Is there Market Discipline in the Swiss Banking Sector?

Urs W. Birchler and Andréa M. Maechler
Swiss National Bank

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Abstract

In this paper, we test for the presence of market discipline in the Swiss banking sector. In particular, we examine the extent to which the Swiss deposit insurance system affects market discipline. In the absence of traded debt, we use depositors' willingness to hold noninsured saving deposits as a proxy for banks' perceived safety. Using a 1987-1998 panel data for some 250 banks, we find mixed evidence of market discipline. Although the fraction of noninsured saving deposits responds to risk variables, depositors do not seem to react strongly to revisions in the depositor protection system. We conclude that depositors are either not well informed about the exact form of thrit depositor protection system or that they do not care about it because they anticipate an implicit deposit guarantee.

E-mail: urs.birchler@snb.ch and andrea.maechler@snb.ch

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1 Introduction

The purpose of this paper is to examine the existence of market discipline in the Swiss banking system. Over the last two decades, a large number of studies have examined market discipline in banking, or the lack thereof. This interest stems largely from the increasing occurrence, or even recurrence, of banking problems across the globe, whether in industrialized, emerging or developing countries. While there is no clear and robust verdict on the role of market discipline in the relative soundness of a banking system, it is often identified as one of its essential ingredients.

First, market discipline can reduce the banking supervisory costs by allowing market forces to react more quickly and more directly to higher risk-taking behavior. Second, market discipline can improve the efficiency of banks by forcing the relatively inefficient banks to exit the industry. Finally, market discipline can reduce moral hazard, which, in the presence of a deposit system, induces banks to undertake excessive risks and deters depositors from monitoring the performance of their bank.

This paper focuses largely on the moral hazard channel, and in particular, on the extent to which depositors monitor their banks by withdrawing their deposits in response to excessive risk-taking. To do this, we examine how changes in bank fundamentals, over time and across banks, affect individual bank deposits. In addition, we differentiate between insured and uninsured deposits to examine the way in which changes in the Swiss deposit insurance system have affected the degree of market discipline in the banking sector.

In this paper, we use the fraction of noninsured saving deposits (relative to total saving deposits) as a measure of market discipline. The reason we use this "quantity" measure is that most Swiss banks do not hold regularly traded debt outstanding. Thus, we cannot use the more common market data (such as yield spreads to government debt) as a proxy for the risk perceived by depositors. Instead, we infer depositors' confidence from the degree to which they are willing to hold noninsured saving deposits in a particular bank.

The main hypothesis underlying this study is that, in the presence of market discipline, depositors monitor the performance of their banks and transfer their deposits to a better bank whenever the performance of their bank is no longer satisfactory. In particular, using a panel data with bank-specific variables for 250 banks over the period 1987-1998, we examine two aspects of market discipline, namely: (i) whether bank fundamentals influence depositors' willingness to entrust their noninsured deposits to a particular bank; and (ii) whether institutional changes in the Swiss depositor protection system alter the behavior of depositors.

The existing literature, which will be summarized below, presents several limitations. First, most studies focus on banks holding publicly traded debt, that is, on relatively big institutions. Second, a vast majority of existing studies are based on US data, while only scant evidence exists for other countries. Thus, by presenting evidence on smaller banks and by using non-US data, the present paper attempts to fill certain gaps in the literature.

The remaining of this paper is organized as follows. While Section 2 highlights some relevant features of the related literature, Section 3 outlines the structure of the Swiss depositor protection system and its historical developments. The empirical methodology is presented in Section 4. While Section 4.1 states our main hypotheses, Section 4.2 discusses the specifications of our empirical model and Section 4.3 describes the data. Summary statistics are provided in Section 4.3.2. Concluding remarks are presented in Section 5.

2 The literature

Generally, the literature analyses the presence of market discipline by using yield spreads (between market instruments and bank debt) as an indication of bank risk. A good overview is given in Board of Governors & US Treasury (2000). While most of this literature deals with US data, Sironi (2000) employs data on European banks. There are only few contributions that try to test for the presence of market discipline by using information other than yield spreads. For example, Covitz, Hancock & Kwast (2000) focus on an institution's probability of issuing subordinated debt. For example, they find that relatively bad debtors are unwilling (or unable) to issue subordinate debt in bad times. Jordan (2000) uses uninsured deposits and finds that in New England, failing banks experience a fall in uninsured deposits, which they try to offset by raising insured deposits. Finally, using data on Argentina, Chile, and Mexico, Peira & Schmukler (1998) use deposit withdrawals as a measure of market discipline. They find that even small, insured depositors exert market discipline.

Another strand of literature analyzes the so-called "leading" indicators or "early warning" indicators. These studies examine movements in variables (such as macro- and micro-economic variables) that a rational investor would most likely react to if they were publicly available. A good survey can be found in Bell (2000). We draw from this literature to select our macroeconomic and bank-specific variables.

3 Protection of depositors in Switzerland

3.1 Protective Regulation

While Switzerland does not have an official deposit insurance system, there exists three different protection schemes for the deposits held at an insolvent bank:[1]

- *The cantonal bank state guarantee:* Deposits held at a cantonal bank are guaranteed by a canton-specific state guarantee. This guarantee covers all deposit liabilities of cantonal banks, irrespective of their type or size.[2]

[1] For more information on the Swiss depositor protection system, refer to Birchler (2000).

[2] There are two exceptions: In the Canton Vaud and in the Canton of Geneva, where de jure the guarantee is limited. De facto, the Canton of Geneva has assumed responsibility for

- *The priority insurance:* In the case of bankruptcy, all saving deposits are granted priority status.[3] This priority status "insures" the depositor in the sense that it gives her priority over the bank's assets in the case of a bankruptcy. This insurance is comparable to the "depositor preference" in the US (which was introduced in 1993). In Switzerland, priority insurance was introduced in 1934 as part of the first federal banking legislation. Until recently, it was restricted to saving deposits, because they were, and still are, considered as the typical investment vehicle for small and unsophisticated investors. The provisions of this priority insurance are laid down both in the *Federal Act on Banks and Savings Banks*[4] and in the *Federal Statute on Debt Enforcement and Bankruptcy*[5]. Its key features can be summarized as follows:

  - In 1934, priority insurance was limited to CHF 5'000 per depositor.[6] In 1971, it was raised to CHF 10'000 and in 1997, it was raised further to CHF 30'000 (approximately US$ 20,000).
  - Priority is granted to all saving deposits and, since 1997, to certain over-the-counter-deposits (such as "bons de caisse" or "Kassenobligationen") and to accounts to which an income (such as wage, pension or alimony) is transferred on a regular basis.
  - Deposits with priority fall into a special class ranking between the second and third of four priority classes. They are senior to all other deposits or liabilities, which fall into the fourth class of general liabilities.
  - Deposits at cantonal banks are not subject to priority rules.

- *The liquidity insurance:* This insurance is based on a 1984 private agreement within the Swiss Bankers Association (SBA). In the fifteen years of its existence, the agreement was called upon in three cases[7]. According to this agreement, member banks mutually guarantee to pay out deposits that have priority.[8] When the SBA pays out depositors, it acquires their claims (including their priority status). Thus, the SBA primarily guarantees the *liquidity* of priority deposits. In return, it bears the residual

all deposits when the bank was in trouble in 2000.

[3] In French and German. this insurance is called, respectively, "privilège en cas de faillite" and "Konkursprivileg".

[4] See Article 15, Section 2.

[5] See Article 37, Section b.

[6] For common accounts, the amount of priority insurance is split among the beneficiaries, i.e., it can be claimed only once.

[7] These banks were: *Banque de Participations et de Placements*, Lugano; *Mebco Bank SA*, Geneva; *Spar+Leihkasse Thun*, Thun. The agreement also played a role in the case of takeovers of troubled banks by larger institutions. Member banks agreed to inject money into troubled institutions, which suggests that they anticipated their duties in the case of a bankruptcy.

[8] Almost all of the Swiss banks have signed the agreement, including the cantonal banks (ask PSU for more details on how many banks are SBA members)

risk that the assets of a failed bank may not even be sufficient to honor priority deposits.[9] The key features of the liquidity insurance are:[10]

- The liquidity insurance covers saving deposits up to CHF 30'000 per depositor.
- In 1993, a cap was introduced to limit the liquidity insurance to a maximum amount of CHF 1 billion per bank[11]

Given the relative complexity of the Swiss depositor insurance system, let us highlight its four main characteristics for the purpose of the present paper, which is based on the 1987-1998 sample period:

1. There is a *liquidity insurance*, which covers all saving deposits up to CHF 30'000 per depositor;
2. In 1993, a cap of CHF 1 billion per bank was imposed on this liquidity insurance;
3. There is a *priority insurance*, which ceiling was raised in 1997 from CHF 10'000 to CHF 30'000 per depositor;
4. The *cantonal bank state guarantee* has remained unchanged over the sample period.

3.2 Insured Liabilities: Some Stylized Facts

Saving deposits, which used to represent the dominant source of funds for Swiss banks, accounts today only for one quarter of all deposits. This is shown in column (1) of Table 1. Notwithstanding this secular decline, saving deposits remain the most important and widely used type of bank account. In Switzerland, there are roughly 2.2 saving accounts per capita.[12] In terms of size, although some saving deposits exceed CHF 100'000 (about US$ 70'000), the average balance is around CHF 15'000. Furthermore, the median is approximately CHF 4'000, which highlights the fact that a majority of saving deposits hold less than CHF 5'000[13]. Clearly, saving deposits represent the investment instrument of the small depositors.

[9] Again, this very much resembles the 1993 US depositor preference rules, under which the FDIC acquires priority of deposits when paying out insured depositors.

[10] For more details, see Winzeler, 1994.

[11] In practice, this limit implies that for several banks the insured amount effectively falls short of the CHF 30'000 per depositor. This is true for twenty-two banks, including the two big banks (where the effective insured amount of saving deposits per depositor becomes negligible), seventeen cantonal banks, and the largest regional bank.

[12] This relatively high figure may also indicate the fact that people diversify their saving accounts across account and across banks. This behavior, which yields transaction costs, may be due partly to the limits imposed on priority and liquidity insurance and partly to the different types of saving accounts.

[13] This estimation is based on 1998 figures. Although there are no precise data on the median, 58 percent of saving accounts have balances below or equal to CHF 5'000. This makes CHF 4'000 a reasonable estimate for the median.

Year end	Savings deposits	Demand deposits	Time deposits	Other deposits	Total deposits	GDP per year
	%	%	%	%	CHF bn.	CHF bn.
	(1)	(2)	(3)	(4)	(5)	(6)
1955	38.6	25.7	10.0	25.8	28.8	28.8
1960	34.4	26.9	13.0	25.7	43.8	39.5
1965	31.1	25.6	18.3	25.0	72.9	64.3
1970	26.4	23.4	28.4	21.8	133.5	95.8
1975	33.5	18.8	20.3	27.4	193.2	148.1
1980	31.2	16.1	27.8	24.9	289.2	180.1
1985	24.5	17.5	32.5	25.5	463.2	237.2
1990	20.7	11.8	42.4	25.0	623.4	317.3
1995	29.7	13.1	36.1	21.1	708.6	363.3
1998	25.1	14.4	47.3	13.2	933.6	380.0

Table 1: Structure of deposits at Swiss banks 1955-1989; Source: Les banques suisses (SNB), several issues; Federal Statistical Office

Table 2 presents the structure of saving deposits by type of insurance, namely, by priority insurance (column 3), cantonal bank state guarantee (column 4) and no insurance (column 5). For example, column (3) shows that the nominal growth in saving deposits has led to a natural decrease in the share of insured saving deposits (under priority insurance), except in 1971 and 1997 when the priority ceiling was revised upwards.[14] In response to the 1997 revision, in 1998 as much as 57 percent of the saving deposits are insured, while the median for insured saving deposits lies at approximately 65 percent. Column (4) shows that the fraction of saving deposits benefiting from a cantonal bank state guarantee have fallen consistently over time. This reflects the fact that cantonal banks are continuously losing market share in deposits. Finally, column (5) shows that the share of *uninsured* saving deposits (enjoying neither priority insurance nor cantonal bank state guarantee) has risen until the 1997 upward revision in priority insurance.[15]

Table 3 breaks the structure of saving deposits into "small" saving accounts (i.e., up to CHF 30'000) and "large" saving accounts (i.e., above CHF 30'000). While the priority insurance protects fully all small saving accounts, it only protects partly (that is, up to the CHF 30'000 ceiling) the large saving deposits. The bottom row of Table 3 shows that, under the current priority insurance ceiling of CHF 30'000, 87 percent of the number of saving accounts (which

[14] When measuring the amount of priority insurance (which, until 1997, covered CHF 10'000 per depositor), we assume that each depositor holds only one deposit. Thus, we abstract from the possibility that one person may hold more than one deposit. This simplification is the best proxy available, since banks neither disclose publicly the insurance structure of their deposits, nor differentiate interest rates between the saving deposits that benefit from priority or liquidity insurance.

[15] The SBA does not have data on the share of deposits enjoying liquidity insurance, except after 1997, when the liquidity insurance coincides with priority insurance.

End of	Saving accounts balance				
	total	average per account	percentage of total with:		
			priority	state guarantee	no protection
	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
1998	234.3	15'160	57.0	33.8	9.2

Table 2: Protection of Savings Deposits 1935-98. Source: Les Banques suisses, several issues

make up only 30 percent of the total volume of saving balances) are small, i.e. fully covered by the priority insurance. The other 13 percent are large saving deposits and therefore receive only partial insurance coverage. On aggregate, 31 percent of saving accounts are covered by priority insurance, which amounts to 57 percent of the total volume of savings. Alternatively, this means that 43 percent of the total volume of saving deposits is *uninsured*, a variable which plays an important role in this paper. Finally, the first row of Table 3 gives the respective insurance figures when the ceiling for priority insurance was still at CHF 10'000, that is, prior to 1997.

4 Empirical Methodology

4.1 Hypotheses

The main hypothesis underlying this study is that, in the presence of market discipline, depositors monitor the performance of their banks by withdrawing their saving deposits whenever the performance of their bank is no longer satisfactory. Thus, in the presence of market discipline, bank fundamentals should help explain the amount of savings (and in particular, the amount of uninsured savings) that depositors are willing to entrust to a given bank. In particular, we test whether a bank that exhibits stronger bank fundamentals is attracting

Max	small savings		large savings		all accounts
CHF	% of accounts	% of total balances	% of accounts	% of total balances w/priority	% of total balances w/priority
(1)	(2)	(3)	(4)	(5)	(6) =(3)+(5)
10'000	69.3	10.0	30.7	20.4	30.5
30'000	86.6	29.8	13.4	27.2	57.0

Table 3: Priority for small and large savings accounts at Swiss banks, end of 1998. Source: Les banques suisses 1998, Table 20.6

a higher ratio of uninsured saving deposits to total saving deposits.

Hypothesis 1 *In the presence of market discipline, the behavior of uninsured saving deposits (as a fraction of total saving deposits) is related to movements in bank fundamentals.*

Furthermore, our panel data set allows us to shed light on the issue of whether depositors who hold their savings in the cantonal banks (which enjoy an extensive cantonal bank state guarantee) are relatively less responsive to fluctuations in the economic fundamentals of their banks than depositors who hold their savings in the regional banks (which do not benefit from a similar state guarantee).

Hypothesis 2 *The fraction of uninsured saving deposits to total saving deposits is more responsive to movements in bank fundamentals in regional banks than it is in cantonal banks.*

Another aspect that we examine in this paper is the degree to which the existence of a deposit insurance system affects market discipline in the Swiss banking sector. As mentioned earlier, while Switzerland does not have an official deposit insurance system, since 1971 all saving deposits up to CHF 10'000 benefit from a "priority insurance", which gives them priority in the case of bankruptcy. In 1997, this priority insurance was raised from CHF 10'000 to CHF 30'000. This revision allows us to test the extent to which a change in the depositor insurance system alters the depositors' behavior. In particular, we test whether, in response to the 1997 priority insurance revision, people are willing to pool their smaller saving deposits (i.e., deposits below CHF 10'000) into a fewer number of larger saving deposits (i.e., deposits between CHF 10'000 and CHF 30'000), which after 1997 benefit from priority insurance.

Hypothesis 3 *Provided that the 1997 revision is credible and publicly known, banks should hold a larger percentage of deposits between CHF 10'000 and CHF 30'000 after 1997.*

Finally, we also examine the impact of the liquidity insurance provided by the Convention of the Swiss Bankers Association (SBA) on market discipline.

Since 1984, SBA member banks mutually guarantee deposits that have priority in bankruptcy up to CHF 30'000 per depositor. In 1993, in response to the Swiss loan crisis, the SBA imposed an insurance cap of 1 billion CHF.[16] In practice, this cap means that 22 Swiss banks (including the two big banks, seventeen cantonal banks and the largest regional bank) provide far less insurance per depositor than the CHF 30'000 guaranteed under the liquidity insurance system. Again, we use this revision in the liquidity insurance to examine whether it has altered depositors' behavior. Provided that this cap is both credible and publicly known, we should see that depositors are less willing to hold their uninsured deposits at banks, which effective insurance is constrained by the cap. Thus, the banks for which the cap is a binding constraint should exhibit a *smaller* ratio of uninsured saving deposits to total saving deposits than the banks for which the cap is not binding. If, however, the cap is neither credible nor publicly known, there should be no significant changes in the pattern of insured saving deposits in the banks for which the cap is binding.

Hypothesis 4 *Provided that the 1993 cap is both credible and publicly known, the banks for which the cap is a binding constraint exhibit a smaller fraction of uninsured saving deposit to total saving deposits than the banks for which the cap is not binding.*

4.2 Model Testing

This section discusses the empirical methodology used in this paper to study market discipline. Market discipline implies that depositors rely on a set of bank-specific information to decide on whether or not to entrust their savings to a particular bank. Thus, we need, on the one hand, a dependent variable that represents a depositor's decision to withdraw her saving deposits and, on the other hand, a set of independent variables that represents the depositor's information set upon which she decides whether or not to withdraw her savings. As far as the dependent variable is concerned, most studies on market discipline use some kind of interest rate spreads on bank debt (such as on subordinated debt). However, since Switzerland does not have any regularly traded outstanding debt, we cannot use market spreads as an indicator of confidence. Instead, we use α_{it}, the ratio of uninsured saving deposits to total saving deposits as our dependent variable.

The fraction α_{it} tells us about the depositors' willingness to hold uninsured deposits in a particular bank. Thus, α_{it} can be interpreted as an indicator of confidence in a bank. In the presence of market discipline, α_{it} should react to changes in bank risk. Thus, the most simple way to assess the presence or

[16] Between 1989 and 1994, the Swiss banking sector experienced an important loan crisis, which hit primarily the regional banks. For example, at the beginning of the crisis, there were 210 regional banks in the Swiss banking sector. Six years later, there were only 135 regional banks left. Of the 75 regional banks that disappered over this time span, over 30 percent disappeared in the last three years.

absence of market discipline is to examine how well movements in α_{it} can be explained by movements in bank risk.[17]

To examine the above-mentioned hypotheses, we rely on 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 $t = 1...T$. α_{it}^{j} is the ratio of uinsured saving deposits to total saving deposits of bank i at time t under insurance j. 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), the ratio of uninsured saving deposits to total saving deposits are determined by three main factors: the general developments in the macro economy, the evolution of the bank risk characteristics (or bank fundamentals) and the revisions in the insurance deposit system.

We assume that the residuals have a conditional mean of zero and a finite conditional variance.

$$E\left[\epsilon_{it}|\Omega_t\right] = 0$$

$$Var\left[\epsilon_{it}|\Omega_t\right] < \infty$$

where Ω_t is the information set at time t (i.e., the right hand side explanatory variables). Further, we assume that the observations are uncorrelated across time and across banks.

$$E\left[\epsilon_{it}\epsilon_{is}\right] = 0 \text{ for } t \neq s$$

$$E\left[\epsilon_{it}\epsilon_{js}\right] = 0 \text{ for } i \neq j$$

To test the degree to which a deposit insurance affects market discipline, we test whether a *change* in the deposit insurance alters depositors' behavior. In this paper, we focus on two revisions, namely: (i) the 1993 cap of CHF 1 billion imposed on (liquidity) insurance; and (ii) the 1997 rise of (priority) insurance (from CHF 10'000 to CHF 30'000).

To examine the impact of the former revision, we examine whether the 1993 cap on liquidity insurance affects the willingness of depositors to hold their (insured) savings in a bank, which *effective* liquidity insurance per depositor is much lower than the standard CHF 30'000. To study this issue, we modify equation (1) to the following expression:

$$\alpha_{it}^{LINC} = \mu_i + \delta' M_t + \beta' X_{it-1} + \rho' DCAP_{it} + \lambda' DCAPSVTL_{it} + \epsilon_{it} \tag{2}$$

where, as before, μ_i stands for each bank's specific (or fixed) effect, M_t is a vector of macroeconomic variables, and X_{it-1} is a vector of bank-specific variables. But

[17] While α_{it} does not capture all of the uninsured deposits held by a bank, it offers the advantage of being independent of factors that affect the demand of savings relative to other deposits (such as time deposits or demand deposits).

now α_{it}^{LINC} represents the ratio of uninsured saving deposits under the liquidity insurance in the absence of a cap (i.e., where saving deposits are insured up to CHF 30'000).

Definition 5 α_{it}^{LINC} = *(noninsured saving deposits under liquidity insurance & assuming no cap / total saving deposits), where noninsured saving deposits represents all savings above CHF 30'000.*

Similarly, to examine the impact of the latter revision, we examine whether the higher level of (priority) insurance provided in the 1997 revision (from CHF 10'000 to CHF 30'000) affects the willingness of depositors to hold larger (i.e., above CHF 10'000) saving deposits. To study this issue, we modify equation (1) to the following expression:

$$\alpha_{it}^{PIB97} = \mu_i + \delta' M_t + \beta' X_{it-1} + \psi' DPI_{it} + \phi' DPISVST_{it} + \epsilon_{it} \qquad (3)$$

where, as before, μ_i stands for each bank's specific (or fixed) effect, M_t is a vector of macroeconomic variables, and X_{it-1} is a vector of bank-specific variables. But in this specification, α_{it}^{PIB97} represents the ratio of uninsured saving deposits under the priority insurance before its 1997 revision (i.e., where saving deposits are insured up to CHF 10'000).

Definition 6 α_{it}^{PIB97} = *(noninsured saving deposits under priority insurance before 1997 revision / total saving deposits), where noninsured saving deposits represent all savings above CHF 10'000.*

For both equations (2) and (3), we report the *within* and the *between* estimators. The results from these estimations yield two different interpretations. The *between* estimators, which focus on differences across banks, enable us to study whether banks with stronger fundamentals attract more uninsured deposits. Alternatively, the *within* estimators, which focus on deviations within a given bank, indicate how a bank's uninsured savings deposits reacts if its fundamentals rise over time. But first, let us briefly present the panel data that we use in this paper.

4.3 The Data

To test our above-mentioned hypotheses, we run both a fixed-effects & a between-effects time series cross section regression on a panel of 250 Swiss banks. The data is on an annual basis and covers the period 1987-1998. The panel is unbalanced, in the sense that the number of observations per bank (N) varies across banks. The bank-specific data used in this study is obtained from the *Swiss National Bank*.

4.3.1 Descriptive Statistics

Three types of data are used in this paper, namely, macroeconomic variables, bank-specific variables and insurance control variables. Let us start with a brief description of each relevant variable.

Macroeconomic Variables

$(GDPG)_t$ = Growth Rate of Swiss GDP. We include the Swiss GDP growth rate to control for the behavior of the overall banking system, .

$(CHMM3)_t$ = 3-month Swiss money market rate. The Swiss short-term interest rate is another relevant variable to control for macroeconomic factors that influence the overall banking system. However, we end up not including this variable in our final results because it is highly correlated with the bank-specific interest rates, and in particular, with the intermediation spread ($SPREAD$) and the bank-specific interest on saving deposits relative to the average industry ($RIRS$).

Bank-Specific Variables

$(MORTTL)_{it-1}$ = Mortgage Lending / Total Liabilities. This variable is a proxy for the fraction of collateralized lending. We expect a *positive* relationship between this variable and α_{it}, the share of uninsured saving deposits.

$(TLTG)_{it-1}$ = Growth Rate of Total Liabilities. Because a fast-growing bank is often associated with a relaxation of lending standards, we expect a *negative* relationship between this variable and α_{it}, the share of uninsured saving deposits.

$(NSD)_{it-1}$ = Non-Saving Deposits / Total Deposits. This variable controls for the substitution effect between saving deposits and non-saving deposits (such as time deposits and demand deposits). Generally, non-saving deposits yield higher returns than standard savings deposits. These higher rates partially compensate the depositors for the lack of insurance on non-saving deposits. Thus, provided that people hold uninsured saving deposits, they should prefer to hold these uninsured deposits in the form of higher-paying non-saving deposits rather than in the form of lower-paying saving deposits. Thus, we expect a *negative* relationship between this variable and α_{it}, the share of uninsured saving deposits.

$(NIETL)_{it-1}$ = Non-Interest Expenditures / Total Liabilities. We expect a *negative* relationship between this variable and α_{it}, the share of uninsured saving deposits.

$(NIRTL)_{it-1}$ = Net Interest Revenues / Total Liabilities. This variable is a proxy for the degree of revenue diversification. A bank, which revenues are primarily drawn from interest-related business may be more risky in the face of a interest-related shock. Thus, we would expect a *negative* relationship between this variable and α_{it}, the share of uninsured saving deposits.

$(NCRTL)_{it-1}$ = Net Commission Revenues / Total Liabilities. We expect a *positive* relationship between this variable and α_{it}, the share of uninsured saving deposits.

$(IRS)_{it-1}$ = Interest Rate on Saving Deposits.

$(SPREAD)_{it-1}$ = (Interest Rate on $Loans_{it-1}$ − IRS_{it-1}). This variable represents the intermediation spread between the interest rate on loans and that on saving deposits. A higher spread is a sign of a profitable bank, that is, a bank with a comfortable operating position. Additionally, a higher intermediation spread can also be a signal that the intermediation business generates such high margins that the risk of failure is relatively low. Thus, we expect a *positive* relationship between this variable and α_{it}, the share of uninsured saving deposits.

$(RIRS)_{it-1} = IRS_{it-1} - \frac{\sum(IRS_{it-1})}{N}$. This variable represents the compensation a bank offers in order to induce depositors to entrust their (uninsured) savings to it. In other words, it represents a bank's relative "aggressiveness" in its desire to attract saving deposits. It also Thus, we expect a *positive* relationship between this variable and α_{it}, the share of uninsured saving deposits.

$(DISAP)_i$ = Dummy, which equals to one if the bank disappears before the end of the sample (i.e., before 1998). Provided that depositors can & do use the available information set to identify a weak bank, we expect a *negative* relationship between this variable and α_{it}, the share of uninsured saving deposits.

Insurance Control Variables

$(DCAP)_{it}$ = Dummy, which equals to one if the bank's volume of insured deposits is constrained by the 1993 CHF 1 billion cap. This dummy variable controls for the 1993 revision in the liquidity insurance.

$(TSTL)_{it}$ = (Total Saving Deposits / Total Liabilities)$_{it}$.

*$(DCAPSVTL)_{it}$ = $(DCAP)_{it}$ * $(TSTL)_{it}$.* This interaction term examines the impact of the 1993 cap on the share of uninsured saving deposits. Provided that the cap is both credible and publicly known, we expect a *positive* relationship between this variable and α_{it}^{LINC}, the share of uninsured saving deposits (as specified under the liquidity insurance in the absence of the cap). Assume a bank, which insured savings de facto are constrained by the cap, experiences a rise in total saving deposits. This rise in savings should translate into a lower share of insured saving deposits. This is because depositors who care about insurance withdraw their (no longer) insured savings deposits. Only uninsured saving deposits (i.e., deposits above CHF 30'000) should remain unresponsive to the imposition of the cap.

$(DPI)_t$ = Dummy, which equals to one after the 1997 priority insurance revision. This dummy variable controls for the 1997 revision in the priority insurance.

$(DPISVTL)_t = (DPI)_t * (SVTL)_t$. This interaction term examines whether the 1997 revision raises depositors' willingness to hold savings in the higher (i.e., CHF 10'000 - CHF 30'000) saving brackets. Provided that the 1997 revision is both credible and publicly known, we expect a *positive* relationship between this variable and α_{it}^{PIB97}, the share of uninsured saving deposits (as specified under the priority insurance *before* the 1997 revision). The 1997 revision encourages people to pool their smaller saving deposits (i.e., below CHF 10'000) into (fewer) *larger* saving deposits (i.e., between CHF 10'000 and CHF 30'000). According to the pre-1997 priority insurance definition, a rise in saving deposits should translate into more "uninsured" saving deposits (which, under the 1997 revision, are considered insured).

4.3.2 Summary Statistics

A quick overview of the data for the banks that we use in our sample is provided in Tables 4 to 6 below. While Tables 4 & 5 present, respectively, the 1987 & 1998 cross-sectional summary statistics, Table 6 presents the summary statistics for the entire panel data.

According to Tables 4 & 5, in 1987 the data set includes 248 banks, of which 27 are cantonal banks and 206 are regional banks. At the end of the sample, however, there are only 141 banks left, of which 24 are cantonal banks and 107 are regional banks. In other words, between 1987-1998, the number of cantonal banks drops by slightly over 10 percent, while the number of regional banks drops by almost 50 percent.

4.4 Empirical Results

The empirical results are depicted in Tables 7 to 10 below. While Tables 7 & 8 present the regression results of equation (2), Tables 9 & 10 present those of equation (3). For each specification, we estimate both the fixed effects estimators and the between effects estimators (respectively, Tables 7 & 9 and Tables 8 & 10).

In our first hypothesis, we examine whether the behavior of uninsured saving deposits (as a fraction of total saving deposits) is related to movements in bank fundamentals. According to our regression results, 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 the fixed effects estimations of equation (2) depicted in column (1) of Table 7. Except for the growth of total liabilities ($TLTG$) and the dummy for the 1997 cap ($DCAP$), all coefficients are statistically significant with the expected sign. Thus, we find that the Swiss banking sector does exhibit a certain degree of market discipline, in the sense that depositors seem to monitor fundamentals of their bank and to respond in accordance with their developments. It is interesting to note that while this result holds true under both priority insurance and liquidity insurance, priority insurance seems to be more relevant than liquidity insurance. Indeed, risk parameters have a stronger influence on the structure of

saving deposits when the dependent variable measures the liquidity insurance (in the absence of the cap) than when it measures the priority insurance (before 1997).

In our second hypothesis, we examine whether the fraction of uninsured saving deposits is more responsive to movements in bank fundamentals in regional banks than it is in cantonal banks. To answer this question, we concentrate on the between effects regression results, which focus on differences across banks rather than on deviations within a particular bank or type of bank. We find that uninsured saving deposits are much more sensitive to bank fundamentals in regional banks than they are in cantonal banks. This can be seen, for example, by comparing the coefficients of columns (2) and (3) in Table 8. Of the twelve variables used in this regression, eight of them are statistically significant in the case of regional banks, while only one of them is statistically significant in the case of the cantonal banks. This result supports the view that cantonal banks, which benefit from a strong cantonal bank state guarantee, may not only lower the scope for market discipline but may also distort the Swiss banking sector.

Our third hypothesis examines the impact of the 1997 priority insurance revision (which raises priority from CHF 10'000 to CHF 30'000) on depositor behavior. In particular, we test whether in response to the higher insurance limit depositors are willing to hold fewer but larger (i.e., between CHF 10'000 and CHF 30'000) saving deposits. We find this to be true for the regional banks but not for the cantonal banks. This is shown, for example, in columns (4) and (6) of Table 9, where the coefficients for the interaction term *DPISVTL* are statistically significant and positive, except for the cantonal banks (for which the coefficient in column (5) is not statistically significant). Nevertheless, it is important to consider these results with a little grain of salt, as the 1997 revision occurs only in the latter part of the panel data. Thus, we do not have many data points over which to test the robustness of our results. This explains also the relative sensitivity of our results to different specifications, as shown, for example, by comparing columns (1)-(3) and (4)-(6) of Table 9. It will be interesting, however, to repeat this exercise in a few years, when we have access to a longer data series.

Finally, our fourth hypothesis examines the impact of the 1993 CHF 1 billion cap imposed on liquidity insurance. In particular, we test whether the fraction of uninsured saving deposits (as defined by the liquidity insurance prior to the 1993 cap) is *smaller* for the banks for which the cap restricts the volume of insurance than for banks for which saving deposits continue to be insured up to CHF 30'000 per deposit. According to our regression results, none of the variable controlling for the imposition of the 1993 cap are statistically significant for the regional and the cantonal banks. This is shown in columns (2) and (3) of Table 7. Thus, we find that the cap has not significantly altered the behavior of depositors.

This result, however, bears three possible interpretations, namely: (i) that the cap is not explicit (i.e., it is not broadly known), (ii) that the cap is not credible, or (iii) that depositors have not yet fully adjusted their behavior to the 1993 revision. While the first interpretations implies that the cap on liquidity

insurance is not properly broadcasted, the second interpretation implies that people anticipate some kind of implicit protection scheme, such as that implied by too-big-to-fail expectations. Regarding the last interpretation, there is no doubt that institutional changes do matter. But people tend to adapt their behavior slowly to institutional changes and particularly so when these institutions are long-standing. The cantonal bank state guarantee dates back to the 19th century, while the deposit priority insurance was introduced in 1934. Only the SBA liquidity insurance is relatively new, as it was introduced only in 1984. Thus, it is not surprising that our empirical findings support the view that in Switzerland (implicit and explicit) protection schemes play (and will continue to play) an important role in people's perception regarding the relative safety of their saving deposits.

Regarding the robustness of our empirical results, they are stable across a broad range of regression specifications, including correcting for the presence of heteroscedasticity and first-order autocorrelation. The results are particulalry robust for the regional banks, which comprise most 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, which is a more likely. 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 Switzerland. In particular, we study the relationship between fluctuations in bank-specific risk characteristics and the patterns of uninsured saving deposits (as a share of total saving deposits). Overall, we find that the "quality" of a bank influences depositors' willingness to hold their uninsured saving deposits in a particular bank. While this result is stronger for regional banks than for cantonal banks, it holds both over time (within estimations) as well as across banks (between estimations). For example, according to our results (where insurance is measured as the liquidity insurance without cap), variations in risk parameters explain at least 55 percent of the variations in the fraction of uninsured saving deposits within a given bank, and at least 35 percent of the variations across banks. Thus, depositors seem to exert considerable market discipline.

We also examine whether depositors are aware of (or care about) institutional changes in the Swiss depositor protection system. Our results are mixed. First, our results suggest that depositors at cantonal banks know that their saving deposits are protected by a relatively strong cantonal bank state guar-

antee. This protection makes their behavior less sensitive to relatively marginal changes in the Swiss depositor protection system. Thus, for those banks, risk parameters have at best a weak influence on the structure of saving deposits. We find, however, that depositors at other banks seem to adjust their holdings of uninsured saving deposits according to developments in bank-specific risk characteristics. While this holds true under both priority insurance and liquidity insurance, priority insurance seems to be more relevant than liquidity insurance.

Finally, we find that neither the 1993 cap on liquidity insurance nor the 1997 increase in priority insurance seem to alter fundamentally the behavior of depositors. This lack of responsiveness can be interpreted in several ways, namely: (i) depositors are not aware of the institutional changes; (ii) depositors anticipate an implicit deposit guarantee; or (iii) depositors have not yet fully adapted to the institutional changes. In either case, we find that, over the length of our panel data, depositors have not significantly altered their behavior in response to institutional changes in the depositor insurance system.

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Table 4:
1987 Cross-Sectional Summary Statistics

Variables	All Banks		Cantonal Banks		Regional Banks	
	Obs.	Mean	Obs.	Mean	Obs.	Mean
Total Savings (in CHF 1'000)	248	519602	27	1686762	206	128510
Total Savings/Total Liabilities	248	0.432	27	0.350	206	0.460
Insured Savings (liquidity insurance) /Total Saving	248	0.286	27	0.301	206	0.284
Insured Savings (liquidity insurance without cap) /Total Savings	248	0.286	27	0.301	206	0.284
Insured Savings (priority insurance) /Total Savings	248	0.575	27	0.602	206	0.572
Insured Savings (priority insurance before 1997) /Total Savings	248	0.575	27	0.602	206	0.572
GDPG = GDP growth rate	0	n.a.	0	n.a.	0	n.a.
CHMM3 = 3-Month Money Market Rate	248	3.180	27	3.180	206	3.180
MORTTL = Mortgage Lending / Total Savings	248	0.545	27	0.412	206	0.582
TLTG = Total Liabilities growth rate	0	n.a.	0	n.a.	0	n.a.
NSD = Non-Saving Deposits / Total Deposits	242	0.253	27	0.352	200	0.216
NIETL = Non-Interest Expenditures / Total Liabilities	248	0.005	27	0.005	206	0.005
NIRTL = Net Interest Revenues / Total Liabilities	248	0.007	27	0.007	206	0.007
NCRTL = Net Commission Revenues / Total Liabilities	248	0.003	27	0.002	206	0.002
SPREAD = Intermediation Spread between Lending & Saving	248	1.621	27	1.673	206	1.625
RIRS = Interest rate on saving deposits relative to average industry	248	-0.005	27	-0.074	206	-0.009
DCAP = Dummy for 1993 liquidity cap	248	0	27	0	206	0

Table 5:
1998 Cross-Sectional Summary Statistics

Variable	All Banks		Cantonal Banks		Regional Banks	
	Obs.	Mean		Mean	Obs.	Mean
Total Savings (in CHF 1'000)	141	1652176	24	3295939	107	267980
Total Savings/Total Liabilities	141	0.438	24	0.317	107	0.486
Insured Savings (liquidity insurance) /Total Saving	141	0.468	24	0.615	107	0.417
Insured Savings (liquidity insurance without cap) /Total Savings	141	0.421	24	0.444	107	0.414
Insured Savings (priority insurance) /Total Savings	141	0.281	24	0.310	107	0.271
Insured Savings (priority insurance before 1997) /Total Savings	141	0.684	24	0.705	107	0.678
GDPG = GDP growth rate	141	0.021	24	0.021	107	0.021
CHMM3 = 3-Month Money Market Rate	141	1.320	24	1.320	107	1.320
MORTTL = Mortgage Lending / Total Savings	141	0.717	24	0.670	107	0.760
TLTG = Total Liabilities growth rate	141	0.079	24	0.018	107	0.079
NSD = Non-Saving Deposits / Total Deposits	141	0.225	24	0.371	107	0.162
NIETL = Non-Interest Expenditures / Total Liabilities	140	0.006	24	0.006	106	0.005
NIRTL = Net Interest Revenues / Total Liabilities	141	0.016	24	0.014	107	0.017
NCRTL = Net Commission Revenues / Total Liabilities	141	0.004	24	0.004	107	0.002
SPREAD = Intermediation Spread between Lending & Saving	141	2.335	24	2.542	107	2.284
RIRS = Interest rate on saving deposits relative to average industry	141	0.002	24	-0.132	107	0.041
DCAP = Dummy for 1993 liquidity cap	141	0.156	24	0.708	107	0.009

Table 6:
Panel Summary Statistics (1987-1998)

Variables	All Banks		Cantonal Banks		Regional Banks	
Total Savings (in CHF 1'000)	2404	871545	313	2319913	1932	167030
Total Savings/Total Liabilities	2404	0.389	313	0.296	1932	0.420
Insured Savings (liquidity insurance) /Total Saving	2404	0.339	313	0.426	1932	0.318
Insured Savings (liquidity insurance without cap) /Total Savings	2404	0.320	313	0.345	1932	0.317
Insured Savings (priority insurance) /Total Savings	2404	0.558	313	0.573	1932	0.556
Insured Savings (priority insurance before 1997) /Total Savings	2404	0.608	313	0.634	1932	0.604
GDPG = GDP growth rate	2154	0.015	285	0.014	1725	0.015
CHMM3 = 3-Month Money Market Rate	2404	4.720	313	4.490	1932	4.768
MORTTL = Mortgage Lending / Total Savings	2404	0.592	313	0.483	1932	0.633
TLTG = Total Liabilities growth rate	2154	0.067	285	0.060	1725	0.066
NSD = Non-Saving Deposits / Total Deposits	2369	0.292	313	0.412	1897	0.249
NIETL = Non-Interest Expenditures / Total Liabilities	2399	0.006	313	0.006	1927	0.005
NIRTL = Net Interest Revenues / Total Liabilities	2402	0.011	313	0.010	1930	0.011
NCRTL = Net Commission Revenues / Total Liabilities	2404	0.003	313	0.003	1932	0.002
SPREAD = Intermediation Spread between Lending & Saving	2404	1.831	313	1.915	1932	1.826
RIRS = Interest rate on saving deposits relative to average industry	2404	-0.002	313	-0.069	1932	-0.002
DCAP = Dummy for 1993 liquidity cap	2404	0.057	313	0.310	1932	0.004

Table 7:
Fixed Effects Estimates of Equation (2)

ALINC_t	All Banks (1)	Cantonal Banks (2)	Regional Banks (3)
GDPG_t	-0.942 ***	-1.279 ***	-0.871 ***
	-13.167	-5.304	-11.389
MORTTL_t-1	0.061 ***	0.110 ***	0.052 ***
	4.251	3.724	2.914
TLTG_t-1	0.008	0.012	0.003
	0.992	0.306	0.362
NSD_t-1	-0.240 ***	-0.254 ***	-0.239 ***
	-12.978	-4.187	-12.122
NIETL_t-1	-6.312 ***	-20.791 **	-0.328
	-3.030	-2.076	-0.118
NIRTL_t-1	2.204 ***	1.315	2.113 ***
	4.578	0.714	4.045
NCRTL_t-1	5.266 ***	23.428 ***	2.396 **
	6.605	3.840	2.191
SPREAD_t-1	0.087 ***	0.062 ***	0.086 ***
	16.744	4.568	14.606
RIRS_t-1	0.089 ***	0.048 **	0.093 ***
	13.091	2.153	12.668
DCAP_t	0.039 **	0.041	0.035
	2.270	1.185	0.169
DCAPSVTL_t	0.030	0.013	0.012
	0.585	0.126	0.021
DISAP_t-1			
_CONS	0.208 ***	0.330 ***	0.182 ***
	13.066	5.190	9.949
No. of Obs.	1860	257	1484
No. of Banks	249	28	207
R-square:			
within	0.5764	0.6649	0.5508
between	0.0673	0.0104	0.1397
overall	0.2414	0.3815	0.2761
corr(u_i, Xb)	-0.3029	-0.3748	-0.1719

The figures in small fonts below the coefficients represent the t-statistics
*The 10, 5 & 1 percent level of significance is depicted by, respectively, *, ** & ***.*

Table 7:
Fixed Effects Estimates of Equation (2)

ALINC_t	All Banks (4)	Cantonal Banks (5)	Regional Banks (6)
GDPG_t	-0.906 ***	-1.289 ***	-0.849 ***
	-12.978	-5.499	-11.345
MORTTL_t-1	0.059 ***	0.115 ***	0.046 ***
	4.181	3.957	2.601
TLTG_t-1			
NSD_t-1	-0.264 ***	-0.265 ***	-0.270 ***
	-16.112	-4.965	-15.518
NIETL_t-1	-6.060 ***	-23.877 ***	0.916
	-3.164	-2.817	0.366
NIRTL_t-1	1.853 ***	1.289	1.781 ***
	3.989	0.739	3.515
NCRTL_t-1	5.120 ***	24.428 ***	2.211 **
	6.747	4.177	2.059
SPREAD_t-1	0.082 ***	0.061 ***	0.078 ***
	16.367	4.617	13.940
RIRS_t-1	0.083 ***	0.041 *	0.085 ***
	12.422	1.910	11.984
DCAP_t	0.038 **	0.037	0.023
	2.293	1.143	0.110
DCAPSVTL_t	0.037	0.025	0.025
	0.752	0.247	0.041
DISAP_t-1			
_CONS	0.230 ***	0.352 ***	0.207 ***
	15.852	6.469	12.412
No. of Obs.	2103	285	1685
No. of Banks	249	28	207
R-square:			
within	0.5441	0.6607	0.5128
between	0.0371	0.0001	0.0900
overall	0.2056	0.3446	0.2373
corr(u_i, Xb)	-0.3545	-0.4015	-0.2182

The figures in small fonts below the coefficients represent the t-statistics
*The 10, 5 & 1 percent level of significance is depicted by, respectively, *, ** & ***.*

Table 7:
Fixed Effects Estimates of Equation (2)

ALINC_t	All Banks (7)	Cantonal Banks (8)	Regional Banks (9)
GDPG_t	-0.893 ***	-1.282 ***	-0.838 ***
	-12.655	-5.410	-11.078
MORTTL_t-1	0.059 ***	0.115 ***	0.045 ***
	4.179	3.946	2.589
TLTG_t-1			
NSD_t-1	-0.265 ***	-0.265 ***	-0.271 ***
	-16.149	-4.952	-15.549
NIETL_t-1	-6.170 ***	-24.123 ***	0.796
	-3.219	-2.818	0.318
NIRTL_t-1	1.840 ***	1.362	1.764 ***
	3.961	0.766	3.479
NCRTL_t-1	5.124 ***	24.523 ***	2.195 **
	6.753	4.175	2.044
SPREAD_t-1	0.082 ***	0.061 ***	0.078 ***
	16.313	4.553	13.919
RIRS_t-1	0.083 ***	0.040 *	0.085 ***
	12.424	1.849	11.990
DCAP_t	0.038 **	0.036	0.024
	2.279	1.109	0.115
DCAPSVTL_t	0.038	0.027	0.019
	0.774	0.270	0.032
DISAP_t-1	0.007	0.007	0.005
	1.328	0.228	1.021
_CONS	0.231 ***	0.352 ***	0.208 ***
	15.898	6.458	12.448
No. of Obs.	2103	285	1685
No. of Banks	249	28	207
R-square:			
within	0.5445	0.6608	0.5131
between	0.0342	0.0000	0.0855
overall	0.2038	0.3441	0.2351
corr(u_i, Xb)	-0.3562	-0.4012	-0.2196

The figures in small fonts below the coefficients represent the t-statistics
*The 10, 5 & 1 percent level of significance is depicted by, respectively, *, ** & ***.*

Table 8:
Between Effects Estimates of Equation (2)

ALINC_t	All Banks (1)	Cantonal Banks (2)	Regional Banks (3)
GDPG_t	2.095 **	2.641	2.876 ***
	2.320	0.806	2.969
MORTTL_t-1	0.066 ***	0.050	0.066 **
	2.580	1.043	2.120
TLTG_t-1	-0.117 *	0.278	-0.481 ***
	-1.929	1.073	-3.482
NSD_t-1	0.059 *	-0.045	0.022
	1.910	-0.401	0.491
NIETL_t-1	-5.168 *	16.435	-6.333
	-1.701	1.128	-1.560
NIRTL_t-1	1.781	-10.959 **	2.729
	1.146	-2.660	1.643
NCRTL_t-1	1.557	-3.474	5.127
	0.865	-0.209	1.542
SPREAD_t-1	0.054 **	-0.085	0.056 **
	2.242	-1.015	2.085
RIRS_t-1	0.116	0.059	0.098
	4.166	0.693	2.820
DCAP_t	0.120 *	0.020	-86.874 ***
	1.733	0.208	-3.084
DCAPSVTL_t	-0.268	-0.134	250.621 ***
	-1.304	-0.406	3.087
DISAP_t-1	-0.208 ***	-0.350	-0.222 ***
	-5.522	-1.542	-5.475
NOTSURV_t-1			
_CONS	0.165 ***	0.503 ***	0.173 ***
	4.057	3.262	3.918
No. of Obs.	1860	257	1484
No. of Banks	249	28	207
R-square:			
within	0.0100	0.3551	0.0022
between	0.3486	0.7001	0.3852
overall	0.0547	0.1033	0.0041
sd(u_i+avg(e_i))	0.0607	0.0332	0.0616

The figures in small fonts below the coefficients represent the t-statistics
*The 10, 5 & 1 percent level of significance is depicted by, respectively, *, ** & ***.*

Table 8:
Between Effects Estimates of Equation (2)

ALINC_t	All Banks (4)	Cantonal Banks (5)	Regional Banks (6)
GDPG_t	-0.903 *	-1.281	-0.531
	-1.688	-0.465	-0.897
MORTTL_t-1	0.083 ***	0.050	0.082 **
	3.220	0.987	2.557
TLTG_t-1	-0.076	0.247	-0.335 **
	-1.230	0.931	-2.351
NSD_t-1	0.093 ***	-0.071	0.063
	2.900	-0.649	1.316
NIETL_t-1	-4.520	16.901	-6.383
	-1.479	1.117	-1.531
NIRTL_t-1	1.204	-11.147 **	2.137
	0.773	-2.600	1.257
NCRTL_t-1	1.064	-3.867	4.568
	0.586	-0.216	1.328
SPREAD_t-1	0.013	-0.081	0.024
	0.474	-0.897	0.780
RIRS_t-1	0.073	0.050	0.073
	2.456	0.541	1.927
DCAP_t	0.109	0.031	-61.652 **
	1.563	0.315	-2.139
DCAPSVTL_t	-0.284	-0.173	177.865 **
	-1.371	-0.514	2.142
DISAP_t-1			
NOTSURV_t-1	-0.058 ***	-0.048	-0.054 ***
	-5.238	-1.214	-4.316
_CONS	0.265 ***	0.555 ***	0.255 ***
	5.826	3.051	5.049
No. of Obs.	1860	257	1484
No. of Banks	249	28	207
R-square:			
within	0.0809	0.3464	0.0047
between	0.3411	0.6837	0.3524
overall	0.1778	0.0630	0.0084
sd(u_i+avg(e_i))	0.0611	0.0341	0.0633

The figures in small fonts below the coefficients represent the t-statistics
*The 10, 5 & 1 percent level of significance is depicted by, respectively, *, ** & ***.*

Table 8:
Between Effects Estimates of Equation (2)

ALINC_t	All Banks (7)	Cantonal Banks (8)	Regional Banks (9)
GDPG_t	1.284	21.665	2.462 **
	1.310	1.588	2.315
MORTTL_t-1	0.073 ***	0.030	0.069 **
	2.840	0.621	2.208
TLTG_t-1	-0.092	0.422	-0.447 ***
	-1.507	1.564	-3.124
NSD_t-1	0.079 **	0.004	0.036
	2.462	0.038	0.772
NIETL_t-1	-4.836	9.553	-6.259
	-1.601	0.642	-1.541
NIRTL_t-1	1.643	-8.734 *	2.644
	1.063	-2.044	1.589
NCRTL_t-1	1.211	10.418	4.717
	0.675	0.555	1.407
SPREAD_t-1	0.027	-0.019	0.042
	1.003	-0.205	1.403
RIRS_t-1	0.091	0.156	0.087
	3.005	1.464	2.344
DCAP_t	0.113	-0.014	-81.659 ***
	1.647	-0.150	-2.844
DCAPSVTL_t	-0.285	0.018	235.568 ***
	-1.393	0.053	2.847
DISAP_t-1	-0.136 ***	-1.959	-0.186 ***
	-2.648	-1.713	-3.353
NOTSURV_t-1	-0.031 **	0.278	-0.016
	-2.058	1.433	-0.946
_CONS	0.219 ***	0.118	0.199 ***
	4.548	0.385	3.830
No. of Obs.	1860	257	1484
No. of Banks	249	28	207
R-square:			
within	0.0063	0.0474	0.0020
between	0.3602	0.7385	0.3881
overall	0.0824	0.0229	0.0043
sd(u_i+avg(e_i))	0.0603	0.0321	0.0617

The figures in small fonts below the coefficients represent the t-statistics
*The 10, 5 & 1 percent level of significance is depicted by, respectively, *, ** & ***.*

Table 9:
Fixed Effects Estimates of Equation (3)

APIB97_t	All Banks (1)	Cantonal Banks (2)	Regional Banks (3)
GDPG_t	-0.983 ***	-1.378 ***	-0.891 ***
	-17.834	-9.191	-14.558
MORTTL_t-1	0.038 ***	0.054 ***	0.034 **
	3.451	2.682	2.457
TLTG_t-1	0.004	0.000	0.000
	0.707	-0.008	0.057
NSD_t-1	-0.210 ***	-0.276 ***	-0.203 ***
	-15.436	-7.254	-13.789
NIETL_t-1	-7.077 ***	-18.980 ***	-3.461 *
	-4.596	-3.050	-1.671
NIRTL_t-1	0.831 **	2.494 **	0.609
	2.063	2.012	1.362
NCRTL_t-1	4.524 ***	16.975 ***	1.555 *
	7.488	4.222	1.893
SPREAD_t-1	0.072 ***	0.055 ***	0.071 ***
	18.577	6.644	15.777
RIRS_t-1	0.075 ***	0.066 ***	0.077 ***
	14.710	4.703	13.770
DPI_t	0.019 ***	-0.008	0.006
	2.758	-0.312	0.679
DPISVT_t	-0.018	0.056	0.007
	-1.269	0.790	0.413
_CONS	0.550 ***	0.680 ***	0.529 ***
	42.594	16.267	35.066
No. of Obs.	1860	257	1484
No. of Banks	249	28	207
R-square:			
within	0.6074	0.7320	0.5868
between	0.0870	0.0083	0.1917
overall	0.2398	0.3465	0.3117
corr(u_i, Xb)	-0.3270	-0.3947	-0.1544

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Table 9:
Fixed Effects Estimates of Equation (3)

APIB97_t	All Banks (4)	Cantonal Banks (5)	Regional Banks (6)
GDPG_t	-0.989 ***	-1.374 ***	-0.889 ***
	-18.020	-9.178	-14.573
MORTTL_t-1	0.041 ***	0.051 **	0.033 **
	3.850	2.580	2.426
TLTG_t-1	0.004	0.004	0.000
	0.738	0.157	0.059
NSD_t-1	-0.211 ***	-0.278 ***	-0.203 ***
	-15.469	-7.303	-13.797
NIETL_t-1	-7.239 ***	-17.574 ***	-3.473 *
	-4.717	-2.949	-1.677
NIRTL_t-1	0.726 *	2.632 **	0.639
	1.841	2.147	1.449
NCRTL_t-1	4.695 ***	16.646 ***	1.520 *
	7.969	4.166	1.861
SPREAD_t-1	0.073 ***	0.055 ***	0.071 ***
	18.736	6.620	15.782
RIRS_t-1	0.075 ***	0.066 ***	0.077 ***
	14.711	4.685	13.772
DPI_t	0.012 ***	0.010	0.009 **
	3.422	1.179	2.468
DPISVT_t			
_CONS	0.550 ***	0.674 ***	0.529 ***
	42.583	16.409	35.309
No. of Obs.	1860	257	1484
No. of Banks	249	28	207
R-square:			
within	0.6070	0.7312	0.5867
between	0.0870	0.0097	0.1916
overall	0.2385	0.3528	0.3114
corr(u_i, Xb)	-0.3347	-0.3857	-0.1523

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Table 9:
Fixed Effects Estimates of Equation (3)

APIB97_t	All Banks (7)	Cantonal Banks (8)	Regional Banks (9)
GDPG_t	-0.971 ***	-1.382 ***	-0.888 ***
	-17.637	-9.280	-14.554
MORTTL_t-1	0.047 ***	0.052 ***	0.037 ***
	4.442	2.716	2.740
TLTG_t-1	0.004	0.002	0.000
	0.745	0.065	0.047
NSD_t-1	-0.210 ***	-0.277 ***	-0.204 ***
	-15.407	-7.324	-13.828
NIETL_t-1	-7.342 ***	-18.424 ***	-3.408 *
	-4.768	-3.096	-1.647
NIRTL_t-1	0.866 **	2.502 **	0.624
	2.146	2.023	1.397
NCRTL_t-1	4.915 ***	16.742 ***	1.611 **
	8.352	4.247	1.973
SPREAD_t-1	0.074 ***	0.055 ***	0.072 ***
	19.524	6.682	16.057
RIRS_t-1	0.076 ***	0.066 ***	0.077 ***
	14.978	4.714	13.886
DPI_t			
DPISVT_t	0.016 **	0.035	0.017 **
	2.386	1.387	2.408
_CONS	0.542 ***	0.679 ***	0.526 ***
	43.174	16.310	36.212
No. of Obs.	1860	257	1484
No. of Banks	249	28	207
R-square:			
within	0.6055	0.7318	0.5866
between	0.0855	0.0088	0.1918
overall	0.2353	0.3491	0.3120
corr(u_i, Xb)	-0.3435	-0.3900	-0.1576

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Table 10:
Between Effects Estimates of Equation (3)

APIB97_t	All Banks (1)	Cantonal Banks (2)	Regional Banks (3)
GDPG_t	1.149502	4.699916	1.272103 *
	1.592	1.506	1.661
MORTTL_t-1	0.080286 ***	0.043831	0.105105 ***
	3.959	1.162	4.238
TLTG_t-1	-0.08252 *	0.161477	-0.07371
	-1.739	0.854	-1.46
NSD_t-1	0.058351 **	-0.10816	0.003494
	2.225	-1.184	0.095
NIETL_t-1	-0.77219	15.44561 *	-1.61902
	-0.325	1.778	-0.513
NIRTL_t-1	-2.32081 *	-7.92154 **	-1.33484
	-1.875	-2.577	-0.995
NCRTL_t-1	-0.04029	4.217009	1.891053
	-0.029	0.377	0.717
SPREAD_t-1	0.013813	-0.05696	0.007249
	0.678	-0.858	0.313
RIRS_t-1	0.075522 ***	0.089605	0.050717
	3.171	1.184	1.631
DPI_t	0.136398 ***	-0.57016	0.121223 **
	3.033	-1.282	2.476
DPI3OST_t	-0.17632 ***	-0.35243 *	-0.16741 ***
	-5.932	-1.753	-5.164
DISAP_t			
NOTSURV_t-1	0.54335 ***	0.734616 ***	0.537115 ***
	16.644	6.54	15.283
_CONS			
No. of Obs.	1860	257	1484
No. of Banks	249	28	207
R-square:			
within	0.0017	0.3814	0.0049
between	0.4004	0.7639	0.4173
overall	0.0600	0.1235	0.0795
sd(u_i+avg(e_i))	0.0482	0.0255	0.0490

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Table 10:
Between Effects Estimates of Equation (3)

APIB97_t	All Banks	Cantonal Banks	Regional Banks
	(4)	(5)	(6)
GDPG_t	-1.38635 ***	0.598501	-1.1621 **
	-3.299	0.3	-2.548
MORTTL_t-1	0.092429 ***	0.044435	0.107133 ***
	4.567	1.149	4.279
TLTG_t-1	-0.05677	0.129701	-0.04898
	-1.19	0.65	-0.954
NSD_t-1	0.069823 ***	-0.12929	0.027554
	2.644	-1.384	0.726
NIETL_t-1	-0.72361	15.7159	-2.94959
	-0.305	1.722	-0.929
NIRTL_t-1	-2.42474 *	-8.38007 **	-1.31887
	-1.964	-2.609	-0.973
NCRTL_t-1	-0.21015	3.265832	1.234953
	-0.15	0.271	0.46
SPREAD_t-1	-0.01388	-0.05942	-0.00798
	-0.637	-0.852	-0.324
RIRS_t-1	0.051293 **	0.078655	0.048519
	2.087	1.016	1.534
DPI_t	0.060276	-0.6284	0.040507
	1.315	-1.255	0.818
DPI30ST_t			
DISAP_t	-0.05186 ***	-0.05669	-0.0468 ***
	-5.984	-1.473	-4.733
NOTSURV_t-1	0.624602 ***	0.805653 ***	0.6041 ***
	17.452	5.891	15.364
_CONS			
No. of Obs.	1860	257	1484
No. of Banks	249	28	207
R-square:			
within	0.0113	0.3922	0.0541
between	0.4018	0.7522	0.4059
overall	0.1413	0.1107	0.2176
sd(u_i+avg(e_i))	0.0481	0.0261	0.0495

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Table 10:
Between Effects Estimates of Equation (3)

APIB97_t	All Banks	Cantonal Banks	Regional Banks
	(7)	(8)	(9)
GDPG_t	0.237333	18.45932	0.665289
	0.295	1.484	0.776
MORTTL_t-1	0.086292 ***	0.040615	0.105636 ***
	4.269	1.084	4.275
TLTG_t-1	-0.06609	0.319811	-0.06136
	-1.394	1.372	-1.205
NSD_t-1	0.067108 **	-0.03198	0.01804
	2.563	-0.284	0.479
NIETL_t-1	-0.79518	11.36255	-2.05706
	-0.338	1.219	-0.652
NIRTL_t-1	-2.26243 *	-5.71	-1.28508
	-1.847	-1.582	-0.961
NCRTL_t-1	-0.17241	12.71531	1.356882
	-0.125	0.952	0.512
SPREAD_t-1	-0.00683	-0.02509	-0.00472
	-0.313	-0.351	-0.194
RIRS_t-1	0.058566 **	0.128662	0.044122
	2.387	1.561	1.411
DPI_t	0.0943 **	-0.08618	0.090081 *
	1.98	-0.141	1.708
DPI3OST_t	-0.10034 **	-1.54441	-0.1159 **
	-2.361	-1.453	-2.504
DISAP_t	-0.03072 **	0.226641	-0.02172
	-2.476	1.142	-1.554
NOTSURV_t-1	0.592653 ***	0.423311	0.570433 ***
	15.619	1.438	13.892
_CONS			
No. of Obs.	1860	257	1484
No. of Banks	249	28	207
R-square:			
within	0.0001	0.0609	0.0028
between	0.4156	0.7828	0.4245
overall	0.1054	0.0224	0.1218
sd(u_i+avg(e_i))	0.0476	0.0252	0.0488

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