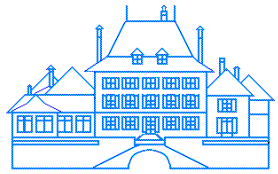

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DO DEPOSITORS DISCIPLINE SWISS BANKS?

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Abstract

In this paper, we test for the presence of market discipline in the Swiss deposit market. In particular, we examine whether depositors monitor their banks and withdraw their savings deposits whenever the fundamentals of their bank are no longer satisfactory. We use a panel of bank-specific data on 250 Swiss banks over the period 1987-1998. We find considerable evidence of market discipline, in the sense that depositors are sensitive to bank-specific fundamentals, to institutional differences across bank groups, and to institutional changes in the Swiss depositor protection system.

Our study complements the existing literature which predominantly builds on price indicators of market discipline (like yield spreads) by an approach based on quantities (the uninsured share of deposits). As few banks have traded debt outstanding, our approach is applicable to a much larger number of banks, including banks from non-industrialized countries.

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1 Introduction

Market discipline for banks is an important element of financial efficiency. In the absence of discipline, depositors implicitly subsidize the risks taken by their banks. This raises the probability of bank failures. As bank failures, through contagion effects, impose potential costs to the banking system or to the economy as a whole, depositor discipline is not only an important pillar of a sound banking system, but of overall economic efficiency.

While the importance of market discipline in banking is widely recognized, there is much less consensus among economists as to its actual *presence*. In theory, it has been argued that depositor discipline in banking is inherently insufficient. Small depositors have little incentive, and often high costs, to gain information on a bank's health.[1] Deposit insurance may further weaken monitoring incentives. At the same time, large and uninsured lenders to a bank may still find monitoring worthwhile.

Researchers have thus spent considerable effort to measure bank creditor discipline. Basically, they have followed two different approaches. First, a number of authors have chosen the price or yield based approach. They use yield spreads (the difference between the market yield on bank debt and a risk-free asset like government debt) as an indication of the market's perception of bank risk. A good overview on this strand of literature is given in Board of Governors & US Treasury (2000); depositor discipline in Europe is examined in Sironi (2000). Second, a few studies follow what we call the quantity based approach, by analyzing to what extent a bank is able to raise (uninsured) debt. Covitz, Hancock & Kwast (2000) find that relatively weak banks are unwilling (or unable) to issue subordinated debt in bad times. Jordan (2000) finds that, in the 1990's New England banks experienced a fall in uninsured deposits prior to failing. Peira & Schmukler (1998) find for Argentina, Chile, and Mexico, that even small, insured depositors exert market discipline by withdrawing deposits from weak banks. Some studies, finally, use a combined approach by looking at prices as well as quantities, see e.g. Park & Peristiani (1998).

In this paper, we examine the presence of market discipline in the Swiss bank deposit market using a quantity based approach. The main hypothesis underlying this study is that depositors monitor their banks and transfer uninsured deposits to a better bank whenever the performance of their bank is not longer satisfactory. To test this hypothesis, we use a panel with bank-specific variables for 250 banks over the period 1987-1998. We examine three particular aspects of market discipline, namely: (i) do bank fundamentals influence depositors' willingness to entrust non-insured deposits to a particular bank; (ii) do institutional differences among bank groups affect the degree of market discipline in the banking sector; and (iii) do institutional changes in the Swiss depositor protection system alter the behavior of depositors? As a proxy for depositor confidence we use the fraction of uninsured savings deposits to total savings deposits held at a bank.

[1] Dewatripont & Tirole (1985)

The use of quantities, rather than prices, in a study on Swiss banks has several advantages. First, on theoretical grounds it can be argued that under asymmetric information a debtor is rationed by quantity rather than by price (see e.g., Stiglitz & Weiss, 1981). Differences in yields may thus underestimate the presence of market discipline. This is particularly true in the Swiss retail deposit market, where banks do not primarily compete via prices (i.e., via the rates they offer), but via quality criteria.

Second, quantity information is available for most banks, not only for banks which have traded debt outstanding. In contrast, the use of yield spreads would limit the analysis to banks with traded debt and thus to relatively big and sophisticated institutions. Such banks are a small minority in most countries, including Switzerland. The quantity based approach thus allows us to complement the existing literature with results for an European country with an important banking sector but with few banks issuing traded debt.

Overall, we find considerable evidence of market discipline in all three respects mentioned: depositors are sensitive to the evolution of bank-specific fundamentals, to institutional differences across bank groups, as well as to institutional changes in the Swiss depositor protection system.

The rest of this paper is organized as follows. Section 2 outlines the Swiss depositor protection system. The empirical methodology is presented in Section 3. Results are provided in Section 4. Section 5 concludes.

2 Protection of Depositors in Switzerland

2.1 Protective Regulation

Switzerland has no explicit, government-run depositor insurance system. Instead, there are three different schemes to protect depositors of failed banks, all three having been effective during our sample period:[2]

1. *State guarantee* for cantonal banks.
2. *Priority insurance* for savings deposits up to CHF 30'000 per depositor (prior to 1997: CHF 10'000).
3. Private *liquidity insurance* for all savings deposits up to CHF 30'000 per depositor and, since 1993, up to an aggregate amount («cap») of CHF 1 billion.

State guarantee for cantonal banks protects deposits at those 25 banks that have been erected by the cantons (i.e. the states).[3] *Priority insurance* protects savings deposits (and some similar liabilities) in the case of bankruptcy up to CHF 30'000 (approximately US$ 20,000) per depositor. These deposits are

[2] For more detailed information see Birchler (2000).

[3] Guarantees are limited to savings deposits in the cantons of Vaud and Geneva, at least de jure.

granted priority status, i.e. they are senior to all other deposits or liabilities.[4] Priority status "insures" deposits in the sense that their holders have a first claim against a failed bank's assets. It is comparable to "depositor preference" introduced in 1993 in the US. When introduced in 1934, priority insurance was limited to CHF 5'000 per depositor. In 1971, the limit was raised to CHF 10'000 and in 1997 to CHF 30'000. *Liquidity insurance* is provided under a private agreement among the Swiss Bankers Association (SBA) assuring the repayment of savings deposits up to CHF 30'000 per depositor in case of bankruptcy. [5] When the SBA pays out depositors, it acquires their respective claims including their priority status.[6] Thus, the SBA primarily guarantees the liquidity of priority deposits. It bears the residual risk that the assets of the failed bank may not even be sufficient to honor priority deposits, though.[7] In 1993, in response to the Swiss loan crisis, the SBA imposed a cap, which restricted the scope of liquidity insurance to an aggregate amount of CHF 1 billion. In practice, this limit implies that for several banks the insured amount effectively falls short of the theoretical limit of CHF 30'000 per depositor.[8]

2.2 Insured Liabilities: Some Stylized Facts

The focus of this article is on savings deposits. Historically, these were the dominant source of funds for Swiss banks. After a secular decline, savings accounts still represent 27.3 percent of all deposits held by the public (end of 2000). The savings account remains the typical investment instrument of small depositors. In 2000 there were 2.2 savings accounts per capita; savings accounts thus outnumber by far any other type of account.[9] A majority of savings accounts are small. Although some savings deposits exceed CHF 100'000 (about US$ 70'000), in 2000 the average balance was around CHF 17'000, with a median around CHF 4'000.[10]

Table 1 presents data on the number and size of savings deposits as well as on the shares covered by either cantonal guarantee of priority insurance.[11]

[4] *Federal Act on Banks and Savings Banks* (Article 15, Section 2). The respective French and German expressions for this protection scheme are "privilège en cas de faillite" and "Konkursprivileg".

[5] A thorough discussion on this private deposit guarantee can be found in Winzeler (1994).

[6] Again, this very much resembles the 1993 US depositor preference rules, under which the FDIC acquires priority of deposits when paying out insured depositors. Note that while depositor preference in the US extends to all, not just to insured deposits, in Switzerland the definitions of deposits having priority and being insured by the SBA coincide.

[7] In the fifteen years of its existence, the agreement was called upon in three cases (*Banque de Participations et de Placements*, Lugano; *Mebco Bank SA*, Geneva; *Spar+Leihkasse Thun*, Thun). In all three cases the respective bank's assets were sufficient to cover priority deposits.

[8] This is true for about twenty banks, particularly for the two big banks.

[9] This relatively high figure is relevant for the present study, as it indicates that people diversify savings accounts across banks, perhaps to avoid holding uninsured savings.

[10] By the end of 2000, 59.6 percent of saving accounts had balances below CHF 5'000, which makes the figure in the text a reasonable estimate for the median.

[11] Unfortunately, no data are available on liquidity insurance. In order to estimate the fraction of savings deposits covered by priority insurance, we assume (somewhat counterfactually) that each depositor holds only one savings account per bank.

End of	Saving accounts balance				
	total	average per account	percentage of total with:		
			priority	state guarantee	neither
	CHF bn.	CHF	%	%	%
	(1)	(2)	(3)	(4)	(5) =100–(3)–(4)
1935	5.8	1'385	n.a.	n.a.	n.a.
1940	5.2	1'342	n.a.	n.a.	n.a.
1945	6.6	1'495	39.0	50.1	10.9
1950	8.2	1'635	38.3	48.9	12.8
1955	11.1	1'956	36.2	47.8	16.0
1960	15.1	2'368	33.3	47.9	18.8
1965	22.7	3'081	30.0	48.0	22.0
1970	35.3	3'902	28.9	44.4	26.8
1975	64.8	5'977	33.8	41.1	25.1
1980	90.3	7'431	30.9	39.1	30.0
1985	113.7	8'692	28.2	36.2	35.6
1990	129.3	8'972	29.2	34.8	35.9
1995	210.3	13'655	22.4	34.8	42.9
2000	211.4	14'305	39.4	33.9	26.7

Table 1: Protection of Savings Deposits 1935-2000. Source: Les Banques suisses, 1935-2000

It highlights three stylized facts. First, nominal growth in savings deposits (column (1)) has led to a continuous decrease in the share of priority savings, except in 1971 and 1997, when the priority ceiling was revised upwards (column (3)). Second, cantonal banks have continuously lost market share in the Swiss deposit market (column (4)). Hence, the fraction of savings deposits covered by a cantonal guarantee has been falling continuously since 1945. Finally, the share of savings deposits enjoying neither priority insurance nor cantonal bank state guarantee has risen steadily until 1997 when the upward revision in priority insurance brought it back to its 1970 level (column (5)).

Table 2 breaks the structure of savings deposits (end of 2000) by size into insured and uninsured parts. Figures for the current per-depositor ceiling (for priority and liquidity) insurance of CHF 30'000 are given on the bottom row. For illustration, figures that would apply under the old ceiling (for priority insurance) of CHF 10'000 are given on the row above. The fractions of insured savings deposits, as a function of the ceiling, are given in columns (2)-(4); the corresponding fractions of uninsured savings deposits in column (5).

Under the current ceiling of CHF 30'000, 31.6 percent of savings deposits have balances below the ceiling and thus are fully insured (column (2)). The other 68.4 percent of deposits exceed the ceiling and are only insured for their bottom part (up to CHF 30'000); in the aggregate (the number of accounts times the ceiling), this adds another 27.2 percent to insured savings deposits (column

Insured and uninsured savings deposits (as a percentage of total savings deposits)				
ceiling	insured			uninsured
CHF	fully	bottom part	total	
	%	%	%	%
(1)	(2)	(3)	(4)	(5)
10'000	11.4	20.5	31.9	68.1
30'000	31.6	27.2	58.8	41.2

Table 2: Savings deposits with and without priority insurance for different values of the per-depositor ceiling; end of 2000, all banks (incl. cantonal banks). Source: SNB, Les banques suisses, 2000, Table 20.2-3

(3)). In total, 58.8 percent of savings deposits are insured (column (4)), while the remaining 41.2 percent of the total volume of savings deposits are *uninsured* (column (5)). For comparison, the row for CHF 10'000 shows that, under this lower ceiling, about two thirds of savings deposits would be uninsured.

3 Empirical Methodology

3.1 Hypotheses

The main hypothesis underlying this study is that depositors exert market discipline by monitoring their banks and by withdrawing uninsured deposits whenever the performance of their bank is no longer satisfactory. Bank fundamentals should thus help to explain the amount of uninsured deposits a bank is able to attract. This leads to our first general hypothesis:

Hypothesis 1 ***(General market discipline.)*** *The supply of uninsured savings deposits (as a fraction of total savings deposits) is related to movements in bank fundamentals.*

Furthermore, we examine whether institutional differences or changes in deposit insurance affect the supply of uninsured savings deposits. First, we examine the effect of *state guarantee*:

Hypothesis 2 ***(State guarantee.)*** *The fraction of uninsured savings deposits (in total savings deposits) is more responsive to movements in bank fundamentals at regional banks than it is at cantonal banks.*

Next, we examine whether the supply of uninsured savings deposits reflects *changes in the deposit insurance system* during the sample period under study. The two relevant changes were the introduction of an aggregate cap for liquidity insurance in 1993 and the increase in the per person limit of priority insurance in 1997. Due to the CHF 1 billion cap liquidity insurance in practice falls short

of the CHF 30'000 per depositor theoretically guaranteed for about the largest 20 Swiss banks. In the presence of market discipline, we thus expect to find relatively less deposits under CHF 30'000 at those banks.

Hypothesis 3 ***(The liquidity insurance cap.)*** *Banks for which the 1993 liquidity insurance cap is a binding constraint exhibit a lower fraction of (theoretically) insured savings deposits than banks for which the cap is not binding.*

The other institutional change we examine is the 1997 extension of priority insurance from CHF 10'000 to CHF 30'000 per depositor. We test whether savings deposits above CHF 10'000 have become more attractive after 1997.

Hypothesis 4 ***(The priority insurance ceiling.)*** *After the 1997 priority insurance revision, a larger percentage of savings deposits exceeds CHF 10'000.*

To test these four hypotheses we use the reduced form model presented in the following section.

3.2 Model Testing

The «mother» hypothesis underlying this paper is that the presence of market discipline can be inferred from the extent to which the supply of uninsured savings deposits reacts to indicators of bank strengths. Our dependent variable thus is α_{it}^{j}, the ratio of uninsured saving deposits to total saving deposits of bank i at time t under insurance type j. The focus on savings deposits allows us to work with a homogeneous aggregate: Changes in the fraction of uninsured savings deposits are not likely to be distorted by shifts between different kinds of deposits as may, e.g., be induced by changes in the level of interest rates.

Our explanatory variables are a set of independent proxies for bank safety on which depositors may base their decisions. We use the following general reduced form:

$$\alpha_{it}^{j} = \mu_i + \delta' M_t + \beta' X_{it-1} + \gamma' D_{it} + \epsilon_{it} \ , \tag{1}$$

where $i = 1...N$ and $t = 1...T$. On the right hand side μ_i stands for each bank's specific or fixed effect. M_t is a vector of macroeconomic variables. X_{it-1} is a vector of bank-specific variables. This vector is included with a lag to account for the fact that balance sheet information is available to the public with a certain delay. D_{it} is a vector of control variables that account for the revisions in the deposit insurance system. Thus, according to equation (1), a bank's ratio of uninsured savings deposits to total savings deposits, apart from bank specific differences, is determined by three main factors: general developments in the macroeconomy, the evolution of the bank fundamentals and revisions in the insurance deposit system.

To estimate equation (1), we use different specifications of a fixed-effects time series cross-section regression on our panel of approximately 250 Swiss banks. As usual we assume that residuals have a conditional mean of zero, a finite conditional variance and are uncorrelated across time and across banks.

3.3 The Data

We use panel data from the *Swiss National Bank* banking statistics on bank-specific variables for approximately 250 Swiss banks. The annual data cover the period 1987-1998. The panel is unbalanced in the sense that the number of observations per bank (N) varies across banks.[12] To estimate equation (1), we combine bank specific variables with macroeconomic variables and deposit insurance control variables. We first introduce our macroeconomic variables.

3.3.1 Macroeconomic Variables

To control for the general conditions of the banking system, we include three macroeconomic variables, namely the Swiss GDP growth rate *(GDPGR),* the 3-month US money market rate *(USMM3M)* and the consumer price index *(CPINDEX).*[13] As these variables reflect the relative strength of the economy, we expect each having a *positive* relationship with the dependent variable α_{it}, the share of uninsured savings deposits.

3.3.2 Bank-Specific Variables

Bank-specific variables are derived from the CAMEL rating system of banks (*C*apital adequacy, *A*sset quality, *M*anagement, *E*arnings and *L*iquidity).

Capital Adequacy As a sound capital base should strengthen depositor confidence, we expect a *positive* relationship between the ratio of capital to total liabilities ($AKTL$) and α_{it}, the share of uninsured saving deposits.

Asset Quality To proxy asset quality, we include four variables. First, the ratio of non-saving deposits to total deposits ($NSDTL$) controls for the substitution effect between savings deposits and non-savings deposits (such as time or demand deposits). As different types of uninsured deposits are substitutes, we expect a *negative* relationship between NSDTL and α_{it}, the share of uninsured saving deposits. Second, the ratio between liabilities to customers and mortgage lending ($TFIN$) tells us to what degree a bank can finance its mortgage lending from customer deposits. As a strong customer base contributes to bank safety, we expect a *positive* relationship between this variable and α_{it},. Third, the ratio of mortgage lending to total liabilities ($MORTL$) is a reasonable proxy for collateralized, i.e. relatively secure, lending. We thus again expect a *positive* relationship with α_{it}. Fourth, the ratio of interbank borrowing to total liabilities ($TBKTL$) measures a bank's dependence on relatively expensive, or fragile, funding. We expect a *negative* relationship with α_{it}.

[12] From 1991-95 the Swiss banking sector experienced a real-estate related loan crisis which hit the regional banks most severly. The number of regional banks fell from 210 to 135.

[13] The selection of our macro and bank-specific variables is consistent with similar studies on market discipline. We also draw from the literature on "leading indicators" of banking crises. See Bell (2000), and, for the UK, Logan (2001).

Management To account for management quality, we include the ratio of non-interest expenditures to total liabilities (*NIETL*). This variable, which includes a variety of expenses (such as payroll, workers compensation and training investment), reflects the management's policy stance. A high level of spending in not-directly-productive activities may reflect an inefficient management. We thus expect a *negative* relationship with our dependent variable.

In order to capture a management's policy we look at the difference between the interest rate on savings deposits offered by the bank and its industry average *AAIRS*. As *AAIRS* represents the bank's relative "aggressiveness" in its desire to attract savings deposits, we expect a *positive* relationship with our dependent variable.

Earnings To account for the bank's earnings profile, we include four variables. A high profit rate, measured by the ratio of net gain to total liabilities (*RTL*), should strengthen depositors' confidence. We thus expect a *positive* relationship with α_{it}, the share of uninsured saving deposits. The next two variables account for the degree of revenue diversification. These are the ratio of net commission revenues to total liabilities *(NCRTL)* and the ratio of net interest rate revenues to total liabilities (*NIRTL*). As diversification of revenue into non-interest income increases bank stability, we expect a *positive* (*negative*) relationship between *NCRTL* (*NIRTL*) and uninsured savings deposits. The fourth earnings-related variable is the growth rate of total liabilities (*TLGR).* Assuming that depositors interpret a high growth rate as a signal of the management's confidence in expanding its activities, we expect a *positive* relationship between this variable and α_{it}.

Liquidity Finally, we account for the degree of liquidity by including the ratio of liquid assets to total liabilities *(GLIQTL).* As a relatively liquid bank, may be less prone to a bank run, we expect a *positive* relationship between this variable and α_{it}, the share of uninsured savings deposits.

3.3.3 Insurance Control Variables

Market discipline also means that depositors know whether, or to what degree, their deposits are protected. E.g., we expect less discipline at cantonal banks. Yet, we also expect an impact of changes in liquidity and priority insurance provisions. Indeed, our sample permits some elaborate test of depositors' knowledge, since insurance rules changed twice during the sample period: In 1993 the cap on liquidity insurance was introduced, and in 1997 the limit (per depositor) on priority insurance was raised.

Liquidity Insurance First, we try to measure whether the 1993 cap on liquidity insurance reduced depositors' willingness to hold their savings deposits in a cap-constrained bank, i.e. in a bank where *effective* liquidity insurance per depositor (as limited by the cap) fell short of the theoretical CHF 30'000. We

include a dummy ($DCAP$), which equals one if (after 1993) the bank's volume of insured deposits was constrained by the cap, and zero otherwise. We expect a *positive* relationship between this dummy variable and α_{it}^{LINC}, the share of savings deposits that would have been uninsured in the absence of the cap. This is because we expect a cap-constrained bank to experience a drop in the volume of (theoretically) insured (below CHF 30'000) savings deposits, and therefore a corresponding rise in the fraction of uninsured savings deposits. We may call this the «small deposits» effect.

In addition, we test whether the expected fall in the share of uninsured savings deposits in a cap-constrained bank is partly compensated through a «large deposit effect». For the holders of large deposits (above CHF 30'000) too, cap-constrained banks should be less attractive, as effective insurance coverage is lower than the standard CHF 30'000. To test this hypothesis, we use two alternative specifications.

In the first specification, we introduce an interaction term ($DCSVTL$) to measure the interaction between the insurance cap ($DCAP$) and the ratio of savings deposits to total liabilities ($SVTL$). We assume that a higher volume of savings deposits is associated with a higher volume of uninsured savings deposits. The insurance cap, which should reduce the volume of savings deposits, should thus also lower the volume of uninsured savings deposits. Consequently, we expect a *positive* relationship between the interaction term and α_{it}^{LINC}. To test the impact of the cap under this specification, we modify equation (1) to the following expression:

$$\alpha_{it}^{LINC} = \mu_i + \delta' M_t + \beta' X_{it-1} + \rho' DCAP_{it} + \phi' SVTL + \lambda' DCSVTL_{it} + \epsilon_{it} \quad (2)$$

where, as before, μ_i stands for each bank's fixed effect, M_t is a vector of macroeconomic variables, and X_{it-1} is a vector of bank-specific variables. The dependent variable, α_{it}^{LINC}, is defined as the fraction of savings deposits that are not covered by liquidity insurance even in the absence of the cap (i.e. as the fraction of savings deposits strictly above CHF 30'000). The last three terms in equation (2) allow us to examine the impact of the introduction of the cap on depositors' behavior. As mentioned, $DCAP$ is the «cap binding» dummy, $SVTL$ is the ratio of savings deposits to total liabilities and $DCSVTL$ is the interaction term between SVTL and the cap.

In an alternative specification, we examine the impact of the cap on the number, rather than the volume, of savings deposits. We include a variable ($DCSNTS$) on the interaction between the insurance dummy ($DCAP$) and the ratio between the number and the volume of savings deposits ($SNTS$) (the reciprocal of average savings balances). We expect a *negative* relationship between this interaction term and α_{it}^{LINC}, the share of uninsured savings deposits (as specified under the liquidity insurance in the absence of the cap). This is because a higher number of savings accounts per volume, or a low average balance, is associated with a low fraction of savings deposits being uninsured. Therefore, if the cap reduces the number of savings deposits, it raises their average volume and thus their uninsured part. To test under this specification, we modify

equation (1) to the following expression:

$$\alpha_{it}^{LINC} = \mu_i + \delta' M_t + \beta' X_{it-1} + \rho' DCAP_{it} + \phi' SNTS + \lambda' DCNTS_{it} + \epsilon_{it} \quad (3)$$

where, α_{it}^{LINC}, μ_i, M_t, X_{it-1} and $DCAP$ are defined as above. The only difference are the last two terms, *SNTS*, the number of savings deposits (per dollar of deposits) and *DCSVTS*, the interaction term between the cap and the number of savings accounts (per dollar of savings deposits).

Priority Insurance The second institutional change we analyze is the 1997 revision to priority insurance, which raised the level of insurance for savings deposits from CHF 10'000 to CHF 30'000 per depositor. One would expect that higher coverage encourages depositors to hold larger (above CHF 10'000) savings deposits. To test this hypothesis, we include a priority insurance dummy (*DPI*), which equals one after the 1997 priority insurance revision and zero before. We expect a *positive* relationship between this variable and α_{it}^{PIB97}, the share of savings deposits uninsured (under the pre-1997 definition).

After the 1997 revision, we particularly expect to see an increase in the number of savings deposits in the size category between CHF 10'000 and CHF 30'000 (which became newly insured), probably at the expense of savings deposits above CHF 30'000. A given number of savings deposits between CHF 10'000 and CHF 30'000 should thus be associated with a higher volume of uninsured savings deposits, while a given number of savings deposits above CHF 30'000 should be associated with a lower volume of uninsured saving deposits. To test this hypothesis, we introduce two interaction terms, *DPSN30ST* and *DPSN30AST.* While the former links the priority insurance dummy (*DPI*) with the number of savings deposits up to CHF 30'000 *(SN30ST),* the latter combines *DPI* with the number of saving deposits above CHF 30'000 (*SN30AST).* We expect a *positive* (*negative*) relationship between the number of savings deposits between CHF 10'000 and CHF 30'000 (above CHF 30'000) and the dependent variable α_{it}^{PIB97}. We consequently modify equation (1) to the following expression:

$$\begin{aligned} \alpha_{it}^{PIB97} &= \mu_i + \delta' M_t + \beta' X_{it-1} + \psi' DPI_{it} + \xi' SN30ST + \upsilon' SN30AST \\ &\quad + \varkappa' DPSN30ST_{it} + \tau' DPSN30ST_{it} + \epsilon_{it} \end{aligned} \quad (4)$$

where, μ_i, M_t, and X_{it-1} are define as above. The dependent variable, α_{it}^{PIB97}, represents the fraction of savings deposits strictly above CHF 10'000 (i.e. not priority insured before the 1997 revision). The last five terms represent the priority insurance variables, namely *DPI*, the priority insurance dummy; $SN30ST$ and *SN30AST*, which are, respectively, the number of saving deposits up to CHF 30'000 and above CHF 30'000; plus $DPSN30ST$ and *DPSN30AST*, the interaction terms between *DPI* and, respectively, $SN30ST$ and *SN30AST*.

3.3.4 Summary Statistics

A quick overview of the data for the banks that we use in our sample is provided in Tables 3-5 below. While Tables 3-4 present, respectively, the 1987-1998 cross-

sectional summary statistics, Table 5 presents the summary statistics for the entire panel data.

According to Tables 3 and 4, the data set includes 247 banks in 1987. The two biggest groups are the 27 cantonal banks and 206 regional banks. At the end of the sample, however, there are only 140 banks left, of which 24 are cantonal banks and 107 are regional banks. In other words, between 1987-1998, the number of cantonal banks dropped by 10 percent, while the number of regional banks dropped by almost 50 percent.

4 Results

Empirical results are reported in Tables 6-10 below. While Table 6 presents the regression results of equation (2), Table 7 presents those of equation (3). To test the robustness of our results, we combine the liquidity insurance variables of equations (2) and (3), and test the extended model both in its standard lagged form (Table 8) and in first-differences (Table 9). Finally, Table 10 presents the regression results of equation (4).

4.1 General market discipline

Our first hypothesis, that the fraction of uninsured savings deposits is related to movements in a bank's fundamentals, is well supported by the data. Both, macroeconomic variables and bank-specific variables, account, partially at least, for fluctuations in the share of uninsured saving deposits. This is shown, for example, in column (1) of Table 6. Except for four of the fifteen bank-specific variables (namely, available capital (*AKTL),* net interest revenues *(NIRTL),* interbank borrowing *(TBKTL)* and liquidity (*GLIQTL)*), all coefficients are statistically significant with the expected sign. We conclude that the Swiss deposit market exhibits a certain degree of market discipline, in the sense that uninsured depositors monitor the fundamentals of their bank and respond accordingly.

4.2 State guarantee

Our results also confirm our second hypothesis, that state guarantee reduces the degree of market discipline. The fraction of uninsured savings deposits held at cantonal banks (which benefit from state guarantee) is indeed less responsive to movements in bank fundamentals their counterpart held at regional banks. In Table 6, nine of the fifteen bank fundamentals are statistically significant in the case of the regional banks (column (3)), as opposed to only four in the case of the cantonal banks (column (2)). This result is consistent with the view that state guarantee weakens market discipline.

4.3 The liquidity insurance cap

Our third hypothesis claims an impact of the 1993 CHF 1 billion liquidity insurance cap. We test whether banks, which are constrained by the insurance cap, experience a drop in insured savings deposits or, alternatively, a rise in uninsured savings deposits. Our results confirm this hypothesis. In Table 6, the insurance dummy, *DCAP*, is positive and statistically significant under a wide range of specifications.

Our regressions also confirm our hypothesis that, for a given level of savings deposits, cap-constrained banks experience a drop in uninsured savings deposits. In column (1) of Table 6, the coefficient of the interaction term *DCSVTL* is both negative and statistically significant.[14] These results suggest that the insurance cap, which reduces the effective insurance below the standard CHF 30'000, not only reduces the level of insured savings deposits but also discourages depositors, who hold large savings deposits (i.e., above CHF 30'000) to entrust their uninsured deposits to banks for whom the cap is binding.

While we find a general response to the introduction of the 1993 insurance cap, there is no measurable difference across bank groups. None of the bank group-specific variables (*DCSVTLiB* where i = regional banks, big banks or other banks), standing for interactions between liquidity insurance variables (*DCAP* and *DCSVTL*) and bank group dummies, in column (3) of Table 6 are statistically significant.[15] Only the structure of savings deposits seems to differ across bank groups. In particular, for a given level of savings deposits, regional banks hold a smaller fraction of uninsured savings deposits relative to the cantonal banks. This is suggested by the coefficient of *SVTLRB,* the volume of savings deposits in regional banks, which is negative and statistically significant in column (3) of Table 6.

To test the sensitivity of our results, we modify the specification of our model and check the consistency of our results. First, we examine whether depositors' response to changes in the depositor protection system remains the same when we focus on the number, rather than on the volume, of savings deposits. We control for the number of savings deposits (as a fraction of total saving) (*SNTS*) and add a term (*DCSNTS* for interaction between the liquidity insurance dummy (*DCAP*) and the number of deposits (as a fraction of total savings) (*SNTS*). The specification of this model is given in equation (3), and the regression results are shown in Table 7. As expected, the introduction of the 1993 insurance cap reduced the level of uninsured savings deposits (as a fraction of total deposits). This confirms our hypothesis that the insurance cap discourages depositors who hold large savings deposits to entrust uninsured deposits to banks for whom the cap is a binding constraint. This is shown

[14] We control for the fact that a higher level of saving deposits (as a share of total liabilities) is associated with a higher volume of uninsured saving deposits. This is shown in Table 6, where the coefficient for *SVTL* is always positive and statistically significant.

[15] To test this hypothesis, we also added a set of interaction variables, which represented the varying effect of *DCAP* across the various bank groups (i.e., *DCiB*, where i = regional banks, big banks and other banks). However, none of these interaction terms turned out to be statistically significant. This result was robust across all specifications.

in Table 7, where the coefficient of *DCSNTS* is statistically significant and negative.

In a further sensitivity test, we combine the liquidity insurance variables of equations (2) and (3) and run the extended model both in its standard lagged form and in first-differences. The results are given in, respectively, Tables 8 and 9. Again, the statistical significance of our liquidity insurance variables confirms our hypothesis that depositors respond to changes in the Swiss depositor system.

4.4 The priority insurance ceiling

Our fourth hypothesis, finally, claiming a positive impact of the 1997 priority insurance revision (which raised priority from CHF 10'000 to CHF 30'000) on savings deposits above CHF 10'000, is not supported by the evidence as such.[16] In column (1) of Table 10, the coefficient of *DPI*, the priority insurance dummy, is not statistically significant. However, our results show a redistribution *within* the category of savings deposits above CHF 10'000: Following the 1997 revision, depositors were willing to hold more savings deposits in the CHF 10'000 to CHF 30'000 brackets and fewer savings deposits above CHF 30'000. In column (3) of Table 10, the coefficient of *DPSN30ST (DPSN30AST)* is positive (negative) and statistically significant.[17]

As far as bank group-specific characteristics are concerned, we again find that savings deposits held at cantonal banks are less responsive than savings deposits held at regional banks. After the 1997 revision, the fraction of savings deposits between CHF 10'000 and CHF 30'000 in cantonal banks increased by less than its counterpart at regional banks. In column (5) of Table 10, the coefficient of *DPSN30C* is negative and statistically significant. This result, however, is not robust across all specifications: While the coefficient of *DPSN30C* is also significant in column (3), it is not significant in column (2).

Our results on the 1997 priority insurance revision must be considered with a grain of salt, as this revision occurs very late in the sample period. Thus, we do not have many data points to test the robustness of our results. This may explain the relative sensitivity of our results to different specifications, as can be seen by comparing columns (1)-(3) of Table 10. It will be interesting, however, to repeat this exercise in a few years with a longer data series.

4.5 Robustness of results

We find our empirical results to be robust across a broad range of specifications, including correcting for the presence of heteroscedasticity and first-order auto-

[16] Given that our dependent variable is defined as uninsured saving deposits before the 1997 revision, it includes all saving deposits up to CHF 10'000. In this context, depositors' willingness to hold larger saving deposits (i.e., saving deposits above CHF 10'000) after the 1997 revision should translate into a higher fraction of *un*insured saving deposits.

[17] While the statistical significance on $DPSN30AST$ is robust across specifications, the statitistical significance on $DPSN30ST$ is not. This can be seen by comparing, for example, the coefficients of these variables in column (1) with those in column (4) of Table 10.

correlation. The results are particularly robust for the regional banks, which represent the great majority of banks in of the sample. While the Breusch and Pagan Lagrangian multiplier test favors the random-effects specification over the fixed-effects specification, the results (in terms of both level of significance and sign of coefficients) remain consistent with those found under the fixed-effects specification. Furthermore, the Hausman specification test rejects the hypothesis that the individual-level effects are adequately modeled by a random-effects model. These results suggest that either the current specification is not appropriate or the zero-correlation assumption between the bank-specific error term and the explanatory variables is violated. Overall, however, the latter interpretation seems more likely, given the consistency of our results over a wide range of specifications.

5 Conclusions

In this paper, we examine the presence of market discipline in the Swiss deposit market. Overall, we find that the perceived "quality", or relative safety, of a bank influences depositors' willingness to hold uninsured savings deposits in that particular bank. Variations in bank-specific fundamentals explain up to 75 percent of a bank's variations in uninsured savings deposits.[18] This result suggests that depositors exert considerable market discipline in the Swiss deposit market.

Second, we find that depositors of regional banks are more responsive to changes in bank-specific fundamentals than those of cantonal banks. For cantonal banks, fundamentals have at best a weak influence on the structure of savings deposits. Similarly, we find that depositors of cantonal banks are less responsive to changes in the Swiss depositor protection system than depositors in regional banks. This suggests that depositors at cantonal banks know that their savings deposits are protected by cantonal state guarantee.

Third, we examine the extent to which depositors respond to institutional changes in the Swiss depositor protection system. We find that the introduction of the 1993 cap on liquidity insurance (which reduces the effective insurance far below the standard CHF 30'000), not only lowers the fraction of savings deposits with balances below CHF 30'000, but also discourages depositors, who hold large savings deposits to entrust their uninsured deposits to banks, for whom the cap is a binding constraint.

We find similar results concerning the 1997 priority insurance revision. In particular, in response to the 1997 revision depositors were willing to hold more savings deposits in the newly-insured brackets (i.e., saving deposits between CHF 10'000 and CHF 30'000) and less in the non-insured brackets (i.e., savings deposits above CHF 30'000). Although our results with respect to the 1997 priority insurance revision are less robust than those found with respect to

[18] Note that if this model explains 75% of the movements in uninsured saving deposits, which make up for approximately 70% of total savings, the model explains almost half of the behavior in total savings.

the introduction of the 1993 liquidity insurance cap, they are consistent with our general conclusion: depositors indeed seem to be sensitive to institutional changes in the Swiss depositor protection system.

Overall, we conclude that, during our sample period, depositors responded to developments in bank-specific variables, to institutional differences across bank groups and to institutional changes in the depositor insurance system. These results suggest that, indeed, even savings depositors who are often regarded as not very sophisticated investors seem to exert discipline in the Swiss bank deposit market. As our study used quantity indicators (fractions of uninsured savings deposits), rather than price indicators (yield spreads), its methodology may be applicable to a large number of banks from industrialized as well as from non-industrialized countries.

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Table 3: 1987 Cross-Sectional Summary Statistics

		All Banks		Cantonal Banks		Regional Banks	
		Obs.	Mean	Obs.	Mean	Obs.	Mean
Dependent Variables	ALINC_i, t	247	0.286	27	0.301	206	0.284
	APIP97_i, t	247	0.575	27	0.602	206	0.572
Macroeconomic Variables	GDPGR_t	0		0		0	
	USMM3M_t	247	7.060	27	7.060	206	7.060
	CPINDEX_t	247	74.700	27	74.700	206	74.700
Bank-specific Variables	AKTL_i, t	0		0		0	
	NSDTL_i, t	247	0.251	27	0.352	200	0.216
	TFIN_i, t	247	20.447	27	9.696	179	20.132
	MORTL_i, t	247	0.547	27	0.412	206	0.582
	TBKTL_i, t	247	0.041	27	0.048	170	0.033
	NIETL_i, t	247	0.005	27	0.005	206	0.005
	AAIRS_i, t	247	-0.005	27	-0.074	206	-0.009
	RTL_i, t	247	0.003	27	0.003	206	0.003
	NCRTL_i, t	247	0.003	27	0.002	206	0.002
	NIRTL_i, t	247	0.007	27	0.007	206	0.007
	TLGR_i, t	0		0		0	
	GLIQTL_i, t	0		0		0	
Liquidity Insurance Variables	DCAP_i, t	247	0.000	27	0.000	206	0.000
	SVTL_i, t	247	0.434	27	0.350	206	0.460
	DCSVTL_i, t	247	0.000	27	0.000	206	0.000
	SAVN30_i, t	247	7'289.255	27	26'297.300	206	2'028.772
	DCSVN30_i, t	247	0.000	27	0.000	206	0.000
	SAVN30A_i, t	247	4'693.308	27	15'994.740	206	1'053.694
	DCSVN30A_i, t	247	0.000	27	0.000	206	0.000
	SNTS_i, t	247	0.109	27	0.094	206	0.111
	DCSNTS_i, t	247	0.000	27	0.000	206	0.000
Priority Insurance Variables	DPI_i, t	247	0.000	-	-	-	-
	SN30ST_i, t	247	0.152	27	0.161	206	0.152
	DPSN30ST_i, t	247	0.000	27	0.000	206	0.000
	SN30AST_i, t	247	0.084	27	0.106	206	0.081
	DPSN30AS_i, t	247	0.000	27	0.000	206	0.000

Table 4: 1988 Cross-Sectional Summary Statistics

		All Banks		Cantonal Banks		Regional Banks	
		Obs.	Mean	Obs.	Mean	Obs.	Mean
Dependent Variables	ALINC_i, t	140	0.418	24	0.444	107	0.414
	APIP97_i, t	140	0.682	24	0.705	107	0.678
Macroeconomic Variables	GDPGR_t	140	0.021	24	0.021	107	0.021
	USMM3M_t	140	5.430	24	5.430	107	5.430
	CPINDEX_t	140	98.000	24	98.000	107	98.000
Bank-specific Variables	AKTL_i, t	139	0.078	23	0.068	107	0.078
	NSDTL_i, t	140	0.220	24	0.371	107	0.162
	TFIN_i, t	136	1.006	24	0.945	103	1.018
	MORTL_i, t	140	0.722	24	0.670	107	0.760
	TBKTL_i, t	140	0.034	24	0.060	107	0.024
	NIETL_i, t	139	0.006	24	0.006	106	0.005
	AAIRS_i, t	140	0.008	24	-0.132	107	0.041
	RTL_i, t	140	0.004	24	0.003	107	0.003
	NCRTL_i, t	140	0.004	24	0.004	107	0.002
	NIRTL_i, t	140	0.016	24	0.014	107	0.017
	TLGR_i, t	140	0.079	24	0.018	107	0.079
	GLIQTL_i, t	139	0.086	24	0.057	107	0.089
Liquidity Insurance Variables	DCAP_i, t	140	0.157	24	0.708	107	0.009
	SVTL_i, t	140	0.441	24	0.317	107	0.486
	DCSVTL_i, t	140	0.049	24	0.218	107	0.003
	SAVN30_i, t	140	18'577.940	24	34'580.960	107	3'058.860
	DCSVN30_i, t	140	16'153.100	24	32'628.380	107	485.570
	SAVN30A_i, t	140	15'115.810	24	29'783.630	107	2'322.991
	DCSVN30A_i, t	140	13'242.160	24	27'940.420	107	393.972
	SNTS_i, t	140	0.072	24	0.065	107	0.073
	DCSNTS_i, t	140	0.010	24	0.045	107	0.001
Priority Insurance Variables	DPI_i, t	140	1.000	-	-	-	-
	SN30ST_i, t	140	0.165	24	0.168	107	0.165
	DPSN30ST_i, t	140	0.165	24	0.168	107	0.165
	SN30AST_i, t	140	0.131	24	0.146	107	0.127
	DPSN30AS_i, t	140	0.131	24	0.146	107	0.127

Table 5: Panel Summary Statistics (1987 - 1998)

		All Banks		Cantonal Banks		Regional Banks	
		Obs.	Mean	Obs.	Mean	Obs.	Mean
Dependent Variables	ALINC_i, t	2392	0.320	313	0.345	1932	0.317
	APIP97_i, t	2392	0.607	313	0.634	1932	0.604
Macroeconomic Variables	GDPGR_t	2143	0.015	285	0.014	1725	0.015
	USMM3M_t	2392	6.194	313	6.017	1932	6.232
	CPINDEX_t	2392	87.548	313	88.856	1932	87.282
Bank-specific Variables	AKTL_i, t	1892	0.068	255	0.057	1520	0.068
	NSDTL_i, t	2357	0.290	313	0.412	1897	0.249
	TFIN_i, t	2185	40.746	313	12.835	1758	47.623
	MORTL_i, t	2392	0.595	313	0.483	1932	0.633
	TBKTL_i, t	2134	0.038	313	0.053	1674	0.027
	NIETL_i, t	2387	0.006	313	0.006	1927	0.005
	AAIRS_i, t	2392	-0.001	313	-0.069	1932	-0.002
	RTL_i, t	2392	0.003	313	0.003	1932	0.003
	NCRTL_i, t	2392	0.003	313	0.003	1932	0.002
	NIRTL_i, t	2390	0.011	313	0.010	1930	0.011
	TLGR_i, t	2143	0.067	285	0.060	1725	0.066
	GLIQTL_i, t	1874	0.086	259	0.063	1520	0.089
Liquidity Insurance Variables	DCAP_i, t	2392	0.056	313	0.310	1932	0.004
	SVTL_i, t	2392	0.390	313	0.296	1932	0.420
	DCSVTL_i, t	2392	0.017	313	0.095	1932	0.001
	SAVN30_i, t	2392	11'123.770	313	30'577.330	1932	2'386.731
	DCSVN30_i, t	2392	5'187.978	313	14'678.340	1932	164.101
	SAVN30A_i, t	2392	7'947.235	313	21'546.380	1932	1'427.446
	DCSVN30A_i, t	2392	4'091.339	313	11'662.540	1932	119.198
	SNTS_i, t	2392	0.098	313	0.084	1932	0.100
	DCSNTS_i, t	2392	0.004	313	0.021	1932	0.000
Priority Insurance Variables	DPI_i, t	2392	0.121	-	-	-	-
	SN30ST_i, t	2392	0.159	313	0.168	1932	0.157
	DPSN30ST_i, t	2392	0.020	313	0.026	1932	0.019
	SN30AST_i, t	2392	0.099	313	0.120	1932	0.095
	DPSN30AS_i, t	2392	0.016	313	0.022	1932	0.015

Table 6: Fixed Effects Estimates of Equation (2) - Liquidity Insurance

Dependent Variable: Liquidity Insurance without Cap	ALINC_t	Specification 1			Specification 2	Specification 3
		All Banks	Cantonal Banks	Regional Banks	All Banks	All Banks
Macroeconomic Variables	GDPGR_t	0.401 ***	0.361	0.374 ***	0.388 ***	0.401 ***
		0.113	0.362	0.119	0.113	0.113
	USMM3M_t	0.006 ***	0.009 **	0.005 ***	0.006 ***	0.006 ***
		0.001	0.004	0.001	0.001	0.001
	CPINDEX_t	0.010 ***	0.011 ***	0.009 ***	0.010 ***	0.010 ***
		0.000	0.001	0.001	0.000	0.000
Bank-specific Variables	AKTL_i, t-1	0.038	0.748 *	-0.169	0.025	0.028
		0.144	0.423	0.165	0.144	0.145
	NSDTL_i, t-1	-0.032	0.080	-0.055 **	-0.032	-0.022
		0.022	0.084	0.024	0.022	0.022
	TFIN_i, t-1	0.000 *	0.000	0.000	0.000 *	0.000
		0.000	0.000	0.000	0.000	0.000
	MORTL_i, t-1	0.076 ***	0.078 **	0.062 ***	0.076 ***	0.071 ***
		0.013	0.039	0.018	0.013	0.013
	TBKTL_i, t-1	-0.067	0.072	-0.086	-0.083	-0.075
		0.066	0.198	0.076	0.067	0.066
	NIETL_i, t-1	-8.528 ***	-6.303	-6.954 **	-8.106 ***	-8.733 ***
		2.662	9.598	3.160	2.671	2.680
	AAIRS_i, t-1	0.011 **	-0.007	0.017 ***	0.011 **	0.012 **
		0.005	0.016	0.005	0.005	0.005
	RTL_i, t-1	1.227 *	0.721	1.417 *	1.192 *	1.405 **
		0.646	1.572	0.773	0.647	0.651
	NCRTL_i, t-1	4.506 ***	9.245	0.261	4.761 ***	4.537 ***
		1.203	6.073	2.169	1.211	1.213
	NIRTL_i, t-1	0.007	-1.739	0.378	0.003	0.102
		0.519	1.805	0.549	0.519	0.519
	TLGR_i, t-1	0.011 *	0.029	0.006	0.011	0.008
		0.006	0.037	0.007	0.007	0.007
	GLIQTL_i, t-1	0.098	-0.177	0.125 *	0.103	0.101
		0.064	0.249	0.068	0.064	0.064
Liquidity Insurance Variables	DCAP_i, t	0.062 ***	0.053	0.127	0.072 ***	0.060 ***
		0.017	0.033	0.165	0.018	0.020
	SVTL_i, t	0.198 ***	0.474 ***	0.209 ***	0.202 ***	0.453 ***
		0.032	0.143	0.033	0.032	0.081
	SVTLRB_i, t					-0.270 ***
						0.081
	SVTLBB_i, t					-1.197 **
						0.502
	SVTLOB_i, t					-0.235
						0.408

DCSVTL_i, t	-0.132 **	-0.168	-0.327	-0.154 ***	-0.163 **
	0.056	0.105	0.467	0.058	0.067
DCSVTLRB_i, t				-0.022	0.022
				0.066	0.068
DCSVTLBB_i, t				-0.169 *	0.236
				0.090	0.212
DCSVTLOB_i, t				-0.003	-0.002
				1.038	1.107
_CONS_i, t	-0.677 ***	-0.953 ***	-0.588 ***	-0.674 ***	-0.694 ***
	0.045	0.161	0.049	0.045	0.046
No. Obs.	1372	227	1085	1372	1372
No. of Groups	227	28	189	227	227
R-square:					
within	0.734	0.7584	0.732	0.735	0.738
between	0.274	0.0736	0.3058	0.275	0.296
overall	0.397	0.5467	0.3737	0.400	0.399
corr(u_i, Xb)	-0.270	-0.1851	-0.3256	-0.272	-0.344

Table 7: Fixed Effects Estimates of Equation (3) - Liquidity Insurance

Dependent Variable: Liquidity Insurance without Cap	ALINC_t	Specification 1			Specification 2	Specification 3
		All Banks	Cantonal Banks	Regional Banks	All Banks	All Banks
Macroeconomic Variables	GDPGR_t	0.283 ***	0.166	0.269 **	0.284 ***	0.276 ***
		0.101	0.333	0.107	0.101	0.101
	USMM3M_t	0.003 ***	0.004	0.003 ***	0.003 ***	0.003 ***
		0.001	0.004	0.001	0.001	0.001
	CPINDEX_t	0.005 ***	0.005 ***	0.005 ***	0.005 ***	0.005 ***
		0.000	0.002	0.001	0.000	0.000
Bank-specific Variables	AKTL_i, t-1	0.243 *	0.258	0.076	0.244 *	0.147
		0.129	0.400	0.149	0.130	0.131
	NSDTL_i, t-1	-0.049 ***	-0.048	-0.056 ***	-0.049 ***	-0.056 ***
		0.019	0.061	0.021	0.019	0.019
	TFIN_i, t-1	0.000	0.000	0.000	0.000	0.000
		0.000	0.000	0.000	0.000	0.000
	MORTL_i, t-1	0.030 **	0.027	0.008	0.030 **	0.020
		0.012	0.036	0.016	0.012	0.012
	TBKTL_i, t-1	-0.031	0.053	-0.105	-0.030	-0.049
		0.059	0.179	0.067	0.059	0.059
	NIETL_i, t-1	-5.650 **	-5.498	-3.170	-5.745 **	-4.851 **
		2.388	8.445	2.842	2.408	2.396
	AAIRS_i, t-1	0.003	-0.022	0.010 **	0.003	0.003
		0.004	0.015	0.005	0.004	0.004
	RTL_i, t-1	0.337	0.079	0.557	0.334	0.285
		0.579	1.435	0.694	0.581	0.584
	NCRTL_i, t-1	1.371	1.845	-0.565	1.354	0.627
		1.077	5.622	1.940	1.080	1.187
	NIRTL_i, t-1	0.084	-1.603	0.685	0.090	0.255
		0.462	1.641	0.488	0.463	0.462
	TLGR_i, t-1	0.004	-0.002	0.001	0.003	0.005
		0.006	0.034	0.006	0.006	0.006
	GLIQTL_i, t-1	0.056	-0.070	0.063	0.053	0.090
		0.057	0.226	0.061	0.057	0.057
Liquidity Insurance Variables	DCAP_i, t	0.143 ***	0.114 ***	-0.015	0.144 ***	0.128 ***
		0.022	0.036	0.140	0.023	0.025
	SNTS_i, t	-1.735 ***	-2.676 ***	-1.667 ***	-1.734 ***	-2.510 ***
		0.099	0.427	0.102	0.100	0.203
	SNTSRB_i, t					0.838 ***
						0.192
	SNTSBB_i, t					1.344 ***
						0.505
	SNTSOB_i, t					0.526
						0.359

DCSNTS_i, t	-1.674 ***	-1.576 ***	0.253	-1.706 ***	-1.715 ***
	0.301	0.490	1.783	0.325	0.341
DCSNTSRB_i, t				-0.084	0.180
				0.268	0.271
DCSNTSBB_i, t				0.070	0.502 *
				0.188	0.284
DCSNTSOB_i, t				-0.667	-1.422
				25.530	25.319
_CONS_i, t	0.005	0.133	0.022	0.005	0.026
	0.056	0.192	0.059	0.057	0.056
No. Obs.	1372	227	1085	1372	1372
No. of Groups	227	28	189	227	227
R-square:					
within	0.787	0.797	0.785	0.787	0.791
between	0.533	0.552	0.553	0.533	0.437
overall	0.616	0.702	0.612	0.616	0.527
corr(u_i, Xb)	-0.269	-0.347	-0.237	-0.266	-0.346

Table 8: Fixed Effects Estimates Using Equations (2) & (3) - Liquidity Insurance

Dependent Variable: Liquidity Insurance without Cap	ALINC_t	Specification 1			Specification 2	Specification 3
		All Banks	Cantonal Banks	Regional Banks	All Banks	All Banks
Macroeconomic Variables	GDPGR_t	0.259 ***	0.194	0.236 **	0.244 **	0.245 **
		0.101	0.333	0.107	0.102	0.101
	USMM3M_t	0.003 ***	0.004	0.003 **	0.003 ***	0.003 **
		0.001	0.004	0.001	0.001	0.001
	CPINDEX_t	0.005 ***	0.005 ***	0.005 ***	0.005 ***	0.005 ***
		0.001	0.002	0.001	0.001	0.001
Bank-specific Variables	AKTL_i, t-1	0.247 *	0.257	0.086	0.245 *	0.168
		0.129	0.400	0.149	0.130	0.132
	NSDTL_i, t-1	-0.036 *	0.022	-0.046 **	-0.037 *	-0.042 **
		0.020	0.078	0.021	0.020	0.020
	TFIN_i, t-1	0.000	0.000	0.000	0.000	0.000
		0.000	0.000	0.000	0.000	0.000
	MORTL_i, t-1	0.033 ***	0.034	0.011	0.034 ***	0.024 *
		0.012	0.036	0.016	0.012	0.012
	TBKTL_i, t-1	-0.015	0.088	-0.085	-0.038	-0.026
		0.059	0.181	0.068	0.060	0.060
	NIETL_i, t-1	-5.363 **	-5.907	-2.923	-5.549 **	-4.760 **
		2.384	9.052	2.836	2.423	2.418
	AAIRS_i, t-1	0.003	-0.020	0.009 *	0.003	0.003
		0.004	0.015	0.005	0.004	0.004
	RTL_i, t-1	0.346	0.205	0.528	0.311	0.473
		0.579	1.442	0.694	0.581	0.587
	NCRTL_i, t-1	1.761	3.048	-0.359	2.039 *	0.270
		1.086	5.705	1.942	1.097	1.258
	NIRTL_i, t-1	-0.044	-1.642	0.514	0.004	0.086
		0.463	1.657	0.490	0.464	0.464
	TLGR_i, t-1	0.003	0.002	0.001	0.003	0.003
		0.006	0.034	0.006	0.006	0.006
	GLIQTL_i, t-1	0.042	-0.105	0.053	0.038	0.064
		0.057	0.229	0.061	0.057	0.058
Liquidity Insurance Variables	DCAP_i, t	0.176 ***	0.136 ***	0.265	0.160 ***	0.149 ***
		0.027	0.046	0.803	0.029	0.033
	SVTL_i, t	0.077 ***	0.204	0.081 ***	0.078 ***	0.158 *
		0.030	0.141	0.030	0.030	0.082
	SVTLRB_i, t					-0.069
						0.086
	SVTLBB_i, t					-0.884
						0.607
	SVTLOB_i, t					-0.843 **
						0.406

SNTS_i, t	-1.655 ***	-2.426 ***	-1.587 ***	-1.669 ***	-2.401 ***
	0.103	0.460	0.106	0.103	0.231
SNTSRB_i, t					0.819 ***
					0.228
SNTSBB_i, t					1.321 *
					0.679
SNTSOB_i, t					0.137
					0.401
DCSVTL_i, t	-0.092 *	-0.077	-0.431	-0.040	-0.095
	0.050	0.098	1.198	0.064	0.070
DCSVTLRB_i, t				-0.239	-0.151
				0	0.224
DCSVTLBB_i, t				0 **	0.274
				0.166	0.425
DCSVTLOB_i, t				-0.042	0.726
				1.632	1.664
DCSNTS_i, t	-1.761 ***	-1.571 ***	-1.417	-1.740 ***	-1.646 ***
	0.302	0.490	5.108	0.329	0.353
DCSNTSRB_i, t				0.963	0.897
				1.010	1.002
DCSNTSBB_i, t				0.661	0.335
				0.417	0.486
DCSNTSOB_i, t				-0.619	-0.476
				44.858	44.401
_CONS_i, t	-0.016	-0.018	0.012	-0.007	0.010
	0.057	0.218	0.059	0.057	0.058
No. Obs.	1372	227	1085	1372	1372
No. of Groups	227	28	189	227	227
R-square:					
within	0.788	0.800	0.787	0.789	0.795
between	0.512	0.533	0.526	0.510	0.389
overall	0.598	0.701	0.584	0.597	0.482
corr(u_i, Xb)	-0.306	-0.330	-0.302	-0.315	-0.4750

Table 9: Fixed Effects Estimates of Equations (2) & (3) in First-Differences - Liquidity Insurance

Dependent Variable: Liquidity Insurance without Cap	ALINC_t	Specification 1			Specification 2	Specification 3
		All Banks	Cantonal Banks	Regional Banks	All Banks	All Banks
Macroeconomic Variables	DGDPGR_t	0.030 0.094	0.026 0.304	0.049 0.099	0.030 0.094	0.030 0.094
	DUSMM3M_t	0.001 0.002	-0.004 0.005	0.002 0.002	0.001 0.002	0.001 0.002
	DCPINDEX_t	0.001 0.001	0.001 0.005	0.001 0.001	0.001 0.001	0.001 0.001
Bank-specific Variables	DAKTL_i, t	0.168 0.188	1.442 ** 0.581	-0.071 0.210	0.166 0.189	0.161 0.191
	DNSDTL_i, t	0.029 0.037	0.036 0.151	0.028 0.039	0.029 0.038	0.033 0.038
	DTFIN_i, t	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000
	DMORTL_i, t	0.029 0.021	0.038 0.059	-0.034 0.030	0.028 0.021	0.027 0.021
	DTBKTL_i, t	0.004 0.078	0.219 0.227	0.016 0.093	0.003 0.079	0.007 0.080
	DNIETL_i, t	-1.867 3.315	-0.291 12.532	-0.148 4.015	-1.331 3.380	-1.514 3.402
	DAAIRS_i, t	0.000 0.004	0.000 0.016	0.000 0.005	0.000 0.004	-0.001 0.004
	DRTL_i, t	-0.539 0.515	-1.137 1.263	-0.682 0.633	-0.578 0.518	-0.540 0.521
	DNCRTL_i, t	1.787 1.885	-5.269 8.501	5.135 * 2.630	2.025 1.928	2.031 2.019
	DNIRTL_i, t	0.346 0.659	3.794 * 2.187	0.001 0.711	0.342 0.661	0.321 0.665
	DTLGR_i, t	0.007 0.005	-0.014 0.036	0.008 * 0.005	0.007 0.005	0.007 0.005
	DGLIQTL_i, t	0.186 ** 0.074	-0.011 0.343	0.212 *** 0.079	0.185 ** 0.074	0.191 *** 0.075
Liquidity Insurance Variables	DDCAP_i, t	-0.013 * 0.008	-0.009 0.016	0.000 0.032	-0.013 * 0.008	-0.014 * 0.008
	DSVTL_i, t	0.236 *** 0.063	0.447 0.341	0.235 *** 0.064	0.236 *** 0.063	0.376 ** 0.187
	DSVTLRB_i, t					-0.145 0.183
	DSVTLBB_i, t					-0.527 1.783
	DSVTLOB_i, t					-0.372 0.450

DSNTS_i, t	-2.004 ***	-1.914 **	-1.944 ***	-2.002 ***	-2.202 ***
	0.128	0.831	0.125	0.128	0.649
DSNTSRB_i, t					0.219
					0.661
DSNTSBB_i, t					-0.586
					3.431
DSNTSOB_i, t					-0.378
					1.181
DDCSVTL_i, t	-0.416 **	-0.759 *	0.071	-0.427 *	-0.551 *
	0.199	0.414	0.956	0.259	0.301
DDCSVTLRB_i, t				0.351	0.488
				1.034	1.049
DDCSVTLBB_i, t				-0.218	0.292
				0.442	1.819
DDCSVTLOB_i, t				0.579	0.939
				2.522	2.561
DDCSNTS_i, t	-3.702 ***	-4.432 ***	0.333	-4.311 ***	-4.061 ***
	0.756	1.563	4.024	0.945	1.106
DDCSNTSRB_i, t				3.424	3.109
				3.922	3.959
DDCSNTSBB_i, t				2.153	2.549
				1.602	3.382
DDCSNTSOB_i, t				8.463	8.733
				44.467	44.577
D_CONS_i, t	0.004	0.002	0.004	0.004	0.004
	0.003	0.015	0.003	0.003	0.003
No. Obs.	1300	224	1018	1300	1300
No. of Groups	225	28	187	225	225
R-square:					
within	0.354	0.363	0.378	0.356	0.358
between	0.444	0.250	0.453	0.444	0.443
overall	0.345	0.348	0.373	0.348	0.350
corr(u_i, Xb)	-0.099	-0.144	-0.065	-0.093	-0.092

Table 10: Fixed Effects Estimates of Equation (4) - Priority Insurance

Dependent Variable: Priority Insurance Before 1997	APIP97_t	Specification 1			Specification 2	Specification 3
		All Banks	Cantonal Banks	Regional Banks	All Banks	All Banks
Macroeconomic Variables	GDPGR_t	0.442 ***	0.391 **	0.449 ***	0.447 ***	0.442 ***
		0.090	0.193	0.101	0.089	0.088
	USMM3M_t	0.003 ***	0.004 **	0.002	0.003 ***	0.002 ***
		0.001	0.002	0.001	0.001	0.001
	CPINDEX_t	0.008 ***	0.009 ***	0.007 ***	0.008 ***	0.007 ***
		0.000	0.001	0.000	0.000	0.000
Bank-specific Variables	AKTL_i, t-1	-0.099	0.103	-0.129	-0.062	-0.033
		0.105	0.213	0.130	0.106	0.106
	NSDTL_i, t-1	-0.045 ***	-0.119 ***	-0.051 ***	-0.049 ***	-0.061 ***
		0.015	0.033	0.018	0.015	0.015
	TFIN_i, t-1	0.000	0.000	0.000	0.000	0.000
		0.000	0.000	0.000	0.000	0.000
	MORTL_i, t-1	0.055 ***	0.032	0.033 **	0.050 ***	0.043 ***
		0.010	0.021	0.015	0.011	0.011
	TBKTL_i, t-1	-0.105 **	-0.053	-0.115 *	-0.095 *	-0.083 *
		0.048	0.097	0.059	0.049	0.049
	NIETL_i, t-1	-5.775 ***	-10.953 **	-4.351 *	-5.513 ***	-6.674 ***
		1.969	4.526	2.547	1.967	1.954
	AAIRS_i, t-1	0.011 ***	0.004	0.016 ***	0.012 ***	0.011 ***
		0.004	0.008	0.004	0.004	0.003
	RTL_i, t-1	1.168 **	0.273	1.166 *	1.249 ***	1.040 **
		0.472	0.789	0.603	0.481	0.476
	NCRTL_i, t-1	3.225 ***	2.950	1.294	1.817 *	0.851
		0.884	3.028	1.711	0.945	1.002
	NIRTL_i, t-1	0.008	0.453	0.262	0.146	0.015
		0.423	0.923	0.488	0.425	0.419
	TLGR_i, t-1	0.006	0.007	0.003	0.004	0.005
		0.005	0.018	0.005	0.005	0.005
	GLIQTL_i, t-1	0.084 *	-0.065	0.110 **	0.082 *	0.084 *
		0.046	0.121	0.053	0.047	0.047
Priority Insurance Variables	DPI_i, t	-0.006	0.005	-0.003	-0.005	-0.005
		0.012	0.036	0.013	0.012	0.012
	SN30ST_i, t	0.004	1.171 ***	-0.164 **	-0.018	-0.153 **
		0.060	0.168	0.067	0.061	0.064
	SN30STCB_i, t					1.215 ***
						0.192
	SN30STBB_i, t					-0.067
						0.559
	SN30STOB_i, t					-0.075
						0.652

SN30AST_i, t	0.469 ***	0.107	0.603 ***	0.486 ***	0.535 ***
	0.051	0.083	0.063	0.051	0.057
SN30ACB_i, t					-0.235 ***
					0.090
SN30ABB_i, t					0.320
					0.335
SN30AOB_i, t					0.743 **
					0.365
DPSN30ST_i, t	0.095	-0.145	0.241 ***	0.145 *	0.215 ***
	0.075	0.197	0.086	0.079	0.079
DPSN30CB_i, t				-0.144	-0.240 **
				0.123	0.122
DPSN30BB_i, t				0.697	1.079
				0.998	1.091
DPSN30OB_i, t				-0.525	-0.590
				0.382	0.474
DPSN30AS_i, t	-0.123 *	0.117	-0.355 ***	-0.234 ***	-0.311 ***
	0.065	0.117	0.081	0.075	0.076
DPSN30AC_i, t				0.262 *	0.422 ***
				0.141	0.143
DPSN30AB_i, t				-0.594	-1.151
				1.252	1.373
DPSN30AO_i, t				0.902 *	0.897
				0.474	0.583
_CONS_i, t	-0.149 ***	-0.313 ***	-0.063	-0.138 ***	-0.123 ***
	0.038	0.077	0.045	0.038	0.038
No. Obs.	1392	227	1085	1392	1392
No. of Groups	227	28	189	227	227
R-square:					
within	0.772	0.889	0.751	0.776	0.785
between	0.556	0.109	0.597	0.523	0.356
overall	0.599	0.580	0.623	0.582	0.384
corr(u_i, Xb)	0.020	-0.199	0.090	-0.012	-0.603