Discussion Paper

The payout behaviour of German savings banks

Matthias Köhler

Non-technical summary

Research question

In recent years, the profits of German savings banks have increasingly come under pressure by the low interest rate environment. This makes it more difficult for them to build up capital as they increase their capital and reserves mainly by retaining profits. Against this background, our study examines the payout behaviour of the savings banks.

Contribution

Our contribution to the literature is our use of a novel data set concerning savings banks' payouts. The data set offers considerably more information on the distributions of savings banks in Germany across time and cross-sections. Unlike the previous studies, we can therefore examine if savings banks' payout behaviour differs between federal states, and if it has changed in recent years.

Results

Our analysis finds that despite the growing number, the majority of savings banks currently do not make any payouts. Furthermore, savings banks distribute only a small part of their net profit to the shareholders. This means that they can still build up capital even if they make payouts. Moreover, despite there being significant differences between the federal states, savings banks hold significantly more capital than is called for by the regulatory framework. Finally, the regression analysis shows that savings banks that have less capital distribute profits to their shareholders considerably less frequently. This correlation has intensified since 2009, even though the Savings Banks Acts (*Sparkassengesetz*e) were relaxed in individual federal states.

Nichttechnische Zusammenfassung

Fragestellung

In den vergangenen Jahren sind die Gewinne der Sparkassen aufgrund des Niedrigzinsumfelds zunehmend unter Druck geraten. Dadurch wird es schwieriger für sie Eigenkapital aufzubauen, da sie dies vorwiegend durch die Einbehaltung von Gewinnen erhöhen. Vor diesem Hintergrund untersucht unsere Studie das Ausschüttungsverhalten der Sparkassen.

Beitrag

Unser Beitrag zur Literatur ist, dass wir einen neuartigen Datensatz zu den Ausschüttungen der Sparkassen nutzen. Der Datensatz bietet deutlich mehr Informationen zu den Ausschüttungen der Sparkassen über die Zeit und den Querschnitt. Deshalb können wir im Unterschied zu den bisherigen Studien untersuchen, ob sich das Ausschüttungsverhalten der Sparkassen zwischen den Bundesländern unterscheidet und ob es sich in den vergangenen Jahren geändert hat.

Ergebnisse

Unsere Analyse zeigt, dass trotz steigender Anzahl die Mehrheit der Sparkassen derzeit keine Ausschüttungen vornimmt. Außerdem schütten die Sparkassen nur einen kleinen Teil ihres Bilanzgewinns an den Träger aus, so dass sie selbst bei einer Gewinnausschüttung weiter Eigenkapital aufbauen können. Darüber hinaus haben die Sparkassen trotz deutlicher Unterschiede zwischen den Bundesländern deutlich mehr Eigenkapital als regulatorisch erforderlich. Die Regressionsanalyse zeigt schließlich, dass Sparkassen, die weniger Eigenkapital haben, deutlich seltener Gewinne an ihre Träger ausschütten. Dieser Zusammenhang hat sich seit 2009 trotz der Lockerung der Sparkassengesetze in einzelnen Bundesländern verstärkt.

The payout behaviour of German savings banks

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Summary

Our analysis finds that despite the growing number, the majority of savings banks currently do not make any payouts. Furthermore, savings banks distribute only a small part of their net profit to the shareholders. This means that they can still build up capital even if they make payouts. Savings banks also hold significantly more capital than is called for by the regulatory framework. Finally, the regression analysis shows that savings banks that have less capital distribute profits to their shareholders considerably less frequently. This correlation has intensified since 2009, even though the Savings Banks Acts (*Sparkassengesetze*) were relaxed in individual federal states. All in all, our results therefore indicate that payouts do not currently pose a threat to the capital adequacy of most savings banks.

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1 Introduction

In recent years, the profits of German savings banks have increasingly come under pressure by the low interest rate environment. This makes it more difficult for them to build up capital as they increase their capital and reserves mainly by retaining profits. Against this background, this study examines German savings banks' payout behaviour.

Our discussion paper is based on the studies of Kleff and Weber (2011) and Rathgeber and Wallmeier (2012). Both studies show that more profitable savings banks with a higher level of capital are much more likely to distribute profits. Our paper supplements these studies in two key respects. First, we have considerably more information about savings banks' distributions than in the two previous studies. We can therefore examine whether savings banks' payout policy varies between the federal states. A possible reason for this could be the Savings Banks Acts, which differ between the federal states and govern whether and what amount of profit the savings banks may distribute.

The second contribution of this paper is that we examine whether savings banks have at the same level of capital distributed profits less frequently in recent years. There has been a growing need to retain profits and build up capital due to the introduction of significantly higher regulatory capital requirements. Under the new capital requirements, also known as Basel III, banks need to gradually increase their tier 1 capital ratio – measured in terms of tier 1 capital relative to risk-weighted assets – to 6 % (instead of 4% under Basel II) by 2015, of which a minimum of 4.5 % (2 % under Basel II) must be common equity tier 1 (CET1) capital. Furthermore, banks are required to build up a capital conservation buffer from 2016, which is to be steadily raised by 0.625 % per year until it reaches 2.5 % in 2019, although it can fall short of this figure in periods of crisis. From 2016, the national supervisor can also require banks to establish a countercyclical capital buffer that can amount to a maximum of 2.5 % in 2019.[2] Both buffers need to be met using CET1 capital. It largely comprises retained profits in the case of savings banks. In addition to the higher capital requirements, savings banks also need reserves to prepare themselves for an abrupt interest rate rise and/or a deterioration in credit quality if the economy weakens. Given the healthy economy, risk provisioning is currently at a historically low level.[3]

Instead of distributing fewer profits, savings banks in North Rhine-Westphalia, Hesse, Schleswig-Holstein and Thuringia could have also distributed profits to their shareholders more frequently in recent years. The statutory framework for distributions was changed in those federal states in 2009, making it easier for savings banks to distribute their profits. This could have led savings banks to distribute profits more frequently rather than less frequently since then.

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2 For an overview of the transposition of Basel III into national law, see Deutsche Bundesbank (2013).
3 See Deutsche Bundesbank (2015).

The paper is structured as follows. The statutory framework that governs public sector savings banks' distribution of profits will be explained in the next chapter. We will look in particular at the amendment to the Savings Banks Acts, which has made it easier for savings banks in some federal states to distribute their profits since 2009. In chapter 3, the data set is presented and the capital base and payout policy of savings banks is examined on a descriptive level over a period from 2003 to 2012. In chapter 4, we analyse the key factors determining the payout policy of savings banks. Chapter 5 summarises the key findings of our analysis.

2 Legal framework for payouts

Savings banks are not provided with capital from their shareholders. This is why they build up their capital mainly through profit retention. This special feature explains why the Savings Banks Acts precisely govern how savings banks' annual profit should be appropriated. As a rule, savings banks may only distribute profits on the proviso that they are also eligible for distribution. Eligibility for distribution is governed in the Savings Banks Acts of each federal state of Germany.[4] According to these acts, a savings bank is only eligible to distribute profits provided its capital or reserves exceed a minimum level prescribed in the Savings Banks Acts. Once the ability to distribute has been determined, the savings banks may distribute the net profit on a percentage scale, depending on their level of capital. As a rule, savings banks that are more poorly capitalised may distribute fewer profits to the shareholders. Full profit distribution is not possible in most of the federal states.[5] These rules are designed to ensure that only those savings banks that hold a sufficient level of capital can distribute profits.

Given that the Savings Banks Acts are enacted by the federal states, the minimum requirements concerning the eligibility to distribute profits are defined differently (see Table 1). In North-Rhine Westphalia, for example, a savings bank could only distribute profits if the ratio of its contingency reserves to risk-weighted assets was at least 7 %. This minimum requirement was abolished in 2009 when changes were made to the Savings Banks Act in North-Rhine Westphalia. The scaling of the amounts available for distribution was also abolished. Equally, there have been no minimum capital requirements allowing savings banks to distribute profits in the federal states of Hesse, Schleswig-Holstein and Thuringia since 2009. This therefore means that, since 2009, every savings bank in those states is free to distribute profits as long as it meets the lower regulatory capital requirements.[6] In all federal states, however, the board of directors of each savings bank should take into consideration the

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[4] For a detailed description of the savings bank legislation relating to distributions, see Lepper (2003) and Steiner and Rathgeber (2009).
[5] See Steiner and Rathgeber (2009).
[6] The minimum contingency reserve, measured by the ratio of contingency reserves to total assets, had to amount to at least 4% in Hesse and at least 5% in Thuringia. In Schleswig-Holstein, savings banks were only eligible to distribute if the ratio of their contingency reserves to total assets was at least 3 %. In Lower Saxony, the distribution requirements were already repealed in 2004.

future economic performance of the institution when deciding whether profits should be distributed.

3 Descriptive analysis of the payout policy and capitalization of savings banks

One of the problems faced when analysing the payout policy of savings banks is that no data are collected on the distributions within the scope of supervisory reporting and savings banks themselves publish only a little information on whether they have distributed profits. For this analysis, therefore, savings banks' distributions were calculated using data taken from the annual financial statements in the *Deutsche Bundesbank*'s prudential information system (BAKIS). The idea behind calculating the distributions is that the holdings of contingency reserves that are reported in the balance sheet can increase only if the savings bank transfers a part of its profit for the year to the contingency reserves ("Vorwegzuführungen") and/or retains a part of its net profit. As the contingency reserves held are known from the reporting system and data on the appropriation of annual profit is reported, it is possible to determine whether or not a savings bank made a distribution in a specific year.[7]

In order to review the plausibility of our calculations, a random sample of the distributions calculated were compared with the actual distributions that the individual savings banks stated in their annual reports. Distributions were identified correctly in all cases. All in all, the data set contains information on the distributions of 423 savings banks for the period from 2003 to 2012. Considerably more observations are therefore available than in the studies of Kleff and Weber (2011) and Rathgeber and Wallmeier (2012).

3.1 Number of savings banks eligible to distribute and savings banks that distribute

Before it is possible to analyse which savings banks distribute profits, it is necessary to examine which savings banks are able to distribute profits. We therefore examine which savings banks were able to distribute in 2012. Table 2 shows that 184 out of 410 savings banks were able to distribute profits. On top of this, there are the 214 savings banks in the federal states of North Rhine-Westphalia, Hesse, Schleswig-Holstein, Thuringia and Lower Saxony, where there were no additional distribution requirements in 2012 (see chapter 2). This means that almost all savings banks were able to distribute profits. Overall, however, only one-third of savings banks that were able to distribute profits actually did so. Consequently, most savings banks made no payouts. Similar observations were made by Kleff and Weber (2011) and Rathgeber and Wallmeier (2012). However, the number of savings banks distributing profits has been rising continuously since 2003, with the exception of 2008 (see Figure 1). It is also interesting that payout behaviour varies considerably between the federal states (see Table 2). For example, while only one savings bank

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[7] For details on the calculation, see the notes in the Annex.

distributed profits in Baden-Württemberg in 2012, 45 did so in North-Rhine Westphalia. This means that one in four savings banks there distributed profits. The proportion of distributing savings banks is higher only in Rhineland-Palatinate, Thuringia and Saarland. In fact, every savings bank in Saxony distributed profits to their shareholders in 2012.

3.2 Savings banks' payout ratio and level of capital

As long as the savings banks distribute only a small part of their profits, they can continue to build up capital despite making payouts. This is the case for most savings banks, although the share of distributed profits relative to net profit has increased to more than 30 % since 2009 (see Figure 1). However, the payout ratio varies greatly between the federal states (see Table 3). The share of distributed profits is highest in Saxony (median of 62 % of net profit) and North Rhine-Westphalia (32 %). The savings banks in Bavaria (median of 11 %) and Saarland (15 %) had the lowest payout ratio.

Distributions pose less of a threat to the capital adequacy of savings banks that hold a sufficient level of capital. Measured in terms of the regulatory tier 1 capital ratio, most savings banks hold sufficient capital. On average, the ratio of tier 1 capital to risk-weighted assets was 14 % in 2012, for example (see Table 4), with the contingency reserves that count towards CET 1 capital accounting for 10 percentage points. This is significantly higher than the regulatory tier 1 capital ratio of 4 % stipulated for 2012 (of which minimum CET1 capital: 2 %) and is also considerably higher than the current minimum tier 1 capital ratio of 6 % (of which minimum CET1 capital: 4.5 %). Furthermore, the savings banks already meet the requirements for the capital conservation buffer that will increase the minimum CET1 capital ratio to 7 % by 2019. This is also the case for savings banks not eligible to distribute profits even though, as expected, they are far more poorly capitalised. Unlike savings banks capable of distributing profits, those that are not eligible to do so failed to meet the requirements for the countercyclical capital buffer that national supervisory authorities can require from 2016. Most savings banks therefore are not reliant on retaining profits in order to meet the higher regulatory capital requirements under Basel III.

It is striking that the level of capital of the savings banks varies significantly between the federal states (see Table 5). The distributing savings banks in Schleswig-Holstein had the lowest level of CET1 capital, measured in terms of the ratio of contingency reserves to risk-weighted assets. These banks have virtually no contingency reserves. Instead, their tier 1 capital consists primarily of common stock or issued share capital. The level of tier 1 capital that they hold relative to risk-weighted assets rises significantly if the contingency reserves stipulated in section 340g of the German Commercial Code (*Handelsgesetzbuch*) − which also count as tier 1 capital − are included in this figure.[8] Nevertheless, tier 1 capital levels

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[8] Pursuant to section 340g of the German Commercial Code, banks may create reserves to hedge against general banking risks (fund for general banking risks). Besides their risk provisioning function, these reserves can also be used to build up capital, for internal financing and for balance sheet management (see, for example, Bornemann et al, 2014).

remain the lowest in Schleswig-Holstein. Compared with the other federal states, the tier 1 capital held by savings banks in North Rhine-Westphalia, Baden-Württemberg and Saarland in 2012 was also below average.[9]

4 Determinants of the payout policy of savings banks

In this chapter, we analyse the factors determining the payout policy of savings banks. We also estimate a logit model, as was done by Kleff and Weber (2010) and Rathgeber and Wallmeier (2012):

$$P_{it} = \frac{\exp(X_{it}\beta)}{(1 - \exp(X_{it}\beta))}$$

The dependent variable P_{it} is the probability that savings bank i distributes profits in year t; X is a vector of control variables that affect the probability of a payout.

Our analysis focuses on the impact the level of capital has on the probability of a savings banks distributing profits. To control for this, we use the ratio of balance sheet capital or contingency reserves to risk-weighted assets.[10] Savings banks that hold a high level of capital should distribute profits more frequently because they are more likely to meet the eligibility requirements and are therefore also more likely to be permitted to distribute profits (see chapter 2). The management board could also be more willing to distribute profit if the savings bank holds a high level of capital and payouts do not jeopardise the capital adequacy of the bank. For this reason, we expect that the probability of a savings bank making distributions is higher if it holds a high level of capital.

We also control for holdings of disclosed contingency reserves, which banks may create pursuant to section 340g of the German Commercial Code for the purpose of hedging against general banking risks. They are recognised as CET1 capital. Savings banks holding large reserves pursuant to section 340g relative to risk-weighted assets should distribute profits more frequently, as they rely less on profit retention to build up CET1 capital. Furthermore, the management board could be more willing to distribute profits if a savings bank has already created high levels of reserves pursuant to section 340g of the German Commercial Code. As with capital and contingency reserves, profitable savings banks should also distribute more frequently.

The size of a savings bank, as measured by the logarithm of total assets, could also influence the distribution probability, because large savings banks could be under greater public pressure to distribute profits than their small counterparts (Kleff and Weber, 2011 and

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[9] It should be noted that only one savings bank distributed profit in Baden-Württemberg in 2012.
[10] Contingency reserves are the equivalent of revenue reserves at private banks.

Rathgeber and Wallmeier, 2012). Furthermore, we control for lending to local government and local government associations. Loans granted to public bodies could be regarded as a substitute for payouts (Kleff and Weber, 2011). This would suggest that the payout probability falls if a savings bank grants a large number of loans to local government and local government associations compared to the volume of loans extended to non-banks.

Our regression model also includes two dummy variables. The "independent savings banks" dummy tests whether the payout policy of an independent savings bank ("Freie Sparkasse") differs to that of a public savings bank. Independent savings banks are not subject to the Savings Banks Act and are thus exempt from the distribution rules. According to Kleff and Weber (2010) and Rathgeber and Wallmeier (2012), the payout probability could also depend on how many shareholders a savings bank has. Savings banks originally had only one shareholder. If two savings banks merge, the sponsorship is transferred to a special-purpose entity ("Zweckverband") to which the shareholders of the merged banks belong. Mergers thus expand the group of shareholders, which could make it more difficult for the individual shareholders to enforce their interests. We use the "special purpose entity" dummy to control for this. Given that the shareholders' interests in a payout could vary, it is not clear whether the probability of a distribution increases or decreases if a savings bank has several shareholders.

As was explained in chapter 2, the payout behaviour also depends on the distribution rules contained in the Savings Banks Acts. In order to control for this and for other differences between savings banks' payout policies across the federal states, our baseline model is estimated with dummy variables for each federal state. Time dummies additionally control for all unobserved effects that vary over time but that impact on all savings banks at the same time, such as economic activity and the interest rate level. Table 6 provides an overview of the variables used in the regression analysis and whether they are expected to be positive or negative. Descriptive statistics can be found in Table 7. To prevent our results from being distorted by outliers, values are winsorized at the 1st and 99th percentile.[11] Standard errors are clustered at the savings bank level to control for autocorrelation in the residuals.

4.1 Results of the regression analysis

In the first step of our regression analysis, we estimate our baseline model. In the second step, we extend our baseline model to include interaction terms in order to examine whether the impact of the level of capital on the distribution probability has changed since 2009. In view of the low-interest-rate environment and tighter capital requirements, we would expect savings banks to have made fewer distributions at the same level of capital than before 2009.

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[11] The results do not change when they are not winsorised.

4.1.1 Baseline model

Table 8 shows the results of the estimates of our baseline model. A savings bank's level of capital is measured using the ratio of balance sheet capital to risk-weighted assets in columns 1 and 2, and alternatively, using the ratio of contingency reserves to risk-weighted assets in columns 3 and 4. To measure savings banks' profitability, we use annual profit after tax relative to total assets in columns 1 and 3, and relative to balance sheet capital in columns 2 and 4.

The results are in line with expectations. Consistent with Kleff and Weber (2011) and Rathgeber and Wallmeier (2012), we find that savings banks that have more capital have a significantly higher distribution probability. The more capital banks have, the more likely they meet the requirements to be able to distribute profits (see chapter 2). On the other hand, savings banks with considerable reserves pursuant to section 340g of the German Commercial Code do not distribute profits significantly more frequently. This changes when we expand our baseline model to include interaction terms (see Tables 9 to 12). In this case, the variable has a significantly positive sign, as expected. Overall, our results imply that savings banks that hold more capital and disclosed contingency reserves are more likely to distribute profits. Distributions pose less of a threat to their capital adequacy. The management board of the savings banks could therefore be more willing to distribute profits to shareholders.

Profitable savings banks also distribute profits significantly more frequently. The same holds true for large savings banks. Large institutions are under greater public pressure to make payouts (Kleff and Weber, 2011). The "Special purpose entity" dummy is also significant. The negative sign indicates that savings banks distribute profits significantly less frequently if the shareholder is a special-purpose entity. As the special-purpose entity has several shareholders, conflicts of interest can arise. Our findings show that this results in a lower distribution probability.[12] "Independent savings banks", on the other hand, distribute profits significantly more frequently. They are not subject to any distribution rules. On its own, the ratio of loans to local governments and local government associations to the total volume of loans extended to non-banks does not influence the distribution probability, as in Rathgeber and Wallmeier (2012).

The annual and federal state dummies are also significant. According to the federal state dummies, the probability that savings banks will distribute profits is significantly higher in Hesse, Lower Saxony, North Rhine-Westphalia, Rhineland-Palatinate, Saarland, Saxony,

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[12] Special-purpose savings banks are created through mergers and acquisitions. If these transactions were made on account of the need to avoid supervisory intervention (as shown, for instance, by Koetter et al, 2007), the lower distribution probability could also be because special-purpose savings banks are not as well capitalised and are thus more reliant than other savings banks on profit retention. We do not believe that this underlies our results. First, we already control for the level of capital of the savings banks in our regression model. Second, a descriptive comparison of the capital ratios demonstrates that special-purpose savings banks have significantly *more* and not less tier 1 capital in relation to risk-weighted assets than the other savings banks.

Saxony-Anhalt, Schleswig-Holstein and Thuringia than in Baden-Württemberg (the reference group). This is consistent with the descriptive analysis in Table 2.[13] The Savings Banks Acts could be one of the reasons why the payout behaviour differs between the federal states. Overall, our results are therefore largely consistent with the results of the previous studies and our hypotheses.

4.1.2 Savings banks' payout policies since 2009

In this section, we will examine whether the payout policy of savings banks has changed in recent years. We are particularly interested in finding out if savings banks have recently made fewer distributions at the same level of capital in order to build up additional capital. The need to retain profits is likely to have become greater, because the introduction of Basel III has significantly increased the regulatory capital requirements.

In order to test whether savings banks distribute less frequently when they hold the same level of capital, we expand our baseline model to include an interaction term between the capital ratio and a dummy for the period from 2009 onwards (balance sheet capital or contingency reserves / risk-weighted assets * dummy from 2009 onwards). We focus on the period from 2009 onwards, as this was the year in which the *Basel Committee on Banking Supervision* first announced comprehensive proposals for reforming capital adequacy regulation.[14] If savings banks distribute less frequently at the same level of capital than before, the interaction term should be negative. The results in Table 8 confirm our hypothesis. The interaction term is significant and has a negative sign, as predicted. Since 2009, savings banks have therefore made considerably less frequent distributions than before. By way of illustration, the probability of a savings bank with balance sheet capital amounting to 10% of risk-weighted assets distributing profits prior to 2009 stood at an average of 40 %, according to our estimates (column 1 in Table 9). This probability has been less than 15 % since 2009. Instead of preparing for Basel III, the saving banks might also have made fewer distributions lately in order to build up reserves to provide a buffer for the low-interest-rate environment and/or a deterioration in credit quality if the economy weakens.

The Savings Banks Acts were amended in the federal states of North Rhine-Westphalia, Hesse, Schleswig-Holstein and Thuringia in 2009 (see chapter 2). We can use this fact to examine whether the payout behaviour of the savings banks in these federal states differs from that of the savings banks in the other federal states. Given that the savings banks are no longer required to meet any additional capital requirements since 2009 in order to be eligible to distribute profits, they could have made more frequent distributions since then compared with the other federal states. In order to test this hypothesis, we expand our baseline model to

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[13] In order to save space, we only present the results for the federal state dummies in Table 8. The annual dummies are not presented in any tables on the grounds of space considerations.

[14] See the press release entitled "Comprehensive response to the global banking crisis" published by the Bank for International Settlements (BIS) on 7 September 2015. Furthermore, the Basel Committee had already adopted stricter regulations in 2009 (updated in 2010 and 2011), particularly for securitisations and market risks (referred to informally as "Basel 2.5").

include a three-way interaction term between the capital ratio, a dummy for Hesse (HS), North Rhine-Westphalia (NRW), Schleswig-Holstein (SH) and Thuringia (TH), and a dummy for the period from 2009 onwards (balance sheet capital or contingency reserves / risk-weighted assets * dummy for HS, NRW, SH and TH * dummy from 2009 onwards). The results in Table 10 confirm our hypothesis. As expected, the coefficient of the three-way interaction term is positive and, in most cases, significant (columns 1, 3 and 4).

In Table 11, we use a separate interaction term for each of the federal states of Hesse, North Rhine-Westphalia, Schleswig-Holstein and Thuringia rather than a joint interaction term for all four federal states. In this model, the three-way interaction term remains significant for North Rhine-Westphalia and Thuringia. However, the overall coefficient remains negative if we add the coefficient for the three-way interaction term and the coefficient for the one-way interaction term between the capital ratio and dummy from 2009 onwards (balance sheet capital or contingency reserves / risk-weighted assets * dummy from 2009 onwards). In summary, our results imply that savings banks in North Rhine-Westphalia and Thuringia at the same level of capital have also made less frequent distributions than prior to 2009. Compared with savings banks in other federal states, however, they distribute profits more frequently.

In order to verify whether the capital of savings banks in Hesse, North Rhine-Westphalia, Schleswig-Holstein and Thuringia had a different impact on distributions prior to 2009 than that of savings banks in other federal states, we include an additional interaction term between the capital ratio and the dummy for each of these federal states (see Table 11). The interaction term for North Rhine-Westphalia, Thuringia and Hesse (balance sheet capital or contingency reserves / risk-weighted assets * dummy for NRW, TH or HS) is insignificant. This supports our assumption that the influence that a savings bank's level of capital has on the distribution probability only changed in these federal states from 2009, possibly as a result of the Savings Banks Acts being amended. By contrast, the interaction term (balance sheet capital or contingency reserves / risk-weighted assets * dummy for SH) for Schleswig-Holstein is significantly negative, ie savings banks there with similar level of capital distribute profits less frequently on average than savings banks in other federal states. Savings banks in Schleswig-Holstein have a poorer capital base and could rely more heavily on profit retention to build up capital.

4.2 Robustness of results

We conduct several tests to review the robustness of our results. First, we test whether the results are dependent on variables that we use to measure savings banks' level of capital. To do this, we replace our previous variables with the ratio of tier 1 capital to risk-weighted assets, or the ratio of capital to total assets as in Rathgeber and Wallmeier (2012), or with the

ratio of reserves to total assets as in Kleff and Weber (2011). There is no change in the results.[15]

So far, we have used time dummies to control for the macroeconomic environment (eg economic activity and interest rate levels). This assumes a broadly similar economic performance across Germany. While this assumption is justified with respect to interest rate levels, economic activity can differ greatly from region to region. Therefore, we also control for local economic growth in Table 12 using the annual growth rate of regional gross domestic product (GDP). The growth rate has a significantly positive sign, ie distribution probability increases in line with strong regional growth. If the local economy is performing well, savings banks could be under heightened pressure to distribute profits because they cannot refuse to do so on the grounds that they need to build up reserves. The worse the economy's performance, the more necessary it becomes to build up reserves. Furthermore, savings banks could be more willing to distribute profits if the economy is performing well.

In recent years, there has been growing media coverage of shareholders pressuring savings banks to distribute profits.[16] These shareholders are often municipalities that are in financial difficulties and want to use the payouts to consolidate their budgets.[17] To examine whether savings banks in heavily indebted municipalities distribute more frequently, we use the ratio of local government and local government associations' core budget debt to regional GDP, as in Kleff and Weber (2011) and Rathgeber and Wallmeier (2012). The data are obtained from the regional debt statistics of the Federal Statistical Office, which were comprehensively amended in 2010, so that there is only limited scope for comparing the values up to 2009 with those as of 2010. This should be taken into consideration in the interpretation. It is also for this reason that we have not controlled for the shareholder's indebtedness thus far. If the heavily indebted shareholder exercises greater pressure on savings banks for a distribution, the distribution probability should rise in line with growing municipal debt. The results in Table 12 confirm this hypothesis. Although the coefficient for the debt ratio has a positive sign, as expected, it is insignificant, as in Rathgeber and Wallmeier (2012). The results do not change even if we use *per capita* debt instead of the debt ratio, as with Kleff and Weber (2011) and Rathgeber and Wallmeier (2012).[18] Overall, therefore, our results do not imply

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[15] In order to save space, we do not present these results. The results can be obtained from the author upon request.

[16] See, for example, the article "Sparkassen sollen Pleitestädte retten" in the Financial Times Deutschland of 22 March 2012, or the article "Neue Begehrlichkeiten" in the Handelsblatt of 25 March 2015.

[17] The shareholders receive support from the General Accounting Offices of Hesse (2012) and Lower Saxony (2015). Both offices consider it reasonable, given the difficult budget position, for municipalities to push the savings banks for distributions when they are faced with financial difficulties.

[18] In place of the debt level, we also control for the ratio of the annual budgetary balance, measured by the difference between gross revenue and gross spending, to total spending. The higher the budget deficit, the more reliant the shareholder is on using debt to finance spending. Shareholders with a high deficit could place greater pressure on savings banks to distribute profit. The variable is insignificant, as for the debt ratio. Because of the changeover to double-entry bookkeeping, there are no data for North Rhine-Westphalia and Saarland (both from 2009), Lower Saxony and Mecklenburg-West Pomerania (from 2012), which means that the sample is considerably smaller than in the baseline model. For this reason, we do not present the results. The results can be obtained from the author upon request.

that savings banks in heavily indebted municipalities are under systematically greater pressure to distribute profits.[19] The results of the other variables do not change.

5 Conclusion

In recent years, the profits of German savings banks have increasingly come under pressure by the low interest rate environment. This makes it more difficult for them to build up capital as they increase their capital and reserves mainly by retaining profits. Against this background, this study examines the savings banks' payout behaviour.

Our analysis finds that despite the growing number, the majority of savings banks currently do not make any payouts. Furthermore, the savings banks distribute only a small part of their net profit to the shareholders. This means that they can still build up capital even if they make payouts. Moreover, despite significant differences between the federal states, savings banks hold significantly more capital than is called for by the regulatory framework. Finally, the regression analysis shows that savings banks that have less capital distribute profits to their shareholders considerably less frequently. This correlation has strengthened despite the fact that the distribution rules have been eased in individual federal states since 2009.

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[19] This pressure can nonetheless exist in isolated cases, as the example of Stadtsparkasse Duisburg or Sparkasse Essen show. See, for example, the article "Sparkassen sollen Pleitestädte retten" in the Financial Times Deutschland of 22 March 2012 or the article "Neue Begehrlichkeiten" in the Handelsblatt of 25 March 2015.

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Annex

Explanation of the data set

No data are collected on the savings banks' distributions within the scope of the supervisory reporting process. For this analysis, the savings banks' distributions were calculated using the data from the annual financial statements available in the Deutsche Bundesbank's prudential information system (BAKIS). The fundamental idea behind calculating the distributions is that the holdings of revenue reserves and contingency reserves that are reported in savings banks' balance sheets can increase only if a savings bank transfers a part of its annual profit to the contingency reserves and/or retains a part of its net profit. As the contingency reserves held are known from the supervisory reporting process and data on the appropriation of annual profit is reported to the Deutsche Bundesbank, it is possible to determine whether or not a savings bank has made a distribution.[20]

This can be illustrated using a simple example. Let us assume a savings bank has €500 million in contingency reserves at the end of 2012 with a net profit of €10 million. The following year, the savings bank reports contingency reserves of €505 million, ie the contingency reserves have increased by €5 million between 2012 and 2013. This increase could be due to the fact that the savings bank retained part of its net profit in 2012 and/or that it had transferred part of its annual profit to the contingency reserves in advance in 2013 (advance allocation). As advance allocations are reported to the Bundesbank, it is known whether the savings bank has made use of the second option. No advance allocations were made in our example. This means that the contingency reserves could only have increased by €5 million in 2013 if the savings bank had retained €5 million from its net profit in 2012. Consequently, the remaining €5 million must have been distributed to the shareholder.

When performing the calculation, it should be noted that net profit in 2012 does not increase the contingency reserves by €5 million until 2013, because the decision on the appropriation of net profit for financial year 2012 is not made until the start of 2013 at the annual general meeting of the savings bank. This means that data for 2013 must be available in order to calculate the payout in 2012. For the same reason, data for 2014 must be available in order to calculate the payout in 2013. As 2014 data for individual institutions were not available at the time this study was written, we are unable to calculate any payouts for 2013. Our data set therefore ends in 2012.

Problems arise when calculating the distributions in the case of acquisitions. With acquisitions, the acquiring institution's contingency reserves rise due to the acquisition, as the contingency reserves of the acquired institution are transferred to the acquiring institution. In

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[20] Profit and loss brought forward as well as other profit/revenue reserves were taken into account in the calculation. As a general rule, they do not play a role in the savings banks.

this case, contingency reserves increase even if no advance allocations from annual profit were made and no net profit is retained. A similar problem arises if common stock is converted into contingency reserves.[21] An additional problem emerged in 2009, when contingency reserves increased several-fold as a result of transition effects associated with the changeover to the Act to Modernise Accounting Law (*Bilanzrechtsmodernisierungsgesetz*), although no advance allocations were made or profit retained. These problems led to around 350 cases in which it could not be clearly determined whether a distribution had been made.

In such cases, we calculated the distributed profits as the average of the value in the previous and following year, ie if a savings bank distributed profits totalling €5 million in the year prior to reallocating common stock to contingency reserves and distributed the same amount in the year thereafter, we assumed that it had also distributed profits totalling €5 million in the year that the reallocation took place. This assumption is plausible because, according to our data, the savings banks' payout behaviour remains relatively constant over time. In order to check whether our results change if these adjustments are disregarded, we deleted all observations in which the aforementioned problems arose and it could not be clearly determined whether a distribution had been made before calculating our estimates again. There was no change in the results.

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[21] On the other hand, the stock of contingency reserves can decrease when reserves are converted into common stock.

Tables

Table 1: Overview of the minimum contingency reserve by federal state (eligibility to distribute as at October 2015)

Federal state	Legal basis	Capital variable	Assessment basis	Minimum quotient
Baden-Württemberg	Section 31 of Savings Banks Act	Contingency reserves	Total assets	4 %
Bavaria	Section 21 of Savings Banks Directive	Reserves	Risk-weighted assets	6 %
Brandenburg	Section 27 of Savings Banks Act	Reserves	Risk-weighted assets	6 %
Bremen	Section 23 of Savings Banks Act	Contingency reserves	Risk-weighted assets	10 %
Hesse	Section 16 of Savings Banks Act			No minimum requirements
Lower Saxony	Section 24 of Savings Banks Act			No minimum requirements
Mecklenburg-West Pomerania	Section 27 of Savings Banks Act	Contingency reserves	Risk-weighted assets	6 %
North Rhine-Westphalia	Section 25 of Savings Banks Act			No minimum requirements
Rhineland-Palatinate	Section 20 of Savings Banks Act	Liable capital	Risk-weighted assets	10 %
Saarland	Section 25 of Savings Banks Act	Liable capital	Risk-weighted assets	9.5 %
Saxony	Section 27 of Savings Banks Act, Section 1 of Savings Banks Distribution Regulation	Tier 1 capital	Risk-weighted assets	6 %
Saxony-Anhalt	Section 27 of Savings Banks Act	Tier 1 capital	Risk-weighted assets	6 %
Schleswig-Holstein	Section 27 of Savings Banks Act			No minimum requirements
Thuringia	Section 21 of Savings Banks Act			No minimum requirements

Table 1 shows the existing requirements for eligibility to make distributions in the individual federal states on the basis of the Savings Banks Acts. "No minimum requirements" means that the federal states' Savings Banks Acts do not include any requirements for the savings banks to be able to distribute profits over and above measures pursuant to section 10 of the German Banking Act (Kreditwesengesetz). Please note: presentation based on Steiner and Rathgeber (2009).

Table 2: Savings banks that distribute and have the ability to distribute (2012)

	Number of savings banks	*of which* savings banks able to distribute	*of which* savings banks that have actually made distributions
Baden-Württemberg	53	37	1
Bavaria	72	71	16
Brandenburg	11	11	3
Hesse	34	34*	14
Lower Saxony	44	44*	13
Mecklenburg-West Pomerania	10	9	3
North Rhine-Westphalia	106	106*	45
Rhineland-Palatinate	26	24	13
Saarland	7	7	6
Saxony	12	12	12
Saxony-Anhalt	13	13	3
Schleswig-Holstein	14	14*	3
Thuringia	16	16*	8
Total	418	398	140

Table 2 shows the number of savings banks that were able to make distributions and had made distributions in 2012. * No distribution requirements in 2012. To ensure the anonymity of the banks, no details are given on the ability of the savings banks in the federal states of Bremen and Hamburg to distribute profits. Very few savings banks operate there. No data are given for Berlin as there are no institution-specific data available for the Berliner Sparkasse.

Table 3: Share of distributed profit relative to net profit

	Mean	Median	Standard deviation
Baden-Württemberg	22.7	23.0	1.1
Bavaria	18.2	11.0	19.0
Brandenburg	27.9	27.0	12.2
Hesse	29.5	25.0	19.7
Lower Saxony	28.9	22.0	23.6
Mecklenburg-West Pomerania	29.9	18.5	27.4
North Rhine-Westphalia	40.3	32.0	28.4
Rhineland-Palatinate	31.1	28.0	18.0
Saarland	14.3	15.0	4.7
Saxony	61.8	62.0	24.6
Saxony-Anhalt	22.7	19.5	17.4
Schleswig-Holstein	38.2	18.5	37.4
Thuringia	28.2	24.0	20.8
All savings banks	34.3	25.0	26.4

Table 3 shows descriptive statistics for the share of profits distributed by the savings banks to their shareholders between 2003 and 2012, relative to net profit. To ensure the anonymity of the banks, no details are given on the ability of the savings banks in the federal states of Bremen and Hamburg to distribute profits. Only very few banks operate there. No data are given for Berlin as there are no institution-specific data available for the Berliner Sparkasse.

Table 4: Capitalization of the savings banks (mean, 2012)

	All savings banks	Savings banks unable to distribute profits	Savings banks able to distribute profits	Savings banks that can but do not distribute any profits	Savings banks that can and do distribute profits
Balance sheet capital / total assets	5.64	4.39	5.70	5.60	5.87
Contingency reserves / total assets	5.32	4.06	5.38	5.33	5.47
Section 340g reserves / total assets	2.31	2.58	2.30	2.23	2.44
Tier 1 capital / total assets	7.39	6.47	7.43	7.32	7.64
Balance sheet capital / risk-weighted assets	10.62	7.91	10.74	10.40	11.37
Contingency reserves / risk-weighted assets	10.02	7.31	10.14	9.89	10.60
Section 340g reserves / risk-weighted assets	4.47	4.94	4.45	4.27	4.77
Tier 1 capital / risk-weighted assets	14.02	11.91	14.12	13.72	14.86
Liable capital / risk-weighted assets	17.39	15.22	17.49	17.11	18.18
Risk-weighted assets / total assets	0.55	0.56	0.55	0.55	0.53

Table 4 shows the different indicators for assessing the level of capital of the savings banks. All values are averages across all savings banks for 2012.

Table 5: Capitalization of distributing savings banks by federal state (mean and median, 2012)

	Balance sheet capital / risk-weighted assets		Contingency reserves / risk-weighted assets		Tier 1 capital / risk-weighted assets	
	Mean	Median	Mean	Median	Mean	Median
Baden-Württemberg	9.59	9.59	9.35	9.35	10.93	10.93
Bavaria	10.64	10.26	10.34	9.69	14.24	14.18
Brandenburg	12.66	12.73	11.98	11.74	21.85	22.29
Hesse	13.40	13.26	11.78	12.28	17.17	17.92
Lower Saxony	12.95	12.82	12.64	12.59	15.23	15.79
Mecklenburg-West Pomerania	13.78	14.43	13.19	13.75	16.63	15.48
North Rhine-Westphalia	9.66	9.49	9.23	8.85	12.75	12.93
Rhineland-Palatinate	12.93	13.36	11.53	12.07	15.86	15.43
Saarland	10.10	9.93	9.77	9.55	11.56	11.72
Saxony	11.98	11.55	11.78	11.31	16.88	14.37
Saxony-Anhalt	12.91	12.98	12.64	12.75	18.02	17.47
Schleswig-Holstein	7.44	7.37	1.72	0.00	11.11	10.28
Thuringia	13.93	14.46	13.42	13.88	19.51	19.76
All savings banks	11.37	11.04	11.37	11.04	14.86	13.97

Table 4 shows the different indicators for the level of capital of savings banks that distributed profits in 2012. All values were calculated for 2012. No data are given for Berlin as there are no institution-specific data available for the Berliner Sparkasse.

Table 6: List of the variables used in the regression analysis

Variable	Definition	Expected sign
Section 340g reserves / risk-weighted assets	Reserves pursuant to section 340g of the German Commercial Code divided by risk-weighted assets	+
Balance sheet capital / risk-weighted assets	Balance sheet capital divided by risk-weighted assets	+
GDP growth	Annual growth rate of gross domestic product (GDP) at district and city level	+
Dummy from 2009 onwards	Dummy variable that adopts a value of one for all years after 2009 and a value of zero if not	-
Dummy for HS, NRW, SH and TH	Dummy variable that adopts a value of one if a savings bank has its registered office in Hesse (HS), North Rhine-Westphalia (NRW), Schleswig-Holstein (SH) or Thuringia (TH), and a value of zero if not	+/-
Dummy for HS	Dummy variable that adopts a value of one if the savings banks have their registered office in Hesse and a value of zero if not	+/-
Dummy for NRW	Dummy variable that adopts a value of one if the savings banks have their registered office in North Rhine-Westphalia and a value of zero if not	+/-
Dummy for SH	Dummy variable that adopts a value of one if the savings banks have their registered office in Schleswig-Holstein and a value of zero if not	+/-
Dummy for TH	Dummy variable that adopts a value of one if the savings banks have their registered office in Thuringia and a value of zero if not	+/-
Independent savings banks	Dummy variable that adopts a value of one if the savings bank is an independent savings bank ("Freie Sparkasse") and a value of zero if not	+
Annual profit / balance sheet capital	Annual profit after tax divided by balance sheet capital	+
Annual profit / total assets	Annual profit after tax divided by total assets	+
Loans to local government and local government associations / non-banks	Loans to local government and local government associations divided by total lending to non-banks	-
Log (total assets)	Logarithm of total assets	
Local government debt / GDP	Up to 2009: debt attributable to local government and local government associations at district level; as of 2010: core budget debt; both figures at district and city level	+
Contingency reserves / risk-weighted assets	Contingency reserves divided by risk-weighted assets	+
Special purpose entity savings banks	Dummy variable that adopts a value of one if the shareholder of an institution is a special-purpose entity ("Zweckverband").	+/-

Table 6 lists the variables used in the regression analysis and states which sign we anticipate for the coefficient of the variable in the regression analysis.

Table 7: Descriptive statistics

	Observations	Mean	Median	Standard deviation
Section 340g reserves / risk-weighted assets	4220	1.27	0.01	2.18
Balance sheet capital / risk-weighted assets	4220	9.65	9.15	2.54
GDP growth	4220	2.38	2.66	4.28
Dummy from 2009 onwards	4220	0.40	0.00	0.49
Dummy for HS	4220	0.08	0.00	0.27
Dummy for NRW	4220	0.25	0.00	0.43
Dummy for SH	4220	0.03	0.00	0.18
Dummy for TH	4220	0.04	0.00	0.19
Dummy for HS, NRW, SH and TH	4220	0.40	0.00	0.49
Independent savings banks	4220	0.01	0.00	0.11
Annual profit / balance sheet capital	4220	3.18	2.93	1.93
Annual profit / total assets	4220	0.17	0.15	0.11
Loans to local government and local government associations / non-banks	4220	5.16	3.81	4.83
Log (total assets)	4220	21.11	21.10	0.92
Local government debt / GDP	4170	4.85	4.28	3.16
Contingency reserves / risk-weighted assets	4220	9.11	8.75	2.75
Special purpose entity savings banks	4220	0.38	0.00	0.48

Table 7 shows descriptive statistics on the variables used in the regression analysis. To prevent our results from being distorted by outliers, the following procedure is used in the case of all variables except the dummy variables: values below the 1st and above the 99th percentile of the respective variables are increased or reduced to the value of the respective percentile ("winsorised").

Table 8: Regression results, baseline model

	(1)	(2)	(3)	(4)
Balance sheet capital / risk-weighted assets	0.281	0.316		
	(0.050)	(0.049)		
	***	***		
Contingency reserves / risk-weighted assets			0.244	0.282
			(0.048)	(0.047)
			***	***
Section 340g reserves / risk-weighted assets	0.090	0.089	0.083	0.081
	(0.056)	(0.055)	(0.054)	(0.053)
Annual profit / total assets	3.243		3.605	
	(0.818)		(0.796)	
	***		***	
Annual profit / balance sheet capital		0.150		0.167
		(0.044)		(0.043)
		***		***
Log (total assets)	0.640	0.651	0.647	0.662
	(0.120)	(0.121)	(0.123)	(0.123)
	***	***	***	***
Loans to local government and local government associations / loans to non-banks	0.030	0.023	0.033	0.026
	(0.025)	(0.025)	(0.025)	(0.025)
Independent savings banks	3.018	2.979	4.681	4.900
	(0.817)	(0.814)	(0.832)	(0.814)
	***	***	***	***
Special purpose entity savings banks	-0.502	-0.508	-0.516	-0.523
	(0.266)	(0.267)	(0.265)	(0.267)
	*	*	*	*
Bavaria	0.692	0.813	0.726	0.853
	(1.081)	(1.085)	(1.083)	(1.086)
Brandenburg	1.673	1.638	1.802	1.765
	(1.319)	(1.316)	(1.311)	(1.306)
Bremen	1.331	1.438	1.129	1.220
	(1.269)	(1.268)	(1.244)	(1.238)
Hamburg	0.930	1.029	0.777	0.857
	(1.282)	(1.280)	(1.248)	(1.239)
Hesse	2.751	2.833	2.876	2.975
	(1.091)	(1.090)	(1.087)	(1.084)
	**	***	***	***
Lower Saxony	2.877	2.988	2.887	3.003
	(1.060)	(1.061)	(1.065)	(1.064)
	***	***	***	***
Mecklenburg-West Pomerania	1.853	1.796	1.991	1.935
	(1.266)	(1.280)	(1.261)	(1.274)
North Rhine-Westphalia	3.410	3.482	3.393	3.466
	(1.028)	(1.029)	(1.028)	(1.027)
	***	***	***	***

Rhineland-Palatinate	3.278	3.361	3.419	3.525
	(1.080)	(1.081)	(1.086)	(1.087)
	***	***	***	***
Saarland	5.556	5.664	5.512	5.624
	(1.481)	(1.488)	(1.477)	(1.483)
	***	***	***	***
Saxony	4.805	4.698	4.847	4.718
	(1.077)	(1.077)	(1.093)	(1.091)
	***	***	***	***
Saxony-Anhalt	2.387	2.349	2.462	2.415
	(1.210)	(1.212)	(1.203)	(1.202)
	**	*	**	**
Schleswig-Holstein	3.391	3.526	3.409	3.563
	(1.216)	(1.209)	(1.211)	(1.200)
	***	***	***	***
Thuringia	2.882	2.840	3.023	2.980
	(1.154)	(1.162)	(1.162)	(1.168)
	**	**	***	**
Number of observations	4220	4220	4220	4220
Pseudo R^2	0.29	0.28	0.28	0.28
Dummy for each federal state	Yes	Yes	Yes	Yes
Wald Chi-Square-statistic federal state dummies	134.51***	125.00***	141.49***	134.86***
Dummy for each year	Yes	Yes	Yes	Yes
Wald Chi-Square-statistic annual dummies	60.92***	64.88***	59.17***	63.3***
Clustered standard errors	Savings bank	Savings bank	Savings bank	Savings bank

***/**/* means significance at the 1 %/5 %/10 % level. z-values on the basis of robust standard errors are in parentheses.

Table 8 shows the results of the logit estimate of our baseline model. The dependent variable is a dummy variable that adopts the value of one if the savings bank has made a distribution between 2003 and 2012, and takes the value of zero if not. All models contain dummies for each year and for each federal state (reference group of the federal state dummies: Baden-Württemberg).

Table 9: Regression results, baseline model with interaction term

	(1)	(2)	(3)	(4)
Balance sheet capital / risk-weighted assets	0.409	0.446		
	(0.064)	(0.063)		
	***	***		
Balance sheet capital / risk-weighted assets * dummy from 2009 onwards	-0.231	-0.231		
	(0.051)	(0.052)		
	***	***		
Contingency reserves / risk-weighted assets			0.328	0.367
			(0.059)	(0.059)
			***	***
Contingency reserves / risk-weighted assets * dummy from 2009 onwards			-0.149	-0.150
			(0.051)	(0.051)
			***	***
Section 340g reserves / risk-weighted assets	0.108	0.107	0.099	0.096
	(0.053)	(0.052)	(0.053)	(0.052)
	**	**	*	*
Annual profit / total assets	3.403		3.719	
	(0.820)		(0.796)	
	***		***	
Annual profit /balance sheet capital		0.161		0.175
		(0.044)		(0.043)
		***		***
Log (total assets)	0.663	0.673	0.657	0.671
	(0.120)	(0.121)	(0.122)	(0.123)
	***	***	***	***
Loans to local government and local government associations / loans to non-banks	0.033	0.026	0.035	0.028
	(0.025)	(0.025)	(0.025)	(0.025)
Independent savings banks	3.117	3.076	4.863	5.087
	(0.836)	(0.830)	(0.878)	(0.860)
	***	***	***	***
Special purpose entity savings banks	-0.504	-0.507	-0.514	-0.520
	(0.267)	(0.268)	(0.266)	(0.267)
	*	*	*	*
Number of observations	4220	4220	4220	4220
Pseudo R^2	0.30	0.29	0.29	0.28
Dummy for each federal state	Yes	Yes	Yes	Yes
Dummy for each year	Yes	Yes	Yes	Yes
Clustered standard errors	Savings bank	Savings bank	Savings bank	Savings bank

***/**/* means significance at the 1 %/5 %/10 % level. z-values on the basis of robust standard errors are in parentheses.

Table 9 shows the results of the logit estimate of our baseline model, extended to include an interaction term between the capital ratio and a dummy that adopts the value of one for the period between 2009 and 2012 and of zero if not.

Table 10: Regression results, baseline model with three-way interaction term

	(1)	(2)	(3)	(4)
Balance sheet capital / risk-weighted assets	0.416	0.451		
	(0.070)	(0.069)		
	***	***		
Balance sheet capital / risk-weighted assets * dummy from 2009 onwards	-0.227	-0.227		
	(0.050)	(0.050)		
	***	***		
Balance sheet capital / risk-weighted assets * dummy for HS, NRW, SH and TH	-0.044	-0.036		
	(0.104)	(0.105)		
Balance sheet capital / risk-weighted assets * dummy from 2009 onwards* dummy for HS, NRW, SH and TH	0.044	0.041		
	(0.025)	(0.025)		
	*			
Contingency reserves / risk-weighted assets			0.328	0.365
			(0.067)	(0.066)
			***	***
Contingency reserves / risk-weighted assets * dummy from 2009 onwards			-0.151	-0.151
			(0.049)	(0.049)
			***	***
Contingency reserves / risk-weighted assets * dummy for HS, NRW, SH and TH			-0.020	-0.013
			(0.093)	(0.094)
Contingency reserves / risk-weighted assets * dummy from 2009 onwards* dummy for HS, NRW, SH and TH			0.052	0.050
			(0.024)	(0.024)
			**	**
Section 340g reserves / risk-weighted assets	0.106	0.105	0.095	0.093
	(0.053)	(0.053)	(0.053)	(0.052)
	**	**	*	*
Annual profit / total assets	3.494		3.811	
	(0.833)		(0.805)	
	***		***	
Annual profit / balance sheet capital		0.165		0.180
		(0.045)		(0.043)
		***		***
Log (total assets)	0.664	0.674	0.660	0.674
	(0.121)	(0.122)	(0.124)	(0.124)
	***	***	***	***
Loans to local government and local government associations / loans to non-banks	0.033	0.026	0.035	0.028
	(0.025)	(0.025)	(0.025)	(0.025)
Independent savings banks	3.113	3.071	4.858	5.104
	(0.833)	(0.830)	(0.904)	(0.894)
	***	***	***	***
Special purpose entity savings banks	-0.504	-0.506	-0.511	-0.516
	(0.268)	(0.269)	(0.267)	(0.269)
	*	*	*	*
Number of observations	4220	4220	4220	4220

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Pseudo R^2	0.30	0.29	0.29	0.28
Dummy for each federal state	Yes	Yes	Yes	Yes
Dummy for each year	Yes	Yes	Yes	Yes
Clustered standard errors	Savings bank	Savings bank	Savings bank	Savings bank

***/**/* means significance at the 1 %/5 %/10 % level. z-values on the basis of robust standard errors are in parentheses.

Table 10 shows the results of the logit estimate of our baseline model, extended to include a three-way interaction term between the capital ratio, a dummy for the federal states of Hesse (HS), North Rhine Westphalia (NRW), Schleswig-Holstein (SH) and Thuringia (TH) (dummy for HS, NRW, SH and TH) as well as a dummy that adopts the value of one for the period between 2009 and 2012 and of zero if not (dummy from 2009 onwards).

Table 11: Regression results, baseline model with separate three-way interaction terms for Hesse, North Rhine-Westphalia, Schleswig-Holstein and Thuringia

	(1)	(2)	(3)	(4)
Balance sheet capital / risk-weighted assets	0.405	0.445		
	(0.071)	(0.070)		
	***	***		
Balance sheet capital / risk-weighted assets * dummy from 2009 onwards	-0.207	-0.210		
	(0.056)	(0.056)		
	***	***		
Balance sheet capital / risk-weighted assets * dummy for HS	-0.143	-0.119		
	(0.159)	(0.156)		
Balance sheet capital / risk-weighted assets * dummy from 2009 onwards* dummy for HS	-0.010	-0.012		
	(0.047)	(0.046)		
Balance sheet capital / risk-weighted assets * dummy for NRW	0.180	0.186		
	(0.157)	(0.158)		
Balance sheet capital / risk-weighted assets * dummy from 2009 onwards* dummy for NRW	0.072	0.066		
	(0.029)	(0.028)		
	**	**		
Balance sheet capital / risk-weighted assets * dummy for SH	-0.555	-0.517		
	(0.291)	(0.278)		
	*	*		
Balance sheet capital / risk-weighted assets * dummy from 2009 onwards* dummy for SH	0.033	0.020		
	(0.081)	(0.078)		
Balance sheet capital / risk-weighted assets * dummy for TH	-0.163	-0.182		
	(0.163)	(0.169)		
Balance sheet capital / risk-weighted assets * dummy from 2009 onwards* dummy for TH	0.084	0.089		
	(0.038)	(0.039)		
	**	**		
Contingency reserves / risk-weighted assets			0.315	0.358
			(0.068)	(0.067)
			***	***
Contingency reserves / risk-weighted assets * dummy from 2009 onwards			-0.127	-0.131
			(0.051)	(0.050)
			**	***
Contingency reserves / risk-weighted assets * dummy for HS			-0.109	-0.091
			(0.122)	(0.120)
Contingency reserves / risk-weighted assets * dummy from 2009 onwards* dummy for HS			-0.017	-0.016
			(0.041)	(0.040)
Contingency reserves / risk-weighted assets * dummy for NRW			0.207	0.215

			(0.138)	(0.137)
Contingency reserves / risk-weighted assets * dummy from 2009 onwards* dummy for NRW			0.086	0.079
			(0.030)	(0.029)
			***	***
Contingency reserves / risk-weighted assets * dummy for SH			0.050	0.067
			(0.194)	(0.188)
Contingency reserves / risk-weighted assets * dummy from 2009 onwards* dummy for SH			0.021	0.014
			(0.075)	(0.072)
Contingency reserves / risk-weighted assets * dummy for TH			-0.150	-0.171
			(0.151)	(0.155)
Contingency reserves / risk-weighted assets * dummy from 2009 onwards* dummy for TH			0.076	0.082
			(0.035)	(0.035)
			**	**
Section 340g reserves / risk-weighted assets	0.113	0.111	0.116	0.112
	(0.049)	(0.049)	(0.051)	(0.051)
	**	**	**	**
Annual profit / total assets	3.832		4.112	
	(0.848)		(0.815)	
	***		***	
Annual profit / balance sheet capital		0.180		0.195
		(0.045)		(0.044)
		***		***
Log (total assets)	0.649	0.659	0.628	0.644
	(0.122)	(0.123)	(0.125)	(0.126)
	***	***	***	***
Loans to local government and local government associations / loans to non-banks	0.027	0.019	0.032	0.023
	(0.026)	(0.026)	(0.026)	(0.026)
Independent savings banks	3.134	3.091	5.173	5.498
	(0.658)	(0.655)	(1.481)	(1.486)
	***	***	***	***
Special purpose entity savings banks	-0.526	-0.528	-0.518	-0.528
	(0.271)	(0.272)	(0.272)	(0.273)
	*	*	*	*
Number of observations	4220	4220	4220	4220
Pseudo R^2	0.31	0.31	0.30	0.29
Dummy for each federal state	Yes	Yes	Yes	Yes
Dummy for each year	Yes	Yes	Yes	Yes
Clustered standard errors	Savings bank	Savings bank	Savings bank	Savings bank

***/**/* means significance at the 1 %/5 %/10 % level. z-values on the basis of robust standard errors are in parentheses.

Table 11 shows the results of the logit estimate of our baseline model, extended to include three separate three-way interaction terms between the capital ratio, a dummy that adopts a value of one for the period between 2009 and 2012 and of zero if not (dummy from 2009 onwards), and a dummy each for the federal states of Hesse (dummy for HS), North Rhine-Westphalia (dummy for NRW), Schleswig-Holstein (dummy for SH) and Thuringia (dummy for TH).

Table 12: Regression results, baseline model with separate three-way interaction terms for Hesse, North Rhine-Westphalia, Schleswig-Holstein and Thuringia as well as additional control variables

	(1)	(2)	(3)	(4)
Balance sheet capital / risk-weighted assets	0.406	0.445		
	(0.071)	(0.070)		
	***	***		
Balance sheet capital / risk-weighted assets * dummy from 2009 onwards	-0.214	-0.218		
	(0.055)	(0.055)		
	***	***		
Balance sheet capital / risk-weighted assets * dummy for HS	-0.126	-0.102		
	(0.161)	(0.158)		
Balance sheet capital / risk-weighted assets * dummy from 2009 onwards* dummy for HS	-0.020	-0.023		
	(0.048)	(0.047)		
Balance sheet capital / risk-weighted assets * dummy for NRW	0.181	0.188		
	(0.155)	(0.156)		
Balance sheet capital / risk-weighted assets * dummy from 2009 onwards* dummy for NRW	0.063	0.057		
	(0.029)	(0.028)		
	**	**		
Balance sheet capital / risk-weighted assets * dummy for SH	-0.539	-0.499		
	(0.265)	(0.251)		
	**	**		
Balance sheet capital / risk-weighted assets * dummy from 2009 onwards* dummy for SH	0.030	0.017		
	(0.076)	(0.074)		
Balance sheet capital / risk-weighted assets * dummy for TH	-0.168	-0.187		
	(0.163)	(0.168)		
Balance sheet capital / risk-weighted assets * dummy from 2009 onwards* dummy for TH	0.093	0.098		
	(0.038)	(0.039)		
	**	**		
Contingency reserves / risk-weighted assets			0.331	0.373
			(0.069)	(0.068)
			***	***
Contingency reserves / risk-weighted assets * dummy from 2009 onwards			-0.155	-0.158
			(0.050)	(0.050)
			***	***
Contingency reserves / risk-weighted assets * dummy for HS			-0.106	-0.086
			(0.126)	(0.124)
Contingency reserves / risk-weighted assets * dummy from 2009 onwards* dummy for HS			-0.026	-0.025
			(0.042)	(0.041)

Contingency reserves / risk-weighted assets * dummy for NRW			0.207	0.216
			(0.137)	(0.137)
Contingency reserves / risk-weighted assets * dummy from 2009 onwards* dummy for NRW			0.075	0.068
			(0.030)	(0.029)
			**	**
Contingency reserves / risk-weighted assets * dummy for SH			-0.251	-0.192
			(0.335)	(0.324)
Contingency reserves / risk-weighted assets * dummy from 2009 onwards* dummy for SH			0.027	0.018
			(0.071)	(0.069)
Contingency reserves / risk-weighted assets * dummy for TH			-0.165	-0.185
			(0.151)	(0.155)
Contingency reserves / risk-weighted assets * dummy from 2009 onwards* dummy for TH			0.090	0.095
			(0.036)	(0.036)
			**	***
Section 340g reserves / risk-weighted assets	0.113	0.111	0.116	0.112
	(0.049)	(0.048)	(0.050)	(0.049)
	**	**	**	**
Annual profit / total assets	3.785		4.120	
	(0.855)		(0.830)	
	***		***	
Annual profit / balance sheet capital		0.177		0.193
		(0.046)		(0.044)
		***		***
Log (total assets)	0.644	0.655	0.626	0.645
	(0.123)	(0.124)	(0.128)	(0.128)
	***	***	***	***
Loans to local government and local government associations / loans to non-banks	0.020	0.012	0.025	0.016
	(0.026)	(0.026)	(0.026)	(0.026)
Independent savings banks	2.678	2.663	2.758	3.406
	(0.749)	(0.744)	(2.697)	(2.644)
	***	***		
Special purpose entity savings banks	-0.511	-0.515	-0.515	-0.526
	(0.273)	(0.274)	(0.272)	(0.274)
	*	*	*	*
GDP growth	0.018	0.018	0.017	0.018
	(0.010)	(0.010)	(0.010)	(0.010)
	*	*	*	*
Local government debt / GDP	0.041	0.041	0.042	0.042
	(0.027)	(0.027)	(0.028)	(0.028)
Number of observations	4170	4170	4170	4170
Pseudo R^2	0.31	0.30	0.30	0.29
Dummy for each federal state	Yes	Yes	Yes	Yes
Dummy for each year	Yes	Yes	Yes	Yes
Clustered standard errors	Savings bank	Savings bank	Savings bank	Savings bank

***/**/* means significance at the 1 %/5 %/10 % level. z-values on the basis of robust standard errors are given in parentheses.

Table 12 shows the results of the logit estimate of our baseline model, extended to include three separate three-way interaction terms between the capital ratio, a dummy that adopts the value of one for the period between 2009 and 2012 and of zero if not, and a dummy each for the federal states of Hesse (HS), North Rhine-Westphalia (NRW), Schleswig-Holstein (SH) and Thuringia (TH). Unlike in Table 10, we also control for the annual growth rate of regional GDP and the debt level of local government and local government associations.

Figures

Figure 1: Number of distributing savings banks and share of distributed profits relative to net profit (median)
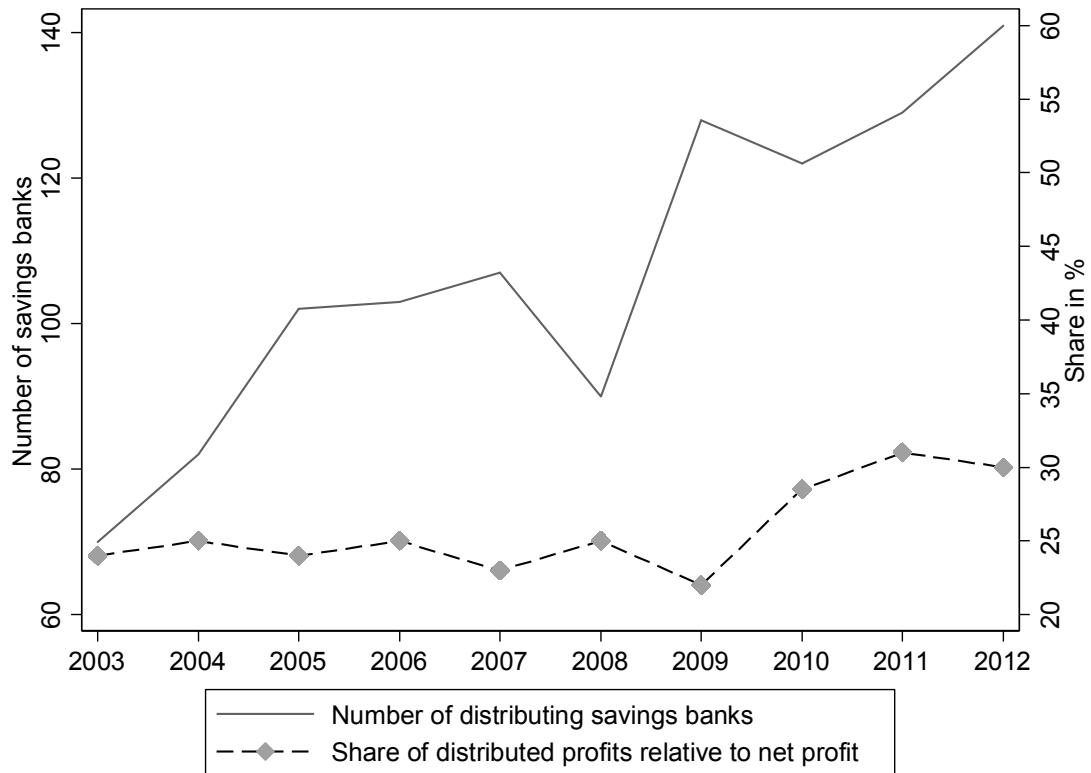

Figure 1 shows the number of distributing savings banks and the share of distributed profits relative to net profit (as a percentage).