the ratio of customer loans to total assets of bank i from year $t-1$ to t as % of beginning-of-year t total assets.
$LLP^{TA}_{i,t}$	Amount of specific LLP built by bank i throughout year t as % of its beginning-of-year t total assets.
$LLA^{TA}_{i,t-1}$	Level of the loan loss allowance of bank i at the end of year $t-1$ as percent of its end-of-year $t-1$ total assets.
$CHNPL_{i,t}$	Change in the non-performing loans of bank i from year $t-1$ to t as % of its beginning-of-year t volume of customer loans.
$CHOBS^{TA}_{i,t}$	Change in off-balance sheet activities of bank i from year $t-1$ to t as % of its beginning-of-year t total assets.
$ZSCORE_{i,t}$	Ratio of capital and profits of bank i at the end of year t to the standard deviation of profits of bank i over time, each position measured relative to total assets of bank i.
$LIM^{BASIS}_{i,t}$	Level of existing 340f reserves of bank i at the end of year t (before considering the yearly change therein) as % of its beginning-of-year t valuation basis.
$LNTA_{i,t}$	Natural logarithm of total assets of bank i at the end of year t.
$CRGDP_{i,t}$	Aggregate volume of bank lending to the economy (in real terms) in year t as % of real gross domestic product in year t.

Table 3: Short description of variables.

Variable	Category	Mean	Std. Dev.	p1	p50	p99
Total assets (in billion euro)	*Coops*	0.41	2.85	0.02	0.14	3.24
	Savings Banks	3.23	11.27	0.15	1.15	57.56
	Commercials	8.28	21.56	0.09	1.52	137.91
$REL\_340f_{i,t}^{RES}$ (in %)	*Coops*	-16.18	39.71	-162.03	-9.98	73.01
	Savings Banks	-11.76	29.65	-114.29	-8.23	71.06
	Commercials	-8.90	45.67	-200.94	0.00	100.00
$NIBRPT_{i,t}^{TA}$ (in %)	*Coops*	0.77	0.59	-0.94	0.78	2.36
	Savings Banks	0.67	0.51	-0.71	0.69	1.79
	Commercials	0.74	0.99	-1.48	0.62	3.10
$CHTIER1_{i,t}^{RWA}$ (in %)	*Coops*	0.27	0.93	-1.65	0.15	3.77
	Savings Banks	0.24	0.88	-1.33	0.13	3.78
	Commercials	0.24	1.69	-2.86	-0.01	4.53
$CHTIER2_{i,t}^{RWA}$ (in %)	*Coops*	0.14	0.97	-2.69	0.06	3.21
	Savings Banks	0.11	0.87	-2.30	0.06	2.58
	Commercials	0.04	1.07	-3.51	0.00	3.50
$CHCL_{i,t}^{TA}$ (in %)	*Coops*	-0.12	2.87	-7.29	-0.17	7.41
	Savings Banks	-0.03	2.29	-5.93	-0.06	5.94
	Commercials	-0.15	4.67	-10.56	-0.16	9.65
$LLA_{i,t-1}^{TA}$ (in %)	*Coops*	1.63	1.10	0.08	1.41	5.36
	Savings Banks	1.79	1.05	0.22	1.63	5.23
	Commercials	2.45	1.87	0.04	2.12	7.27
$LLP_{i,t}^{TA}$ (in %)	*Coops*	0.02	0.47	-1.30	0.02	1.41
	Savings Banks	0.02	0.39	-1.04	0.02	1.09
	Commercials	0.02	0.86	-2.96	0.04	2.69
$CHNPL_{i,t}$ (in %)	*Coops*	0.05	1.93	-4.50	-0.08	6.12
	Savings Banks	0.01	1.38	-3.63	-0.10	4.10
	Commercials	0.24	3.49	-6.57	-0.07	12.51
$CHOBS_{i,t}^{TA}$ (in %)	*Coops*	-0.05	1.93	-5.54	-0.11	5.70
	Savings Banks	-0.03	2.06	-5.82	-0.12	9.36
	Commercials	-0.52	3.40	-9.35	-0.20	8.78
$ZSCORE_{i,t}$	*Coops*	28.39	13.78	7.80	25.47	73.69
	Savings Banks	24.05	11.31	6.59	21.63	64.25
	Commercials	16.73	11.19	5.55	14.79	59.35
$LIM_{i,t}^{BASIS}$ (in %)	*Coops*	1.36	0.89	0.12	1.14	3.71
	Savings Banks	1.58	0.91	0.08	1.48	3.61
	Commercials	1.40	0.90	0.08	1.20	3.68

Table 4: Descriptive statistics for non-binary variables by bank category.

Note: Values given here are based on those observations that use 340f reserves (also see Table 2) only. *Savings Banks* contains all savings banks as well as "Landesbanken". *Coops* consists of all cooperative banks, including the cooperative central institutions. *Commercials* contains all privately held and regional banks as well as the German money-center banks. "No." denotes the number of observations in our panel per category. "Mean" ("Std. dev.") describes the mean (standard deviation) of each variable across all observations in each category. "Total assets" refers to total assets. For comprehensive variable descriptions see Table 3.

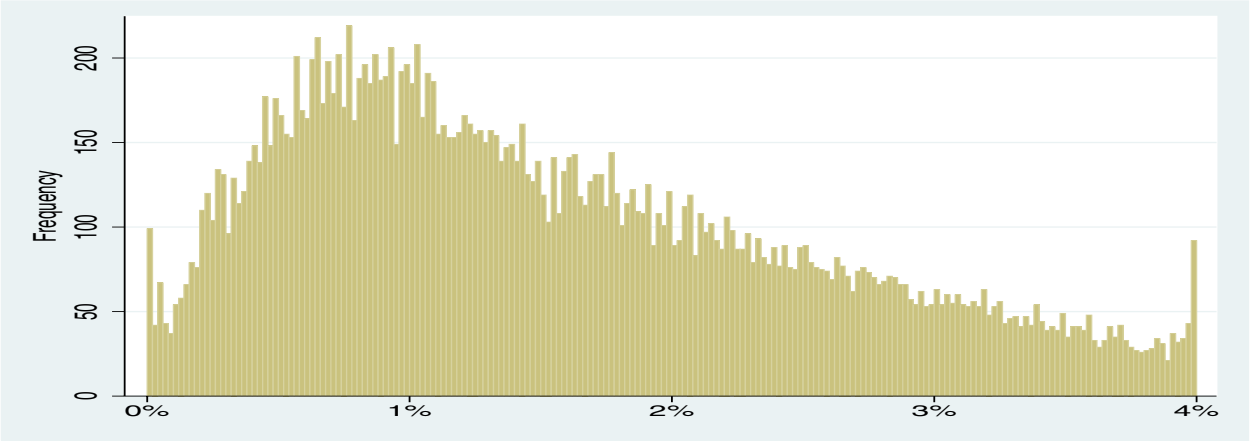

Figure 2: Level of 340f reserves as % of valuation basis.

Note: The distribution interval width is chosen as 0.02%. "Frequency" refers to the number of observations in each interval. The valuation basis (as the denominator) comprises customer and interbank loans as well as bonds, other fixed-income securities, shares and securities bearing variable interest that at the same time are designated to the "liquidity reserve" (also see Section 2.1).

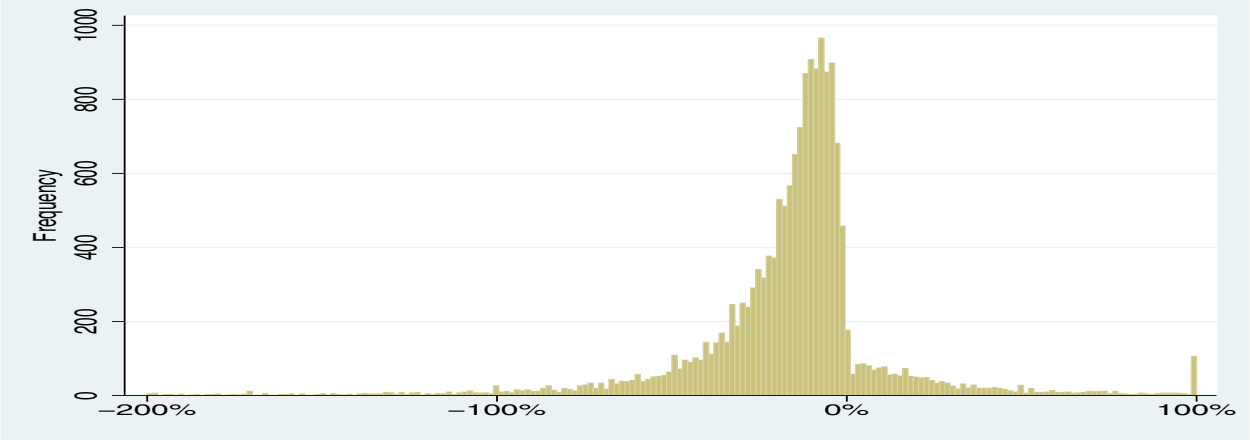

Figure 3: Release of 340f reserves as % of their beginning-of-year level.

Note: The distribution interval width is chosen as 1%. "Frequency" refers to the number of observations in each interval. For reasons of visibility, we neglect 3,586 (115) observations with a zero change in 340f reserves (a release smaller than -200%, i. e. an increase in the level of 340f reserves by more than 200%) of their previously existing level.

Figure 4 contrasts the variability of net income pre- compared to post-340f. The left-hand boxplot presents the standard deviation of net income pre-340f, whereas that on the right-hand side exhibits the standard deviation of net income post-340f, both as percent of mean total assets.[15] As the major conclusion to be drawn from this figure, the median as well as the upper and the lower quartile in the right-hand boxplot are located well below the ones on the left. Thus, by managing their 340f reserves correspondingly, banks are apparently successful in reducing the variability of their net income to a large extent. This provides support for H4. Note also that the interquartile range shrinks from roughly 0.0025% in the left-hand boxplot to 0.0010% on the right, meaning that by using 340f reserves all banks are moving closer to one another with respect to the standard deviation of net income.

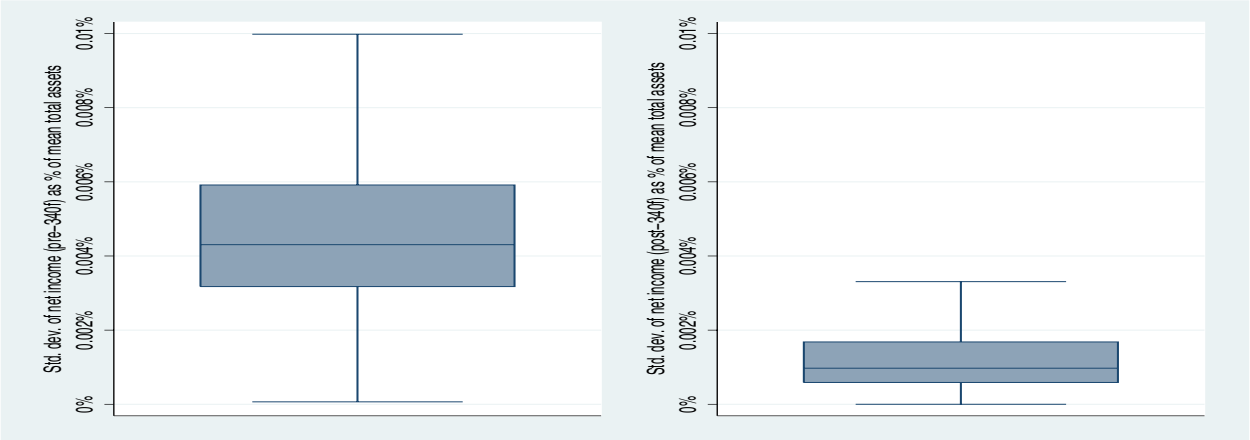

Figure 4: Standard deviation of net income pre- and post-340f.

Note: For reasons of visibility, values outside the upper and lower whisker in each boxplot are neglected. Standard deviations are calculated using all observations in the sample. To enhance reliability of the standard deviations used, we reproduced this graph using only standard deviations of banks with at least eight observations in the panel. The results remain unchanged.

To investigate the relevance of the earnings benchmarks as hypothesized in *H1*, *H2* and *H3*, we proceed by conducting contingency analyses on the relationship between the benchmark-related binary variables and releases of 340f reserves. Such analyses test independence between two or more categorical variables. A corresponding chi-squared test investigates the null hypothesis

[15] To enhance the reliability of this figure, we reproduced both boxplots using only banks with at least eight observations in the panel. We find the results to be stable.

that rows and columns of the contingency table are independent in a statistical sense. This should be the case if none of the two variables under consideration is influenced by the other.[16] Table 5 relates the binary variable $D\_REL\_340f_{i,t}$ to $D\_LOSS_{i,t}$ in Panel A (referring to *H1*), to $D\_PREV_{i,t}$ in Panel B (*H2*), and to $D\_PEER_{i,t}$ in Panel C (*H3*).

			Panel A: $D\_LOSS_{i,t}$		Panel B: $D\_PREV_{i,t}$		Panel C: $D\_PEER_{i,t}$		
			0	1	0	1	0	1	Total (by panel)
$D\_REL\_340f_{i,t}$	0	Frequency	18,426	63	15,166	3,323	14,296	4,193	18,489
		Row%	99.66	0.34	82.03	17.97	77.32	22.68	100.00
		Col%	96.19	5.36	99.40	65.49	99.28	70.68	90.94
	1	Frequency	730	1,112	91	1,751	103	1,739	1,842
		Row%	39.63	60.37	4.94	95.06	5.59	94.41	100.00
		Col%	3.81	94.64	0.60	34.51	0.72	29.32	9.06
		Total	19,156	1,175	15,257	5,074	14,399	5,932	20,331
		Row%	94.22	5.78	75.04	24.96	70.82	29.18	100.00
		Col%	100.00	100.00	100.0	100.00	100.0	100.0	100.00

Panel A/B/C: Pearson chi2 = 1.1e+04/5.3e+03/4.2e+03; Pr = 0.000/0.000/0.000

Table 5: Contingency table on $D\_REL\_340f_{i,t}$ and the benchmark-related variables.

Note: The table shows contingency analyses on $D\_REL\_340f_{i,t}$ with $D\_LOSS_{i,t}$, $D\_PREV_{i,t}$ and $D\_PEER_{i,t}$. For comprehensive variable descriptions, see Table 3. "Row%" (by panel) gives the share of observations in each field on the overall number of observations in each row. "Col%" gives the share of observations in each field on the overall number of observations in each column. The given values of the chi-squared test at the bottom (investigating independence of rows and columns of the contingency table) strongly indicate these to be independent.

Panel A relates $D\_REL\_340f_{i,t}$ to $D\_LOSS_{i,t}$. It is striking that a majority of 94.64% (only a minority of 3.81%) of observations failing (managing) to reach the zero earnings target, i. e. having $D\_LOSS_{i,t} = 1$, release reserves. Moreover, 60.37% of observations releasing 340f reserves miss this target pre-340f.[17] These findings clearly support *H1*. With respect to *H2*, Panel B relates $D\_REL\_340f_{i,t}$ to $D\_PREV_{i,t}$. 34.51% (0.58%) of observations that fail (manage) to reach the zero earnings changes target have a release of 340f reserves. Furthermore, 95.06% of

[16] For further details on contingency analysis, see Agresti (2007).

[17] It is important to note that this table does not allow to derive any statement on whether these observations reached this target post-340f.

observations releasing 340f reserves miss this target before doing so. Both outcomes strongly support *H2*. Finally, Panel C refers to *H3* and relates $D\_REL\_340f_{i,t}$ to $D\_PEER_{i,t}$. 29.32% (0.72%) of the observations that fail (manage) to reach the peer group income target release 340f reserves. Additionally, 94.41% of observations releasing 340f reserves miss the corresponding target pre-340f. Thus, *H3* is strongly supported, too.

To corroborate our bivariate results by controlling for bank-specific conditions as well as effects caused by the business cycle, we now turn to our multivariate analysis. Table 6 reports the correlation coefficients among all variables used in the following regressions. With only four correlations exceeding the level of 0.4, correlation among regressors is generally below levels in which multicollinearity would be a serious problem. All correlations between the dependent variable ($REL\_340f_{i,t}^{RES}$) and the earnings-related ones are in line with our hypothesized expectations. Therefore, we refrain from commenting on Table 6 in more detail.

	$REL\_340f^{RES}_{i,t}$	$D\_LOSS_{i,t}$	$D\_PREV_{i,t}$	$D\_PEER_{i,t}$	$NIBRPT^{TA}_{i,t}$	$CHTIER1_{i,t}$	$CHTIER2_{i,t}$	$CHCL^{TA}_{i,t}$	$LLA^{TA}_{i,t-1}$
$REL\_340f^{RES}_{i,t}$	1.0000								
$D\_LOSS_{i,t}$	0.3379	1.0000							
$D\_PREV_{i,t}$	0.3412	0.4246	1.0000						
$D\_PEER_{i,t}$	0.3268	0.3845	0.5602	1.000					
$NIBRPT^{TA}_{i,t}$	-0.2231	-0.2830	-0.2692	-0.3915	1.0000				
$CHTIER1^{RWA}_{i,t}$	0.0391	0.0541	0.0789	0.0162	-0.1485	1.0000			
$CHTIER2^{RWA}_{i,t}$	0.2205	0.1555	0.1578	0.1349	-0.1584	0.3781	1.0000		
$CHCL^{TA}_{i,t}$	0.0475	-0.0076	0.0193	0.0139	0.0416	-0.1699	-0.0216	1.0000	
$LLA^{TA}_{i,t-1}$	-0.0410	0.0678	0.0022	0.0565	-0.1606	-0.0162	-0.0236	-0.0875	1.0000
$LLP^{TA}_{i,t}$	0.1765	0.2241	0.1988	0.1736	0.5064	-0.0968	0.0111	0.0449	-0.1415
$CHNPL_{i,t}$	0.1346	0.1603	0.1246	0.0937	0.1753	-0.0343	-0.0164	-0.0373	-0.1072
$CHOBS^{TA}_{i,t}$	-0.0297	-0.0240	-0.0240	-0.0212	0.0603	-0.0504	-0.0255	0.0587	-0.0304
$ZSCORE_{i,t}$	-0.0351	-0.1868	-0.1386	-0.1930	0.1097	0.1067	0.0436	-0.0245	-0.1711
$LIM^{BASIS}_{i,t}$	0.1692	-0.0181	-0.0737	-0.1470	0.0593	0.1920	0.1445	-0.0655	-0.0292
$LNTA_{i,t}$	0.0083	0.0293	-0.0298	0.0945	-0.1299	0.0247	-0.0217	-0.0638	0.0881
$CRGDP_{i,t}$	-0.0797	0.0152	-0.0488	-0.0813	0.0392	-0.1800	-0.1082	0.0587	0.0396
$REL\_340f^{RES}_{i,t-1}$	0.2303	0.0605	0.0552	0.0635	-0.0368	0.0038	-0.2559	-0.0186	-0.0124
$REL\_340f^{RES}_{i,t-1}$	-0.0028	-0.0099	-0.0006	0.0006	-0.0051	0.0023	-0.0060	0.0050	-0.0075

	$LLP^{TA}_{i,t-1}$	$CHNPL_{i,t}$	$CHOBS^{TA}_{i,t}$	$ZSCORE_{i,t}$	$LIM^{BASIS}_{i,t}$	$LNTA_{i,t}$	$CRGDP_{i,t}$	$REL\_340f^{RES}_{i,t-1}$	$REL\_340f^{RES}_{i,t-2}$
$LLP^{TA}_{i,t}$	1.0000								
$CHNPL_{i,t}$	0.4338	1.0000							
$CHOBS^{TA}_{i,t}$	-0.0080	-0.0253	1.0000						
$ZSCORE_{i,t}$	-0.0896	-0.0373	0.0284	1.0000					
$LIM^{BASIS}_{i,t}$	-0.1007	0.0207	-0.0081	0.1706	1.0000				
$LNTA_{i,t}$	-0.0450	-0.0117	-0.0009	-0.0242	0.0590	1.0000			
$CRGDP_{i,t}$	0.0757	0.0390	-0.1349	-0.1324	-0.1959	-0.0114	1.0000		
$REL\_340f^{RES}_{i,t-1}$	0.0414	0.0587	-0.0072	-0.0051	0.0924	0.0167	0.0179	1.0000	
$REL\_340f^{RES}_{i,t-2}$	-0.0095	-0.0009	0.0160	0.0014	0.0006	-0.0001	0.0184	0.0177	1.0000

Table 6: Correlations.

Note: Pearson's correlation coefficients are reported. For comprehensive variable descriptions, see Table 3.

4.3. Multivariate analysis

4.3.1. Research design

Our multivariate results on the impact of different earnings-related variables on releases of 340f reserves are derived from a dynamic generalized method of moments estimation technique (Blundell and Bond (1998)) with Windmeijer (2005) correction. We use $REL\_340f_{i,t}^{RES}$ as the dependent variable, and two of its lags are used as regressors since second-order autocorrelation is present in the data. Doing so also accounts for the potential existence of unobservable bank-individual effects. We are primarily interested in the results of the earnings-related variables $D\_LOSS_{i,t}$ (referring to *H1*), $D\_PREV_{i,t}$ (*H2*), $D\_PEER_{i,t}$ (*H3*), and $NIBRPT_{i,t}^{TA}$ (*H4*). We apply the Hansen test of overidentifying restrictions (Arellano and Bond (1991); Blundell and Bond (1998)) to assess the validity of our instruments. As this test may be weakened by many instruments (Roodman (2009)), we use only a very limited set of instruments. Moreover, we use the same lag structure in all our model specifications. The formal design of the models of block A (see Table 7) is given in equation (1):

$$\begin{aligned} REL\_340f_{i,t}^{RES} &= \beta_0 + \beta_1 \cdot D\_LOSS_{i,t} + \beta_2 \cdot D\_PREV_{i,t} + \beta_3 \cdot D\_PEER_{i,t} \\ &+\beta_4 \cdot NIBRPT_{i,t}^{TA} + \beta_5 \cdot CHTIER1_{i,t} + \beta_6 \cdot CHTIER2_{i,t} \\ &+\beta_7 \cdot CHCL_{i,t}^{TA} + \beta_8 \cdot LLA_{i,t-1} + \beta_9 \cdot LLP_{i,t} + \beta_{10} \cdot CHOBS_{i,t}^{TA} \\ &+\beta_{11} \cdot ZSCORE_{i,t} + \beta_{12} \cdot LIM_{i,t}^{BASIS} + \beta_{13} \cdot LNTA_{i,t} \\ &+\beta_{14} \cdot CRGDP_{i,t} + \beta_{15} \cdot REL\_340f_{i,t-1}^{RES} \\ &+\beta_{16} \cdot REL\_340f_{i,t-2}^{RES} + \epsilon_{i,t}. \end{aligned} \tag{1}$$

Including two lags of the dependent variable follows Bikker and Metzemakers (2005), who assume a gradual adjustment of LLP due to a lagged availability of information on the optimal level of provisions. Thus, we conjecture changes in 340f reserves to adjust gradually over time.

4.3.2. Analysis disregarding strength of earnings management incentives

To begin with, we estimate equation (1) on a sample containing banks from all categories (henceforth: full sample). The estimated coefficients and standard errors (in brackets below the coefficients) are shown in the second column of Table 7 (Model A.1). Following up, we split our sample according to the categories introduced in Section 2.2 and estimate equation 1 separately for each category. Results for *Coops* are contained in Model A.2, those for *Savings Banks* in A.3 and those for *Commercials* in A.4. The tests of overidentifying restrictions as well as autocorrelation for all models indicate that the instruments used are valid and that we adequately controlled for second-order autocorrelation.

The results on the full sample (Model A.1) reveal a strongly significant[18] and positive association of $D\_LOSS_{i,t}$ (β_1 = 14.443) with $REL\_340f_{i,t}^{RES}$. This confirms our bivariate results regarding *H1*, because it indicates that banks missing the zero earnings target release 340f reserves to a larger extent than those who succeed in reaching this target. Second, the coefficient on $D\_PREV_{i,t}$ (β_2 = 5.579) shows that missing the zero earnings changes target (i. e. having a pre-340f net income below the previous year's level as the bottom line of the P&L) is also strongly significantly correlated with a release of 340f reserves. Supporting *H2*, bank managers indeed try to avoid a drop in net income by adjusting the level of 340f reserves correspondingly. Third, the positive and strongly significant coefficient on $D\_PEER_{i,t}$ (β_3 = 6.382) reveals that missing the peer group earnings target is positively associated with a release of 340f reserves as well. Backing *H3*, banks with a net income pre-340f below the previous year's average net income of their peer group release 340f reserves to a larger extent than banks which already reached this target pre-340f. The negative and strongly significant coefficient of the last of our earnings management-related variables, $NIBRPT_{i,t}^{TA}$ (β_4 = -17.574), is in line with our expec-

[18] We refer to results being "strongly significant" ("significant' and "weakly significant", respectively) if the corresponding level of significance is 1% (5% and 10%, respectively).

		dependent variable: $REL\_340f_{i,t}^{RES}$			
indep. var.	Exp.	A.1 (*All categories*)	A.2 (*Coops*)	A.3 (*Savings Banks*)	A.4 (*Commercials*)
$D\_LOSS_{i,t}$	+	14.443***	9.030***	20.791***	45.661***
		(1.854)	(2.523)	(3.064)	(10.370)
$D\_PREV_{i,t}$	+	5.579***	4.540***	7.129***	9.370***
		(0.603)	(0.606)	(1.356)	(3.611)
$D\_PEER_{i,t}$	+	6.382***	7.518***	4.448***	1.391
		(0.776)	(0.858)	(1.411)	(5.471)
$NIBRPT_{i,t}^{TA}$	−	-17.574***	-20.294***	-13.497***	-4.776
		(1.451)	(1.431)	(1.777)	(6.133)
$CHTIER1_{i,t}^{RWA}$	−	-5.256***	-6.080***	-4.067***	-2.734**
		(0.309)	(0.392)	(0.527)	(1.378)
$CHTIER2_{i,t}^{RWA}$	+	11.545***	12.830***	7.542***	12.174***
		(0.553)	(0.666)	(0.934)	(4.003)
$CHCL_{i,t}^{TA}$	−	0.349***	0.380***	0.206	0.225
		(0.089)	(0.105)	(0.145)	(0.382)
$LLA_{i,t-1}^{TA}$	?	-1.112***	-1.300***	-1.027***	0.660
		(0.302)	(0.372)	(0.366)	(1.181)
$LLP_{i,t}^{TA}$	+	20.840***	23.327***	16.037***	5.735
		(1.394)	(1.453)	(2.042)	(5.474)
$CHOBS_{i,t}^{TA}$	−	-0.101	-0.121	0.094	0.356
		(0.102)	(0.135)	(0.140)	(0.325)
$ZSCORE_{i,t}$	?	0.063***	0.104***	0.040	0.107
		(0.018)	(0.023)	(0.035)	(0.140)
$LIM_{i,t}^{BASIS}$	+	7.768***	8.941***	6.355***	4.242
		(0.431)	(0.568)	(0.750)	(3.562)
$LNTA_{i,t}$	?	-0.714***	-1.275***	-1.220***	-1.188
		(0.179)	(0.316)	(0.423)	(1.779)
$CRGDP_t$	−	-0.111***	-0.076**	-0.069**	-0.135
		(0.018)	(0.033)	(0.032)	(0.164)
$REL\_340f_{i,t-1}^{RES}$	?	0.297***	0.307***	0.290***	0.175***
		(0.019)	(0.018)	(0.069)	(0.042)
$REL\_340f_{i,t-2}^{RES}$	?	0.001	-0.030**	-0.001***	-0.047**
		(0.001)	(0.013)	(0.000)	(0.020)
No. of obs.		20,331	14,482	5,403	446
No. of banks		3,619	2,829	701	89
No. of instruments		20	20	20	20
AR(1) test (p-value)		0.000	0.000	0.000	0.013
AR(2) test (p-value)		0.112	0.780	0.567	0.799
Hansen test (p-value)		0.197	0.379	0.748	0.720

Table 7: No consideration of different strengths of earnings management incentives.

Note: We use a dynamic generalized method of moments estimation technique following Blundell and Bond (1998) with Windmeijer (2005) correction to examine the impact of different earnings- and risk-related variables on releases of 340f reserves. For comprehensive variable descriptions, see Table 3. The functional form of the models is given by $REL\_340f_{i,t}^{RES} = \beta_0 + \beta_1 \cdot D\_LOSS_{i,t} + \beta_2 \cdot D\ PREV_{i,t} + \beta_3 \cdot D\_PEER_{i,t} + \beta_4 \cdot NIBRPT_{i,t}^{TA} + \beta_5 \cdot CHTIER1_{i,t} + \beta_6 \cdot CHTIER2_{i,t} + \beta_7 \cdot CHCL_{i,t}^{TA} + \beta_8 \cdot LLA_{i,t-1} + \beta_9 \cdot LLP_{i,t} + \beta_{10} \cdot CHOBS_{i,t}^{TA} + \beta_{11} \cdot ZSCORE_{i,t} + \beta_{12} \cdot LIM_{i,t}^{BASIS} + \beta_{13} \cdot LNTA_{i,t} + \beta_{14} \cdot CRGDP_{i,t} + \beta_{15} \cdot REL\_340f_{i,t-1}^{RES} + \beta_{16} \cdot REL\_340f_{i,t-2}^{RES} + \epsilon_{i,t}$. *, ** and *** indicate significance at the 10%, 5% level and 1% level, respectively. Robust standard errors clustered on the bank level are given in brackets below the coefficients.

tations, too. The level of a bank's non-discretionary income is inversely correlated with its propensity to release 340f reserves. This aligns with expected earnings management behavior as predicted by *H4*. As an interim result, all our earnings management hypotheses have been confirmed so far.

Besides commenting on the coefficients of the earnings-related variables individually, it is also interesting to compare their levels to one another. The coefficient on $D\_LOSS_{i,t}$ is a little less than three times larger than those on $D\_PREV_{i,t}$ and $D\_PEER_{i,t}$. Thus, bank managers seem to release 340f reserves to a much larger extent in order to achieve the zero earnings target, whereas the zero earnings changes and the peer group earnings targets seem to be less important. It is worth noting that the magnitude of the coefficient on $NIBRPT_{i,t}^{TA}$ exceeds all previously mentioned ones. This means that a decrease in a bank's non-discretionary income by one unit (i. e. one percentage point in relation to total assets) is far more strongly associated with a release of 340f reserves than a one-unit change (from 0 to 1) in the target-related variables.

The strongly significant coefficients on $CHTIER1_{i,t}^{RWA}$ (β_5 = -5.256) and $CHTIER2_{i,t}^{RWA}$ (β_6 = 11.545) are consistent with capital management being relevant for managing 340f reserves. Increasing tier 1 capital diminishes the necessity of releasing 340f reserves for raising the next period's equity. Increasing tier 2 capital (net of changes in 340f reserves) enables banks to release 340f reserves without harming the regulatory capital ratio.

We comment only briefly on our (further) control variables. The positive and strongly significant coefficient on $CHCL_{i,t}^{TA}$ (β_7 = 0.349) indicates that an increase in a bank's loan portfolio is accompanied by a release of 340f reserves. The strongly significant and negative coefficient on $LLA_{i,t-1}^{TA}$ (β_8 = -1.112) shows that higher levels of the loan loss allowance in year $t-1$ are associated with diminished releases of 340f reserves in year t. On the contrary, the coefficient on $LLP_{i,t}^{TA}$ (β_9 = 20.840) is positive and strongly significant. The higher the LLP, the larger the

extent to which 340f reserves are released. The insignificant coefficient on $CHOBS_{i,t}^{TA}$ indicates that the extent of a bank's market risk exposure is unrelated to releases of 340f reserves. Regarding the last of our risk-related variables, the coefficient on $ZSCORE_{i,t}$ ($\beta_{11} = 0.063$) is positive and strongly significant. More (less) stable banks apparently release 340f reserves to a larger (lower) extent. This latter finding is consistent with the risk provisioning function of 340f reserves, whereas particularly the positive outcome on $CHCL_{i,t}^{TA}$ is counterintuitive in this respect.

A higher level of existing 340f reserves (as measured by $LIM_{i,t}^{BASIS}$) has the expected positive association with a release. On the contrary, the size of a bank (controlled for by $LNTA_{i,t}$) is negatively associated with $REL\_340f_{i,t}^{RES}$. Finally, a higher credit over GDP ratio is negatively correlated with a release in 340f reserves. It shows that during economically weak (strong) periods, banks release (build) 340f reserves, which is in line with the aim to reduce income variability over time. The positive coefficient on the one-year lag of the dependent variable is positive and strongly significant, which supports our assumptions concerning gradual adjustments in 340f reserves.

In presenting the results by bank category (given in Models A.2 to A.4 of Table 7), we mainly focus on interesting differences between the categories rather than repeating findings similar to those already discussed. The reasonable assumption of all three samples being independent to one another allows us to compare the magnitude of each coefficient across samples.

The strongly significant results on $D\_LOSS_{i,t}$ indicate that the zero earnings target is indeed important to all categories of banks. However, the corresponding coefficient β_1 is notably larger for *Commercials* (45.661) than for *Savings Banks* (20.791) and *Coops* (9.030). Avoiding presentation of a loss within its financial statements is apparently most relevant to *Commercials*. This may be due to the fact that a negative net income may cause discontinuities in dividend

payments, which is particularly harmful to *Commercials* because they are fully exposed to capital market valuation.

With respect to $D\_PREV_{i,t}$, the coefficients on all subsamples are positive, strongly significant, and similar in magnitude. Thus, reaching the zero earnings changes target is equally relevant across all categories. The last of the benchmark-related variables, $D\_PEER_{i,t}$, has a significant and positive coefficient for *Coops* and *Savings Banks* only, for which reaching the peer group earnings target by means of releasing 340f reserves indeed seems to be relevant. The peer group earnings target may be irrelevant particularly for the money-center banks among the *Commercials* because their performance is probably evaluated against their own or analysts' earnings forecasts rather than against the performance of peer group banks. Moreover, the rather heterogeneous business models of small manager-owned banks contained in this category aggravate the definition of an adequate peer group. The coefficient on $NIBRPT_{i,t}^{TA}$ is negative and strongly significant for *Coops* and *Savings Banks* only, while being insignificant for *Commercials*. Apparently, using 340f reserves to reduce income variability over time is prevalent only in banks belonging to those two categories.

It is striking that none of the risk-related variables is significant in explaining releases of 340f reserves in *Commercials*. Thus, we do not find any evidence at all of 340f reserves being used for risk provisioning in this category of banks. Moreover, the coefficients on $CHCL_{i,t}^{TA}$ and $ZSCORE_{i,t}$ are positive and strongly significant for *Coops* only. The results on our full sample (Model A.1) seem to be driven by the dominance of banks in this category.

4.3.3. Analysis considering strength of earnings management incentives

Section 4.3.2 revealed that managers of banks missing any of the earnings targets pre-340f release reserves to a larger extent. Within those banks, we should be able to observe differently

pronounced incentives to release 340f reserves depending on the ability of indeed reaching the missed target by doing so. Revealing these differences would also reinforce our findings presented in the previous section and therefore provide a first robustness check.

Following up, we, technically speaking, discern three subsets of banks with respect to each target. The first encompasses banks with a positive net income pre-340f, i. e. those that do not miss the zero earnings target pre-340f (a pre-340f net income above their previous year's one for the zero earnings changes target, respectively reaching the peer group average net income for the peer group earnings target). Managers of these banks, which we refer to as belonging to subset $NOLOSS$ ($NOPREV$ and $NOPEER$, respectively), should have lower incentives for releasing 340f reserves than those of banks missing the target (as revealed in Section 4.3.2).

Among banks that miss the target pre-340f, we denote the ones that are unable to reach it even by releasing all of their 340f reserves as belonging to subset $LOSS-$ ($PREV-$, respectively $PEER-$). Their managers face two (or even three) conflicting options with respect to 340f reserves. First, they may nevertheless decide to release reserves to bring the bank closer to the missed target. However, this comes at the cost of foregoing the possibility to use 340f reserves for managing earnings in future periods. Second, managers may opt to leave their reserves unchanged and "save" them for use in future periods instead (see Kerstein and Rai (2007)). Third, and in particular with respect to the zero earnings target, managers may choose to increase their reserves also in such a situation to drive the bank further away from the missed target. This may be beneficial to the management in two respects. Increasing 340f reserves raises funds available for exerting managerial discretion while it further lowers the current year's net income, which in turn reduces stakeholders' expectations regarding future performance. Such behavior, similar to what is known as big bath accounting (see Kirschenheiter and Melumad (2002)), would be particularly plausible if other reasons (e. g. unsatisfactory efforts of a recently

dismissed CEO, a distressed merger or simply a general downturn in the economic cycle) can be held responsible for bad bank performance.[19]

Finally, we distinguish one subset consisting of those banks that miss the respective target pre-340f, but are able to reach it post-340f by releasing their 340f reserves. Managers of those banks, which we will denote as belonging to subset $LOSS+$ ($PREV+$ and $PEER+$, respectively), should exhibit the strongest incentives for releasing 340f reserves. Table 8 arranges the subsets of banks according to the strength of the underlying incentives for releasing 340f reserves.

Net income pre-340f	above target	below target	
Level of 340f reserves	irrelevant	smaller than the gap to the target	larger than the gap to the target
Subsets of observations	$NOLOSS$ $NOPREV$ $NOPEER$	$LOSS-$ $PREV-$ $PEER-$	$LOSS+$ $PREV+$ $PEER+$
Incentives for releasing 340f reserves	weakest	ambiguous	strongest

Table 8: Subsets of observations regarding the gap to the income target.

Note: The subset $NOLOSS$ contains observations with a positive net income pre-340f, i. e. those that do not miss the zero earnings target pre-340f. $LOSS-$ ($LOSS+$) comprises observations that have a negative net income pre-340f, and that are unable (able) to reach zero net income by releasing their 340f reserves. The subset $NOPREV$ contains observations with a net income pre-340f above their own previous year's income level, i. e. those that do not miss the zero earnings changes target pre-340f. $PREV-$ ($PREV+$) comprises observations with a a net income pre-340f below their own previous year's income level, and that are unable (able) to reach zero net income changes by releasing their 340f reserves. The subset $NOPEER$ contains those observations with a net income pre-340f (as % of its beginning-of-year t total assets) above the average previous year's post-340f income level of its peer group (as % of mean total assets), i. e. those that do not miss the peer group earnings target pre-340f. $PEER-$ ($PEER+$) comprises observations with a net income pre-340f (as % of its beginning-of-year t total assets) below the average previous year's post-340f income level of its peer group (as % of mean total assets), and that are unable (able) to reach peer group net income by releasing their 340f reserves.

Table 9 provides information on the number of observations in each subset.

To investigate the differently pronounced incentives, we complement the hypotheses *H1*, *H2* and *H3* by *H1a*, *H2a* and *H3a*, respectively. With respect to differently pronounced incentives for releasing 340f reserves to reach the zero earnings target, we hypothesize:

[19] As it is not within the scope of this paper, we refrain from introducing big bath accounting in more detail.

	$D\_LOSS_{i,t} = 0$	$D\_LOSS_{i,t} = 1$		
	$(D\_NOLOSS_{i,t} = 1)$	$D\_LOSS-_{i,t} = 1$	$D\_LOSS+_{i,t} = 1$	Total
No. of observations	19,156	115	1,060	20,331
% of obs. using 340f	94.22	0.57	5.21	100.00
	$D\_PREV_{i,t} = 0$	$D\_PREV_{i,t} = 1$		
	$(D\_NOPREV_{i,t} = 1)$	$D\_PREV-_{i,t} = 1$	$D\_PREV+_{i,t} = 1$	Total
No. of obs.	15,257	250	4,824	20,331
% of obs. using 340f	75.04	1.23	23.73	100.00
	$D\_PEER_{i,t} = 0$	$D\_PEER_{i,t} = 1$		
	$(D\_NOPEER_{i,t} = 1)$	$D\_PEER-_{i,t} = 1$	$D\_PEER+_{i,t} = 1$	Total
No. of obs.	14,066	461	5,471	20,331
% of obs. using 340f	69.18	2.27	26.91	100.00

Table 9: Composition of the subsets of observations.

Note: The subset $NOLOSS$ contains observations with a positive net income pre-340f, i. e. those that do not miss the zero earnings target pre-340f. $LOSS-$ ($LOSS+$) comprises observations that have a negative net income pre-340f, and that are unable (able) to reach zero net income by releasing their 340f reserves. The subset $NOPREV$ contains observations with a net income pre-340f above their own previous year's income level, i. e. those that do not miss the zero earnings changes target pre-340f. $PREV-$ ($PREV+$) comprises observations with a a net income pre-340f below their own previous year's income level, and that are unable (able) to reach zero net income changes by releasing their 340f reserves. The subset $NOPEER$ contains those observations with a net income pre-340f (as % of its beginning-of-year t total assets) above the average previous year's post-340f income level of its peer group (as % of mean total assets), i. e. those that do not miss the peer group earnings target pre-340f. $PEER-$ ($PEER+$) comprises observations with a net income pre-340f (as % of its beginning-of-year t total assets) below the average previous year's post-340f income level of its peer group (as % of mean total assets), and that are unable (able) to reach peer group net income by releasing their 340f reserves.

Hypothesis 1a (*H1a*). *Belonging to $LOSS+$ is more positively correlated with a release of 340f reserves than belonging to $LOSS-$, which, in turn, is more positively related to such a release than belonging to $NOLOSS$.*

Regarding the extent of a release of 340f reserves to reach the zero earnings changes target, we similarly hypothesize:

Hypothesis 2a (*H2a*). *Belonging to $PREV+$ is more positively correlated with a release of 340f reserves than belonging to $PREV-$, which, in turn, is more positively related to such a release than belonging to $NOPREV$.*

Finally, concerning the release of 340f reserves to reach the peer group earnings target, we hypothesize:

Hypothesis 3a (*H3a*). *Belonging to $PEER+$ is more positively correlated with a release of 340f reserves than belonging to $PEER-$, which, in turn, is more positively related to such a release than belonging to $NOPEER$.*

For investigating *H1a*, we substitute $D\_LOSS_{i,t}$ by a set of related binary variables. $D\_NOLOSS_{i,t}$ equals 1 if bank i in year t has a positive net income pre-340f, and 0 otherwise. Thus, it refers to the subset of banks named $NOLOSS$. $D\_LOSS-_{i,t}$ equals 1 if bank i in year t has a negative net income pre-340f (thus, it misses the zero earnings target), and is unable to (at least) reach zero net income post-340f even by releasing all of its 340f reserves. Otherwise, it is 0. Thus, it captures the subset of banks named $LOSS-$. $D\_LOSS+_{i,t}$ equals 1 if bank i in year t has a negative net income pre-340f, but is able to reach zero net income post-340f by releasing its 340f reserves. Otherwise, it is 0, and it corresponds to subset $LOSS+$. It is worth noting that an observation's value will only equal 1 in exactly one of the three binary variables.

We replace $D\_PREV_{i,t}$ ($D\_PEER_{i,t}$) by $D\_NOPREV_{i,t}$ ($D\_NOPEER_{i,t}$), $D\_PREV-_{i,t}$ ($D\_PEER-_{i,t}$), and $D\_PREV+_{i,t}$ ($D\_PEER+_{i,t}$) to address *H2a* (*H3a*). These variables are defined analogously to the aforementioned ones with respect to *H1a*, taking the previous year's (the peer group's average) net income as the reference.[20]

We re-estimate equation 1 using the subsets of binary variables, while leaving all other explanatory variables unchanged, and report the results in Table 10. To prevent perfect multicollinearity, the subsets $NOLOSS$, $NOPREV$ and $NOPEER$ are taken as the basis groups.

To begin with Model B.1 (on the full sample), the insignificant coefficient on $D\_LOSS-_{i,t}$ does not allow to draw any conclusion on the behavior of banks in subset $LOSS-$, i. e. those missing the zero earnings target pre-340f and being unable to reach it even by releasing all of their 340f reserves. On the contrary, the strongly significant and positive coefficient on $D\_LOSS+_{i,t}$ (15.684) indicates that banks missing the zero earnings target pre-340f, but able to meet it post-340f by releasing their 340f reserves, do so to the largest extent. This supports *H1a*.

The insignificant coefficient on $D\_PREV-_{i,t}$ does not allow to infer any statement on the behavior of banks in subset $PREV-$. However, consistent with the findings for the zero earnings target, banks belonging to $PREV+$ indeed release 340f reserves to a larger extent than those belonging to $NOPREV$. This also confirms *H2a*.

Both coefficients on $D\_PEER-_{i,t}$ and $D\_PEER+_{i,t}$ are strongly significant. Disregarding their ability to reach the peer group earnings average, managers of banks in both subsets release 340f reserves to a larger extent than those of banks in $NOPEER$. Startling (and clearly contradicting *H3a*) is the fact that the coefficient on $PEER-$ exceeds that on $PEER+$. Apparently,

[20] Comprehensive variable descriptions are provided in Table 3. An overview of the number of observations in each subset of banks is provided in Table 9 in the appendix.

		dependent variable: $REL\_340f_{i,t}^{RES}$			
indep. var.	Exp.	B.1 (*All categories*)	B.2 (*Coops*)	B.3 (*Savings Banks*)	B.4 (*Commercials*)
$D\_LOSS-_{i,t}$	?	-17.635	-27.120*	-17.778	28.889*
		(11.227)	(16.283)	(17.865)	(14.91)
$D\_LOSS+_{i,t}$	+	15.684***	10.992***	19.621***	61.004***
		(1.710)	(2.392)	(2.804)	(12.912)
$D\_PREV-_{i,t}$	?	4.212	4.663	24.319*	-0.811
		(5.257)	(7.309)	(13.632)	(5.733)
$D\_PREV+_{i,t}$	+	5.636***	4.507***	6.923***	13.501***
		(0.602)	(0.599)	(1.305)	(4.698)
$D\_PEER-_{i,t}$	?	18.980***	16.600*	24.797**	8.892
		(5.001)	(8.766)	(10.204)	(7.572)
$D\_PEER+_{i,t}$	+	5.778***	7.177***	4.052***	-1.048
		(0.758)	(0.815)	(1.344)	(6.021)
$NIBRPT_{i,t}^{TA}$	−	-18.016***	-20.910***	-13.241***	-4.403
		(1.436)	(1.386)	(1.767)	(5.699)
$CHTIER1_{i,t}^{RWA}$	−	-5.151***	-5.933***	-4.139***	-2.330*
		(0.312)	(0.399)	(0.517)	(1.354)
$CHTIER2_{i,t}^{RWA}$	+	11.394***	12.597***	7.737***	12.642***
		(0.546)	(0.659)	(0.884)	(4.046)
$CHCL_{i,t}^{TA}$	−	0.360***	0.395***	0.186	0.308
		(0.089)	(0.104)	(0.145)	(0.367)
$LLA_{i,t-1}^{TA}$	?	-1.040***	-1.259***	-0.907**	1.043
		(0.299)	(0.371)	(0.387)	(1.137)
$LLP_{i,t}^{TA}$	+	21.414***	24.008***	15.878***	5.657
		(1.372)	(1.398)	(2.021)	(4.99)
$CHOBS_{i,t}^{TA}$	−	-0.087	-0.117	0.116	0.454
		(0.101)	(0.135)	(0.134)	(0.332)
$ZSCORE_{i,t}$	?	0.066***	0.108***	0.038	0.150
		(0.019)	(0.022)	(0.038)	(0.138)
$LIM_{i,t}^{BASIS}$	+	7.936***	8.976***	7.014***	4.516
		(0.459)	(0.586)	(0.876)	(4.125)
$LNTA_{i,t}$	?	-0.867***	-1.338***	-1.654***	-0.900
		(0.192)	(0.316)	(0.490)	(1.782)
$CRGDP_t$	−	-0.105***	-0.068**	-0.063**	-0.126
		(0.019)	(0.034)	(0.032)	(0.162)
$REL\_340f_{i,t-1}^{RES}$	?	0.296***	0.306***	0.291***	0.201***
		(0.019)	(0.018)	(0.068)	(0.042)
$REL\_340f_{i,t-2}^{RES}$	?	0.000	-0.029**	-0.001**	-0.051***
		(0.000)	(0.013)	(0.000)	(0.02)
No. of obs.		20,331	14,482	5,403	446
No. of banks		3,619	2,829	701	89
No. of instruments		23	23	23	23
AR(1) test (p-value)		0.000	0.000	0.000	0.013
AR(2) test (p-value)		0.122	0.885	0.520	0.414
Hansen test (p-value)		0.169	0.391	0.688	0.739

Table 10: Consideration of different strengths of earnings management incentives.

Note: We use a dynamic generalized method of moments estimation technique following Blundell and Bond (1998) with Windmeijer (2005) correction to examine the impact of different earnings- and risk-related variables on releases of 340f reserves. For comprehensive variable descriptions, see Table 3. The functional form of the models is given by $REL\_340f_{i,t}^{RES} = \beta_0 + \beta_{17} \cdot D\_LOSS-_{i,t} + \beta_{18} \cdot D\_LOSS+_{i,t} + \beta_{19} \cdot D\_PREV-_{i,t} + \beta_{20} \cdot D\_PREV+_{i,t} + \beta_{21} \cdot D\_PEER-_{i,t} + \beta_{22} \cdot D\_PEER+_{i,t} + \beta_4 \cdot NIBRPT_{i,t}^{TA} + \beta_5 \cdot CHTIER1_{i,t} + \beta_6 \cdot CHTIER2_{i,t} + \beta_7 \cdot CHCL_{i,t}^{TA} + \beta_8 \cdot LLA_{i,t-1} + \beta_9 \cdot LLP_{i,t} + \beta_{10} \cdot CHOBS_{i,t}^{TA} + \beta_{11} \cdot ZSCORE_{i,t} + \beta_{12} \cdot LIM_{i,t}^{BASIS} + \beta_{13} \cdot LNTA_{i,t} + \beta_{14} \cdot CRGDP_{i,t} + \beta_{15} \cdot REL\_340f_{i,t-1}^{RES} + \beta_{16} \cdot REL\_340f_{i,t-2}^{RES} + \epsilon_{i,t}$. *, ** and *** indicate significance at the 10%, 5% level and 1% level, respectively. Robust standard errors clustered on the bank level are given in brackets below the coefficients.

managers of banks unable to reach the peer group earnings target post-340f nevertheless release more of their existing 340f reserves than those able to achieve the target.

The strongly significant and negative coefficient on $NIBRPT_{i,t}^{TA}$ is qualitatively identical to the one in Model A.1. Since this and the findings on all other variables in this model remain widely unchanged, we refrain from commenting on those in more detail and instead refer to Section 4.3.2 for their interpretation.

Regarding the category-specific models B.2 to B.4, we discuss three major differences between the categories. First, it is striking that the coefficient on $D\_LOSS-_{i,t}$ is weakly significant and negative for *Coops*. Apparently, managers of *Coops* that miss the zero earnings target and are unable to reach it even by releasing all of their 340f reserves, opt to further increase these reserves. However, we are cautious in interpreting this as a sign of big bath accounting because more appropriate tests would be needed, and this is not within the scope of our paper. Second, the significantly positive coefficient for *Commercials* is in line with the previous findings that also observations unable to reach the target post-340f are releasing reserves to come closer to the target. Third, the coefficient on $D\_PREV-_{i,t}$ is weakly significant and positive for *Savings Banks* only. Managers of *Savings Banks* missing the zero earnings changes target pre-340f and unable to meet it even by releasing all of their banks' 340f reserves nevertheless opt for such a release. This brings their net income closer to the previous year's income level.

4.3.4. Earnings management during the financial crisis

The fact that our sample data cover the period 2007 through 2009 enables us to address whether the tremendous turmoil caused by the financial crisis led to changes in earnings management behavior compared to the rather calm economic pre-crisis period. To do so, we split up our sample into those observations belonging to the period 1997 through 2006 on the one hand,

and 2007 through 2009 on the other. We re-estimate equation (1) on both periods separately. As for the previous regressions, we also split up our sample into the different bank categories. We report the results in Table 11.

Before we discuss our findings, it is worth commenting on two important, but rather technical, issues concerning our regressions. First, one may be inclined to consider only 2008 and 2009 as the (core) crisis period. However, we conjecture that considering 2007 as a crisis year as well is appropriate for at least two reasons. To begin with, early indicators of a crisis (such as the financial distress of the UK bank Northern Rock) already prevailed at the end of 2007. Moreover, financial statements for 2007 were prepared during early 2008, and thus at a time when the financial crises was already speeding up considerably. Second, it is worth noting that we allow observations from the crisis period to partly obtain their lagged values (necessary for using dynamic panel data estimations) from the period before the crisis. Doing so is inevitable because the rather short time period of three years would otherwise not allow to estimate dynamic panel data models.

Regarding our results, it is worth noting that not a single sign of any coefficient in the models of block C to F changes compared to those of our baseline model in block A. However, the analysis reveals some quite interesting differences between the non-crisis and the crisis period with respect to the magnitude of some coefficients. For the sake of brevity, we comment on those differences almost exclusively for variables related to earnings management.

The magnitude of the coefficient on $D\_LOSS_{i,t}$ for *Coops* and *Commercials* is larger in the crisis period, whereas for *Savings Banks* this is true before the crisis.[21] Managers of *Coops* and *Commercials* are more strongly inclined to use their 340f reserves to cross the zero profit line during the crisis, whereas these incentives seem to be lower for the management of *Savings*

[21] Since the subsamples of the crisis and the non-crisis period are not independent of one another, caution is advised in interpreting the relative magnitude of the coefficients to one another.

		dependent variable: $REL\_340f_{i,t}^{RES}$							
		C (*All categories*)		D (*Coops*)		E (*Savings Banks*)		F (*Commercials*)	
indep. var.	Exp.	(1) 97-06	(2) 07-09	(1) 97-06	(2) 07-09	(1) 97-06	(2) 07-09	(1) 97-06	(2) 07-09
$D\_LOSS_{i,t}$	+	17.933***	15.999***	7.852*	15.423***	26.514***	12.930***	48.251***	34.482***
		(2.436)	(1.503)	(4.489)	(1.594)	(4.334)	(2.343)	(12.682)	(11.607)
$D\_PREV_{i,t}$	+	6.930***	1.071**	5.286***	0.465	8.120***	1.518	10.646**	1.898
		(0.759)	(0.489)	(0.741)	(0.503)	(1.67)	(1.04)	(4.333)	(4.096)
$D\_PEER_{i,t}$	+	7.562***	3.637***	9.892***	3.835***	4.208**	2.727**	-3.352	0.265
		(0.977)	(0.581)	(1.07)	(0.613)	(1.651)	(1.352)	(6.151)	(6.159)
$NIBRPT_{i,t}^{TA}$	−	-17.585***	-12.512***	-21.426***	-12.614***	-16.074***	-17.948***	-2.027	-16.194***
		(1.772)	(0.954)	(1.699)	(0.943)	(2.094)	(2.132)	(6.771)	(4.501)
$CHTIER1_{i,t}^{RWA}$	−	-7.195***	-2.391***	-9.677***	-2.708***	-4.209***	-1.316***	-3.080**	-1.866
		(0.631)	(0.188)	(0.734)	(0.205)	(1.041)	(0.479)	(1.57)	(1.288)
$CHTIER2_{i,t}^{RWA}$	+	18.748***	4.571***	21.448***	4.756***	10.054***	2.306**	11.722**	9.749***
		(1.266)	(0.306)	(1.318)	(0.314)	(1.39)	(1.028)	(5.963)	(2.827)
$CHCL_{i,t}^{TA}$	−	0.446***	-0.107	0.489***	-0.275***	0.219	0.048	0.025	0.402
		(0.113)	(0.070)	(0.135)	(0.076)	(0.182)	(0.195)	(0.506)	(0.332)
$LLA_{i,t-1}^{TA}$	?	-1.515***	-0.575	-1.662***	-1.012***	-1.684***	0.683	0.501	1.376
		(0.340)	(0.352)	(0.498)	(0.377)	(0.418)	(0.823)	(1.446)	(1.692)
$LLP_{i,t}^{TA}$	+	18.770***	12.716***	21.347***	11.937***	16.552***	19.635***	3.203	15.417**
		(1.635)	(1.084)	(1.600)	(1.043)	(2.347)	(3.311)	(5.179)	(6.229)
$CHOBS_{i,t}^{TA}$	−	-0.111	0.067	-0.191	0.056	0.075	0.527	0.357	0.871
		(0.116)	(0.173)	(0.154)	(0.16)	(0.139)	(0.573)	(0.403)	(0.553)
$ZSCORE_{i,t}$	?	0.063***	0.082***	0.111***	0.071***	0.066	0.077**	0.048	0.420
		(0.022)	(0.015)	(0.030)	(0.015)	(0.046)	(0.034)	(0.172)	(0.282)
$LIM_{i,t}^{BASIS}$	+	9.294***	5.958***	11.912***	6.863***	7.531***	6.412***	4.671	-1.327
		(0.623)	(0.477)	(0.907)	(0.441)	(0.973)	(1.530)	(3.924)	(3.268)
$LNTA_{i,t}$	?	-0.737***	0.192	-1.074***	0.616**	-1.560***	1.522*	-0.273	1.172
		(0.208)	(0.218)	(0.409)	(0.270)	(0.544)	(0.781)	(1.919)	(1.723)
$CRGDP_t$	−	-0.271***	-0.567***	-0.206***	-0.636***	-0.240***	-0.176**	0.038	-0.997**
		(0.028)	(0.043)	(0.059)	(0.043)	(0.045)	(0.081)	(0.192)	(0.496)
$REL\_340f_{i,t-1}^{RES}$	?	0.383***	0.156***	0.369***	0.157***	0.340***	0.067	0.103	0.400***
		(0.036)	(0.021)	(0.026)	(0.02)	(0.086)	(0.132)	(0.081)	(0.045)
$REL\_340f_{i,t-2}^{RES}$	?	0.001	0.015**	-0.056***	0.014**	0.001	-0.023	-0.020	0.055**
		(0.001)	(0.007)	(0.017)	(0.007)	(0.001)	(0.057)	(0.021)	(0.027)
No. of obs.		16,328	4,003	11,524	2,958	4,447	956	357	89
No. of banks		3,443	1,517	2,693	1,111	670	370	80	36
No. of instruments		20	20	20	20	20	20	20	20
AR(1) test (p-value)		0.000	0.000	0.000	0.004	0.000	0.028	0.034	0.032
AR(2) test (p-value)		0.250	0.572	0.530	0.188	0.411	0.545	0.236	0.559
Hansen test (p-value)		0.340	0.163	0.748	0.065	0.723	0.172	0.405	0.970

Table 11: Earnings management via 340f reserves during the financial crisis.

Note: We use a dynamic generalized method of moments estimation technique following Blundell and Bond (1998) with Windmeijer (2005) correction to examine the impact of different earnings- and risk-related variables on releases of 340f reserves, separated by exchange-listed and non-listed banks. For comprehensive variable descriptions, see Table 3. The functional form of the models is given by $REL\_340f_{i,t}^{RES} = \beta_0 + \beta_1 \cdot D\_LOSS_{i,t} + \beta_2 \cdot D\_PREV_{i,t} + \beta_3 \cdot D\_PEER_{i,t} + \beta_4 \cdot NIBRPT_{i,t}^{TA} + \beta_5 \cdot CHTIER1_{i,t} + \beta_6 \cdot CHTIER2_{i,t} + \beta_7 \cdot CHCL_{i,t}^{TA} + \beta_8 \cdot LLA_{i,t-1} + \beta_9 \cdot LLP_{i,t} + \beta_{10} \cdot CHOBS_{i,t}^{TA} + \beta_{11} \cdot ZSCORE_{i,t} + \beta_{12} \cdot LIM_{i,t}^{BASIS} + \beta_{13} \cdot LNTA_{i,t} + \beta_{14} \cdot CRGDP_{i,t} + \beta_{15} \cdot REL\_340f_{i,t-1}^{RES} + \beta_{16} \cdot REL\_340f_{i,t-2}^{RES} + \epsilon_{i,t}$. *, ** and *** indicate significance at the 10%, 5% level and 1% level, respectively. Robust standard errors clustered on the bank level are given in brackets below the coefficients.

Banks. Moreover, all coefficients on $D\_PREV_{i,t}$ are insignificant across the categories during the crisis period.[22] Sudden and severe declines in profitability owing to the crisis may presumably make it challenging to achieve zero earnings changes, and profits lower than the previous year are quite likely more acceptable in a financial crisis (Rajan (1994)). In addition, in contrast to $D\_LOSS_{i,t}$, the relevance of reaching the peer group earnings target seems to decline during the crisis, as indicated by the fact that the coefficients on $D\_PEER_{i,t}$ are smaller during 2007 through 2009. Finally, the negative and strongly significant coefficient on $NIBRPT_{i,t}^{TA}$ for *Commercials* is interesting because it is insignificant in our baseline Model A as well as in the non-crisis period (Model F.1). Apparently, managers of these institutions release 340f reserves to a larger (lower) extent if the non-discretionary income of their bank is rather low (high), but they tend to do so only during the crisis.

In a nutshell, the financial crisis does not alter the patterns of use of 340f reserves for earnings management too much. However, the prevailing differences indicate that benchmark-beating earnings management via 340f reserves becomes more relevant during the crisis with respect to the zero earnings target, whereas the zero earnings changes and the peer group earnings target lose relevance during the crisis across all bank categories. Finally, presenting a stable income stream proves to be more important during the crisis, particularly to *Commercials*.

4.3.5. Earnings management and stock exchange listing

Even though the majority of banks in our setting are unlisted, we have so far shown the tremendous relevance of earnings management particularly among non-listed institutions. To explicitly address potential differences between listed and non-listed banks (as done in, e. g., Beatty *et al.* (2002)), we split our sample according to this characteristic.

[22] The fact that it is strongly significant for the crisis period when using the full sample stresses the importance of conducting category-specific analyses.

Doing so yields a subsample of 104 listed banks (with a total of 558 observations) and one of 3,512 non-listed banks (19,749 observations), on both of which we re-estimate equation (1). The results are not given here (but are available upon request) since, by and large, they resemble those of the models in block A (Table 7). These similarities are not surprising. Listed banks are solely present in *Commercials*, and only some of the small regional banks contained in this category drop out of the group of listed banks. Therefore, the results for listed banks resemble those for *Commercials* in the models of block A, whereas those for non-listed banks are quite similar to those for *Coops* and *Savings Banks*.

Accordingly, we find particularly the zero earnings (but also the zero earnings changes) target to be more relevant to listed banks, whereas incentives to reduce income variability by means of 340f reserves seems to prevail more strongly among non-listed institutions.

5. Conclusion

Most empirical studies on earnings management either examine why (i. e. with what objective) *or* how (i. e. by means of what instrument) earnings are managed in banks.

Our analysis of 340f reserves provides a perfect arena for combining both questions. Legally intended to provision against the special risks inherent to the banking business, their use for earnings management is implicitly accepted. Only few legal restrictions are imposed on these reserves, and their use directly influences a bank's net income, which demonstrates the tremendous amount of discretion contained in 340f reserves. We clearly find 340f reserves to be used for earnings management. More specifically, they are used to (1) avoid a negative net income, (2) avoid a drop in net income compared to the previous year, (3) avoid a shortfall in net income compared to a peer group, and (4) reduce the variability of net income over time. We (5) find

a diminished relevance of avoiding a drop in net income as well as a shortfall relative to the peer group during the financial crisis. Finally, we are (6) unable to confirm any differences in the relevance of hidden reserves for earnings management between listed and non-listed banks.

Beyond providing interesting insights into how managerial discretion is exerted in German banks, particularly in times of financial crises, our findings have important policy implications. They show that earnings management is an important driver behind the use of 340f reserves, a fact that contributes to the ongoing discussion on whether or not allowing banks to build hidden reserves is useful. In bad times, when such reserves are needed, they are released in order to reach income targets. This narrows the information function of the published accounting information, because problem banks may use 340f reserves as camouflage to appear financially sound. Even though supervisors should be able to detect such behavior, the broad public is not.

We do not conceal that our empirical study shares one limitation with those examining the use of LLP in banks. Both LLP and 340f reserves may either be used to accomplish managerial objectives (such as earnings and capital management) or they may simply show a bank's reaction to changes in its (credit) risk exposure. In some of our models, we indeed find some risk indicators (changes in the volume of the loan portfolio or non-performing loans) to significantly explain changes in 340f reserves. At the same time, we also find incentives to beat earnings benchmarks to significantly explain these changes. However, the question which of the two motives is the primary driver behind the use of 340f reserves remains unanswered. As we are not aware of any adequate way to address this limitation, we leave it to future research.

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