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**Working Paper**

## Capital policy of German savings banks: a survey

ZEW Discussion Papers, No. 05-63

**Provided in Cooperation with:**

ZEW - Leibniz Centre for European Economic Research

*Suggested Citation:* Kleff, Volker (2005) : Capital policy of German savings banks: a survey, ZEW Discussion Papers, No. 05-63, Zentrum für Europäische Wirtschaftsforschung (ZEW), Mannheim

This Version is available at:

<https://hdl.handle.net/10419/24159>

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Discussion Paper No. 05-63

**Capital Policy of German Savings Banks –  
A Survey**

Volker Kleff

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Wirtschaftsforschung GmbH

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## **Non-technical summary**

This study examines in detail the capital policy of banks with rather peculiar characteristics. German savings banks are public corporations, whose access to the capital market is strongly restricted. Therefore, they heavily rely on retained earnings. One of the very few alternatives to increase their capital ratio, besides retaining profits, is to issue subordinated debt.

We find that 47 percent of all surveyed savings banks target a quantitative capital ratio. Interestingly, these savings banks target both lower and higher capital marks, whereas other savings banks with a qualitative capital target only wish to increase or maintain the capital ratio, but not to reduce it. Since their capitalisation does not differ significantly, we conclude that these banks, aiming at a quantitative capital ratio, have a more complex capital management. In support of this finding we obtain evidence that these savings banks, having a quantitative capital target, are more likely to choose a more complex Basel II approach. However, also larger savings banks prefer more complicated Basel II approaches. These savings banks are more likely to have the willingness and abilities to apply more sophisticated approaches.

The savings banks' target capital ratio is determined particularly by the savings banks' willingness to take risk, their desired credit growth and their profitability. For reaching the target capital ratio, instruments that manipulate the level of capital are preferred over instruments that change the level of risk-weighted assets. The most important instruments are lowering costs and issuing subordinated debt. We find that the issuance of subordinated debt is significantly more important for savings banks with a low regulatory capital ratio. For these banks issuing subordinated debt is even the most important instrument to raise capital.

After examining the issuance of subordinated debt in more detail, we ascertain that the most important motivation to issue subordinated debt is to increase the so-called Tier 2 capital. The case is especially true for savings banks with a low Tier 1 capital endowment. Preserving low interest rates on the capital market is another important motivation to issue subordinated debt.

About 60 percent of all surveyed savings banks plan to apply the simplest, i.e. the standardised approach under Basel II, whereas about 40 percent will apply the IRB foundation approach. However, the consequences of Basel II on the capital ratio are limited. Independent of the selected approach, the majority of savings banks in both groups will not increase capital due to the new capital agreement. Furthermore, the abolishment of the owner's statutory obligation regarding all third party liabilities of the savings banks will affect the savings banks' capital endowment only moderately.

# **Capital Policy of German Savings Banks – A survey**

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September 2005

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## **Abstract**

In contrast to earlier field studies, we survey German public savings banks on their management of capital. We find that the most important determinants of the savings banks' target capital ratio are risk aversion, the desired credit growth and profitability. Savings banks prefer to manage the level of capital rather than the level of risk-weighted assets in order to reach their target capital ratio. The most important instruments to increase the level of capital are lowering costs and issuing subordinated debt. We obtain strong evidence that issuing subordinated debt is a particularly important instrument to increase capital for less capitalised savings banks.

**Keywords:** Capital, Savings Banks, Germany, Survey

**JEL classification code:** G21

## 1 Introduction

Ever since Modigliani and Miller (1958) proved in their path-breaking paper that capital policy is irrelevant in perfect markets, a significant amount of literature has examined how the optimal capital policy should look, if the unrealistic assumption of perfect markets is eliminated. However, despite much effort, there is little consensus on how firms choose their capital structure. According to Miller (1988) and Myers (2001), we are still lacking a comprehensive explanation for firms' capital policy.

So far, most of the studies have focused on the non-financial corporations with the legal form of joint-stock companies. Financial firms usually were neglected, since their capital ratios are subject to strict legal regulation and consequently differ from those of non-financial firms.<sup>1</sup> This paper enriches existing literature by focusing on financial firms. Restricting the analysis to financial firms only may offer a deeper insight into the motivation behind the capital policy than examining a heterogeneous sample of all non-financial firms. We focus on German savings banks, which are expected to be particularly homogenous, since they are characterised by unique institutional settings. They are the only banking group worldwide, which is made up of public institutions. Due to their special characteristics, capital policy may be different for these banks.

Due to their public ownership, their business is restricted by law in many ways. Consequently, savings banks are financially less flexible. Most obvious is, for instance, the fact that German savings banks cannot increase equity capital by issuing stocks. Therefore, they might rely on retained profits to a greater extent than joint-stock companies. One of the few alternatives to increase capital is to issue subordinated debt or other hybrid capital. The pecking order theory of Myers and Majluf (1984), therefore, may not be applicable. It claims that there is a hierarchy of funding sources, which ranges from the most preferred retained profits to the issuance of equity capital.<sup>2</sup> But in accordance with Orgler and Taggart (1983) and Diamond and Rajan (2000), for instance, the traditional trade-off theory may also hold for savings banks. According to the trade-off theory, savings banks target an optimal capital ratio, which balances the utility and costs of issuing debt. Savings banks might have to plan their capital endowment more precisely than other firms, since they have no possibility to receive capital from a parent company or hardly can receive funds from the highly indebted local authorities, who represent their responsible bodies.

In the following, we thus examine whether savings banks target a quantitative capital ratio. Alternatively, changes in the capital ratio might reflect rather random changes in annual profits and changes in credit growth. In the next step we thus inspect to what extent profitability and credit growth – besides other factors – influence the savings banks' determination of their target capital ratios. Furthermore, as savings banks only have a limited choice of instruments to manage their capital ratio, we also analyse, which instruments are of greatest importance to achieving the target capital

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<sup>1</sup> See e.g. Rajan/Zingales (1995).

<sup>2</sup> See e.g. Shyam-Sunder et al. (1998) and Fama/French (2002) for an empirical verification of the trade-off and pecking order theory.

ratio. Since subordinated debt seems to be of high importance for the savings banks, we discuss the motivation to issue subordinated debt in more detail. Finally, the expected effects of the abolition of the owner's statutory obligation and of the new Basel Accord on the savings banks' capital policy are also examined.

Since databases could only partly answer these questions and are of little help in examining the motivation behind the savings banks' capital policy, we survey the banks directly. A series of surveys on the capital policy of non-financial corporations by Pinegar and Wilbricht (1986), Graham and Harvey (2001), Bancel and Mittoo (2002) and Brounen et al. (2004) has already demonstrated the efficiency of this methodology. A more related survey by Marques and Santos (2004) even refers explicitly to the capital policy of banks. But in contrast to our survey, it focuses on Portuguese banks in the legal form of joint-stock companies. As far as we know, this paper is the first to survey German public savings banks regarding their capital policy.

The structure of this paper is as follows. Section 2 presents the methodology of the survey. Section 3 introduces the results by presenting some descriptive statistics, and Section 4 provides the main results regarding the savings banks' management of capital. Section 5 concludes.

## **2 Methodology**

### *2.1 Design*

The questionnaire comprises two sections. The first section surveys important key characteristics of the participating savings banks. The aim of this section is to differentiate the results from the second section according to these key characteristics. We positioned this part at the beginning of the questionnaire, since these questions are most easily answered and might motivate responses on the following questions as well. Indeed, all surveyed savings banks answered both the first and the second section of the questionnaire. The second part comprises the questions regarding the savings banks' capital policy. Based on recent literature on the capital policy of non-bank companies, we adapted the questionnaire to the special characteristics of the German savings banks sector.

We conducted beta tests at two savings banks, incorporated their suggestions and revised the survey. On October 6, 2004, we sent the questionnaires to all public savings banks by regular mail and asked for reply by fax or regular mail. We directed the questionnaire to the CEOs of the savings banks and requested a forwarding of the questionnaire to the relevant specialist department if necessary. On November 26, 2004, we reminded the savings banks that had neither yet answered nor indicated that they did not wish to participate in the survey. Finally, we received 87 completed questionnaires – a response rate of 18.5 percent. It is comfortably higher than the response rate obtained by Brounen et al (5%), Graham and Harvey (9%) or Trahan and Gritman (12%).

## 2.2 Statistical tests

We sorted the responses according to the specific characteristics of the savings banks and applied statistical tests, in order to examine whether some groups of savings banks differ significantly in their behaviour. Since the assumption of normally distributed data was refused, we focused on nonparametric tests. The Pearson's  $\chi^2$  independence test, which tests for the statistical independence of categorical variables, is the most general test in this context. However, this test is less appropriate for analysing a potential relationship between two ordinal variables in small samples. Therefore, we focused on Spearman's correlation whenever possible. Based on ranks, it measures the correlation between two ordinal variables similar to the correlation coefficient for continuous variables. In each case, we report both the correlation itself and its level of significance (p-value).

## 3 Descriptive statistics

We focused our survey on public savings banks, since the seven free savings banks<sup>3</sup> in Germany could manage capital differently. Many of them are in the legal form of joint-stock companies and are expected to have much better access to capital than public savings banks. At the time the survey was conducted, 471 public savings banks existed.

**Table 1: Overview of participation by the federal states**

Federal state	Number of sav. banks	Expected dis-tribution (%)	Responses	Sample dis-tribution (%)	Response ratio by state (%)
North Rhine-Westphalia	114	0.24	23	0.26	0.20
Baden-Wuerttemberg	57	0.12	13	0.15	0.23
Hesse	34	0.07	12	0.14	0.35
Bavaria	82	0.17	12	0.14	0.15
Schleswig-Holstein	18	0.04	9	0.10	0.50
Lower Saxony	50	0.11	5	0.06	0.10
Rhineland-Palatinate	27	0.06	3	0.03	0.11
Thuringia	16	0.03	3	0.03	0.19
Saxony	18	0.04	3	0.03	0.17
Saxony-Anhalt	22	0.05	1	0.01	0.05
Brandenburg	12	0.03	1	0.01	0.08
Mecklenburg-Western Pomerania	13	0.03	2	0.02	0.15
Saarland	7	0.01	0	0.00	0.00
Bremen	1	0.00	0	0.00	0.00
<b>Total</b>	<b>471</b>	<b>1.00</b>	<b>87</b>	<b>1.00</b>	<b>0.18</b>

**Note:** The second column refers to the total number of savings banks per federal state at the time the survey was conducted. The third column is calculated by dividing the number of savings banks per federal state by the total of all savings banks. The fourth column gives the number of the returned questionnaires per federal state and the fifth column is calculated by dividing the number of received questionnaires per federal state by the total number of all received questionnaires. The last column finally gives the share of received answers compared to the actual number of banks in the given state.

<sup>3</sup> Free savings banks do not belong to a specific local authority like the overwhelming majority of public savings banks. Some of the free savings banks are joint-stock companies.



Table 1 shows both the number of savings banks in each federal state that could potentially have participated in the survey and the number of savings banks which in fact have responded. On the basis of these numbers, we calculated the individual response ratios per federal state. Furthermore, we present the data relative to the total number of all savings banks (Expected distribution) and of all respondent savings banks (Sample distribution), respectively. According to Table 1, savings banks of nearly all German federal states participated in the survey. We did not receive any answers from the very small federal state of Bremen (1 savings bank) and Saarland (7 savings banks). The response ratio by federal state is particularly high in Schleswig-Holstein, Hesse, Baden-Wuerttemberg, Thuringia and North Rhine-Westphalia. In these federal states, the individual response ratio is larger than the sample response ratio of 18.5 percent. Differentiating between Western and Eastern Germany, we find that the response ratio is smaller in Eastern Germany (12.3 percent) than in Western Germany (19.7 percent). However, the varying response rates among the federal states do not have a significant effect on the results of this paper. We sorted the results according to the varying federal states but did not find any remarkable variations. Therefore, our results generally refer to the total sample of all federal states.

In the next step, we tested for a potential response bias. It could be argued, for instance, that only large and/or strongly capitalised banks participated in the survey. As a consequence, our conclusions drawn from the polled savings banks might not hold for the total sample of all savings banks. Therefore, we compared the characteristics of the polled savings banks with those that did not participate in the survey. In the first step, we examined whether there might be a response bias regarding the size of the savings banks. Therefore, we constructed four size classes and categorised the savings banks. The thresholds of 0.7, 1.3 and 2.3 billion euro in total assets represent the quartiles of the size distribution of all German savings banks, according to the savings banks' national association (DSGV, 2005a), by the end of 2003. As a consequence, we expected that the sample of participating savings banks is equally distributed among these classes. In fact, we find that the survey is slightly biased towards larger savings banks. We received 37 percent of all replies by banks smaller than the median of all German savings banks and 63 percent by larger savings banks. Since there are three types of savings banks, which typically differ in size, we examined whether the participation by the three different types of savings banks could explain the small bias. There are savings banks related to a city (*Stadtsparkassen*), which are typically smaller in size, since they conduct their business exclusively in the urban area. In contrast, *Kreissparkassen* typically are larger in size, since they conduct their business in the whole district. Finally, *Zweckverbandssparkassen* are related to an association of cities and/or districts. Consequently, they are, on average, larger than the other types of savings banks. As shown in Table 2, the size index significantly differs between the different types of savings banks according to Pearson's  $\chi^2$  independence test and ranges from 2.5 for *Stadtsparkassen* to 3.1 for *Zweckverbandssparkassen*. The mean of the size index represents the mean of the distribution over the four size classes. A mean of 1 (4) would indicate that all considered savings banks belong to the smallest (largest) size class.

Indeed, we find that the fraction of large *Zweckverbandssparkassen* in our sample is slightly higher than expected. However, the fraction of small *Stadtsparkassen* in our sample is also somewhat higher than expected. According to the DSGV (2005b), 23 (48) percent of all public savings banks were *Stadtsparkassen* (*Zweckverbandssparkassen*) at the end of 2003. In total, the distribution among the different types of savings banks in our sample is more or less similar to the distribution among all German savings banks. Therefore, the distribution of the participating savings banks among the different types of savings banks cannot explain the small bias towards larger savings banks. Thus, we argue that larger savings banks had more personnel resources to participate in our survey than smaller ones.

**Table 2: Representativeness of the sample**

Total assets (end of 2003) in bill. euro	Sample (%)	Real (%)
[0; 0.7[	0.13	0.25
[0.7; 1.3[	0.24	0.25
[1.3; 2.3[	0.22	0.25
[2.3; 100[	0.41	0.25
N=86	1.00	1.00

  

Type of savings bank	Sample (%)	Real (%)
<i>Stadtsparkasse</i>	0.26	0.23
<i>Kreissparkasse</i>	0.23	0.28
<i>Gemeinde/Amtssparkasse</i>	0.00	0.01
<i>Zweckverbandssparkasse</i>	0.51	0.48
N=87	1.00	1.00

  

Type of savings bank	N	Mean of size index
<i>Stadtsparkasse</i>	23	2.5
<i>Kreissparkasse</i>	20	2.9
<i>Zweckverbandssparkasse</i>	43	3.1
Chi <sup>2</sup> independence test [P-value]		[0.041]

**Note:** The mean of size index reflects the mean size class of the relevant subsample. It is 1 if all responding savings banks have total assets less than 0.7 billion euro and it is 4, if all participating savings banks have total assets larger than 2.3 billion euro. *Gemeinde/Amtssparkassen* are savings banks, which refer to smaller villages.

Table 3 examines the savings banks' capitalisation in greater detail. According to the declaration by the DSGV (2004), savings banks had, on average, a total capital ratio (Tier 1 and Tier 2) of 11.5 % and a Tier 1 capital ratio of 7.4 % at the end of 2003. These figures served as a basis for defining the different capitalisation classes in our survey. We find that 46 % (54%) of all participating savings banks had a total capital ratio of less (more) than 11.5 % at the end of 2003. These figures indicate that the threshold of 11.5% is suitable in order to differentiate between savings banks with lower and higher levels of capitalisation. As far as the Tier 1 ratio is concerned, we find that 39% (61%) of all savings banks in our sample have a Tier 1 capital ratio of below (more than) 7.0 percent.

It could be argued, that smaller savings banks have more difficulties in increasing capital than larger savings banks, because small banks cannot exploit economies of scale, and issuing subordinated debt might be too expensive for them. Therefore, smaller savings banks might be less capitalised. In line with Werner and Padberg (1998), however, the Spearman's rank correlation does not indicate any significant correlation between the savings banks' size and capitalisation. Furthermore, we examined the relationship between capitalisation and the existence of outstanding subordinated debt more closely.<sup>4</sup> In line with the findings by Ito and Sasaki (1998) for Japanese banks, we obtain evidence that better capitalised savings banks resort to issuing subordinated debt to a significantly smaller extent. In other words, savings banks, which have issued subordinated debt, are significantly less capitalised than other savings banks. Therefore, we find first evidence that outstanding subordinated debt might be a signal that these savings banks have difficulties in increasing capital.

**Table 3: Capitalisation, size and subordinated debt**

Total regulatory capital ratio (end of 2003)	N	%	Mean of size index	Fraction of sav.banks with subord. debt (%)
[0 %; 9.5 %[	5	0.06	1.80	0.60
[9.5 %; 11.5 %[	35	0.41	2.97	0.91
[11.5 %; 13.5 %[	30	0.35	2.90	0.60
[13.5 %; 100 %[	16	0.19	3.13	0.56
Spearman's correlation			0.118	0.274
[P-value]			[0.281]	[0.011]
Tier 1 capital ratio (end of 2003)	N	%	Mean of size index	Fraction of sav.banks with subord. debt (%)
[0 %; 7.0 %[	32	0.39	3.09	0.94
[7.0 %; 100 %[	52	0.61	2.79	0.58
Spearman's correlation			-0.1545	0.388
[P-value]			[0.161]	[0.000]
Outstanding subordinated debt	N	%	Mean of size index	Mean of capitalisation index
Yes	62	0.72	3.02	2.53
No	24	0.28	2.63	3.00
Spearman's correlation			-0.161	0.274
[P-value]			[0.138]	[0.011]

**Note:** The mean of the capitalisation index reflects the mean capitalisation class of the relevant subsample of savings banks. It equals 1 if all responding savings banks have a total capital ratio smaller than 9.5 percent of risk-weighted assets, and it is 4 if all participating savings banks have a total capital ratio larger than 13.5 percent of risk-weighted assets.

Table 4 shows some further descriptive statistics, which will be helpful in differentiating the analysis. The capital management of savings banks might be influenced by the intended selection among the three approaches to calculate minimum

<sup>4</sup> According to Table 3, only 28 percent of all savings banks have not issued subordinated debt.

capital requirements under the new Basel II capital accord. In the new capital framework, which will become effective at the end of 2006,<sup>5</sup> savings banks can choose from several approaches, which increase in complexity: the standardised approach, the IRB foundation, and the IRB advanced approach. We find that 60 percent of all surveyed savings banks intend to implement the standardised Basel approach. 39 percent of them want to use the IRB foundation approach, and 1 percent the IRB advanced approach. The intended selection of the Basel II approach clearly depends on the size of the savings bank. Smaller savings banks prefer the simple standardised approach, while larger savings banks prefer the IRB foundation approach or even the IRB advanced approach. Spearman's correlation indicates a highly significant correlation between size and the selection of the Basel II approach.

Furthermore, about every fourth savings bank in our sample is a so-called *Handelsbuchinstitut*. These are savings banks, which hold a nontrivial amount of securities primarily for trading purposes. Managing of capital might differ for *Handelsbuchinstitute*, since they bear a higher market risk than other savings banks. We find that *Handelsbuchinstitute* are significantly larger than other savings banks. Probably professional trading by savings banks needs a certain infrastructure, which is only available in larger savings banks. However, we do not find that *Handelsbuchinstitute* are significantly better capitalised or have issued significantly more subordinated debt than other savings banks.

**Table 4: Other characteristics**

Intended Basle II approach	N	%	Mean of size index	Mean of capitalisation index	Fraction of <i>Handelsbuchinstitute</i> (%)
Standardised approach	50	0.60	2.68	2.64	0.24
IRB-foundation approach	32	0.39	3.19	2.66	0.30
IRB advanced approach	1	0.01	4.00	3.00	0.00
Spearman's correlation			0.242	0.020	-0.054
[P-value]			[0.028]	[0.856]	[0.628]

  

<i>Handelsbuchinstitut</i>	N	%	Mean of size index	Mean of capitalisation index	Fraction of sav.banks with subord. debt (%)
Yes	23	0.27	3.78	2.91	0.83
No	63	0.73	2.59	2.57	0.69
Spearman's correlation			-0.502	-0.163	0.137
[P-value]			[0.000]	[0.135]	[0.207]

  

Desired credit growth above average	N	%	Mean of size index	Mean of capitalisation index	Fraction of sav.banks with subord. debt (%)
Yes	10	0.12	2.50	2.70	0.90
No	76	0.88	2.96	2.66	0.70
Spearman's correlation			0.132	-0.005	0.142
[P-value]			[0.225]	[0.960]	[0.190]

<sup>5</sup> See Basel Committee on Banking Supervision (2004), Tz. 2.

Finally we asked the savings banks whether they follow an above average credit growth. An above average credit growth could require a higher capitalisation, e.g. by issuing subordinated debt in order to fund the higher credit growth. Interestingly, only 12 percent of the surveyed savings banks stated that they aim for an above average credit growth, although we might have expected a ratio of 50 percent. However, we could not find any significant relationship between the desired credit growth and the savings banks' capitalisation or issuance of subordinated debt.

As mentioned before, economies of scale may exist that could have some influence on the savings banks' profitability and capitalisation. For instance, the diversification of the savings banks' credit portfolio might depend on the savings banks' size. The larger the bank, the more likely it is to have borrowers from a greater variety of industries. In addition, savings banks might use economies of scale in monitoring the borrowers. In fact, the surveyed savings banks confirm that larger savings banks have some advantages regarding the credit diversification and the monitoring of borrowers. The relevant index means, which could range from 1 (does not apply at all) to 5 (completely true), are 3.49 and 2.65, respectively. In order to detect potential varying assessments by the savings banks, we classified the results according to the size of the savings banks. As far as the diversification of the credit portfolio is concerned, we could not find any significant difference in the judgement by small and large savings banks. But the relevance of economies of scale in the monitoring of credits is significantly different for both groups. From the point of view of large savings banks, there are significantly stronger economies of scale in the monitoring of borrowers than from that of small savings banks. This result could indicate that small savings bank underestimate the economies of scale in the monitoring of borrowers.

**Table 5: Economies of scale**

	Index		Total assets <2.3 bill. €		Total assets >=2.3 bill. €		Sp.'s corr.	[P-value]
	N	mean	N	Index mean	N	Index mean		
Economies of scale in the diversification of the credit portfolio	87	3.49	52	3.44	35	3.57	0.029	[0.793]
Economies of scale in the monitoring of credits	86	2.65	51	2.41	35	3.00	0.257	[0.017]

## 4 Capital management of savings banks

### 4.1 Do savings banks have a quantitative capital target?

According to the trade-off theory of capital, an optimal capital ratio exists that balances the expenses and the utility of debt and thus minimises funding costs.<sup>6</sup> On the one hand, debt is tax-deductible and thus might have a decisive advantage in contrast to equity capital, which has to be accumulated from profits. Furthermore, savings banks can resort to savings deposits to a great deal, which are low interest-bearing and increase the attractiveness of debt.<sup>7</sup> On the other hand, banking regulation forces the savings banks to hold a minimum amount of regulatory capital. Overall, savings banks thus might hold a specific regulatory capital ratio weighing the risk of falling below the regulatory minimum and the attractiveness of debt. Therefore, the trade-off theory should be of relevance for the German savings banks as well. Marques and Santos (2004) find that the trade-off theory is the most relevant theory for Portuguese banks.

According to Table 6, 46 percent of all German public savings banks confirmed that they target a quantitative mark for the regulatory capital ratio, which would be in line with the trade-off theory. According to these banks, they need one to seven years to reach this quantitative capital target, if they have not yet reached it. The other savings banks do not target a specific quantitative capital ratio, but claim to manage the ratio qualitatively; that means that they wish to increase, decrease or keep the current capital ratio. Interestingly, we find remarkable differences between both groups of savings banks regarding the direction of desired changes in the capital ratio. There is a large number of savings banks which have a quantitative capital ratio and want to reduce the capital ratio, but there is not a single savings bank with a qualitative capital target that aims at a lower capital ratio. Therefore, the  $\chi^2$  independence test refuses the hypotheses that the existence of a quantitative target for the total capital ratio and the desired changes in the capital ratio are statistically independent. However, Spearman's rho does not indicate a significant correlation between both variables.

We examined whether the targeting of the capital ratio depends on various factors. First, we analysed whether the savings bank's decision to target a quantitative capital ratio depends on its size. The larger the bank, the better the planning might be. Therefore, we expected that particularly larger savings banks tend to manage their capital ratio quantitatively. However, we found no significant relationship between size and the existence of a quantitative target capital ratio. Second, we assumed that better capitalised savings banks may have a better capital planning and therefore tend to have a quantitative target capital ratio. But we also found no evidence for this assumption. Third, *Handelsbuchinstitute* could rely on capital planning more heavily, since they have to bear considerably more market risk than other banks, which might require a more sophisticated capital planning. Again, we found no significant relationship. Finally, we examined whether the savings banks' prospective selection of the Basel II approach might allow some conclusions regarding their capital planning.

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<sup>6</sup> See e.g. Myers (1984).

<sup>7</sup> See Miller (1995).

We expected that the savings banks, which intend to apply a more sophisticated Basel II approach, also may have a more sophisticated capital planning. In fact, we found that savings banks intending to use a more sophisticated Basel II approach significantly prefer to target a quantitative capital ratio.

**Table 6: Quantitative capital target**

Existence of a quantitative target for the total capital ratio	N	%	Mean of size index	Mean of total capital index	Lowering total capital ratio (%)		Keeping total capital ratio (%)		Increasing total capital ratio (%)			
					N	Stand. (%)	N	Stand. (%)	N	Stand. (%)		
Yes	40	0.47	2.95	2.65	35	0.40	24	0.00	0.20	0.38	0.40	0.63
No	46	0.53	2.85	2.70								
Spearman's correlation [P-value]			-0.059 [0.594]	0.020 [0.856]					-0.069 [0.602]			
Chi <sup>2</sup> independence test [P-value]									[0.002]			

  

	N	%	<i>Handelsbuchinstitut</i>		Intended Basel II approach			
			Yes (%)	No (%)	N	Stand. (%)	IRB found.(%)	IRB adv. (%)
Quantitative capital target	40	0.47	0.30	0.70	40	0.45	<b>0.53</b>	0.03
No quantitative capital target	46	0.53	0.22	0.78	43	<b>0.74</b>	0.26	0.00
Spearman's correlation [P-value]				0.094 [0.387]			-0.306 [0.005]	

#### 4.2 Determinants of the target capital ratio

As mentioned above, many savings banks do target a certain quantitative capital ratio. Others have an unspecific qualitative target. However, it is unclear so far, how this quantitative or qualitative target is determined. Table 7 gives an overview of the potential determinants on the savings banks' target capital ratio, ranked according to their relevance for the savings banks.<sup>8</sup> On the right side of the Table the means for savings banks with a Tier 1 capital ratio below and above 7 percent are presented. The Spearman's correlation index indicates whether the importance of the determinants differs significantly between both subsamples.

We found that the three most important factors driving the savings banks' target capital ratio is the willingness to take risk, the target credit growth, and the current profitability. The closer the capital ratio is to the regulatory minimum, the higher is the risk of falling below the regulatory minimum. Therefore, savings banks with a greater willingness to take risk may choose a smaller capital ratio than other banks that prefer a higher amount of excess capital above the regulatory minimum. Since the expected volatility of the capital ratio might also have an influence on the risk of falling below the regulatory minimum, this variable is of some relevance as well.<sup>9</sup> Besides the willingness to take risk, the desired credit growth is also of high importance. The

<sup>8</sup> It should be noted that the ranking is based on means, which could, as an exemption, range between 1 and 4 instead of 1 and 5, since there are only four potential answers possible for the relevant question.

<sup>9</sup> See Grimmer (2003), pp. 249-250.

higher the desired credit growth, the larger is the target regulatory capital ratio, since the latter will be decreased by extending credit lending. The desired credit growth might be of greater importance for the target capital ratio, especially for savings banks, which already have a rather small capital ratio, since the financial scope to extend credit growth is smaller for these banks. Indeed, Spearman's correlation indicates that this variable is of a significantly higher importance to savings banks with a Tier 1 ratio below 7 percent. For these savings banks, desired credit growth is even more important than the willingness to take risk. Interestingly, we find some evidence that the desired credit growth is less relevant for savings banks aiming at an above average credit growth. These banks probably would not desire a credit growth above average, if they had not the financial scope to increase credit growth without considerably increasing the capital ratio.

Not surprisingly, profitability is an important driver of the target capital ratio as well. The higher the profitability, the more profits can be retained and the more the capital ratio can be raised. Not only the current profitability, but also the future profitability is of high relevance. A positive outlook for future profitability makes the savings banks increase their target capital ratio. That means that savings banks do not get tired of increasing capital even in case of higher future profitability.

Portfolio risk also has some relevance for the target capital ratio. The higher the portfolio risk, the lower the regulatory capital ratio is and the higher the risk of going bankrupt is. In order to maintain the previous capital ratio, savings banks target a higher capital ratio when portfolio risk increases.

Interestingly, some financial ratios like the return on equity (ROE) and the cost-income ratio also have an influence on the target capital ratio. Since, the higher the ROE, the more attractive equity capital is, savings banks with a higher ROE aim at a larger capital ratio. Furthermore, costs of issuing subordinated debt play a certain role in the planning of the capital ratio as well.<sup>10</sup> The higher the costs of issuing subordinated debt, the more difficult it is to raise the capital ratio via this instrument. Therefore, higher costs of issuing subordinated debt decrease the financial flexibility of savings banks and result in a lower target capital ratio. Not surprisingly, we find that the relevance of this variable for the capital ratio depends significantly on the fact whether the savings bank has issued subordinated debt or not. Spearman's correlation indicates that the costs of issuing subordinated debt are significantly more relevant for the savings banks that actually have issued subordinated debt. Only these banks might assess the relevance of the costs properly.

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<sup>10</sup> See Grimmer (2003), pp. 249-250.



**Table 7: Determinants of the capital ratio**

Potential determinants of the capital ratio	N	Index mean	Tier1<7%		Tier1>=7%		Sp.'s corr.	[P-val.]
			N	mean	N	mean		
Willingness to take risk	83	3.46	30	3.50	50	3.42	-0.029	[0.801]
Desired credit growth	84	3.33	30	3.60	51	3.20	<b>-0.249</b>	<b>[0.025]</b>
Current profitability	84	3.13	30	3.07	51	3.12	0.035	[0.756]
Expected profitability	84	3.04	30	3.13	51	2.94	-0.083	[0.464]
Portfolio risk	81	2.90	29	3.00	49	2.80	-0.093	[0.420]
ROE	81	2.65	30	2.70	48	2.54	-0.062	[0.588]
Cost-Income Ratio	83	2.47	30	2.67	51	2.29	-0.159	[0.155]
Costs of issuing subordinated debt	82	2.46	30	2.70	49	2.37	-0.155	[0.172]
Expected volatility of the total capital ratio	81	2.46	30	2.63	49	2.31	-0.152	[0.182]
Diversification of the credit portfolio	82	2.43	30	2.57	49	2.29	-0.120	[0.294]
Economic situation	84	2.36	30	2.43	51	2.25	-0.075	[0.509]
Unidentified loss reserves	83	1.88	30	2.07	50	1.72	-0.146	[0.196]
Fiscal disadvantage of equity capital vs debt	81	1.80	30	1.87	48	1.73	-0.040	[0.729]
Excess capital ratio of neighbouring savings banks	81	1.68	29	1.66	49	1.67	0.034	[0.770]
Size (Total assets)	84	1.65	30	1.80	51	1.57	-0.087	[0.438]

  

Potential determinants of capital ratio	N	Index mean	High credit growth		Low credit growth		Sp.'s corr.	[P-val.]
			N	mean	N	mean		
Desired credit growth	84	3.33	10	3.00	74	3.38	<b>0.192</b>	<b>[0.081]</b>

  

Potential determinants of capital ratio	N	Index mean	Subord. debt issued		No subord. debt issued		Sp.'s corr.	[P-val.]
			N	mean	N	mean		
Costs of issuing subordinated debt	82	2.46	61	2.74	21	1.67	<b>-0.417</b>	<b>[0.000]</b>

  

Potential determinants of capital ratio	N	Index mean	Small banks (TA<2.3 bill.€)		Large banks (TA >=2.3 bill.€)		Sp.'s corr.	[P-val.]
			N	mean	N	mean		
Diversification of the credit portfolio	82	2.43	49	2.35	33	2.55	0.092	[0.411]

The lower the diversification of the credit portfolio, the higher the target capital ratio of the surveyed savings banks is. Interestingly, this relationship holds, although the savings banks are not forced to do so by regulation. Since larger banks do have a certain advantage in the diversification of the credit portfolio (see Table 5), we assumed that the assessment of the relevance of this variable could depend on the bank's size. However, we do not find any significant differences.

The current economic situation has a positive impact on the target capital ratio.<sup>11</sup> Savings banks might target a higher capital ratio when the economic situation improves, since credit demand will rise. Assuming that the savings banks will satisfy

<sup>11</sup> Ayuso et al. (2004), however, find a significant and negative relationship between the economic situation and the regulatory capital ratio. Some banks could indeed aim at a larger regulatory capital ratio in an economic upswing but could accept that the larger credit supply finally lowers the regulatory capital ratio.

the increased credit demand, they would consequently need a larger regulatory capital ratio.<sup>12</sup>

The higher the unidentified credit reserves, the higher the target capital ratio is. Savings banks, which have to increase their unidentified credit reserves, might be in a worse financial situation than other banks and may try to increase the capital ratio as an additional buffer against unexpected credit losses. Furthermore, the larger the fiscal disadvantage of equity capital versus debt, the smaller the target capital ratio is. But the low index mean of 1.80 indicates that overall tax considerations do play a minor role in the planning of the capital ratio.<sup>13</sup> The (voluntary) high tax payments of the savings banks compared with other banks would leave tax minimisation efforts by the banks implausible anyway.<sup>14</sup> Since the argumentation of the trade-off theory usually is based on these tax considerations, we obtain little support for the relevance of the theory here. Nevertheless, the theory is not generally put into question, since funding with the help of low interest-bearing deposits is very attractive for savings banks irrespective of tax considerations.

The excess capital ratio of other savings banks in the neighbourhood has only a marginal effect on the target capital ratio. Savings banks hardly consider neighbouring savings banks as competitors, since in general the savings banks' business areas do not overlap due to the laws of the individual federal states (*Regionalprinzip*).

As far as size is concerned, the theoretical effect on the target capital ratio is not clear. On the one hand, larger savings banks can issue subordinated debt at lower costs than smaller savings banks and therefore might aim at higher target capital ratios. On the other hand, larger savings banks might benefit from some advantages in the diversification of the credit portfolio and thus may target a lower capital ratio. However, since the savings banks claim a meagre positive relationship between size and the target capital ratio, the diversification effect seems to be of little relevance. The Wilcoxon rank sum test indicates at least that the mean of 1.65 is significantly different from 1.00 on a one percent level.

#### 4.3 *How do savings banks change their capital ratio?*

We also surveyed the German savings banks about what instruments were most important to manage their capital ratio. In general, savings banks can change their regulatory capital ratio towards their target capital ratio by changing the level of capital or changing the level of risk-weighted assets. In order to increase the regulatory capital ratio, for instance, savings banks can increase the level of capital and/or decrease the level of risk-weighted assets. But the number of instruments to increase capital or decrease risk-weighted assets is limited. Table 8 summarises the importance of several instruments to manage the capital ratio.

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<sup>12</sup> See Deutsche Bundesbank (2005a) for the relationship between the economic development, the credit supply and the regulatory capital endowment of savings banks.

<sup>13</sup> Grimmer (2003) determines that the tax advantage only has a minor importance when savings banks determine their target capital ratio.

<sup>14</sup> See Maurer (1998) and Gerlach/Gondrich (1994).

We find that savings banks favour the instruments that manipulate the level of capital, whereas the instruments manipulating the risk-weighted assets are of less importance. A potential reason is the fact that savings banks are responsible for the loan supply of their region due to the public mandate. Therefore, savings banks could face limitations in decreasing their credit supply in order to reduce their risk-weighted assets. In that regard, their credit supply could be less pro-cyclical compared to other banks.<sup>15</sup>

The most preferred instruments for raising the capital ratio are lowering of costs and issuance of subordinated debt. We find that savings banks with a Tier 1 capital ratio below 7 percent even prefer issuing subordinated debt to lowering costs. Probably lowering costs might take too long a time for these less capitalised banks until profitability and the capital ratio increase. Spearman's correlation indicates that issuing subordinated debt is significantly more important for savings banks with a Tier 1 capital below 7 percent than for the banks with a higher ratio. These banks are expected to rely particularly on external capital to increase the total capital ratio. Restricting lending and decreasing risk-weighted assets by asset swaps, e.g. decreasing high risk-weighted assets in favour of lower risk-weighted assets, are generally of lesser importance than lowering costs and issuing subordinated debt. However, for savings banks that have no outstanding subordinated debt, the relevance of instruments might be different. Not surprisingly, issuing subordinated debt is a significantly less important instrument to increase capital for savings banks without subordinated debt than for those with subordinated debt, according to Spearman's correlation. Furthermore, we find that these savings banks would prefer restricting lending over issuing subordinated debt. Possibly, the costs of issuing subordinated debt are too deterrent for these banks.

Other potential instruments to increase the capital ratio by increasing the level of capital refer to the §340f HGB<sup>16</sup> reserves and the equity capital contributions from public institutions (e.g. non-participating deposits). The reserves, according to §340f HGB, could be used to increase Tier 1 capital, although lowering §340f reserves simultaneously means lowering Tier 2 capital. Therefore, this instrument is only suitable for the banks that have enough Tier 2 capital but lack Tier 1 capital. However, it also requires that there are still enough §340f reserves available.

Indeed, we find that lowering §340f reserves in order to increase profits is significantly more relevant for higher capitalised savings banks with a Tier 1 ratio above 7 percent. Probably the lower capitalised savings banks already have intensely used this instrument to increase the Tier 1 capital ratio, so that it is of less importance now.

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<sup>15</sup> See e.g. Ayuso et al. (2004).

<sup>16</sup> HGB is the abbreviation for *Handelsgesetzbuch*, the legal basis for German businesses.

**Table 8: Instruments of managing the capital ratio**

Instrument	Index		Tier1<7%		Tier1>=7%		Sp.'s corr.	[P-val.]
	N	mean	N	mean	N	mean		
Lowering costs	87	3.90	32	3.88	52	3.87	-0.036	[0.749]
Issuance of subordinated debt	87	3.40	32	3.94	52	3.08	<b>-0.305</b>	<b>[0.005]</b>
Restricting lending	85	3.02	31	3.19	51	2.86	-0.125	[0.264]
Decreasing risk-weighted assets by asset swap	87	2.60	32	2.72	52	2.46	-0.113	[0.308]
Lowering §340f reserves to increase retainable profits	84	2.27	31	1.94	50	2.52	<b>0.212</b>	<b>[0.057]</b>
Capital contributions from public institutions	87	2.25	32	2.34	52	2.15	-0.095	[0.393]
Lowering §340f reserves to increase §340g reserves	84	2.19	30	1.93	51	2.31	0.180	[0.109]

  

Instrument	Index		Subord. debt		No sub.debt		Sp.'s corr.	[P-val.]
	N	mean	N	mean	N	mean		
Lowering costs	87	3.90	63	4.06	24	3.46	<b>-0.219</b>	<b>[0.041]</b>
Issuance of subordinated debt	87	3.40	63	3.87	24	2.17	<b>-0.511</b>	<b>[0.000]</b>
Restricting lending	85	3.02	62	3.05	23	2.96	-0.024	[0.829]
Decreasing risk-weighted assets by asset swap	87	2.60	63	2.65	24	2.46	-0.073	[0.500]
Lowering §340f reserves to increase retainable profits	84	2.27	62	2.26	22	2.32	0.015	[0.894]
Capital contributions from public institutions	87	2.25	63	2.32	24	2.08	-0.087	[0.422]
Lowering §340f reserves to increase §340g reserves	84	2.19	62	2.03	22	2.64	<b>0.205</b>	<b>[0.062]</b>

  

Instrument	Index		§340g reserves do not exist		§340g reserves already exist		Sp.'s corr.	[P-val.]
	N	mean	N	mean	N	mean		
Lowering costs	87	3.90	70	3.77	15	4.40	<b>0.255</b>	<b>[0.018]</b>
Issuance of subordinated debt	87	3.40	70	3.37	15	3.67	0.078	[0.481]
Restricting lending	85	3.02	69	2.97	14	3.29	0.092	[0.407]
Decreasing risk-weighted assets by asset swap	87	2.60	70	2.59	15	2.80	0.078	[0.480]
Lowering §340f reserves to increase retainable profits	84	2.27	68	2.19	15	2.73	0.145	[0.190]
Capital contributions from public institutions	87	2.25	70	2.13	15	2.80	0.134	[0.221]
Lowering §340f reserves to increase §340g reserves	84	2.19	68	1.85	15	3.60	<b>0.443</b>	<b>[0.000]</b>

§340f reserves may be decreased for two reasons. On the one hand, they might help to increase profits in the same year, which means higher retainable profits and thus the possibility to increase Tier 1 capital. On the other hand, §340f reserves might be converted to §340g reserves, which are the disclosed counterpart of §340f reserves and are attributable to Tier 1 capital.

In general, increasing profits seems to be more important than increasing §340g reserves when lowering §340f reserves. All in all, savings banks are rather reluctant to create the more transparent reserves according to §340g HGB, since only 18 percent of all polled savings banks do have such an item in their balance sheet. Savings banks might fear that the §340f reserves could be abolished if all banks should use §340g reserves. However, we find that savings banks that already have §340g reserves are significantly less reluctant to convert §340f reserves into §340g reserves. Since lowering costs is of significantly lower importance for these banks, increasing the §340g reserves might be an alternative to lowering costs. Furthermore, we find that converting §340f reserves into §340g reserves is a significantly more attractive instrument to increase Tier 1 capital for savings banks without outstanding subordinated debt. These savings banks might still have enough §340f reserves to

lower, since they could do without subordinated debt as an alternative Tier 2 component so far.

#### *4.4 The special role of subordinated debt*

Issuing subordinated debt is one of the few alternatives of savings banks for increasing the capital ratio. It is heavily used. On average, German savings banks have issued subordinated debt amounting to 35 percent of their capital, according to Deutsche Bundesbank (2005b).<sup>17</sup> Additionally, it has to be taken into account that about 20 percent of all savings banks have not issued any subordinated debt.

The results so far suggest that particularly lower capitalised savings banks make use of this instrument. In order to support this finding, we examine the motivation behind issuing subordinated debt in more detail. Table 9 summarises the results.

Not surprisingly, the most important motivation behind issuing subordinated debt is to increase Tier 2 capital. But other reasons are of high importance as well. Many savings banks indicated that preserving a low interest rate level is also an important reason for issuing subordinated debt. Funding credit growth, increasing Tier 3 capital or the aim to reach the target capital ratio more quickly is of minor importance.

We find that all listed reasons for issuing subordinated debt are significantly more important for lower capitalised savings banks with a Tier 1 ratio below 7 percent than for better capitalised banks. However, the difference is particularly pronounced regarding the rise of total capital. Therefore, we conclude that particularly lower capitalised savings banks make use of subordinated debt to increase capital. These banks' issuance of subordinated debt seems to be strongly influenced by internal necessities, whereas better capitalised banks are less forced to issue subordinated debt in order to increase total capital.

Not surprisingly, we find that the motivation to issue subordinated debt significantly differs between savings banks that in fact have issued subordinated debt and those that have not. These savings banks, without any outstanding subordinated debt, are significantly less motivated to issue subordinated debt than other savings banks. Nevertheless, the ranking of the individual motivations is generally the same for both groups of savings banks. Again, we find that both increasing total capital and preserving low interest rates are the main drivers of subordinated debt issuance.

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<sup>17</sup> Deutsche Bundesbank (2005a) defines capital here as the sum of subscribed capital, the reserves, the §340g HGB reserves and the subordinated debt.

**Table 9: Motivation to issue subordinated debt**

Motivation	Index		Tier1<7%		Tier1>=7%		Sp.'s corr.	[P-val.]
	N	mean	N	mean	N	mean		
Increasing total capital	87	2.91	32	3.91	52	2.27	<b>-0.519</b>	<b>[0.000]</b>
Preserving low interest rates	86	2.33	31	2.81	52	2.00	<b>-0.292</b>	<b>[0.007]</b>
Funding desired credit growth	87	1.98	32	2.56	52	1.62	<b>-0.352</b>	<b>[0.001]</b>
Increasing Tier 3 capital	86	1.76	31	2.16	52	1.42	<b>-0.309</b>	<b>[0.005]</b>
Achieving target capital ratio faster	86	1.70	32	2.03	51	1.47	<b>-0.183</b>	<b>[0.098]</b>

  

Motivation	Index		Subord. debt		No sub.debt		Sp.'s corr.	[P-val.]
	N	mean	N	mean	N	mean		
Increasing total capital	87	2.91	63	3.47	24	1.42	<b>-0.615</b>	<b>[0.000]</b>
Preserving low interest rates	86	2.33	62	2.63	24	1.54	<b>-0.367</b>	<b>[0.001]</b>
Funding desired credit growth	87	1.98	63	2.22	24	1.33	<b>-0.355</b>	<b>[0.001]</b>
Increasing Tier 3 capital	86	1.76	62	1.94	24	1.29	<b>-0.232</b>	<b>[0.032]</b>
Achieving target capital ratio faster	86	1.70	62	1.87	24	1.25	<b>-0.239</b>	<b>[0.027]</b>

  

Motivation	Index		High credit growth		Low credit growth		Sp.'s corr.	[P-val.]
	N	mean	N	mean	N	mean		
Funding desired credit growth	87	1.98	10	1.60	77	2.03	0.145	[0.180]

  

Motivation	Index		Quantitative capital target		No quantitative capital target		Sp.'s corr.	[P-val.]
	N	mean	N	mean	N	mean		
Achieving target capital ratio faster	86	1.70	40	2.13	45	1.33	<b>-0.305</b>	<b>[0.005]</b>

  

Motivation	Index		<i>Handelsbuch-</i> <i>institut</i>		No <i>Handels-</i> <i>buchinstitut</i>		Sp.'s corr.	[P-val.]
	N	mean	N	mean	N	mean		
Increasing Tier 3 capital	86	1.76	23	1.43	63	1.87	<b>0.184</b>	<b>[0.091]</b>

Funding desired credit growth by issuing subordinated debt might be especially important for savings banks with high credit growth. Therefore, we explicitly differentiated between savings banks with a credit growth below and above average. However, we do not find that these savings banks with a high credit growth are in need of subordinated debt to fund their credit growth. The index means of both groups suggest rather that the savings banks with high credit growth need subordinated debt to a lesser extent than other banks. Therefore, we obtain evidence that high credit growth is only targeted if savings banks can fund their high credit growth internally.

Furthermore, we find that achieving the target capital growth faster by issuing subordinated debt is significantly more relevant for the savings banks that in fact have a quantitative capital target. Especially the latter banks thus consciously use subordinated debt as an instrument to reach their optimal quantitative capital ratio.

Finally, we examined whether issuing subordinated debt as a means to increase Tier 3 capital is more important for *Handelsbuchinstitute* than other banks. Specific short-term subordinated debt might be assigned to Tier 3 capital, which is needed by *Handelsbuchinstitute* in order to underlay their market risk. However, we do not find

that these savings banks, especially, issue subordinated debt in order to increase Tier 3 capital. In contrast, Spearman’s correlation indicates that *Handelsbuchinstitute* are even less reliant on subordinated debt as an instrument to increase Tier 3 capital than other banks. Since *Handelsbuchinstitute* are somewhat better capitalised according to Table 4, they might strongly resort to capped Tier 2 capital instead of subordinated debt in order to underlay their market risk.

4.5 Capital policy and legal changes

Until July 2005, the local authorities, as the responsible bodies of the public savings banks, had to guarantee all third party liabilities of the savings banks. Due to these guarantees, savings banks were able to fund themselves very favourably by issuing debt. However, since these guarantees were regarded as ineligible subventions by the EU, they were abolished by July 2005, although a transitional period until 2015 was acknowledged.

Due to these legal changes, the savings banks might be forced to defend their highest rating class by improving their capital endowment. Table 10 summarises the potential effect of the reduced public guarantees on the savings banks target capital ratio.

**Table 10: Influence of reduced public guarantees on the target capital ratio**

	N	Index mean	Tier1<7%		Tier1>=7%	
			N	Index mean	N	Index mean
Reduced public guarantees (Anstaltslast/Gewährträgerhaftung)	87	2.37	32	2.63	52	2.29
Spearman's correlation				-0.132		
[P-value]				[0.232]		

The savings banks were asked to assess the potential effect on their target capital ratio on a scale ranging from 1 (no effect) to 5 (very strong effect). The index mean is just the mean of the declared magnitude of the effect. Therefore, the mean of 2.37 for all surveyed savings banks represents a small to moderate effect on the savings banks. Especially lower capitalised savings banks might be forced to increase their capital ratio due to the reduction in public guarantees. However, differentiating for lower and higher capitalised savings banks reveals a remarkable, but not significant effect of these legal changes on the savings banks’ behaviour. Both savings banks with a Tier 1 capital ratio below and above seven percent intend to moderately increase their total capital ratio because of the reductions in the public guarantees.

The future changes in the minimum capital requirements of banks, according to the new Basel II proposal, are expected to have a considerable impact on the capital management of savings banks as well. We expect that the impact on the savings bank’s target capital ratio depends on the approach that the savings bank intends to apply. The standardised, the IRB foundation and the IRB advanced approach are increasing in complexity. However, since the banks’ risk components are increasingly

measured more accurately, these approaches might increasingly allow the banks to hold less capital for a given risk exposure.<sup>18</sup> Therefore, savings banks applying more complex approaches might even be allowed to hold less capital than before.

According to Table 11, the majority of savings banks will not change their Tier 2 capital endowment due to Basel II. However, 31 percent of the savings banks indicated that these regulatory changes will make them increase Tier 2 capital and a single savings bank even declared that it will decrease Tier 2 capital due to Basel II.

Particularly lower capitalised savings banks might be forced to increase their Tier 2 capital because of the new capital accord, since their financial scope is smaller. Indeed, we find that 41 percent of all lower capitalised savings banks intend to increase the Tier 2 endowment due to Basel II, whereas only 27 percent of the higher capitalised savings banks intend to do so. However, these differences are not significant.

We also distinguish the effect of Basel II according to the various Basel II approaches the savings banks intend to apply. Although applying more sophisticated approaches theoretically should result in smaller minimum capital requirements,<sup>19</sup> the real effect is less clear. According to the results of the third quantitative impact study (QIS 3), minimum capital requirements, on average, will presumably increase by 12 percent for large German banks applying the standardised approach and 15.5 percent for banks choosing the IRB foundation approach. In the case of small German banks, however, minimum capital requirements will increase by 0.2 percent for banks applying the standardised approach and decrease by 9.6 percent for banks choosing the IRB foundation approach.<sup>20</sup>

Sorting our survey results by the intended Basel II approaches, however, indicates no significant difference in the capital changes dependent on the various approaches. Nevertheless, we found that the share of savings banks that will increase Tier 2 capital due to Basel II is a bit higher for savings banks applying the IRB foundation approach. More of these banks probably would have had to increase their capital ratio if they had chosen the standardised approach instead of the IRB foundation approach.

We obtain an insignificant difference as well, when differentiating between both *Handelsbuchinstitute* and other savings banks. We expected that *Handelsbuchinstitute* might prefer a more complex approach. The banks with a high market risk could particularly benefit from lower capital requirements related to more complex approaches, and, they are more likely to have the know-how to apply these approaches.

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<sup>18</sup> See Basel Committee of Banking Supervision (2004), Tz. 14.

<sup>19</sup> See Basel Committee of Banking Supervision (2001), Tz. 13.

<sup>20</sup> See Deutsche Bundesbank (2003).



**Table 11: Influence of Basel II on the target capital ratio**

	Decreasing capital (%)	No effect (%)	Increasing capital (%)	Index mean	N	Sp.'s corr.	[P-val.]
Consequences of Basel II	1.1	67.8	31.0	2.30	87		
<i>Results for subsamples:</i>							
... Tier1 ratio<7%	3.1	56.3	40.6	2.38	32		
... Tier1 ratio>=7%	0.0	73.1	26.9	2.27	52	-0.117	[0.288]
... Choosing Stand. app.	0.0	72.0	28.0	2.28	50		
... Choosing IRB found. app.	3.0	63.6	33.3	2.30	33	0.068	[0.540]
... <i>Handelsbuchinstitut</i>	4.3	65.2	30.4	2.26	23		
... <i>No Handelsbuchinstitut</i>	0.0	68.8	31.3	2.31	64	0.036	[0.742]

## 5 Conclusions

We surveyed 87 German savings banks on their management of capital. In contrast to earlier studies, our paper focuses on German public savings banks, which are unique worldwide, since they have very special institutional characteristics. They are public corporations, whose access to the capital market is restricted. Therefore, they heavily rely on retained earnings. One of the very few alternatives to increase capital, besides retaining profits, is to issue subordinated debt.

We find that 47 percent of all savings banks target a quantitative target capital ratio. This result is in line with the trade-off theory of capital, which states that a specific optimal capital ratio exists. Interestingly, these savings banks target both lower and higher capital targets, whereas other savings banks with a qualitative capital target only wish to increase or maintain the capital ratio, but not to reduce it. Since their capitalisation does not differ significantly, we conclude that the banks aiming at a quantitative capital ratio have a more complex capital management.

In line with this finding, we obtain evidence that the savings banks, with a quantitative capital target, are more likely to choose a more complex Basel II approach. However, larger savings banks also prefer more complicated Basel II approaches, since large savings banks are more likely to have the willingness and abilities to apply more sophisticated approaches.

The savings banks' target capital ratio is particularly determined by the savings banks' willingness to take risk, the desired credit growth and profitability. In order to reach the target capital ratio, instruments that manipulate the level of capital are preferred to instruments that increase the level of risk-weighted assets. The most important instruments are lowering costs and issuing subordinated debt. We find that the issuance of subordinated debt is significantly more important to savings banks with a Tier 1 ratio below 7 percent. For these banks, issuing subordinated debt is even the most important instrument to increase capital. We find that particularly lower capitalised savings banks have issued subordinated debt.

Examining the issuance of subordinated debt in more detail, we ascertain that the most important motivation behind issuing subordinated debt is to increase Tier 2 capital. This motivation is significantly more relevant for less capitalised savings banks with a Tier 1 ratio below 7 percent. Preserving low interest rates on the capital

market is an additional important motivation behind issuing subordinated debt. Of little relevance is the aim to reach the target capital ratio faster. However, this motivation is significantly more relevant for savings banks targeting a quantitative capital ratio.

About 60 percent of all surveyed savings banks plan to apply the simplest, the standardised approach under Basel II, whereas about 40 percent will apply the IRB foundation approach. However, the consequences of Basel II on the capital ratio are limited. Independent of the selected approach, the majority of savings banks in both groups will not increase capital due to the new capital agreement. Furthermore, the abolishment of the public guarantees regarding all third party liabilities of the savings banks in July 2005 will affect the savings banks' capital endowment only moderately.

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