

# The restructuring of the Swiss banking system

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## 1 Introduction<sup>1</sup>

### 1.1 The Swiss banking system

The Swiss banking system is characterised by universal banks. With the exception of insurance, which needs a special license, any authorised bank may offer the entire range of banking services. In practice, however, only the largest banks are truly universal banks. Most smaller banks are more or less specialised. Up to 1994, official statistics classify eight different kinds of banks: Cantonal banks, big banks, regional banks, Raiffeisenkassen, other Swiss-owned banks, foreign banks, finance companies, and private banks. At the end of 1994, the category “finance companies” was eliminated. The companies belonging to this category had to either become banks or exit the market. As Table 1 shows, most former finance companies became foreign banks.

The big banks conduct virtually all banking activities, and played an important role in the domestic as well as the international markets even prior to the merger of UBS and SBC. The cantonal and regional banks concentrate their businesses to the domestic market and, although also being universal banks, tend to emphasise mortgage lending. The same can be said for the Raiffeisen banks. Private banks engage mostly in portfolio management, while foreign banks are specialised in foreign-exchange trading, trade finance, underwriting, securities trading, and portfolio management. Finance companies have been involved in various kinds of capital market and lending activities.<sup>2</sup>

### 1.2 Restructuring of the industry

Table 1  
Number of banks and finance companies, 1984-97

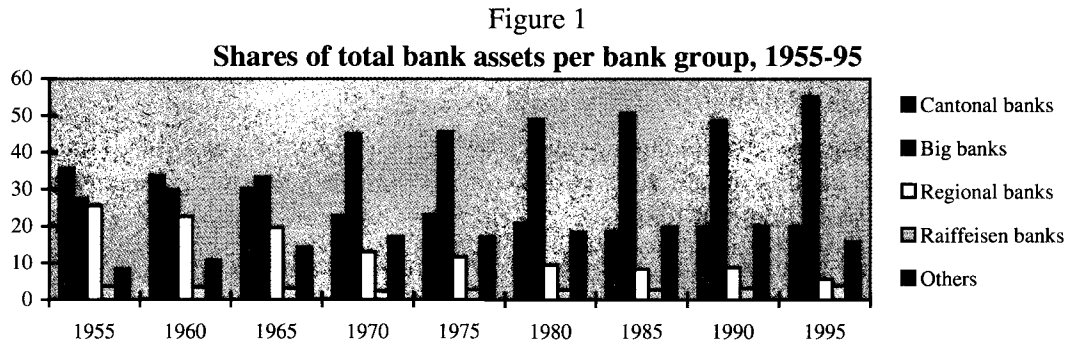
	84	85	86	87	88	89	90	91	92	93	94	95	96	97	Increase 1986-97
Cantonal banks	29	29	29	29	29	29	29	28	28	28	27	24	23	23	-21%
Big banks	5	5	5	5	5	5	4	4	4	3	3	3	3	3	-40%
Regional banks	216	215	214	213	212	209	203	188	173	154	134	122	114	112	-48%
Raiffeisen banks	2	2	2	2	2	2	2	2	2	2	1	1	1	1	-50%
Other Swiss-owned banks	82	85	88	91	89	91	92	92	93	87	86	84	81	80	-2%
Foreign banks	119	120	125	128	133	135	142	146	148	156	153	155	157	152	28%
Finance companies	103	112	119	130	133	137	130	112	101	79	71				-31%
Private banks	24	24	24	23	22	22	22	19	18	18	17	17	17	16	-33%

Sources: Swiss National Bank, Das schweizerische Bankwesen 1993 (p.22), Die Banken in der Schweiz 1996 (p.21), corrected by majority holdings: SVB by CS since 1993, SoBa by SVB since 1995, Neue Aargauer Bank by CS since 1995, Bank Wartau-Sevelen by SBV since 1995, Bank in Gossau by SBV since 1995, CEPY by Banque Cantonale.

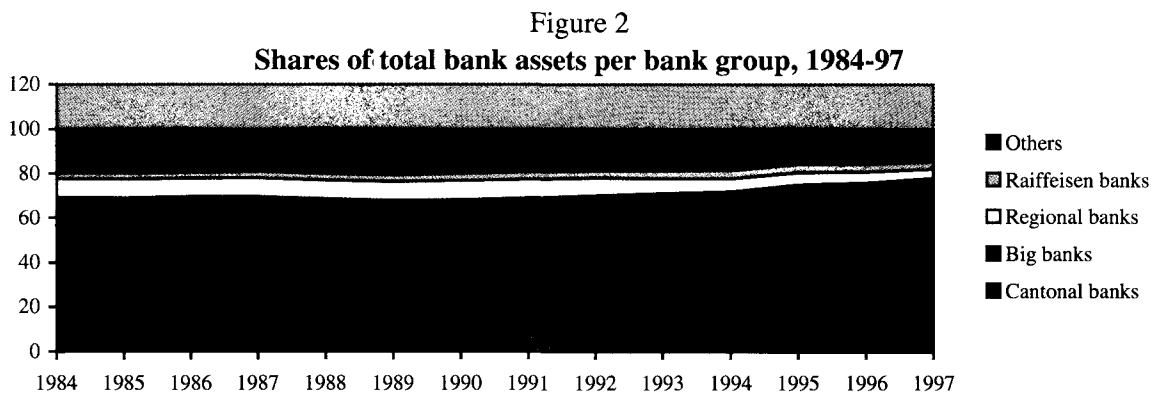
<sup>1</sup> This section was written by Dominik Egli.

<sup>2</sup> For more comprehensive surveys of the Swiss banking structure see Birchler and Rich (1991) or Meier and Mathinsen (1996).

Table 1 lists the evolution of the number of banks and finance companies from 1984 to 1997. As the raw numbers indicate, the Swiss banking industry has undergone a strong concentration process. Out of 29 cantonal banks, 6 were taken over or merged, nearly half of the regional banks disappeared, and the number of big banks effectively diminished from 5 to 3. The process has not come to an end yet, as becomes clear with the merger of UBS and SBC in July 1998. The new UBS is presently the second largest financial institution in the world. The decline of the number of Raiffeisen banks from 2 to 1 has resulted from the merger of the two central institutions in 1994. The evolution of the number of foreign banks and finance companies are mostly due to regulatory changes (see above), while the number of private banks has declined by one third.



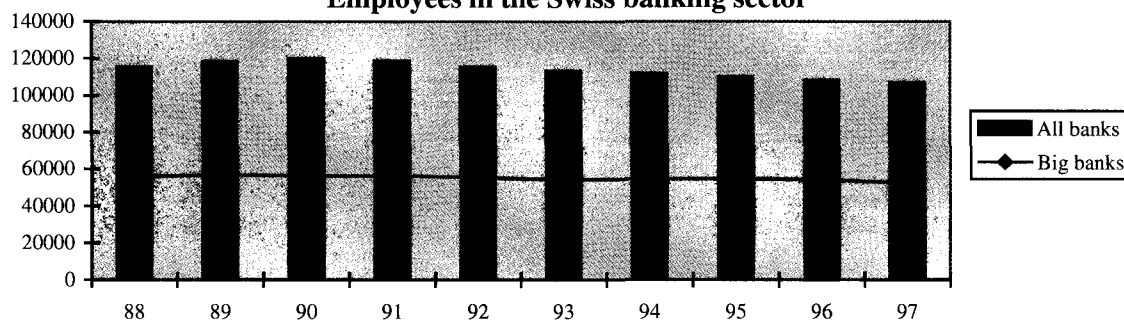
Raw numbers only tell part of the truth, and one is wondering how the shares of total bank assets of the different groups evolved over the same time horizon. As Figure 1 shows, in the long run, we observe a striking increase in the significance of the big banks, whereas the importance of the cantonal banks and especially of the regional banks has sharply declined. As Figure 2 indicates, this process is continuing. The big banks' share in total assets rose by about ten percentage points between 1993 and 1997 with the losers still being the regional and the cantonal banks.



The data also show that the fall in the number of regional and cantonal banks was accompanied by a declining importance of these subgroups for the Swiss banking sector, while that of the big banks rose sharply.

Figure 3 shows the impact of the concentration process on domestic employment in the Swiss banking sector. Over the last decade, overall domestic employment in the sector has decreased by 7.2%, in the big banks by 5.2%. Employment at Swiss banks abroad has nearly doubled, mostly due to the foreign expansion of the big banks. Overall, the Swiss banking sector in 1997 employed 1.75% fewer people than in 1988.

Figure 3  
Employees in the Swiss banking sector



The new UBS plans to reduce overall employment by 13,000 persons, of which 7,000 in Switzerland. Relative to 1997, this amounts to a *ceteris paribus* reduction of 10.9% of total employment of the Swiss banking sector, 6.6% domestic and 47% foreign.

Another fact worth mentioning is the insertion of Winterthur Versicherung into the Credit Swiss Group, with the latter becoming one of the world's largest all finance corporations.

Last but not least, PTT, the Swiss mailing company, recently started to extend its financial services. Under the heading "postfinance", PTT now offers life insurance and three investment funds. PTT maintains 3,700 branches and settles 70% of the intra-Swiss remittances.

## 2 The impact of the restructuring on monetary policy<sup>3</sup>

The restructuring of the Swiss banking system in the 1990s has not resulted in any fundamental changes in the SNB's medium-term strategy for monetary policy. The greater concentration of the banking system particularly among the largest banks, however, raises questions concerning the implementation of policy, in particular with respects to liquidity management and lender of last resort.

### 2.1 Liquidity management

The current medium-term monetary policy strategy of the SNB is framed around a 5-year target growth path for the monetary base.<sup>4</sup> The multi-annual strategy, covering the period from the end of 1994 to the end of 1999, envisages an annual average increase in the seasonally-adjusted monetary base of 1%. The growth path represents an "ideal" trend that would result if inflation remained stable at roughly 1% and real GDP growth corresponds to its potential of 2%. Within this framework, giros have a dual function. First, they act as an instrument in the SNB's efforts to control the monetary base. Expected giro levels are set consistent with the SNB's projected level of the monetary base for the next quarter. Second, giros serve as an indicator in the very short run. The daily evolution of giros provides the SNB information so that it can respond quickly to changing liquidity demands and thus prevent too pronounced swings in the overnight rate.

The banks' demand for giros arise from their settlement needs and the restriction that all banks in Switzerland are subject to liquidity requirements that can be fulfilled either through giros, postal

<sup>3</sup> This section was written by Andreas Fischer.

<sup>4</sup> See Rich (1997) for a discussion concerning the history of monetary targeting in Switzerland. The monetary base is the sum of the notes in circulation plus the reserve accounts of the banking system with the SNB (called giro accounts).

checking accounts or vault cash. The largest share of the required reserves of the large Swiss banks is held in the form of giros and postal checking accounts. From time to time, the large Swiss banks may abruptly shift their liquidity needs from giros to postal checking accounts or the other way around. The idiosyncratic substitution of liquidity positions may be interpreted as a shock by the SNB, because it is difficult to identify the source of the sudden shift in demand for giros, which may stem from real factors or from the substitution between giros and postal checking accounts. The inability to identify the shock immediately stems from the fact that the SNB and the market do not know the total liquidity position on a given day. Although the SNB knows the giro and the level of notes on a daily basis, it receives the positions of the postal checking accounts with a lag of one month. If the large shifts in the giro demand are not properly identified, a shock manifests itself in the overnight rate, which can spill over also into short-term interest rates. As a result, there is the danger that the substitution between giro and postal checking accounts may have a more prolonged effect on short-term interest rates than is desired. Under such circumstances of uncertainty, the substitution in the liquidity positions, which are often a function of the size of the bank, forces the SNB to smooth interest rates more than it initially intended.

Recently, the SNB has introduced a repo market, which is open to a wide range of banks operating in Switzerland. Thus far, the repo market is dominated by the large Swiss banks. The current structure of this market implies that large shifts in liquidity positions among the large banks can still occur.

## **2.2 Lender of last resort**

The trade-off between the moral hazard cost of the lender-of-last-resort-role and the benefits in preventing financial crises has greater repercussions when the banking system is dominated by a small number of actors. The recent merger between UBS and SBC has elevated concerns of “too-big-to-fail” within the Swiss banking system. Mergers of this size could also have indirect consequences for the future behaviour of other financial institutions. Knowing that the central bank will prevent a financial crisis if it appears imminent encourages other financial institutions to undertake less precautionary measures against systemic risks. Although the SNB is not legally responsible for monitoring banks in Switzerland, it has stepped up its efforts to gather information of banking activity.

## **3 The impact of the UBS merger on systemic stability<sup>5</sup>**

### **3.1 Introduction**

The dominant position of the new UBS in all important domestic bank operations (especially domestic lending and retail banking), and the likelihood of the bank becoming even more internationally oriented than it already is, raises questions concerning systemic stability. Systemic stability is an issue since a banking failure can cause social costs well beyond the private costs. Social costs appear when banks, which are tightly linked with other market agents go bankrupt. In Switzerland, this primarily applies to the two (formerly three) big banks, which are not only linked with each other (through the interbank market, reputational externalities, joint operations, etc.), but also have close ties to other Swiss banks and the Swiss corporate and household sectors.

The effective or presumed system-level relevance of individual banks leads to the so-called “too-big-to-fail” (TBTF) problem; i.e. expectations by market agents that banks with system-level relevance can rely on government aid if they get into financial difficulties. These expectations act to stabilise the system in the short term, as they reduce the risk of a run on the banks. At the same time, they create a competitive advantage for the affected banks through lower refinancing costs. However, they have a series of negative side effects. One effect is the distortion of competition due to the implicit

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<sup>5</sup> This section was written by Christian Braun and Christian Walter.

guarantee, which is equivalent to a government subsidy through the transfer of assets from the government to the shareholders of the banks in question. A second effect is the hampering of market discipline, caused by the risk-independent rates for borrowing by these banks. This effect leads to a long-term increase in systemic risk. In Switzerland, such TBTF expectations focus primarily on the big banks. Both big banks are regarded as warranting a rescue bid because of their size and the extent of their ties to other market agents.<sup>6</sup>

Through the merger, two of the banks with system-level relevance now form a single bank. This increases the risk to the system by further reducing the scope for diversification at the level of individual banks. Although the market share of the new UBS is likely to be less than that obtained by simply adding the market shares of the two partners in the merger, its market shares in the domestic interbank, lending and deposit-taking businesses will be well above those of the previous market leaders. A failure of the new bank certainly would cause external costs on a previously unknown scale.

Assuming that a payments crisis at the new UBS would result in promises of government aid, there would be potentially massive transfer payments at the expense of the federal budget. Because of the particular nature of the subject, however, it is impossible to estimate the funding required. In any event, the present regulatory system with its weaknesses of early recognition of problems and lack of obligation to intervene at an early stage, offers no guarantee that a UBS with payments problems, and the resulting government bailout, would imply only a minimal burden to the national budget. For instance, a 3% deficit in cover for liabilities would leave a shortfall of around CHF 20 billion (about 5% of GDP)!

The decisive question for the purposes of system protection is the size of the potential risk posed by the new UBS. A central factor here is the bank's business strategy. It is, of course, difficult at present to assess the new bank's characteristics in terms of risk tolerance, quality of risk control and capital adequacy. It can, however, be said that the management is aiming at ambitious returns on equity. In the short term the potential for cost savings in domestic retail banking should make it possible to achieve above-average returns. In the long term, however, a marked rise in the return on equity is dependent on a permanent increase in the ratio between growth in cash flow and growth in equity. Although a long-term increase in return on equity is consistent with capital market equilibrium, it does imply a permanent increase in risk; i.e. a permanent increase in the volatility of returns.

Table 2  
**Relationship between return on equity and systematic volatility**

<b>Activity</b>	<b>Beta</b>	<b>Return (%)</b>	<b>Systematic volatility (%)</b>
Full-service banking	0.97	9.8	19.4
Retail banking	1.09	10.5	21.8
Investment banking (national)	1.16	11.0	23.2
Institutional asset management	1.21	11.3	24.2
Private banking	1.31	11.9	26.2
Investment banking (global)	1.51	13.1	30.2

Sources: Matten (1996), p. 97, and own calculations.

Table 2 above illustrates the increase in volatility of returns associated with an increase in return on equity. It shows three ratios for international banks grouped by their primary activities. The first shows the sensitivity of share prices of the banks involved to changes in the corresponding market

<sup>6</sup> The actions of the central bank in the "Chiasso affair" at Credit Suisse in the seventies are, at the very least, not inconsistent with this assessment.

indices. For example, a value of 1.2 for this ratio (known as the beta in financial theory) means that a 1% change in the relevant market index will on average result in a 1.2% change in the same direction in the share price. A central result of financial theory is that the expected return on a share is an increasing function of the beta. The second ratio in the table shows the return to be expected on the basis of the beta, based on the parameters for the Swiss stock market,<sup>7</sup> while the third ratio shows the systematic volatility in the return on equity. This is the portion of the fluctuation in return on a share which is due to changes in the market as a whole. These changes cannot be avoided by portfolio diversification. The systematic volatility of a share is the product of the beta and the volatility of the market index.

According to the table, the increased emphasis on asset management and international investment banking proposed by the new UBS, is consistent with a long-term increase in the return on capital employed. It does, however, imply an increase in the systematic volatility. It is important to note that the systematic volatility is simply the volatility caused by the market as a whole; there is also a company-specific component, which is likely to be substantial for the new UBS for some time.

Greater fluctuations in returns for the new UBS (compared with that of its two constituent banks) is a matter of concern in terms of systemic stability. Thus, from a static point of view, there is now an increased risk of a very large financial group becoming insolvent. Risk control at the new UBS will be of vital importance to the resulting potential risk. A sound risk control culture at all levels and in all business areas and markets is crucial to meet the risk management requirements of the new UBS.

### **3.2 Implications for bank regulators**

So far, the Swiss Federal Banking Commission (SFBC) has not paid special attention to the unique position of the big banks in terms of system protection. The most important element in bank regulation, capital adequacy, does not distinguish between banks with system-level relevance and those without. The SFBC has also devoted only a minor part of its resources to supervise the big banks, although these banks not only occupy a special position in terms of risk to the system but also have a more complex risk profile than other banks. However, the SFBC has recently announced plans to strengthen the supervision of the big banks.

The SFBC's proposed concept for the supervision of the big banks involves three elements: first, strengthening internal and external auditing; second, closer contact between the SFBC and the managements of these banks; and third, increased on-site inspections, also involving the banks' foreign branches.

These measures are to be welcomed. They will enable the SFBC to form its own picture of the risk-generating processes within these banks. They should also enhance the ability of the SFBC to identify problems at an early stage. In addition, the Swiss National Bank has, as lender of last resort, a pre-eminent interest in the solvency of the big banks. However, based on experience in other countries, it is not clear whether the proposed measures alone will be sufficient to limit the systemic risks – and the potential costs to the public sector – to an acceptable level. Hence, additional measures, e.g., mandatory early intervention, might be worth considering.

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<sup>7</sup> For the calculation of returns and systemic volatility, the risk-free Swiss interest rate is assumed to be 4% while the risk premium and volatility of the Swiss equity market are put at 6% and 20% respectively.

## 4 The impact of the UBS merger on competition in retail banking<sup>8,9</sup>

### 4.1 Introduction

On 1st July 1998, the UBS and the SBC, two of the three Swiss big banks, merged to form the new UBS. The announcement of the merger in December 1997 triggered a heated debate about its competitive impact. On the one hand, two economists from the University of Lausanne (Damien Neven and Thomas von Ungern-Sternberg) forcefully argued that the merger would have a severe impact on competition in the retail banking segment, especially for loans to small and medium-sized enterprises (see Neven and von Ungern-Sternberg (1998) and von Ungern-Sternberg and Neven (1998)). On the other hand, two expertises requested by the UBS countered Neven and von Ungern-Sternberg mainly on their definition of the relevant markets as local (see Volkart (1998b) and Watter (1998)). Since relevant data are not publicly available, the discussion was partly based on plausibility grounds, partly on sheer assertions.

In May 1998, the Wettbewerbskommission, the Swiss antitrust agency, decided to force the new UBS to sell 25 branches as well as two subsidiary banks, namely the Banco Gottardo and the Solothurner Bank. The UBS will have to make a list of 35 branches out of which a potential buyer can pick 25 branches at will. The list of the 35 branches will have to be accepted by the Wettbewerbskommission. The UBS has to consider branches in the three main language regions and in eight specified regions which are critical from an antitrust point of view. In addition, UBS has to maintain credit lines to those clients which had loans at one of the merged banks at least up to year 2004. Last but not least, the UBS is not allowed to quit partnership agreements in infrastructure enterprises.

In this study, we will investigate the competitive impact of the merger empirically. The two main questions we will look at are:

- What is the impact of the merger on concentration in the Swiss retail banking sector?
- What are the expected consequences of the change in concentration on competition in the Swiss retail banking industry?

To answer the first question, we have computed the Herfindahl index and the three-firm concentration ratio for the product groups “loans and mortgages” and “savings deposits”. In order to estimate the impact of the merger we have compared the concentration indices for 1997 with the indices which would have prevailed if the two banks had been merged already at that time. The analysis shows a considerable impact of the merger for both concentration indices and product groups, especially in cantons with previously low concentration indices.

In order to answer the second question (i.e. the possible impact of the merger on competition), we have estimated the relationship between concentration and prices for the period 1987 to 1997. We will take two different points of view about the impact of concentration on competition. First, we analyse how concentration interferes with prices *between the cantons*. Second, we examine the relationship between concentration and prices *over time*. We call the former “canton-analysis”, the latter “time-analysis”.

For both approaches, we have tested three hypotheses. First, the contestable-market hypothesis which suggests no relationship between concentration and prices, in our case interest rates. Second, the structure-performance hypothesis which suggests a negative (positive) relationship between concentration and deposit (loan and mortgage) rates. Third, the market-efficiency hypothesis which suggests the opposite relationship. From an antitrust-policy point of view, the rejection of the

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<sup>8</sup> This section was written by Dominik Egli and Bertrand Rime.

<sup>9</sup> We would like to thank Jean-Marie Antoniazza Robert Fluri and Susanne Ziegler-Peter for excellent data assistance and Urs Birchler for helpful discussions.

structure-performance hypothesis would indicate that the merger has no negative impact on competition.

Our main results can be summarised as follows:

- The canton-analysis shows that the efficient-market hypothesis cannot be rejected for deposits as well as mortgages for small cantons, whereas the contestable-markets hypothesis cannot be rejected for both products for medium and large cantons.
- The time-analysis shows that the structure-performance hypothesis cannot be rejected for deposits, especially for large cantons. For mortgages, the contestable-market hypothesis cannot be rejected.

These results suggest that antitrust policy should concentrate on changes of concentration indices, and not on absolute levels. An extrapolation of these results on the UBS merger, however, should be made with caution. Our estimations are based on a period with more or less steady changes of concentration. Overall, these changes are of the same magnitude as the impact of the UBS merger. However, the merger is a one-time shock, not a steady change. As we will argue below, the merger might considerably influence the game oligopolists play in Swiss retail banking markets.

## **4.2 Definition of relevant markets for deposits, loans and mortgages**

In our empirical analysis we will look at two product groups relevant for households and small businesses: (1) loans and mortgages, and (2) savings deposits.

For antitrust considerations, defining the relevant geographic market is of considerable significance. By construction, the Herfindahl index is higher for narrowly defined markets. Consequently, merging banks tend to define their market broadly,<sup>10</sup> while antitrust agencies stick to more narrow definitions. As noted by Simons and Stavins (1998), the US agencies, “consider a local, economically integrated area to be a banking market. In practice, this usually means a city, a metropolitan statistical area, or a rural county.” Similarly, the German Bundeskartellamt chose a very close definition in evaluating the competitive impact of the merger between the Bayerische Volksbank and Hypobank in Bavaria. Such small markets as the towns Kempten, Augsburg or Rosenheim have been defined as relevant markets.

The fact that anti-trust agencies define local markets as relevant does not necessarily indicate that this is economically appropriate. We therefore investigate the theoretical considerations which should govern the definition of relevant markets as well as the empirical findings on these questions.

The appropriate definition of a market depends on the products in consideration. Kwast, Starr-McCluer and Wolken (1997) indicate that related market power problems in the banking industry are only to be expected for “locally limited products”. In their view, locally limited products are those consumed by households and small businesses. It still remains to define the products actually falling into this category, and what “locally limited” exactly means. Without doubt, today a household has the opportunity to buy and sell stocks not only via the bank at its residence. It can also open a deposit account at a bank located at a more distant place. Similar considerations count for other banking products. However, the question is not where consumers and small businesses could do their business, but where they actually choose to do so. In the following, we will give some theoretical arguments as to why we think the products chosen are carried out locally, and will review the evidence. This is followed by a discussion of the geographical definition of markets we have employed.

Loan and mortgage markets are characterised by asymmetric information, and based on this, banks can be seen as delegated monitors (Diamond (1984)). Monitoring is less costly the closer a bank and its customers are located. Different regional markets can have distinctive characteristics, which create a potential for economies of scale in information gathering.

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<sup>10</sup> In the application for the merger, UBS defined the relevant market for loans as the national market (Watter 1998).



Depositors use their deposit accounts not only for savings but also for payment services. The closer the bank, the lower are the transportation costs. Also, reputational effects can provide incentives for depositors to prefer local banks.

Additionally, combining loans or mortgages and payment services at the same branch helps the bank to get information about a specific customer and improves monitoring quality, from which both parties may profit. It may also reduce the transactions costs of the customer.

Based on US data for 1992 and 1993, Kwast, Starr-McCluer and Wolken (1997) report that 97.5% of households and 92.4% of small businesses using financial services had at least one account at a local depository institution, which for 96.5% and 93.5% was the primary account. In contrast, only 20.2% of households and 8% of small businesses had accounts at non-local depository institutions. By "local", the authors mean within 30 miles of residence or headquarters. The services most likely to be purchased locally are checking, savings and money market accounts, lines of credit, and certificates of deposit. Moreover, the authors examine the degree of clustering of financial services by households and small firms at their primary bank. Interestingly, clustering occurs for those services that are predominantly purchased locally, from which Kwast, Starr-McCluer and Wolken (1997) conclude that "a strong circumstantial case can be made that small businesses, as well as households, frequently tend to cluster their purchases of certain financial services at a local depository institution. Unlike households, the cluster for small businesses appears to include not only asset services, but also important credit and non-financial management services" (p. 988f). These results confirm those of an earlier study by Elliehausen and Wolken (1990). Rhoades (1996a), surveying the available evidence, concludes: "Evidence indicates that local market areas are generally the appropriate focus for analysis of the competitive effects of bank mergers. In particular, surveys of both households and small businesses point strongly toward the relevance of geographical markets" (p. 344).

The relevant market definition can change over time. What immediately comes to mind are electronic banking, ATMs and the like. Electronic banking has the potential to significantly reduce information and transaction costs for some products like checking and savings accounts. Their short- and medium term impact should, however, not be exaggerated. Electronic banking today is still relatively costly. One needs a PC and an access to the Internet, and the ability to use these tools. It will certainly take decades until most customers have equipment, skills and enough confidence to move to electronic banking. In addition, electronic banking does not reduce information costs for products where the bank has to rely on information about local markets. In these cases, the advantages of clustering services still induce customers to stick to the local bank, even if some services could also be provided electronically by a distant bank. It might be the case that the customers will do part of their banking business electronically, but this will not influence the relevant market definition as long as the customers do not switch to a more distant bank. On the possible influence of ATMs, Rhoades (1996a) concludes: "ATMs are not a substitute for a branch and are not the broad-based retail platform for the delivery of banking services that will ultimately constitute retail electronic banking" (p. 353).

Securitisation of loans and mortgages might also reduce the monitoring incentives of banks. But since the incentive to monitor only vanishes after the securitisation of a loan or a mortgage, and the success of a securitisation hinges on the reputation of the bank engaged, the influence is unlikely to be particularly important.

For Switzerland, an additional argument against a narrow definition of the relevant markets is that the merger will challenge the dominant positions of the cantonal banks.<sup>11</sup> Since interest rates for the UBS services are set nationwide, the ability of the local banks to exploit market power is reduced. Although it might be true that the UBS will set nationwide interest rates, not leaving at least some room to branch managers to adjust to local conditions would simply not be profit-maximising. It is hard to believe (and in times of shareholder-value maximisation also hard to justify) that a bank would refrain from making profits.

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<sup>11</sup> Cantonal banks are state owned, and have to take public interests into consideration.

The theoretical and empirical considerations indicate that the relevant markets for savings deposits, loans and mortgages are local markets. The appropriate definition of "localness" remains a critical point. The German Kartellamt, for instance, takes towns with less than 100,000 inhabitants as local centres. As indicated above, Kwast, Starr-McCluer and Wolken (1997) define local markets as a circle around the banking institution with a radius of 30 miles. For Switzerland, data for similarly narrow markets are not available, but we dispose of data at the canton level. The Swiss cantons differ substantially in size and population density. Most of them have more than 100,000 inhabitants and a good part of them also have more than one central town which satisfies the definition of local markets according to the Bundeskartellamt.

### 4.3 The impact of the UBS merger on concentration

Table 3 shows the number of banks active in each of the Swiss cantons. Clearly the canton Zürich, the centre of the Swiss financial system, hosts the largest number of banks. A lot of private banks are located in Geneva, while only few banks are active in the smaller cantons like Uri, Schwyz, Ob- and Nidwalden and the two Appenzells.

Table 3  
Number of banks active in each canton, 1997

Zürich	63	Glarus	7	Appenzell AR	7	Vaud	28
Bern	44	Zug	8	Appenzell IR	4	Valais	9
Luzern	14	Freiburg	17	St. Gallen	25	Neuchâtel	7
Uri	5	Solothurn	14	Graubünden	10	Genève	55
Schwyz	8	Basel-Stadt	18	Aargau	19	Jura	9
Obwalden	6	Basel-Land	7	Thurgau	7		
Nidwalden	5	Schaffhausen	14	Ticino	31		

These figures are only indicative of the concentration of the banking systems by canton. More informative concentration indices are the three-firm index C3 and the Herfindahl index H. The three-firm concentration index is equal to the sum of the three highest market shares in the market under consideration. If the C3 index is 100, there are at most three banks active in the market. The Herfindahl index sums up the squares of the market shares. It can take values between 0 and 10,000. The upper bound is reached when there is a monopolistic bank. For a market with two equally large banks, the H index is 5,000, for three equally large banks 3,333. In a market where a large bank has a market share of 80% and two smaller banks have market shares of 10%, the H index is 6,400. Note that for all these cases, the C3 index is 100. The H index therefore entails more information than the C3 index.

Table 4  
Number of cantons with Herfindahl indices for different ranges

	Loans and mortgages			Savings deposits		
	1987	1997	UBS	1987	1997	UBS
0-1,800	6	3	0	6	3	1
1,801-2,500	9	11	7	8	11	8
2,501-3,200	1	2	6	1	2	6
3,201-10,000	10	10	13	11	10	11

Our data stem from the yearly reports of the banks to the Swiss National Bank. Table 4 shows the number of cantons with Herfindahl indices for different ranges.

For both product groups, the number of cantons with Herfindahl indices of less than 1,800 has decreased in the last decade. The merger reduces the numbers to 0 and 1, respectively. At the other end of the spectrum, in about 40% of the cantons the Herfindahl indices exceed 3,200 after the merger.

Table 5 shows the increase in the Herfindahl index implied by the merger, again for different ranges.

For about half the cantons, the Herfindahl index rose by more than 200 points and for roughly one fifth by more than 600 points. These are considerable numbers.

Another interesting question concerns the relationship between the level and the increase of concentration implied by the merger.

	Loans and mortgages	Savings deposits
0-199	10	13
200-399	6	5
400-599	3	4
> 600	7	4

As Table 6 shows, those cantons with an increase in concentration of less than 200 have pre-merger Herfindahl indices higher than 1,800, most of them even higher than 3,200. Conversely, those cantons with an increase of more than 600 predominantly had low pre-merger levels. The merger therefore reduces the dispersion of concentration between cantons.

		<200	201-400	401-600	>600
Savings deposits	0-1,800	0	1	1	0
	1,801-2,500	4	2	1	3
	2,501-3,200	1	1	0	2
	3,201-10,000	8	1	0	1
Loans and mortgages	0-1,800	0	1	1	1
	1,801-2,500	2	3	1	5
	2,501-3,200	0	1	1	0
	3,201-10,000	9	1	0	0

As another piece of information, we compare market size, measured by population size, with the Herfindahl indices after the merger. Table 7 shows the ranges of the indices for the cantons with less than 200,000 inhabitants, a criterion that half the cantons meet.

Obviously, the Herfindahl indices for the small Swiss cantons are very high, but the importance of market size is spectacular.

Table 7  
**Herfindahl indices after the merger for cantons  
with a population under 200,000**  
In parentheses: all cantons

	Loans and mortgages	Savings deposits
0-1,800	0 (0)	0 (1)
1,801-2,500	2 (7)	2 (8)
2,501-3,200	1 (6)	2 (6)
3,200-10,000	10 (13)	9 (11)

In the United States, the decision to investigate the impact of a merger on competition relies on DOJ Merger Guidelines. According to the Guidelines, a merger potentially harms competition if the Herfindahl index after the merger is higher than 1,800 *and* the merger leads to an increase of the index of at least 200 points. In case both criteria are met, the federal agencies and the Department of Justice analyse the impact of the merger under consideration. By doing so, they take possible mitigating factors into account, such as competition from thrift institutions and credit unions, the ease of entry, the attractiveness for entry, possible efficiency improvements implied by the merger, and the number of firms remaining in the market (Simons and Stavins (1998)). If a merger is considered anticompetitive, the merging bank is required to divest branches and offices as a condition for approval. As von Ungern-Sternberg and Neven (1998) report, the US antitrust agencies already forced the merging banks to sell branches in cases the Herfindahl index rose over 2,300. In some cases, where the concentration was already high before the merger, the index was still close to 3,000 after branches had been sold, and all the agencies could do was to prevent an even higher concentration. The US agencies not only analyse planned mergers, but also provide support for banks planning to merge, thereby reducing the number of cases they have to analyse for approval.

To conclude, if the Wettbewerbskommission had based its decision on the standards used in the United States, it would, without doubt, have had to take serious actions.

To our knowledge, the C3 index is nowhere used as a basis for policy considerations. Nevertheless, it is informative to look at. Qualitatively, however, the results are the same as for the Herfindahl-indices, so we have left the tables for the Appendix.

#### **4.4 The impact of concentration on competition**

We approximate the impact of concentration on competition by investigating the relationship between concentration and interest rates for savings deposits and mortgages.

The literature offers three possible effects that concentration can have on prices. The structure-performance approach which takes concentration as exogenously given. Based on the banking-model of Klein (1971), Hannan (1991a) shows that higher concentration allows the firms to exploit market power and thus leads to less favourable prices for consumers.

The efficient-structure hypothesis, pioneered by Demsetz (1973), takes concentration as endogenous. Firms differ by exogenously given efficiency levels. Firms with high efficiency levels set lower prices and gain higher market shares. If there are economies of scale, banks in cantons with a small number of large banks produce more efficiently than banks in cantons with an atomistic banking sector. In the absence of market power, this leads to a higher concentration ratio and more consumer friendly prices in the cantons with only few banks. In the same vein, banks in large markets could provide their services more efficiently than banks in small markets. In addition, a high dispersion of efficiencies leads to a high dispersion of market shares, which, in itself, results in a higher Herfindahl concentration index compared to an industry with low dispersion of efficiencies.

The contestable-markets theory (Baumol, Panzer and Willig (1982)) defines sustainable market equilibria as a situation when no entry would be profitable given the equilibrium price. Due to the threat of entry, the firms in the market are not able to exploit their market power in a sustainable equilibrium.

The three theories have different implications for the relationship between concentration and prices. According to the structure-performance hypothesis, there is a negative (positive) relationship between concentration and deposit (loan) rates. Conversely, the market-efficiency hypothesis implies a positive (negative) relationship between concentration and deposit (loan) rates, while under the contestable-markets hypothesis there is no relationship between concentration and loan (deposit) rates.

Besides the three theories stated above, our results might be explained by other factors specific to the Swiss banking system. First, the state-owned cantonal banks are major players in most cantons. Most of them were founded in the second half of the 19th century, with the main goal to intensify competition. Subsequently, this goal has been considerably diluted. Instead of intensifying competition, the cantonal banks had to pursue public interests such as providing mortgages and loans at favourable rates. One way to achieve these goals is to set consumer friendly interest rates. In cantons, where the cantonal bank has a high market share, this effect may lead to a positive (negative) relationship between concentration and deposit (mortgage) rates (market-efficiency hypothesis). In addition, as the cantonal banks are not necessarily profit maximisers, they do not try to exploit their market power. This serves as an alternative explanation for the absence of a relationship between concentration and interest rates (contestable-markets hypothesis). Second, the Swiss big banks are active in all cantons and set national reference rates for some products. In the absence of regional discrimination, prices will probably not depend on local concentration in those cantons where the big banks dominate the market (contestable-market hypothesis). For savings deposits, the possibility of cantonal discrimination can be excluded as the big banks offer the same rate in all cantons. For mortgages, the fact that the big banks set national reference rates until 1997 does not exclude cantonal discrimination, as market power related margins may have been absorbed in risk premia.

As already said in the introduction, we use the decade prior to the UBS merger to discriminate between the three hypotheses. This will allow us to make predictions concerning the impact of the merger on future interest rates in the Swiss retail banking industry. There is an important caveat, however. The changes in concentration in the past decade have been gradual, whereas the merger implies a quite abrupt shift in industry structure. Moreover, the game played in the local oligopolies may change in the future as the new UBS becomes the biggest player in some cantons where it formerly only ranked in second or third position.

#### 4.5 The model

The general specification of the model is as follows (see Hannan (1991a)):<sup>12</sup>

$$(1) \quad rL_i = \alpha_0 + \alpha_1 \cdot CONC_i + \alpha_2 M_i + \alpha_3 B_i + \varepsilon_i$$

$$(2) \quad rD_i = \beta_0 + \beta_1 \cdot CONC_i + \beta_2 M_i + \beta_3 B_i + \nu_i$$

where  $rL_i$  denotes the loan rate of bank  $i$ ,  $rD$  denotes the savings deposits rate,  $CONC$  a concentration index (either the Herfindahl or the C3 index),  $M$  a vector of market characteristics and  $B$  a vector of bank characteristics.

As mentioned earlier (see Section 4.1), we estimate the relationship between interest rates and concentration (i) between the cantons and (ii) over time, based on pooled data. For the canton analysis, we introduce period specific intercepts. By doing this, we control for periods' idiosyncrasies,

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<sup>12</sup> Hannan (1991b) suggests introducing market share together with its interaction with concentration in the estimated equation. Our estimates based on this second specification do not differ substantially from those obtained with equation (1) and (2), although colinearity problems appear because of the interaction term.

such as the level of the competitive reference rate and the national average of the cantonal concentration indices at a given time. Under this first approach, the coefficient of the concentration index will capture the impact of changes in concentration from one canton to another, without respect for the national trend in concentration. For the time-analysis, we include canton-specific intercepts. This allows us to control for cantons' idiosyncrasies, such as the average level of concentration in a canton over the reference period. Under this second approach, the coefficient of the concentration index will capture the influence of the variations in concentration over time, without respect for the average level of concentration in a canton over the reference period.

The approach traditionally employed in the empirical industrial organisation literature is cross-section analysis. Examples for the banking industry are Evanoff and Fortier (1988), Berger and Hannan (1989), Hannan (1991a) and Neuberger and Zimmerman (1991). Recently, the traditional approach has come under attack, mostly because market idiosyncrasies are difficult to control for and questions the appropriateness of static comparisons between markets. Under the term "the new empirical industrial organization", Bresnahan (1989) proposed to investigate market power by time-series analysis. Examples for the banking industry are Hannan and Liang (1991) and Simons and Stavins (1998). By pooling the data, we are able to apply both approaches with the same data set.

Besides these formal considerations, cross-section and time-series analyses lead to different policy conclusions. A positive relationship between concentration and prices in a cross-section study indicates that antitrust policy should be intensified in markets with high concentration. A positive relationship in a time-series analysis, however, indicates that antitrust policy should intervene in cantons where concentration is increasing.

Equations (1) and (2) suggest that savings and mortgage rates depend on concentration as well as on variables specific to banks and cantons.

To control for canton-specific characteristics, we introduce the number of per capita bank offices and average per capita income as explaining variables. Per capita bank offices (*PCBO*) reflects the relative availability of bank offices and can be seen as a measure of competition in the banking market. If more offices mean greater competition, higher deposit rates and a positive sign are expected. Alternatively, a higher number of offices per capita enhances a bank's ability to deliver services. Transactions costs and, perhaps, information costs seem to be important for customers and convenience of location can then be seen as a form of product differentiation (Rhoades (1996b)). The variable thus approximates the convenience and service differentials between cantons, and the expected sign of the variable is negative for savings deposits. Finally, the number of offices per capita can be used as a proxy for strategic barriers to entry established by incumbent banks (branch proliferation), as noted by Gilbert and Matutes (1993). In case of branch proliferation, we expect a negative impact of *PCBO* on savings deposits rates. The average per capita income (*INC*) measures the relative wealth of bank customers. Wealthy customers may have attractive investment opportunities, which increases the price elasticity of deposit supply and reduces the market power of local banks.

To control for bank-specific characteristics, we introduce a dummy variable *CANT* which reflects the state guarantee for cantonal banks. *CANT* is unity for cantonal banks and zero otherwise. It is expected to have a negative sign for savings and deposits, as investors demand a lower risk premium for banks liabilities guaranteed by the state. *NUMB*, the number of branches a bank has in a specific canton, serves as a proxy for the convenience and service components of a bank's product. Banks may offset lower deposit rates by the advantages of an extensive network of branches. The average salaries of a bank (*SAL*) is introduced for the same purpose, namely as a proxy for the quality of a bank's service. The expected sign of *SAL* and *NUMB* for savings and deposits is negative. Finally, the variable *SIZE* (total assets) serves as a measure of a bank's size, which may be considered an indicator of a bank's health. Better health leads to lower demanded risk premia and, therefore, to lower deposit rates. Bank total assets also influence operating and refinancing costs.

For mortgages, we additionally have to control for credit risk. An increase of the risk of mortgage lending is expected to lead to higher risk premia, which induce higher mortgage rates. As a proxy for the risk, we use the ratio of provisions to total assets (*RPRO*).

#### 4.6 The data

We use end-of-year interest rates for savings deposits and mortgages at cantonal and regional banks for the period 1987 to 1997. Our database does not cover banks operating in more than one canton, which excludes the big banks. All bank-related data stem from the Swiss National Bank database “IPSO” while the data on population and income stem from the “Annuaire statistique de la Suisse”.

#### 4.7 Relationship between concentration and prices between cantons

In this section, we examine the relationship between concentration and interest rates based on their variation from one canton to another. For this approach, the three hypotheses are:

- Contestable-markets hypothesis (H0): differences of concentration between cantons have no impact on savings deposits and mortgage rates;
- Structure-performance hypothesis (H1): differences of concentration between cantons have a negative (positive) impact on savings deposits (mortgage) rates;
- Market-efficiency hypothesis (H2): differences of concentration between cantons have a positive (negative) impact on savings deposits (mortgage) rates.

A confirmation of H1 would have two implications for anti-trust policy. First, it would indicate that the national concentration indices underestimate the possible impact of concentration on interest rates. And second, it would indicate that anti-trust policy should be intensified in cantons with high concentration indices.

##### 4.7.1 Specification of the model

By inserting the control variables mentioned above into equations (1) and (2), we get the following specifications for savings deposits

$$(1') \quad rD_i = \beta_0 + \beta_1 CONC_i + \beta_2 PCBO_i + \beta_3 INC_i + \beta_4 NUMB_i + \beta_5 SAL_i + \beta_6 SIZE_i + \beta_7 CANT_i + v_i$$

and for mortgage rates

$$(2') \quad rL_i = \alpha_0 + \alpha_1 CONC_i + \alpha_2 PCBO_i + \alpha_3 INC_i + \alpha_4 NUMB_i + \alpha_5 SAL_i + \alpha_6 SIZE_i + \alpha_7 RPRO_i + \varepsilon_i$$

where  $CONC_i$  is the concentration indicator (Herfindahl index or C3 index) for the product under consideration. The intercepts act as proxies for the rate of an alternative competitive financing source, or a competitive investment opportunity of the bank. Hannan (1991a) uses a similar approach in his empirical analysis of the US loan market.

Equations (1') and (2') are estimated separately for the years 1989, 1993 and 1997, and on a pooled basis for 1989-97. In the latter case, the intercepts are estimated separately for each year to control for periods' idiosyncrasies.

##### 4.7.2 Results

Tables 8 and 9 present the results for savings deposits and mortgage loans

For savings deposits, the coefficients of both concentration indicators are positive and significant at the 1% level in the pooled estimates. In the cross-section estimates, the relationship between concentration and savings deposits rates is also positive, but only at the 5% significance level.

Table 8  
Estimation results for savings deposits rates

	Herfindahl index				C3 index			
	1989	1993	1997	1989-97	1989	1993	1997	1989-97
Intercept 1989	3.88 (39.25)			4.03 (68.37)	3.89 (39.95)			3.99 (66.47)
Intercept 1991				5.21 (87.27)				5.17 (84.36)
Intercept 1993		3.75 (22.7)		3.89 (65.10)		3.73 (21.39)		3.85 (62.23)
Intercept 1995				2.95 (49.57)				2.90 (46.55)
Intercept 1997			2.11 (16.73)	1.93 (29.04)			1.94 (13.48)	1.88 (27.41)
<b>Concentration</b>	<b>0.271 *</b> (2.13)	<b>0.477 *</b> (2.13)	<b>0.889 **</b> (3.34)	<b>0.497 **</b> (5.74)	<b>0.517 *</b> (2.01)	<b>0.284</b> (1.22)	<b>0.753 *</b> (3.06)	<b>0.360 **</b> (4.25)
Per capita bank offices	0.292* (2.34)	0.353 (1.87)	-0.00353 (-0.30)	0.0883 (1.29)	0.277* (2.09)	0.313 (1.59)	-0.108 (-0.88)	0.0340 (0.47)
Average income per capita	-2.82E-06 (-1.64)	4.80E-06 (1.56)	-3.50E-06 (-1.44)	1.08E-06 (1.00)	-2.73E-06 (-1.29)	4.07E-06 (1.13)	-6.39E-06 (-2.18)	-3.60E-06 (-0.28)
Bank assets	1.27E-09 (0.18)	6.64E-11 (0.01)	5.23E-09 (0.80)	7.74E-11 (0.03)	6.87E-10 (0.09)	-3.95E-10 (-0.04)	4.36E-09 (0.67)	-4.35E-10 (-0.15)
Average salary of employees	0.00392** (3.98)	-0.00218 (-1.63)	-0.000210 (-0.68)	-0.000184 (-0.62)	0.00360** (3.64)	-0.000245 (-1.83)	-0.000185 (-0.59)	-0.000208 (-0.70)
Number of branches	-0.000409 (-0.36)	0.000223 (1.15)	0.000874 (1.06)	0.001511** (2.77)	-0.003602** (3.64)	0.00207 (1.06)	0.000946 (1.14)	0.00144** (2.62)
Cantonal bank dummy	-0.101 (-1.72)	-0.304** (-3.24)	-0.305** (-3.46)	-0.214** (-6.02)	-0.0802 (-1.36)	-0.282** (-2.94)	-0.281** (-3.23)	-0.196** (-5.48)
Adjusted R <sup>2</sup>	0.071	0.083	0.147	0.947	0.055	0.065	0.135	0.946

In parentheses: t-values Student. \* or \*\* indicate that the coefficient is significant at the 5% or 1% level respectively.

Table 9  
Estimation results for mortgage rates

	Herfindahl index				C3 index			
	1989	1993	1997	1989-97	1989	1993	1997	1989-97
Intercept 1989	5.85 (47.44)			5.88 (98.99)	5.89 (46.91)			5.95 (98.04)
Intercept 1991				7.10 (118.72)				7.18 (116.07)
Intercept 1993		6.19 (25.18)		6.05 (101.13)		6.28 (27.08)		6.12 (98.98)
Intercept 1995				5.44 (92.43)				5.54 (88.68)
Intercept 1997			4.27 (62.73)	4.53 (71.51)			4.12 (49.67)	-1.27E-08 (-0.13)
<b>Concentration</b>	<b>-0.492**</b> (-3.58)	<b>-0.581*</b> (-1.98)	<b>0.15</b> (0.53)	<b>-0.50**</b> (-6.02)	<b>-0.279*</b> (-2.04)	<b>-0.662*</b> (-2.11)	<b>0.17</b> (0.68)	<b>-0.421**</b> (-4.86)
Per capita bank offices	0.0256 (0.19)	-0.146 (-0.51)	0.0862 (1.48)	-0.0277 (0.40)	0.0495 (0.33)	-0.0646 (0.27)	0.0696 (1.18)	0.0192 (0.27)
Average income per capita	-3.58E-07 (-0.18)	-2.43E-06 (-0.52)	-2.02E-06 (-1.50)	2.27E-07 (0.20)	-5.14E-08 (-0.02)	1.35E-06 (0.27)	-2.62E-06 (-1.80)	1.74E-06 (1.33)
Bank assets	-1.87E-08* (-2.24)	-1.44E-10 (-0.01)	5.74E-09* (2.51)	-9.15E-10 (-0.32)	-1.9E-08* (-2.25)	-1.12E-09 (-0.08)	5.80E-09* (2.54)	-9.27E-10 (-0.33)
Average salary of employees	0.00131 (1.10)	6.44E-05 (0.03)	-7.26E-08 (-0.81)	-6.82E-08 (-0.67)	0.00173 (1.44)	3.52E-08 (0.17)	-1.51E-07 (-1.11)	-1.27E-08 (-0.13)
Number of branches	0.00219 (1.71)	0.000904 (0.32)	-0.0015** (-3.18)	0.000218 (0.38)	0.00226 (1.72)	0.00108 (0.38)	-0.0013** (-2.97)	0.000216 (0.38)
Ratio of provisions to total assets	-14.61 (-1.66)	2.90 (0.28)	12.06** (2.83)	0.033 (0.49)	-17.16 (-1.92)	4.74 (0.47)	13.41** (3.09)	0.0383 (0.56)
Adjusted R <sup>2</sup>	0.122	0.036	0.21	0.900	0.055	0.042	0.21	0.899



The results for mortgages mirror those for savings deposits. The coefficient of the concentration indices are negative and significant at the 1% level in the pooled data estimations and negative and significant at the 5% level in the cross section estimations for each year.

The positive (negative) and significant relations observed between concentration and savings deposits (mortgages) rates lead us to reject the structure performance paradigm for both products. Our results are compatible with the market-efficiency as well as the hypothesis of consumer friendly pricing by dominant cantonal banks. However, the results could also be driven by differences in market size due to our definition of cantons as relevant markets. In order to discriminate between these hypotheses, we have performed additional tests.

#### 4.7.3 Testing the hypothesis of consumer friendly pricing by cantonal banks

In the case of consumer friendly pricing by cantonal banks, the positive (negative) relationship between savings deposits (mortgages) rates and concentration should be observable only in markets where the cantonal bank has a dominant position. To test this hypothesis, we create two dummy variables, *MAJ* and *MIN*, which reflect the dominance of the cantonal bank and enter directly in interaction with the concentration indices. *MAJ* is unity when the cantonal bank controls more than half of the market and zero otherwise.<sup>13</sup> Conversely, *MIN* is unity when the cantonal banks controls less than half of the market and zero otherwise.

Table 10  
Estimation results for data pooled over the 1987-97 period

	Savings deposits		Mortgages	
	Herfindahl	C3	Herfindahl	C3
Intercept 1989	4.03 (67.44)	3.99 (65.56)	5.87 (97.89)	5.96 (96.23)
Intercept 1991	5.21 (86.20)	5.17 (83.36)	7.10 (117.94)	7.18 (113.17)
Intercept 1993	3.89 (64.15)	3.84 (61.38)	6.04 (100.39)	6.13 (96.81)
Intercept 1995	2.96 (49.12)	2.90 (46.12)	5.44 (92.02)	5.53 (85.72)
Intercept 1997	1.93 (28.87)	1.88 (27.17)	4.53 (71.17)	4.62 (68.16)
<b>MAJ x Concentration</b>	<b>0.501**</b> (5.75)	<b>0.357**</b> (4.20)	<b>-0.547**</b> (-6.02)	<b>-0.413**</b> (-4.42)
<b>MIN x Concentration</b>	<b>0.562**</b> (3.28)	<b>0.345**</b> (3.54)	<b>-0.710**</b> (-3.72)	<b>-0.402**</b> (-3.40)
Per capita bank offices in canton	0.0814 (1.16)	0.0393 (0.53)	-0.00566 (-0.08)	0.0146 (0.19)
Average cantonal income per capita	9.99E-07 (0.91)	-2.90E-07 (-0.22)	9.42E-07 (0.75)	1.61E-06 (1.13)
Bank assets	2.46E-10 (0.08)	-5.24E-10 (-0.18)	-1.48E-09 (-0.52)	-8.46E-10 (-0.29)
Average salary of bank employees	-0.000176 (-0.59)	-0.000213 (-0.71)	-2.001E-08 (-0.21)	-1.35E-08 (-0.14)
Cantonal bank dummy	-0.215 (0.91)	-0.196** (-5.47)		
Bank number of branches	0.00147** (2.65)	0.00146** (2.63)	0.000334 (0.58)	0.000206 (0.36)
Ratio of provisions to total assets			0.0372 (0.55)	0.0377 (0.55)

<sup>13</sup> Obviously, introducing only one dummy variable would suffice as the two dummies sum to unity. The two specifications lead to identical results. Our approach, however, makes the interpretation of the results easier.

The modified specification for savings deposits can thus be written as:

$$rD_i = \beta_0 + \beta_1 MAJ \cdot CONC_i + \beta_2 MIN \cdot CONC_i + \beta_3 PCBQ + \beta_4 INC_i + \beta_5 NUMB_i + \beta_6 SAL_i + \beta_7 SIZE_i + \beta_8 CANT_i + v_i$$

and for mortgages as:

$$rL_i = \alpha_0 + \alpha_1 MAJ \cdot CONC_i + \alpha_2 MIN \cdot CONC_i + \alpha_3 PCBQ_i + \alpha_4 INC_i + \alpha_5 NUMB_i + \alpha_6 SAL_i + \alpha_7 SIZE_i + \alpha_8 RPRO_i + \varepsilon_i$$

According to the results in Table 10, the coefficients of both concentration indicators remain positive and significant at the 1% level for savings deposits and mortgages, independently of the dominance of the cantonal bank. The hypothesis of consumer friendly pricing by dominant cantonal banks can therefore be rejected. The remaining hypotheses compatible with our results are thus the efficiency paradigm and the possibility of a bias related to differences in cantons' size.

#### 4.7.4 Testing for the influence of canton size

To test the possibility that the relationship between interest rates and concentration is biased by differences in size between the cantons, we have divided the 26 cantons into three classes according to their population. The "large" class contains the cantons with more than 300,000 inhabitants (8 cantons), the "medium" class cantons with population between 300,000 and 100,000 (9 cantons) and the "small" class with the remaining 9 cantons with less than 100,000 inhabitants.

Tables 11 and 12 present the results for both products: to save space, we display only the coefficient of the concentration indices and the F- and p-values based on a Wald test of the null hypothesis that concentration has no impact on interest rates.

Table 11  
Savings deposits: separate estimates for cantons stratified by size

		Herfindahl			C3		
		Small canton	Medium canton	large canton	Small canton	Medium canton	large canton
MAJ x Concentration	Coefficient	1.09 **	0.209	0.22	0.98 **	0.398	0.32
	F-value	13.83	0.28	0.52	12.24	1.43	0.11
	probability	0.0002	0.6034	0.4778	0.0005	0.2302	0.7447
MIN x Concentration	Coefficient	1.23 *	0.296	-1.11 **	1.01 **	0.443	-2.11 *
	F-value	4.22	0.17	11.89	7.46	1.26	4.44
	probability	0.0399	0.6845	0.0006	0.0063	0.2606	0.0350

\* or \*\* indicate that the coefficient is significant at the 5% or 1% level respectively..

Table 12  
Mortgages: separate estimates for cantons stratified by size

		Herfindahl			C3		
		Small canton	Medium canton	large canton	Small canton	Medium canton	large canton
MAJ x Concentration	Coefficient	-0.75*	0.046	0.138	-1.39 *	0.103	-0.0310
	F-value	3.73	0.10	0.61	4.59	0.18	0.09
	probability	0.0495	0.745	0.4345	0.032	0.672	0.7591
MIN x Concentration	Coefficient	-1.63*	0.332	-0.171	-1.75 *	0.213	-0.145
	F-value	3.90	1.78	0.81	4.65	0.58	1.87
	probability	0.04821	0.1824	0.3628	0.0315	0.4448	0.1717

\* or \*\* indicate that the coefficient is significant at the 5% or 1% level respectively..

Interestingly, concentration has a positive (negative) and significant impact on savings deposits (mortgages) only in small cantons, regardless of the dominance of the cantonal bank. No significant relationship is observed in medium-sized cantons. In large cantons, we find a negative relationship between concentration and savings deposits rates when the cantonal bank is not dominant.

#### **4.7.5 Interpretation of the results**

Our results support the efficiency paradigm for savings deposits as well as for mortgages, but only in small cantons. A possible explanation is that economies of scale quickly disappear with size. In large cantons, banks operate with high volumes (CHF 1,400 million average credit volume per bank); i.e. on the segment of the cost curve where economies of scale may have been exhausted. In that case, differences in bank size and, accordingly, in bank concentration may be unrelated to cost efficiency and to prices. Conversely, in small cantons, banks operate with lower volumes (CHF 500 million on average); i.e. on the segment of the cost curve where economies of scale may be present. Small cantons with larger banks and more concentrated systems may therefore present a higher level of efficiency than small cantons with low concentration, which implies a positive relationship between concentration and deposit (mortgage) interest rates. In medium-sized cantons, both the structure-performance and the market-efficiency hypotheses are rejected. In large cantons, finally, the structure-performance hypothesis cannot be rejected for savings deposits when the cantonal bank is not dominant. For mortgages, the absence of a significant relationship leads us to reject both the structure-performance and the market-efficiency hypothesis.

The reliability of our results is reduced by several factors. First, we do not dispose of data for banks active in more than one canton, which excludes major players like the big banks. This omission does not affect the analysis for the market segment of savings deposits, as the big banks set uniform national rates for this product. For mortgages, however, the publication of a national reference rate does not exclude the possibility of cantonal discrimination, as margins related to market power may be absorbed in canton-specific risk premia. A more rigorous analysis of competition in the mortgage market would therefore require the inclusion of big banks' interest rates stratified by cantons. Unfortunately, this statistic is not available. Second, our market definition was imposed by data constraints and therefore contains some arbitrariness. In particular, the cantonal market definition may be too narrow for small cantons and too broad for large cantons. Third, the control variables did not perform well in explaining cantonal and individual bank idiosyncrasies. Hence, misspecification cannot be excluded. Fourth, the dominance of the cantonal banks in the majority of the cantons reduces the pertinence of the test of the structure performance paradigm based on the absolute level of concentration.

Our results contrast sharply with those obtained in similar studies for the United States, which generally support the structure performance paradigm for retail banking products. Hannan (1991a) finds that the C3 index has a positive and significant impact on commercial loans of less than 100,000 dollars, while Neuberger and Zimmerman (1991) observe a negative and significant impact of the C3 concentration ratio on negotiable order of withdrawal deposit accounts and money market deposit accounts. Using data from 1996 data, Radecki (1998) finds a positive impact of concentration on savings rates at state levels, but no impact at local levels. In addition to the aforementioned drawbacks in our database, two main elements may explain the observed differences between the United States and Switzerland. First, the regional segmentation of the banking market may be less pronounced in Switzerland; distances are shorter, there are no legal restrictions to bank entry in the cantons, and the big banks may help equalising the cantonal level of competition by setting national reference rates. Second, the domination of the cantonal bank reduces the relevance of the level of concentration in tests of the structure performance paradigm.

## **4.8 Relationship between concentration and prices over time**

In this section, we test whether changes in concentration over time have had an impact on savings

deposits and mortgages rates. A similar approach has been used by Simons and Stavins (1998) in their study of the impact of mergers on MMDA and CD's interest rates in the United States.

We conduct two tests. The first is specified in relative terms. It determines whether deposit (mortgage) rates decrease (increase) by more than the national average in those cantons where concentration increased by more than the national average. Using this approach, we can omit including a competitive reference rate as control variable (alternative refinancing source or investment opportunity). This constitutes a substantial advantage, given the difficulty of identifying an appropriate reference rate for instruments without explicit maturity like savings deposits and mortgages. The main weakness of the relative test is its inability to capture the impact of changes in concentration on prices when concentration indices follow a similar trend in all cantons.

For the relative test, the hypotheses are:

- Contestable-markets hypothesis (H0): changes of concentration over time differing from the national average have no impact on interest rates;
- Structure-performance hypothesis (H1): changes of concentration over time differing from the national average have a negative (positive) effect on deposit (mortgage) interest rates;
- Market-efficiency hypothesis (H2): changes of concentration over time differing from the national average have a positive (negative) effect on deposit (mortgage) interest rates.

The second test is specified in absolute terms and attempts to determine whether absolute changes in the concentration indices affect the relationship between deposit (mortgage) interest rates and the competitive reference rate. This approach can identify the impact of concentration on interest rates even in cases where the changes in concentration are similar in all cantons. However, its reliability is reduced by the difficulty of controlling precisely for the competitive reference rate.

For this test, the hypotheses are similar to those above except that for each hypothesis we look at changes in absolute rather than relative terms.

A confirmation of H1 in the absolute or in the relative test would have two implications for antitrust policy. First, it would indicate that changes in the cantonal concentration indices are more relevant than changes in the national indices. Second, it would indicate that policy has to be intensified in cantons where the merger leads to an important increase in concentration index, independently of the absolute level of the indices.

The results of the analysis should not be mechanically extrapolated to make a prediction of the impact of the UBS-merger on competition. As shown in Table 13, the average increase in concentration implied by the UBS merger is similar in amplitude to the variations in concentration observed during the last ten years. Nothing guarantees that the instantaneous change in concentration implied by the merger will have an impact on interest rates similar to changes in concentration of the same amplitude but occurring progressively over a decade.

Table 13  
**Trends in concentration: comparison between the UBS merger and that of the last ten years**

	Mortgages		Savings deposits	
	C3	Herfindahl	C3	Herfindahl
Variation implied by the merger (cantonal average)	0.078	0.041	0.060	0.035
Variation during the period 1987-97 (cantonal average of absolute values)	0.059	0.044	0.048	0.049
Maximal range during the period 1987-97 (cantonal average)	0.081	0.060	0.067	0.063

Our estimation method is pooled data analysis with canton-specific intercepts. The database includes annual observations for the period 1987-97. The pooling of the data over the different cantons increases the degrees of freedom. The inclusion of canton-specific intercepts neutralises the impact of cantonal characteristics, as far as those are stable over time. This means, in particular, that our estimations capture the impact of changes in concentration over time in a different canton, without respect to the average level of concentration in this canton over the reference period.

#### 4.8.1 Specification of the model in relative terms

We use the following specifications for the savings deposits:

$$\tilde{r} D_i^t = \beta_k + \beta_1 \cdot \tilde{CONC}_i^t + \beta_2 \cdot \tilde{PCBO}_i^t + \beta_3 \cdot \tilde{WAGE}_i^t + \beta_4 \cdot \tilde{CANT}_i^t + \epsilon_i^t$$

and for mortgage loans:

$$\tilde{r} L_i^t = \alpha_k + \alpha_1 \cdot \tilde{CONC}_i^t + \alpha_2 \cdot \tilde{PCBO}_i^t + \alpha_3 \cdot \tilde{WAGE}_i^t + \alpha_4 \cdot \tilde{RPRO}_i^t + v_i^t$$

where  $\alpha_k$ ,  $\beta_k$  are canton specific intercepts and all variables with a *tilde* are defined as deviations from the national mean; for example,  $\tilde{r} D_i^t = rD_i^t - rD_{CH}^t$ , with  $rD_{CH}^t$  representing the national mean.<sup>14</sup>

#### 4.8.2 Specification of the model in absolute terms

As said above, the test in absolute terms requires the inclusion of a competitive reference rate as control variable. In the absence of an explicit maturity for savings deposits and mortgages, we proxy the reference rate with a basket of money market and swap rates.

We use the following specifications for the savings deposits:

$$rD_i^t = \beta_k + \beta_1 \cdot CONC_i^t + \beta_2 \cdot PCBO_i^t + \beta_3 \cdot SAL_i^t + \beta_4 \cdot CANT_i^t + \beta_5 \cdot ilm^t + \beta_6 \cdot i3y^t + \beta_7 \cdot i10y^t + v_i^t$$

and for mortgage loans:

$$rL_i^t = \alpha_k + \alpha_1 CONC_i^t + \alpha_2 PCBO_i^t + \alpha_3 SAL_i^t + \alpha_4 RPRO_i^t + \alpha_5 \cdot ilm^t + \alpha_6 \cdot i3y^t + \alpha_7 \cdot i10y^t + \epsilon_i^t$$

where  $ilm^t$  is the one-month money market rate,  $i3y^t$  the three-year swap rates (one year moving average) and  $i10y^t$  the ten-year swap rates (one year moving average).

#### 4.8.3 Results

Table 14 presents the results for savings deposits and mortgages based on the test in relative terms. We observe a negative relationship between savings deposits rates and concentration, significant at the 1% level for the Herfindahl index and at the 5% level for the C3 index. No significant relationship emerges between mortgage rates and concentration.

The negative relationship between savings deposits and the Herfindahl index remains significant in the test in absolute terms (Table 15), although at the 5% level only, while the relationship with the C3 index disappears. For mortgages, the test in absolute terms confirms the absence of a significant relationship between concentration and interest rates.

Overall, the results provide partial evidence in favour of the structure-performance hypothesis for savings deposits. Concerning mortgages, none of the concentration indicators have a significant influence on interest rates and we can reject the structure-performance hypothesis for this product.

<sup>14</sup> The national mean does not include banks active in more than one canton.

Table 14  
**Test in relative terms**  
Pooled data estimates with canton-specific intercepts, period 1987-97

All variables defined as deviations from the national mean	Savings deposits		Mortgages	
	Herfindahl	C3	Herfindahl	C3
<b>Concentration</b>	<b>-1.55**</b>	<b>-0.565*</b>	<b>-0.454</b>	<b>-0.473</b>
	(-4.20)	(-2.12)	(-1.11)	(-1.43)
Total per capita bank offices	-0.0268	0.0402	0.00707	0.0177
	(-0.65)	(1.28)	(0.17)	(0.41)
Average salary of bank's employees	-0.000491	-0.000342	0.00465	0.000672
	(-1.01)	(-0.70)	(1.01)	(1.70)
Cantonal bank dummy	-0.0934**	-0.0722**		
	(-3.22)	(-2.74)		
Ratio of provisions to total assets			0.0296	0.0324
			(0.46)	(0.50)
Maximal canton specific intercept	0.734**	0.409**	0.21	0.265
	(5.82)	(4.40)	(1.60)	(1.94)
Minimal canton specific intercept	-0.167*	-0.250*	-0.593**	-0.561**
	(-2.27)	(-2.61)	(-4.76)	(-4.61)
Adjusted R <sup>2</sup>	0.267	0.252	0.103	0.106

Table 15  
**Test in absolute terms**  
Pooled data estimates with canton-specific intercepts, period 1987-97

	Savings deposits		Mortgages	
	Herfindahl	C3	Herfindahl	C3
<b>Concentration</b>	<b>-1.19*</b>	<b>0.142</b>	<b>-0.614</b>	<b>-0.571</b>
	(-2.08)	(0.33)	(-1.26)	(-1.54)
Total per capita bank offices	-0.528**	-0.579**	-0.389**	-0.378**
	(-6.13)	(-6.44)	(-5.05)	(-4.96)
Average salary of bank's employees	-0.000979	-0.00100	0.00129	0.00134
	(-1.29)	(-1.32)	(1.49)	(1.42)
1-month interbank rate	-0.818**	-0.812**	-0.806**	-0.808**
	(-35.38)	(-34.05)	(-41.44)	(-41.64)
10-year swap rate (12-month moving average)	-3.58**	-3.58**	-3.14**	-3.12**
	(-30.07)	(-30.07)	(-31.28)	(-31.05)
3-year swap rate (12-month moving average)	3.99**	3.99**	3.58**	3.57**
	(37.04)	(36.73)	(39.31)	(39.25)
Cantonal bank dummy	-0.0837	-0.0848*		
	(-1.95)	(-1.97)		
ratio of provisions to total assets			0.103	0.107
			(1.43)	(1.48)
Maximal canton specific intercept	9.47**	9.09**	9.23**	10.49**
	(24.89)	(20.53)	(42.02)	(31.86)
Minimal canton specific intercept	7.96**	7.67**	10.38**	9.47**
	(29.11)	(19.38)	(33.55)	(31.45)
Adjusted R <sup>2</sup>	0.918	0.918	0.878	0.878

#### 4.8.4 Pools including cantons with similar features

As said above, the 26 cantons present a number of specific characteristics, and it may be interesting to conduct separate estimates for pools of cantons with common features. We have divided the cantons into pools of about the same size according to the criteria (i) amplitude of the change in concentration, (ii) correlation between the concentration index and the cantonal bank market share, (iii) population size, and (iv) level of concentration at the beginning of the sample period. The estimation results for each pool are presented in Tables 16 to 19: to save space, we display only the coefficient of the concentration index and its F- and p-values based on a Wald test of the null hypothesis that concentration has no impact on savings deposits rates.

Large variations in concentration are more likely to affect competition as they can modify the game played in the regional oligopolies (emergence of a new market leader etc.). The negative relationship between concentration and savings deposits should be more visible in cantons which experienced large variations of concentration during the reference period. The results in Table 16 confirm this assumption for the Herfindahl index, but are inconclusive for the C3 index.

Table 16  
Estimates stratified by the amplitude of the concentration change

Savings deposits		Variations in Herfindahl index			Variations in C3 index		
		small amplitude	medium amplitude	large amplitude	small amplitude	medium amplitude	large amplitude
Absolute test	Coefficient	-0.752*	-0.696	-1.28*	-3.91	-3.07*	0.51
	F-value	4.42	0.16	4.28	0.55	2.62	0.99
	Probability	0.0354	0.6860	0.0387	0.4574	0.055	0.3175
Relative test	Coefficient	-0.789	0.246	-1.85**	-2.35*	0.0539	0.124
	F-value	0.30	0.07	12.13	4.69	0.00	0.13
	Probability	0.5822	0.789	0.0005	0.0303	0.9391	0.7209

If cantonal banks are not profit maximisers, the negative impact of concentration on savings deposits interest rates over time should be more pronounced in the cantons where the changes in concentration are not highly correlated with changes in the cantonal bank market share. As shown in Table 17, the hypothesis is supported by the estimations based on the Herfindahl index. For the C3 index, however, the results are inconclusive.

Table 17  
Estimates stratified by the correlation between changes in concentration and changes in the cantonal bank market share

Savings deposits		Herfindahl index			C3 index		
		low correlation	medium correlation	high correlation	low correlation	medium correlation	high correlation
Absolute test	Coefficient	-4.58**	0.0866	-3.30**	0.172	0.454	-2.92*
	F-value	7.30	0.05	11.02	0.03	0.53	4.05
	Probability	0.0069	0.9409	0.0009	0.8600	0.4673	0.0442
Relative test	Coefficient	-2.61**	-1.43	-0.315	-0.921*	0.209	-0.441
	F-value	10.66	3.50	0.14	3.12	0.22	0.53
	Probability	0.0010	0.0614	0.7189	0.0475	0.6454	0.3903

Concerning canton size, we could expect the negative relationship between concentration and savings interest rates to be more pronounced in large than in small cantons, where increases in concentration might lead to efficiency gains in the presence of decreasing economies of scale. The results for the Herfindahl index confirm this hypothesis, while those based on the C3 index provide no significant results.

Table 18  
Estimates stratified by cantons' population size

Savings deposits		Herfindahl index			C3 index		
		low population	medium population	high population	low population	medium population	high population
Absolute test	Coefficient	-1.49	-1.36	-0.269*	0.447	0.69	-0.465
	F-value	1.38	0.79	0.39	0.05	1.03	0.55
	Probability	0.24	0.38	0.0328	0.8315	0.3096	0.4578
Relative test	Coefficient	-0.718	-0.782	-1.65**	-1.54	-0.182	0.175
	F-value	0.71	0.68	7.21	2.74	0.17	0.19
	Probability	0.398	0.4102	0.0072	0.0978	0.6843	0.6644

We had no priors about the impact of the initial level of concentration on the relationship between changes in concentration and changes in savings deposits rates. According to Table 19 the negative impact of the Herfindahl index on interest rates is more significant in cantons where the initial concentration level was low. For the C3 index, the negative impact of concentration is more significant in cantons with a medium initial level of concentration.

Table 19  
Estimates stratified by the initial level of the concentration index

Savings deposits		Herfindahl index			C3 index		
		low level	medium level	high level	low level	medium level	high level
Absolute test	Coefficient	-2.17*	1.67	-1.48	0.650	-1.98*	-1.98
	F-value	4.07	3.61	0.90	1.04	3.94	0.34
	Probability	0.025	0.0572	0.3353	0.3073	0.04717	0.5576
Relative test	Coefficient	-1.78*	0.809	-2.29	-1.22	-0.899	-2.19
	F-value	6.33	1.65	1.68	1.51	3.68	1.48
	Probability	0.01187	0.1944	0.1944	0.2198	0.05492	0.2231

#### 4.8.5 Interpretation of the results

The above results are compatible with the structure performance paradigm for savings deposits, while this paradigm is not supported for mortgages.

The fact that the negative relationship between changes in savings deposits rates and changes in concentration is more pronounced in the cantons which experienced greater changes in concentration or where the changes in concentration were not closely correlated with changes in the cantonal bank market share confers some reliability to our results.

The absence of a significant relationship between concentration and mortgage interest rates is surprising, as this instrument also belongs to retail banking products where we usually suspect regional segmentation and a low contestability of the market. The heterogeneous nature of our



mortgage rates sample, which contains mortgages with variable as well as fixed interest rates, may explain this lack of consistency. The difficulty of controlling the riskiness of lending on a forward looking basis also reduces the reliability of the estimates for mortgages.

#### **4.9 Conclusions**

Overall, our study yields ambivalent results on the relationship between concentration and interest rates in the retail banking industry.

On the one hand, the canton-analysis indicates that changes in concentration from canton to canton are positively (negatively) related with savings deposits (mortgages) interest rates, at least in small cantons. This result contradicts the structure performance paradigm and supports the efficiency paradigm. For medium and large cantons, the structure-performance hypothesis has to be rejected.

Based on these results, antitrust authorities should not be too preoccupied with high concentration indices in small cantons, as the efficiency effects of concentration seem to have dominated in the past. In future, however, the high level of concentration in some cantons may generate market power problems if cantonal banks try to exploit their dominant position, or if big banks get a dominant position and switch from the policy of a national interest rate to cantonal discrimination. From that perspective, the recent renouncement of the big banks to publish national reference rates for mortgages increases the scope for spatial discrimination.

On the other hand, the time-series analysis indicates that changes in concentration over time are negatively related to savings deposits interest rates, especially in cantons characterised by large population and low correlation between the concentration index and the cantonal bank market share. For mortgages, we observe no significant relationship between changes in concentration over time and interest rates. Based on these results, antitrust agencies should intervene against increases in the concentration level, especially in large cantons where the efficiency motivation seems less likely.

Several elements can explain the contrast between our results and those obtained for the United States, where the bulk of empirical evidence supports the structure-performance hypothesis for cross-section as well as for time series data, regardless of the size of the market. First, the absence of legal barriers to banks in the Swiss cantons, the shorter distances and the national interest rate policy of the big banks reduce the local segmentation of the Swiss retail banking market. Second, the dominant position of cantonal banks which are not necessarily profit maximisers makes the absolute level of concentration less relevant for the market power issue. Third, in small cantons, the efficiency gains implied by higher concentration may more than offset the negative effects related to market power.

Finally, we have to stress that the apparently harmless effects of absolute concentration indices on competition observed during the last years should not be carelessly extrapolated into the future. First, cantonal banks may get under greater pressure to adopt a profit maximising behaviour and, consequently, to exploit their dominant position. This shift could be triggered by a change of the ownership structure (possible privatisation) or by the abolishment of the state guarantee. Second, the game played in the local oligopolies may change in the future as the new UBS becomes the market leader in cantons where it formerly only ranked in second or third position. Third, we cannot exclude an attempt by big banks to introduce some cantonal discrimination for savings deposits and mortgages. In these three cases, the predictions of the structure performance paradigm could materialise in the cantons with high concentration levels, leading to undesirable effects on mortgages and savings deposits rates.

## Appendix: The impact of the merger on concentration, C3 indices

Table A1  
C3 indices in different ranges (number of cantons)

	Loans and mortgages			Savings deposits		
	1987	1997	UBS	1987	1997	UBS
0-69	12	8	2	10	8	2
70-79	5	9	6	6	9	7
80-89	5	4	11	6	4	10
90-100	4	5	7	4	5	7

Table A2  
Increase of C3-indices due to the UBS merger in different ranges (number of cantons)

	Loans and mortgages	Savings deposits
0-5	9	11
6-10	8	10
11-15	8	5
16-20	1	0

Table A3  
Relation between pre-merger levels and increases of C3-indices (number of cantons)

		0-5	6-10	11-15	16-20
Savings deposits	0-69	0	4	2	0
	70-79	3	3	2	0
	80-89	3	3	1	0
	90-100	5	0	0	0
Loans and mortgages	0-69	1	3	3	1
	70-79	2	2	5	0
	80-89	1	3	0	0
	90-100	5	0	0	0

Table A4  
C3 indices after the merger for cantons with a population under 200,000  
In parentheses: all cantons

	Loans and mortgages	Savings deposits
0-69	0 (2)	0 (2)
70-79	3 (6)	3 (7)
80-89	3 (11)	5 (10)
90-100	7 (7)	5 (7)

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