Board and Executive Compensation in State-Owned Banks
-
Empirical Evidence for Switzerland

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Abstract

The paper focuses on board and executive compensation practices of state-owned banks in Switzerland. Based on a sample of 23 cantonal banks over the period from 2002 to 2006, we investigate the main determinants of board and executive pay. We take into account firm-specific characteristics such as bank performance, size, and risk exposure. Given that the banks in our sample are owned almost entirely by the cantons, we also integrate a set of political-economic factors related to the cantons' financial power, their political orientation, and the remuneration of the state governors. In addition, we investigate the effects of the intensity of competition in the local mortgage markets on the compensation schemes. Our results suggest that board and executive compensation are governed by different mechanisms. In addition, political-economic factors as well as product market competition seem to be important determinants of board and executive pay at cantonal banks.

JEL Code: G30; J33; G2
Key Words: Board compensation; Executive Compensation; Banking industry; Pay for Performance; Political economy

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1 Introduction

In recent years, managerial pay has received a lot of attention in both the academic literature as well as in the popular business press.[1,2] Previous research has focused mainly on the compensation practices used at industrial firms. Very few studies concentrated on the banking industry. In addition, most of the work on executive compensation focused on US firms, for which disclosure requirements made available information on executive compensation. In Switzerland, the recent implementation of corporate governance regulations, including the disclosure requirements of stock exchanges, has led to a greater transparency of compensation practices in public companies traded on the Swiss stock market. As a result, data on compensation practices at Swiss banks have become more available.

Our paper is a further contribution to literature on compensation in the banking industry. In particular, we study the compensation practices of board members and executives in state-owned banks in Switzerland. The study has two purposes: First, it gives a recent overview of board and executive compensation practices in state-owned banks in Switzerland, the so-called cantonal banks. The banks in our sample, being ranked behind the big banks, represent the second most important bank group in Switzerland. Second, our analysis attempts to investigate the main determinants of compensation structures within state-owned banks, which are of particular interest in this context. Given the specific ownership structure, we take into account not only firm-specific characteristics commonly related to compensation issues, but we also integrate a set of political-economic factors that are expected to affect the remuneration schemes of the banks considered.

By the end of 2006, 331 banks were registered in Switzerland.[3] Based on criteria related to the banks' strategic position, the geographic market, and their legal form; the Swiss National Bank (SNB) classifies the banking institutes into the categories: *Cantonal Banks*, *Big Banks*, *Regional Banks*, *Raiffeisen Banks*, *Private Banks*, and *Other Banks*.[4] In our study, we restrict our attention to the cantonal banks. Our choice is motivated by the following. First, there is very little published analysis of the behavior of the Swiss cantonal banks,[5] and, given that cantonal banks are the second largest category of Swiss banks, there is a need for research in this area. Second, the cantons are the major (and, in most cases, the only) shareholders of the cantonal banks. Therefore, the cantonal banks belong indirectly to the citizens of their respective cantons. Such an ownership structure calls for a high degree of transparency of the banking activities, and this

[1] See Murphy (1999) or Core, Guay, and Larcker (2003) for reviews of the literature.
[2] See Handelszeitung no 40, 2005; Bilanz no 21/05, December 2005 or Neue Zürcher Zeitung no 213, Sept. 14th 2007.
[3] Bank statistics of the Swiss National Bank (SNB), www.snb.ch.
[4] More details about the different bank groups can be found in the appendix.
[5] See Pedergnana and Piazza (2004) for an analysis of the 24 Swiss cantonal banks over the years from 1997-2003.

includes the compensation of the banks' board and executive management. Third, our sample is limited to cantonal banks because of the limited availability of data for other types of banks, and because the banks of the different categories are not easily compared with each other. For example, a big bank differs from a regional bank not only with respect to its business activities and its earnings structure, but also with respect to the tasks, responsibilities, and the compensation schemes of its decision makers. Unfortunately, the Raiffeisen Banks (the Regional banks), the banks most comparable to the cantonal banks, have, in almost all cases, chosen not to publish their board and executive compensation figures and, therefore, cannot be included in our analysis.

Our sample includes 23 (out of the 24) cantonal banks in Switzerland, and presents data covering the years from 2002 to 2006. We use a multivariate regression framework and attempt to explain board and executive compensation by commonly used firm-specific variables such as performance, size, and risk exposure. As additional explanatory variables, we include a set of political-economic factors related to the cantons, such as the financial power of the canton, the compensation level of the state governors, the political orientation of the cantons, the canton's ownership share of the bank, and the canton's influence on setting board compensation. These factors are expected to affect the compensation practices of the banks in our sample. In addition, in the regional mortgage markets, we control for the market concentration, which might be an additional determinant of compensation.

As the first step in a two-step analysis, we explain the level of board and executive compensation by the firm-specific and canton-specific characteristics mentioned above. As the second step, we explore the extent to which pay is linked to performance, i.e., we estimate the effect of a change in bank performance from one year to another on the level as well as to changes of board and executive compensation over the same period.

The main results of our analysis are as follows: For state-owned banks, board and executive compensation depends not only upon the commonly used firm-specific pay determinants, but also upon canton-specific factors related to the political economic processes. In addition, our analysis reveals that, in addition to many shared factors, the board and executive compensation are partly driven by different factors. As to the specific pay determinants of board members, we find that the bank's performance of the past year has a negative impact on board pay, which is quite surprising. In contrast, bank size has a positive impact on board pay, while changing the bank's exposure to risk does not seem to matter. Interestingly, board members in financially stronger cantons earn less. Also, the governors' pay level has a positive impact on board compensation. Finally, the higher the cantons' ownership share of the bank, the less the board members earn, which may be some evidence for the impact of the forces of direct democracy.

Changes in board compensation are strongly related to changes in bank performance over the same period, which confirms effects described in the principal-agent theory.

Executive compensation, in contrast, seems to be positively related to the banks' past performance. Similarly, size and risk of the bank have both a positive and significant impact on executive pay. As to the political-economic factors, executives in wealthier and more politically conservative cantons earn more. In addition, the governors' pay is positively correlated with the level of executive compensation. Finally, the market concentration in cantonal mortgage markets seems to have a negative impact on executive compensation, i.e., executives in less concentrated and possibly more competitive markets earn more. Looking at the impact of the observed positive changes in performance on executive compensation over time, we find that the executives in our sample did not benefit from the better performance that occurred over the years considered. Although their compensation increased over time, the changes were not driven by improvements to bank performance.

The new aspects of our work are as follows. It is the first paper that investigates board and executive compensation practices in Swiss cantonal banks. While there are a few studies that investigate compensation issues of listed Swiss companies in different industries,[6] our study uniquely focuses on the banking industry. Second, our study considers not only the firm-specific characteristics that are commonly related to compensation issues, but it also includes political-economic factors that are likely to affect the remuneration structure in the banks under consideration. Third, while most of the existing papers focus on executive compensation only, our study investigates both board and executive compensation practices. Finally, our paper reveals some recent and interesting information about compensation practices in the Swiss banking industry. Given that banking is a business that values discretion and that the Swiss usually do not talk about their salaries, our paper provides valuable insight into a largely unexplored subject.

The paper is structured as follows. Section 2 describes the pay determinants included in our analysis. The data description is in section 3. The main results of our empirical analysis can be found in section 4, and section 5 concludes. Some supplementary information is provided in the appendix.

[6] Beiner et al. (2005), for example, investigate the relationship between product market competition, incentive schemes, and firm valuation for 156 Swiss companies listed at the Swiss stock exchange SWX. They find that more intensive product market competition is associated with stronger incentive schemes for managers and a lower firm value.

2 Pay Determinants in the Banking Industry

This section describes the main determinants of board and executive pay included in our analysis. The first factors considered in our analysis are the firm-specific factors. To account for the particular ownership structure of the banking institutions considered in our analysis, we consider the canton-specific aspects related to the political-economic processes.

2.1 Firm-Specific Characteristics

The first three factors considered in our analysis are the firm-specific factors of performance, size, and risk exposure.

Firm Performance

The principal-agent theory suggests that managerial pay should be related to managerial actions in order to align the insurance motive of the manager with the wealth-maximizing incentive of the shareholders (Jensen, 1986). Therefore, market movements outside the control of managers or board members should be excluded from the performance measures. Although relative performance evaluation might have a significant impact on compensation, we assume that market movements affect the banks in the sample in a similar way. Therefore, our performance measures are based on individual bank returns. Usually, firm performance is measured by the (change in) shareholder value (e.g. Cuñat and Guadalupe, 2005). Given that not all banks in our sample are listed at the stock exchange, we use the return on equity before taxes, which is defined as EBIT over total assets, as the main performance indicator. The return on assets as well as the return on the regulatory required equity before taxes serve as alternative performance measures. The latter ratio corrects the return on equity for the fact that a bank may hold more reserves than is required by the regulator.

Firm Size

Several empirical studies provide evidence for a positive correlation of firm size with compensation.[7] According to Rosen (1982, 1990), the actions of a CEO multiply over the scale of his operations, which allows him to accrue rents in a competitive equilibrium. In a competitive labor market, the more talented senior executives are allocated to the larger firms since the marginal productivity of their actions is magnified across the lower levels of the hierarchy. In our analysis, we use total loans as main proxy for firm size. The number of employees serves as an alternative size measure.

Firm Risk

According to several studies, firm risk is an important determinant of management compensation (e.g. Evans et al., 1997; Knopf and Teall, 1996; Saunders et. al. 1990). The greater the exposure

[7] See Ciscell and Carroll (1980) for a survey.

of a firm to risk, the greater the possibility of failure for the firm, which is a disaster for both the firm and its executives. Thus, firms must compensate the executives accordingly. Firm risk is usually measured by the standard deviation of monthly stock returns. Unfortunately, this metric does not work for all the banks in our study because, as mentioned above, not all the banks in our sample are listed at the stock exchange. Fortunately, for banks, there is another way to measure exposure to risk. Given the capital requirements imposed on the banking industry, bank risk is reflected in the capital structure. The higher the risk a bank is facing, the more equity it needs to secure its risky balance sheet positions. Therefore, we measure bank risk by the excess capital ratio, which is the ratio of the effective equity holdings over the required equity holdings as imposed by the regulator.[8] A higher excess capital ratio stands for a higher degree of security and, therefore, a lower risk of financial instability and illiquidity.[9] As an alternative risk measure, we use the leverage defined as the ratio of total assets minus equity over equity.

In addition to the firm-specific factors, we take into account several canton-specific characteristics related to political-economic factors. The cantons are the major, and, in most cases, the only shareholders of the cantonal banks. Given this ownership structure, the cantons and the responsible government agencies are the dominant principal. By including these canton-specific factors, we take into account the influence of the main owners and their specific characteristics on the decisions taken within the banking institutes.

2.2 Canton-Specific Characteristics

The final six factors considered in our analysis are the canton-specific factors: the canton's financial power, the compensation level of its governor, the canton's political orientation, the canton's ownership share in the cantonal bank, the canton's control over board compensation, and the canton's market concentration in the cantonal banking market.

Financial Power of the Canton

As a first canton-specific characteristic, we consider the financial situation of the canton. We expect a positive impact of a canton's financial power on the level of board and executive compensation because a financially healthier dominant owner may be willing and able to afford to spend more on the compensation of their bank managers. We measure the financial situation of the cantons by the index of financial power. This index, which is provided by the Federal Department of Finance, is used to determine the flows of money among the Swiss cantons. It is based on the revenue of the canton, the relative tax burden, as well as the share of the canton classified as mountain area. Note that the cantons are mostly autonomous in setting their taxes.

[8] In Switzerland, the banking regulatory authority is the Swiss Banking Federal Banking Commission (Eidgenössische Bankenkommission).
[9] See Verordnung über die Banken und Sparkassen (Bankenverordnung, BankV), June 2004, Art. 12 ff.

Compensation Level of Cantonal Governors

As an additional factor, we include the governors' compensation level in a canton relative to the compensation level in other cantons in our analysis. We expect a positive impact of the governors' compensation on the remuneration of board and executives of cantonal banks, given that the governors' remuneration may serve as a benchmark for board and executive compensation in cantonal banks. The relative level of governors' remuneration is measured by a dummy variable that takes the value of one, if the salary in a canton is above the median of all cantons, or zero, if the salary is below the median. The construction of a dummy variable is necessary because the governors' salaries are available for the year 2001 only.[10]

Political Spectrum of the Canton

The board members of a cantonal bank are chosen by the local cantonal government. Thus, the board composition is dependent upon the party coalitions that control the local cantonal government. Accordingly, the political ideologies of the parties in control of the cantonal government are expected to have an impact on key decisions taken by the board, which include the determination of board and executive compensation. We capture the political climate by an indicator that goes back to Hermann and Leuthold (2003). The indicator of the political spectrum ranges from left respectively most liberal (smallest number, with -2.01) to right, respectively most conservative (largest number, with 1.50) and is derived from the positioning of poll outcomes on an ideological coordination system. The respective values are normalized z-values and have to be interpreted in a relative way. The problem with conventional indicators of political orientation, which are often based on the number of seats of the parties in the federal government or similar measures (e.g. Feld and Matsusaka 2003), is that they often do not take into account that the ideology of a particular political party may vary a lot between the cantons. For instance, the SVP (a conservative party) in the canton of Zurich is quite different from the SVP in the canton of Bern. The indicator by Hermann and Leuthold (2003) is based on the real ideology of the canton's population and independent of party labels.

[10] The lack of data for all the years is not a problem because the remuneration schemes for governors are not likely to have changed much over the period considered.

Ownership Share of Canton

To take into account the ownership structure of cantonal banks, we include the share of the capital owned by the canton as an additional pay characteristic. Note that the ownership in the cantonal bank represents a significant position in the balance sheet of the respective cantons. Given that cantons are public corporations, where salaries are generally lower than in the private sector[11], we expect cantonal banks where the canton holds a higher ownership share to pay lower levels of board and executive compensation. Also, a higher state ownership may go together with a weaker impact of the market forces and more governance by the canton. We measure the canton's ownership by the share of the bank capital that belongs to the respective canton.

Decision Power of Canton over Board Compensation

In a minority of the cantons, the compensation for the board members is determined by the cantonal parliament.[12] In cantons where this is not the case, board compensation is set either by the board or by a compensation committee consisting of selected board members. Clearly, members of the parliament might have a different opinion about the level of board compensation than the board members themselves. Therefore, we expect the different compensation settings to have an effect on the level of board compensation. Whether the involvement of the cantonal parliament has a positive or a negative effect on the level of board compensation, however, has to be sorted out empirically. The decision power of the cantonal parliament on board compensation is measured by a dummy variable which takes the value of one if the cantonal parliament has decision power over board compensation, and zero else. This variable is included only in the regressions to explain board compensation.

[11] See also the Swiss Survey of Wages (Schweizerische Lohnstrukturerhebung) of the Federal Office of Statistics, Neuchatel.

[12] Note that the parliament has usually no influence on the compensation of executives, which lies in the responsibility of the board.

Market Concentration in the Cantonal Banking Market

Finally, we include in our analysis a measure for the intensity of product market competition. According to a small but growing literature in the area of industrial organization, there exist complex interactions between product market competition and executive compensation. From a theoretical point of view, the relationships between competition and compensation are characterized be several opposite effects, and it is largely unresolved whether a higher product market competition has a positive or negative impact on the level of compensation and the performance-pay sensitivity (e.g. Schmidt 1997, Raith 2002; Vives 2004). From an empirical point of view, Beiner et al. (2005) provide evidence for a positive impact of the intensity of product market competition on the strength of incentives for executives of listed Swiss firms. Similarly, Cuñat and Guadaloupe (2005) investigate the relationship between product market competition and the compensation packages of CEOs, executives, and workers in UK firms. They show that a higher level of product market competition increases the performance pay sensitivity of compensation schemes.

We use the Herfindahl-Hirschman Index (HHI) as a commonly accepted measure of market concentration. It is calculated by summing up the squares of the market shares in the mortgage markets of the banks that have at least a one percent market share in the canton. The HHI takes into account the relative size and distribution of the firms in a market, and it converges to zero in the case of a market comprised of a large number of more or less equally sized firms. The HHI increases both as the number of firms in the market decreases and as the disparity in size between those firms increases. The second indicator of market competition is the market share of the cantonal bank in the mortgage markets of the respective canton.

3 Data and Sample

This chapter provides a definition of the variables used in the empirical analysis, a description of the banks in the sample, the descriptive statistics of the variables used in the analysis, as well as information on total board compensation and total executive compensation.

3.1 Definition of Variables

In this section, we provide a description of the variables used in the empirical analysis. The compensation data refer to the board as well as to the executive committee.[13] Information on board compensation include total board compensation, the compensation of the best-paid board member (who is usually the president of the board), as well as the average compensation of a board member. The latter compensation figure is computed by dividing the total board compensation by the number of board members. For the executives, we have the total executive

[13] In German, the executive committee is called a *Geschäftsleitung*.

compensation and the compensation by executive, which is total executive compensation divided by the number of executives. Note that the average board and executive compensation figures approximate the amounts that are effectively paid to the individual persons. Usually, the members of the board and the executive committee do not receive the same compensation, which reflects that the different members have different tasks and responsibilities with varying time commitments. The definitions of the compensation variables as well as the other firm- and canton-specific factors can be found in Table 1.

The data sources for the bank-specific information, if not noted otherwise, are the annual reports of the banks. The information on the financial power of the cantons is taken from the Federal Department of Finance.[14] Information on the compensation paid to cantonal governors was taken from www.badac.ch, an online database of information on the administration of Swiss cantons and cities. The information on the political orientation of the cantons was provided by Hermann and Leuthold (2003). Finally, the canton-specific Herfindahl-Hirshman indices and the market shares of cantonal banks in the cantonal mortgage markets are taken from Piazza (2006).

[14] This indicator is available for a two-year period and not for a particular year. The values for the year 2002 in our sample correspond to the index for the period 2000/01, the values for 2003 correspond to the index for 2002/03, the values for 2004 correspond to the index for 2004/05 and finally the values for 2005 correspond to the index for 2006/07.

Table 1: Definition of variables

Bank-specific variables	
Total board compensation	Total compensation of all board member
Board compensation	Average compensation of a board member, defined as total board compensation divided by the number of board members
Highest board compensation	Compensation of the highest paid board member (usually the president of the board)
Total executive compensation	Total compensation of all executives
Executive compensation	Average compensation of an executive, defined as total executive compensation divided by the number executives
Board members	Number of board members
Executive members	Number of executives
Total loans	Firm size: Total loans
Employees	Firm size: Number of employees
ROE before taxes	Performance measure: Return on equity before taxes in %, defined as ratio of profits before transfers to reserves for general banking risk and before taxes over the book value of equity
ROA	Performance measure: Return on assets, defined in %, defined as ratio of profits before transfers to reserves for general banking risk and before taxes over the total assets
RORE	Performance measure: Return on required equity in %, defined as ROE before taxes multiplied by the equity coverage ratio
Excess capital ratio	Risk measure: Excess capital ratio in %, defined as ratio of the effective equity over required equity as imposed by the bank regulations[15]
Leverage	Risk measure: Debt ratio in %, defined as ratio of total assets minus equity over equity
Canton-specific variables	
Financial power	Index of financial power of the cantons (average of all cantons = 100)
Compensation of governors	Compensation of cantonal governors; dummy variable that takes the value of one if the governors' compensation is above the median, and zero else
Political spectrum	Indicator of the political orientation of the canton, ranging from left (smallest value) to right (highest value)
Ownership share	Share of bank capital owned by the canton
Decision power of canton	Decision power of cantonal parliament over the determination of board compensation; dummy variable that takes the value of one if cantonal parliament sets board compensation, and zero else
Market concentration	Market concentration in the cantonal mortgage markets as measured by the Herfindahl-Hirschman index
Market share cantonal banks	Market share of the cantonal banks in cantonal mortgage markets

Kommentar [KW1]: There seems to be an extra (empty) row here. I deleted it.

[15] In German, this ratio is called an *Eigenmitteldeckungsgrad*.

3.2 Sample Description

As a starting point, we target all the 24 cantonal banks in Switzerland.[16] Cantonal banks are defined as banks with a statutory basis under cantonal law, with the canton holding a minimum of one third of the bank's capital and the voting rights. Note that the state guarantee, which was a key attribute of cantonal banks in the past, no longer constitutes an essential characteristic. Cantonal banks may be established either as public institutions or as public limited companies.[17]

Eleven out of the 24 cantonal banks are listed at the Swiss stock exchange SWX, whose listed firms are required to publish information on total board compensation, on the highest individual board compensation, as well as on total executive compensation. The other banks in our sample reveal their compensation information on a voluntary basis.

Our data cover the years from 2002 to 2006. Board compensation data are available for 23 out of 24 cantonal banks, although not for all the years under consideration. For the Banco dello Stato del Cantone Ticino, for example, we dispose of compensation information only for the years 2005 and 2006. The Banque Cantonale de Fribourg is not part of our sample at all. Given that these banks are not listed at the stock exchange, they are not required to publish their compensation data. Executive compensation information is available for up to 17 banking institutions. Again, not all compensation figures are available for all the banks over the entire period. Therefore, our panel is unbalanced. The missing banks are all smaller institutions that are not listed at the stock exchange.[18] Table 2 reports the structure of the compensation data included in our sample.

[16] This number has declined over the years. Apart from the mergers of the two respective cantonal banks in the cantons of Berne (1990), Geneva (1994) and Vaud (1996), the Solothurner Bank, a subsidiary of the former Swiss Bank Corporation, acquired the majority of shares of the former Solothurner Kantonalbank in 1994. Furthermore, the Union Bank of Switzerland (today's UBS AG) took over the Appenzell-Ausserrhodische Kantonalbank in early 1996.

[17] 16 out of the 24 cantonal banks are institutions under public law, but with a certain degree of autonomy. Five cantonal banks are semi-private public companies under special law (Swiss Contract Code (OR) Art. 763), namely Banque Cantonale Vaudoise, Zuger Kantonalbank, Banque Cantonale du Jura, Banque Cantonale du Valais and Banque Cantonale de Genève. Furthermore, one cantonal bank. is constituted as a semi-private public company (Swiss Contract Code (OR) Art. 762) The Berner Kantonalbank BEKB and the Luzerner Kantonalbank are the only banks that are constituted as common private stock companies. See also The Swiss Banking Sector, Compendium Edition 2004, Swiss Bankers Association.

[18] In addition to cantonal banks of Fribourg and Tessin, the missing institutions are the cantonal banks of the cantons of Appenzell Innerrhoden, Glarus, Nidwalden, Obwalden, Schaffhausen, and Uri.

Table 2: Number of observations by compensation variable and year

Variable	Number of observations					
	2002	2003	2004	2005	2006	Total
Board compensation	15	22	22	23	24	106
Highest board compensation	14	20	22	21	21	98
Executive compensation	13	16	16	17	17	79

This table shows the number of observations: both in total and by compensation variable for each year. The data sources are the annual reports of the banks.

3.3 Descriptive Statistics

Table 3 shows descriptive statistics of all the variables used in our analysis. On average, the banks in our sample spend 679'000 CHF on board compensation per year, and each board member receives about 73'000 CHF on average. As our figures reveal, the average differences between banking institutions are quite large. While the lowest figure of 10'000 CHF refers to the Cantonal Bank of Appenzell Innerrhoden, which is the second smallest cantonal bank as measured by total assets in 2006, board members of the Banque Cantonale Vaudoise (BCV) get the highest amount with 318'000 CHF, on average. The large variation between banks is also reflected in the maximum board compensation, which is the individual compensation of the best-paid member of the board. On average, a board has between nine and ten members, but the number varies from 6 up to 15 persons. Similarly, there are between 5 and 6 executives, on average, in the cantonal banks of our sample, and this figure varies from three up to 16 members.

Furthermore, the average return on equity before taxes, *ROE,* amounts to 9.88%. The return on required equity before taxes, *RORE*, which corrects the *ROE* for the fact that a bank may hold more reserves than what is required by the regulator, is 17.97% on average. The return on assets *ROA* is 0.79% on average. The excess capital ratio, which is our risk measure, is 172.7% on average. This means that the cantonal banks in our sample hold 1.7 times more equity than would be required by bank regulations, on average. Leverage, the alternative risk measure, amounts to 11.7%, which means that debts constitute little less than 12% of equity on average. The canton-specific measure of financial power indicates that the cantons in our sample are slightly less affluent than the average over all Swiss cantons, which is normalized to 100. The political spectrum variable ranges from -2.01, the most leftwards or politically liberal position, to 1.50, the most rightwards or politically conservative position. Note that these values are normalized *z*-values and can be interpreted in only a relative way. Therefore, the political orientation of the cantons in our sample is, on average, skewed slightly toward the more liberal. As to the ownership of the banks, the cantons own 81% of the cantonal banks, on average. The lowest value of 50% refers to the canton of Geneva. Finally, the Herfindahl-Hirschman index as

a measure for the market concentration indicates that the cantonal mortgage markets are very concentrated, on average. At the same time, we also observe a large variation between cantons. The lowest value, which corresponds to the lowest market concentration, is reported in the canton of Bern, while the canton Appenzell Innerrhoden exhibits the highest market concentration in the mortgage market. According to the US Department of Justice and the Federal Trade Commission, markets with a Herfindahl-Hirschman index higher than 1'800 are considered as highly concentrated.[19] The market shares of the cantonal banks in the cantonal mortgage markets reveal a similar picture. Overall, the descriptive statistics reveal a large variation between the banking institutes with respect to the characteristics considered, despite the fact that all the banks in our sample all belong to the same bank category.

[19] See U.S. Department of Justice and the Federal Trade Commission (1997), Section 1.51, General Standards.

Table 3: Descriptive statistics

Variable	Mean	Median	Std. Dev.	Min.	Max	N
	Firm-specific variables					
Total board compensation	678.50	572.32	498.78	90.33	2'223.00	106
Board compensation	72.56	62.06	57.91	10.04	317.57	106
Highest board compensation	226.81	173.74	237.74	24.00	1'401.60	97
Total executive compensation	3'107.29	2'730.93	1'517.82	921.02	8'239.00	79
Executive compensation	554.64	551.40	221.10	172.91	1'373.17	79
Number of board members	9.42	9.00	2.34	6.00	15.00	106
Number of executives	5.58	5.00	2.50	3.00	16.00	106
Total loans	110.40	99.71	107.35	15.08	583.00	106
Number of employees	782.17	641.55	874.92	65.50	4'305.00	96
Return on equity before taxes (%)	9.88	10.58	8.75	-72.72	20.40	106
Δ*ROE* from (*t*-1) to *t*	1.52	0.86	8.62	-28.02	82.05	106
Return on required equity (%)	17.97	18.60	9.81	-55.30	40.60	106
Δ*RORE* from (*t*-1) to *t*	3.33	2.00	7.86	-4.80	69.90	91
Return on assets before taxes (%)	0.79	0.80	0.48	-2.80	1.84	106
Δ*ROA* from (*t*-1) to *t*	0.13	0.10	0.40	-0.50	3.30	82
Excess capital ratio (%)	172.69	173.00	29.75	76.00	270.40	106
Leverage (%)	11.71	10.98	3.43	6.32	30.90	106
	Canton-specific variables					
Financial power of canton	93.08	82.50	47.42	30.00	227.00	106
Compensation of governors	0.48	0.00	0.50	0.00	1.00	106
Political spectrum	0.05	0.31	0.89	-2.01	1.50	106
Ownership share of canton	81.14	80.70	18.37	49.83	100.00	106
Decision power of canton	0.08	0.00	0.27	0.00	1.00	106
Market concentration	3'047.50	2'830.50	1'086.71	1'367.00	6'715.00	106
Market share of cantonal banks	43.64	46.00	15.55	17.00	79.00	106

This table reports the descriptive statistics of the variables used in the regression analyses: *Total board compensation* is the total amount of compensation paid to all board members. *Board compensation* is the total amount of compensation paid to all board members divided by the number of board members. *Total executive compensation* is the total amount of compensation paid to all executives. *Executive compensation* is the total amount of compensation paid to all executives divided by the number of executives. *Number of board members* is the number of board members. *Number of executives* is the number of executives. *Total loans* is the total value of all loans. *Number of employees* is the total number of employees. *Return on equity before taxes (ROE)* is the return on equity before taxes, defined as ratio of profits before transfers to reserves for general banking risk and before taxes over the book value of equity. Δ*ROE* is the change from year (*t*-1) to *t* of the return on equity before taxes. *Return on required equity (RORE)* is the return on required equity, defined as return on equity before taxes multiplied by the equity coverage ratio. Δ*RORE* is change from year (*t*-1) to *t* of the return on required equity. *Excess capital ratio* is the current equity holdings relative to the required equity holdings. *Leverage* is the ratio of total assets minus equity over equity. *Financial power of the canton* is an index for the financial power of the canton (average over all cantons=100). *Compensation of governors* is a dummy variable for the level of compensation of the cantonal governors, and it takes the value of one if the compensation of the governors in 2001 is above the median value of all Swiss cantons, and zero else. *Political spectrum* is an indicator of the political orientation of the canton, ranging from left (smallest value) to right (highest value). *Decision power of canton* is a dummy variable that takes the value of one if the cantonal parliament has decision power over the board compensation, and zero else. *Market concentration* is the Herfindahl-Hirschman index of the cantonal mortgage market and is defined as the sum of the squared market shares of the banks with at least one percent market share in the cantonal mortgage market. *Market share of cantonal banks* is the market share of the cantonal banks in the cantonal mortgage market. *N* is the total number of observations over all the years. The data are expressed in 1'000 CHF of 2006, except *Total loans,* for which the data are in 10 Mio of CHF of 2006. The data sources are the annual reports of the banks, the Federal Department of Finance and the online database www.badac.ch. The period covers the years from 2002 to 2006.

3.4 Total Board Compensation

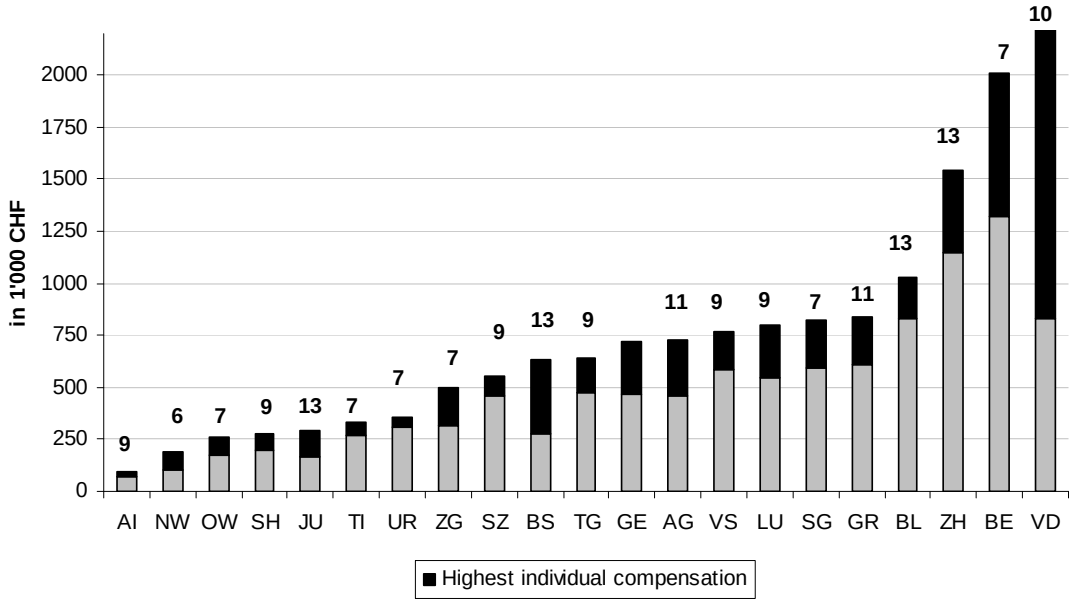
To present bank-specific levels of board compensation, Figure 1 shows the total compensation paid to the board members in 2006, the most recent year in our data. In addition, we also report the highest compensation paid to an individual board member, who is usually the president of the board. This information is captured by the grey area in each column. Finally, the number of board members is indicated as well. The cantons are ranked according to their level of total board compensation.

As we can see from Figure 1, the Banque Cantonale Vaudoise (BCV) has the most expensive board, which receives a total compensation of 2.23 Mio CHF in 2006.[20] The BVC is closely followed by the cantonal bank of the canton of Bern, the BEKB, which spends 2.1 Mio. CHF on its board in 2006. The third bank having a relatively high total board compensation is the Zürcher Kantonalbank (ZKB) with 1.55 Mio. CHF. However, the ZKB has 13 board members, while there are only seven and ten persons on the boards of the BCV and the BEKB, respectively.

Looking at the highest compensations paid to individual board members, we observe that the highest amount, 1.4 Mio. CHF, is paid to the president of the BCV in 2006. That figure amounts to 0.9 Mio. CHF in 2005. Thus, the increase in compensation from 2005 to 2006 corresponds to 56 %. The cantonal bank of Appenzell Innerrhoden is at the other end of the ranking, with a highest individual board compensation of 24'000 CHF. Finally, we also observe a large variation in the share of the highest compensation relative to total board compensation in our sample. On average, the highest individual compensation corresponds to 32% of total compensation for the banks in our sample. While the BCV pays 63% of the total board compensation to its best paid board member, this ratio amounts to 14% for the Urner Kantonalbank.

[20] Recently, the Berner Kantonalbank BEKB introduced an elaborated incentive system with a bonus-malus system that is unique in the Swiss banking industry. Based on profit targets that range over several years, the compensation values are determined at the end of each year. Depending on whether the targets have been met or not, the fixed part of the compensation is reduced by up to 50% in case of an underperformance and it is increased by up 100% in case of an over performance. The BEKB has reported very good results for the recent years, which is reflected in the board compensation figures of 2006 as well.

Figure 1: Total and highest individual board compensation in 2006 and number of board members



This figure shows total board compensation, the highest individual compensation, as well as the number of board members in 2006. The values are expressed in 1'000 CHF of 2006. The data sources are the annual reports of the banks.

3.5 Total Executive Compensation

Figure 2 reports total executive compensation for 17 cantonal banks in our sample for the year 2006. In addition, we indicate the number of executives for each bank. As noted earlier, executive compensation figures are not available for seven cantonal banks. The missing banks are all smaller institutions that are not listed at the stock exchange and, therefore, do not have to publish their compensation figures.[21]

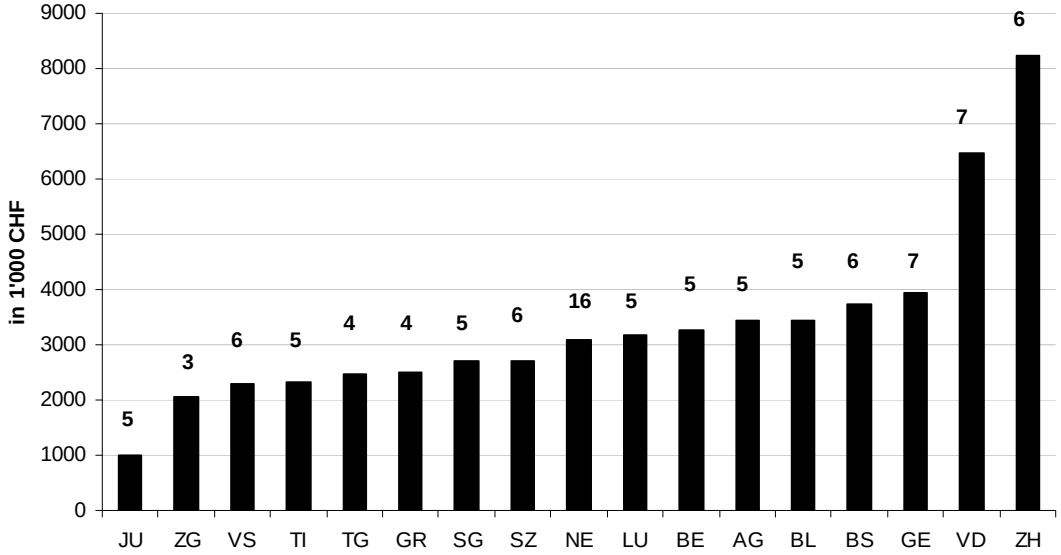
The cantonal banks of the relatively larger and urban cantons pay the highest amounts to their executives. On average, larger cantons also have larger cantonal banks, and the best-paid executives, on average, work for the larger banks. As we will see, bank size, among other characteristics, plays an important role in the absolute level of compensation. Clearly, the larger the institution is, the more difficult is it to manage, which generally requires more elaborated management skills. Furthermore, executives working in urban centers, such as Zurich or Basel, face a larger set of professional outside options compared to a bank executive in a rural canton,

[21] In contrast to the board compensation figures, there is no rule that forces the banks to reveal the highest individual executive compensation value. Consequently, most cantonal banks do not publish this information. The Zürcher Kantonalbank, for instance, started publishing this information in 2003.

such as of Jura. It is likely that this difference between urban and rural cantons is reflected in our data as well.

The number of executives ranges from three, for the canton of Zug, to a maximum value of 16, for the canton of Neuchatel. The average number of executives is six. Contrary to what one could expect, the number of board members and the number of executives are not correlated with each other.

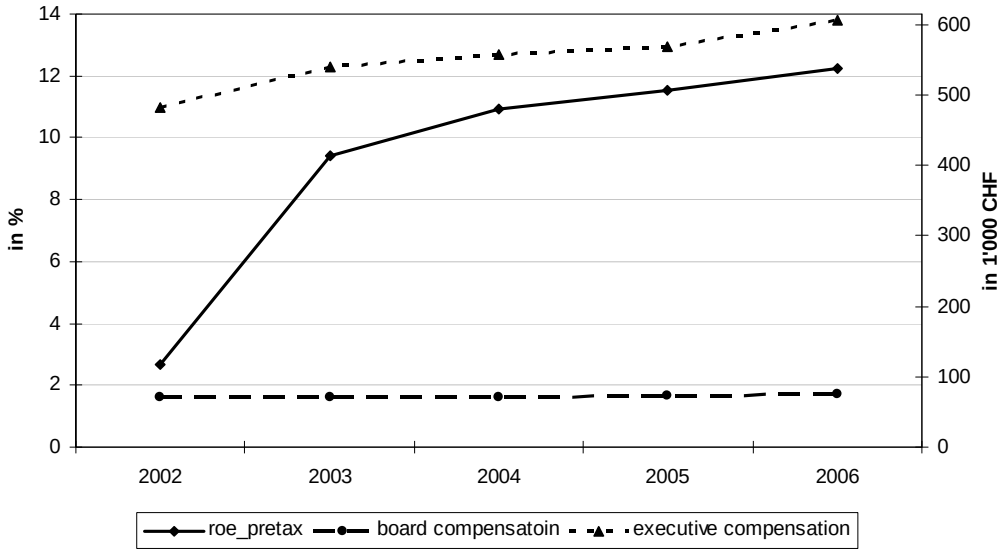
Figure 2: Total executive compensation in 2006



This figure shows total executive compensation as well as the number of executives in 2006. The values are expressed in 1'000 CHF of 2006. The data sources are the annual reports of the banks.

Figure 3 reports the average bank performance and the average board and executive compensation over time. Note that bank performance, measured by the return on equity before taxes, has steadily increased over the years considered. While executive compensation figures also show a clear upwards tendency, on average, the compensation of the board members remains rather stable over time. The picture is similar when looking at the alternative performance measure: return on equity before taxes multiplied by the equity coverage ratio. At this point in our analysis, we do not present this alternative performance measure, but we do use it in the robustness tests later on. In what follows, we investigate this and further relationships within a regression framework, while taking into account all relevant compensation determinants.

Figure 3: Bank performance and average compensation over time



This figure shows the return on equity before taxes and the average board and executive compensation over the years from 2002 to 2006. The values are yearly averages over all the banks in our sample. The data sources are the annual reports of the banks.

4 Empirical Analysis

In this section, we investigate the determinants of board and executive compensation in Swiss cantonal banks within a multivariate regression framework. We use simple OLS regressions and correct for heteroscedasticity as well as for autocorrelation of the error term (clustering on firm level). In addition, we include time dummies to control for year effects. In a first step, we investigate the effects of the pay determinants as described in chapter 2 on the level of compensation. In a second step, we estimate pay-for-performance sensitivities to see whether a change in performance has an impact on the compensation level as well as the change of compensation from one period to the next. We report the results for board compensation and executive compensation in separate subsections.[22]

4.1 The Level of Compensation

Our main interest is to understand which factors determine the level of compensation for the board members and executives of the Swiss cantonal banks. We use the following three compensation measures: (1) the average compensation of board members, which is defined as total board compensation divided by the number of board members, (2) the highest individual board compensation, and (3) the average compensation of executives, which is computed by dividing total executive compensation by the number of executives.

[22] Information on correlation coefficients between the variables is provided in the appendix.

According to the existing literature and our earlier explanations in section 2, we take into account firm performance, firm size, and a measure for firm risk as firm-specific pay determinants.[23] In a second specification, we additionally include canton-specific characteristics such as the financial power of the canton, the compensation level of the governors, the canton's political orientation, the share of the bank owned by the canton, and whether the cantonal parliament has decision power over setting board compensation. In the third specification, we additionally control for the market concentration in the cantonal mortgage markets. The regression models are summarized by equations (1) to (3).

$$compensation_{lit} = \beta_0 + \beta_1 performance_{it-1} + \beta_2 size_{it} + \beta_3 risk_{it} + \sum_k \delta_t D_t + u_{it} \quad (1)$$

$$\begin{aligned} compensation_{lit} = {} & \beta_0 + \beta_1 performance_{it-1} + \beta_2 size_{it} + \beta_3 risk_{it} + \\ & \beta_4 financialpower_{jt} + \beta_5 governorwage_j + \beta_6 politicalspectrum_j + \\ & \beta_7 cantonownership_{jt} + + \beta_8 decisionpowercanton_j + \sum_k \delta_t D_t + u_{it} \end{aligned} \quad (2)$$

$$\begin{aligned} compensation_{lit} = {} & \beta_0 + \beta_1 performance_{it-1} + \beta_2 size_{it} + \beta_3 risk_{it} + \\ & \beta_4 financialpower_{jt} + \beta_5 governorwage_j + \beta_6 politicalspectrum_j + \\ & \beta_7 cantonownership_{jt} + \beta_8 decisionpowercanton_j \\ & \beta_8 marketconcentration_{jt} + \sum_k \delta_t D_t + u_{it} \end{aligned} \quad (3)$$

$i = 1,..,N_j \qquad j = 1,..,22 \qquad t = 2002,..,2006$

$l = board\ member, highest\ paid\ board\ member,\ executive\ member$

$u_{it} \sim N(0, \sigma^2)$

[23] In addition, we tried to include the dummy variable *dpub*, which is equal to one if the bank is listed on the stock exchange, and zero else. This variable, however, is highly correlated with firm size, and a simultaneous inclusion of *size* and *dpub* causes a multicollinearity problem.

4.1.1 Board Compensation

Table 4 reports the results from regressing board compensation as well as the highest board compensation on the explanatory variables considered. Board compensation seems to be negatively affected by the past performance of the bank, as measured by the ROE before taxes. This result is significant at the 1% level in all the specifications considered. This result matches the picture drawn in Figure 3, where it is apparent that board compensation could not keep up the increase in performance that occurred in the period under consideration. This outcome contradicts predictions from principal-agent theory, suggesting a positive correlation between pay and performance. As to firm size, which is approximated by total loans, the results confirm our expectations that larger firms tend to pay more to their board members. Usually, larger firms are more difficult to manage, given that they have more business activities, offer more products and are involved in more complex transactions compared to smaller firms. All this increases the demands on the board members. Risk, as measured by the excess capital ratio, does not seem to have a significant effect on board compensation, except for the second specification, where the effect is bearly significant. Again, this result seems surprising, given our expectation that risk would have a positive impact on compensation.

Let us now consider the canton-specific pay determinants, which are included in the model specifications (2) and (3). Interestingly, cantonal banks in financially more powerful cantons pay less to their board members compared to financially weaker cantons. Normally, we would expect banks in richer cantons to pay more to their board members, both because they have the money and because there may be less financial pressure on the cantonal banks in the more affluent environments. However, serving on the board of a cantonal bank is only a part-time occupation, with the exceptions of the BCV and the ZKB, and board members probably derive the greater part of their income from other sources. Thus, it is possible that board member accept the position not merely for the compensation but for the prestige of the position and for enhanced access to the financial and social life of the canton. Most likely, the value of such access is greater in the financially stronger canton and might serve to compensate the board members for the lower remuneration.

As expected, the compensation level of governors has a significant and positive impact on the level of board compensation. In fact, the salary of the local cantonal governor might serve as an upper benchmark for the board members of a cantonal bank.

The indicator of the political orientation, which is higher, the more rightwards a canton is considered, does not have a significant impact on board compensation. In contrast, the

ownership share of the canton negatively affects board compensation, i.e., the more a canton owns of the bank, the less do the board members earn. The ownership share reflects the extent of control of the cantonal authorities on the bank, and the more the canton owns of the bank, the more can it take influence on its decisions, at least on a strategic level. The dummy variable, *Board compensation set by parliament*, explicitly controls for the fact that the cantonal legislative may determine the compensation of the board members. The effect is significant at the 10% level in the full specification, which means that the board members earn more if the parliament has decision power over their compensation. Finally, the results of our third specification suggest that the market concentration in the cantonal mortgage market does not have a significant impact on board compensation. Overall, our model specifications explain up to 62% of the variation in the dependent variable.

In addition to analyzing the average individual board compensation, we estimate the model with the highest individual board compensation as explained variable. It is interesting to see whether the benefits of the best-paid board member, who is often the president of the board, can at least be partially explained by the factors considered before. Note that the number of observations is smaller because certain banks do not report this figure for the first years of the period under consideration. As to the firm-specific pay determinants, only firm size seems to have a significant and, as expected, positive effect on the highest compensation in all model specifications. The coefficients of past performance are insignificant in two out of three specifications, and risk does not seem to matter either. From the canton-specific factors in the second specification, we find that only the compensation of the governors has a positive and significant impact on the maximum board compensation. Similar to the average board compensation, the ownership share of the canton has a negative effect on the highest individual board compensation, but it is significant at the 10% level only. Even though the models can explain up to 38% of the variation in the dependent variable, the fit is not as good as for the regression results of average board compensation. This can be related to the fact that additional and currently undetected variables could be important determinants of the maximum board compensation. Also, some of the best paid board members have been specifically hired to bring the bank out of difficult situation (e.g. in the case of the Banque Cantonale Vaudoise), and these are somehow special cases which differ from the average considerations.

Table 4: The compensation of board members

	Board compensation			*Highest board compensation*		
	(1)	(2)	(3)	(1)	(2)	(3)
L1.ROE before taxes	-1.84***	-1.54***	-1.62***	-0.28	1.48*	1.69
	(0.35)	(0.27)	(0.22)	(0.92)	(0.85)	(1.24)
Total loans	0.32**	0.31***	0.30**	1.21*	1.18**	1.22*
	(0.15)	(0.11)	(0.13)	(0.67)	(0.54)	(0.66)
Excess capital ratio	0.37	0.65*	0.60	1.60	2.87	2.98
	(0.37)	(0.34)	(0.42)	(1.76)	(2.02)	(2.36)
Financial power of canton	-	-0.35**	-0.33**	-	-0.91	-0.96
		(0.13)	(0.15)		(0.59)	(0.75)
Compensation of cantonal governors	-	44.14***	40.40*	-	152.07*	162.02
		(15.43)	(21.02)		(76.12)	(106.79)
Political spectrum (left to right)	-	2.02	5.58	-	-45.33	-54.78
		(8.17)	(14.38)		(48.09)	(79.80)
Ownership share of canton	-	-1.02**	-1.01***	-	-3.07*	-3.11*
		(0.34)	(0.35)		(1.68)	(1.80)
Decision power canton	-	24.24	26.58*	-	106.09	98.99
		(15.09)	(13.47)		(129.34)	(119.52)
Market concentration	-	-	-0.01	-	-	0.01
			(0.01)			(0.05)
N	106	106	106	97	97	97
Adjusted R-squared	0.36	0.58	0.58	0.21	0.38	0.38
F	17.43***	21.99***	84.28***	4.83***	1.32	2.13*

This table reports estimates from OLS regressions of the *Board compensation* and the *Highest board compensation* on the following pay determinants: the lagged value of the *Return on equity before taxes (ROE)*, which is the ratio of profits before transfers to reserves for general banking risk and before taxes over the book value of equity; *Total loans;* the *Excess capital ratio*, which is defined as current equity holdings relative to the required equity holdings; the *Financial power of the canton* (average over all cantons=100); the *Compensation of governors*, which is a dummy variable for the level of compensation of the cantonal governors and takes the value of one if the compensation of the governors in 2001 is above the median value of all Swiss cantons, and zero else; the *Political spectrum* is an indicator of the political orientation of the canton, ranging from left (smallest value) to right (highest value); *Market concentration* is the Herfindahl-Hirschman index of the cantonal mortgage market. The period covers the years from 2002 to 2006. The data are expressed in 1'000 CHF of 2006, except the variable *Total loans*, which is in 10 Mio of CHF of 2006. The data sources are the annual reports of the banks, the webpage of the Federal Department of Finance, the online database www.badac.ch and the Atlas of the political landscapes in Switzerland. Standard errors in brackets are corrected for heteroscedasticity and autocorrelation (clustering). *N* refers to the total number of observations over all the years. An *F*-test is performed for the simultaneous significance of all coefficients. Time dummies and constant included. ***, **, and * denotes statistical significance at the 10%, 5%, and 1% level.

4.1.2 Executive Compensation

Table 5 reports the results from regressing the executive compensation, which is defined as total executive compensation divided by the number of executives, on the set of the explanatory variables considered above. The set of variables is identical to the one used to explain board compensation, except the influence of the cantonal parliament, which is relevant only for the board. Past performance, as measured by the one-year lag of the ROE before taxes, has a positive and highly significant impact on executive compensation. This result provides evidence for an existing link between pay and past performance and stands in line with classical agency theory. Similarly, bank size, approximated by total loans, has a strong and positive impact on executive compensation and reflects the common expectations of a positive correlation between firm size and executive compensation, which reflects the complexity of management skills. As to the effect of bank risk, as measured by the excess capital ratio, we do not find any significant impact on executive compensation. This result is surprising and stands in contrast to the commonly held belief that a higher risk should be compensated by a higher compensation.

Concerning canton-specific pay determinants, the financial power of the canton has a strong and positive impact on executive pay. This result is not surprising and may simply show that a cantonal bank in a financially healthy environment can afford or may be willing to pay more to its executives compared to banking institutes in less affluent areas. Similarly, the compensation paid to the governors of the canton positively affects executive pay, and the reasons might be similar to the ones put forward for board compensation. The political orientation of the canton has a strong influence on executive pay. The more politically conservative the canton, the more the bank executives earn. In contrast to board compensation, where the political spectrum does not have any impact, executive pay seems to be sensitive to the relative strength of political parties. The ownership share of the canton does not seem to affect the level of executive compensation, which stands again in contrast to the result for the level of board compensation. This finding may be explained by the fact that the canton or the respective agency has a certain impact on decisions related to the board members, but that the executives are mainly managed by the board, which determines, among other aspects, also the level of executive pay.

Finally, the inclusion of the Herfindahl-Hirschman index in our third specification leads to an interesting result, namely that a higher market concentration, which is usually associated with weaker product market competition, has a negative impact on the level of executive compensation. Clearly, managing a bank in a competitive market is more challenging, risky, and

demanding than managing a bank in a less competitive market, and this fact should also be reflected in the compensation. To a certain extent, this result stands in line with Beiner et al. (2005) who find a positive correlation between the intensity of product market competition and the strength of incentives for executives. Overall, the pay determinants included in our model specifications have a large explanatory power. In addition, there exist some fundamental differences in how those factors affect board and executive compensation.

Table 5: The compensation of executives

	Executive compensation		
	(1)	(2)	(3)
L1ROE before taxes	3.09***	2.59***	2.37***
	(0.69)	(0.44)	(0.46)
Bank size (total loans)	1.83***	1.52***	1.48***
	(0.22)	(0.13)	(0.13)
Excess capital ratio	1.21	1.14	1.10*
	(0.90)	(0.67)	(0.65)
Financial power of canton	-	0.80***	1.02***
		(0.21)	(0.20)
Compensation of cantonal governors	-	79.10**	65.66**
		(24.69)	(25.76)
Political spectrum (left to right)	-	34.25*	44.24**
		(18.30)	(19.92)
Ownership share of canton	-	-0.34	-0.30
		(0.84)	(0.74)
Market concentration	-	-	-0.03**
			(0.01)
N	79	79	79
Adjusted R-squared	0.77	0.89	0.89
F	22.03***	94.46***	151.63***

This table reports estimates from OLS regressions of the *Executive compensation* on the following pay determinants: the lagged value of the *Return on equity before taxes (ROE)*, which is the ratio of profits before transfers to reserves for general banking risk and before taxes over the book value of equity; *Total loans;* the *Excess capital ratio*, which is defined as current equity holdings relative to the required equity holdings; the *Financial power of the canton* (average over all cantons=100); the *Compensation of governors*, which is a dummy variable for the level of compensation of the cantonal governors and takes the value of one if the compensation of the governors in 2001 is above the median value of all Swiss cantons, and zero else; the *Political spectrum* is an indicator of the political orientation of the canton, ranging from left (smallest value) to right (highest value); *Market concentration* is the Herfindahl-Hirschman index of the cantonal mortgage market. The period covers the years from 2002 to 2006. The data are expressed in 1'000 CHF of 2006, except the variable *Total loans*, which is in 10 Mio of CHF of 2006. The data sources are the annual reports of the banks, the webpage of the Federal Department of Finance, the online database www.badac.ch and the Atlas of the political landscapes in Switzerland. Standard errors in brackets are corrected for heteroscedasticity and autocorrelation (clustering). *N* refers to the total number of observations over all the years. An *F*-test is performed for the simultaneous significance of all coefficients. Time dummies and constant included. ***, **, and * denotes statistical significance at the 10%, 5%, and 1% level.

4.2 Pay for Performance Sensitivities

To explain the level of board and executive compensation, we are interested in the extent to which changes in performance are reflected in compensation. Following a large empirical literature on the relationship between pay and performance,[24] we estimate pay-for-performance sensitivities. in order to see whether the level of compensation as well as changes of compensation from year (t -1) to year t are sensitive to changes in bank performance over the same period. As in our other model specifications, we control for bank size, risk, canton-specific characteristics, and the concentration in the mortgage market. Again, we estimate the models separately for the board compensation, the highest board member's compensation, and the executive compensation. Equations (4) to (6) summarize the model specifications. In addition, we consider the level of compensation as well as the change in compensation from year t to year (t -1) as explained variables and report the corresponding results in the left, respectively the right section of the tables.

$$(\Delta)compensation_{lit} = \beta_0 + \beta_1 \Delta performance_{it} + \beta_2 size_{it} + \beta_3 risk_{it} + \sum_k \delta_t D_t + u_{it} \quad (4)$$

$$\begin{aligned}(\Delta)compensation_{lit} = {} & \beta_0 + \beta_1 \Delta performance_{it} + \beta_2 size_{it} + \beta_3 risk_{it} + \\ & \beta_4 financialpower_{jt} + \beta_5 governorwage_j + \beta_6 politicalspectrum_j + \\ & \beta_7 cantonownership_{jt} + \beta_8 decisionpowercanton_j + \sum_k \delta_t D_t + u_{it}\end{aligned} \quad (5)$$

$$\begin{aligned}(\Delta)compensation_{lit} = {} & \beta_0 + \beta_1 \Delta performance_{it} + \beta_2 size_{it} + \beta_3 risk_{it} + \\ & \beta_4 financialpower_{jt} + \beta_5 governorwage_j + \beta_6 politicalspectrum_j + \\ & \beta_7 cantonownership_{jt} + \beta_8 decisionpowercanton_j + \\ & \beta_9 marketconcentration_{jt} + \sum_k \delta_t D_t + u_{it}\end{aligned} \quad (6)$$

$i = 1,..,N_j \qquad j = 1,..,22 \qquad t = 2002,..,2006$

$l = board\ member, highest\ paid\ board\ member,\ executive\ member$

$u_{it} \sim N(0, \sigma^2)$

[24] See Jensen and Murphy (1990), Murphy (1985, 1986) Rosen (1990), Barro and Barro (1990).

4.2.1 Pay-for-Performance and Board Compensation

Table 6 reports the estimation result for the compensation of board members. The left side of the table reports the result with the level of compensation as the explained variable, while the right side of the table refers to the results with the change in compensation as left-hand side variable. A positive change in performance, as measured by the difference of the ROE before taxes from year (t-1) to year t, has a strong and positive effect on both the level of compensation and the change in compensation over time. This observation accords nicely with the principal-agent theory, which predicts that better performance should be reflected in higher compensation.

As to the other pay determinants, the results for the level of compensation as the explained variable confirm the results from the former results reported in Table 4, where performance is measured by the one-year lag of the performance measure instead of its change. When considering the year-to-year change in compensation as the explained variable, the political orientation of the canton has a significant effect. According to our results, the more politically conservative a canton, the greater the increase in board compensation over time. This observation can be explained from an ideological point of view. A more politically conservative orientation often correlates with a strong preference for a liberal economy. Such an environment is also more likely to favor incentive-compatible compensation schemes, which often lead to a more variable compensation over time.

Table 6: Pay-for-performance of board compensation

	Board compensation			*ΔBoard compensation*		
	(1)	(2)	(3)	(1)	(2)	(3)
ΔROE before taxes	1.96***	1.45***	1.48***	1.22***	1.21***	1.31***
	(0.20)	(0.15)	(0.23)	(0.04)	(0.05)	(0.09)
Bank size (total loans)	0.30*	0.29**	0.29*	0.01	0.01	-0.02
	(0.16)	(0.12)	(0.14)	(0.01)	(0.01)	(0.01)
Excess capital ratio	0.19	0.50**	0.47	0.04	0.05	-0.03
	(0.25)	(0.22)	(0.31)	(0.03)	(0.04)	(0.04)
Financial power of canton	-	-0.35**	-0.34**	-	-0.02	0.01
		(0.13)	(0.16)		(0.03)	(0.03)
Compensation of cantonal governors		43.59***	41.65*	-	1.55	-3.25
		(14.50)	(20.54)		(2.54)	(2.93)
Political spectrum (from left to right)	-	0.29	2.09	-	1.74*	5.42**
		(8.50)	(15.48)		(0.88)	(2.12)
Ownership share of canton	-	-0.98**	-0.97**	-	-0.09	-0.06
		(0.35)	(0.36)		(0.06)	(0.06)
Decision power canton	-	22.03	23.19*	-	2.50	3.12
		(13.55)	(12.83)		(2.15)	(3.09)
Market concentration	-	-	-0.00	-	-	0.00
			(0.01)			(0.01)
Observations	106	106	106	82	82	82
Adjusted R-squared	0.34	0.56	0.56	0.41	0.44	0.40
F	151***	75.78***	243.1***	866***	531***	633***

This table reports estimates from OLS regressions of the *Board compensation* as well as the change in the *Board compensation* from (*t*-1) to *t* on the following pay determinants: the change in the *Return on equity before taxes (ROE)* from (*t*-1) to *t*, which is the ratio of profits before transfers to reserves for general banking risk and before taxes over the book value of equity; *Total loans;* the *Excess capital ratio*, which is defined as current equity holdings relative to the required equity holdings; the *Financial power of the canton* (average over all cantons=100); the *Compensation of governors*, which is a dummy variable for the level of compensation of the cantonal governors and takes the value of one if the compensation of the governors in 2001 is above the median value of all Swiss cantons, and zero else; the *Political spectrum* is an indicator of the political orientation of the canton, ranging from left (smallest value) to right (highest value); *Market concentration* is the Herfindahl-Hirschman index of the cantonal mortgage market. The period covers the years from 2002 to 2006. The data are expressed in 1'000 CHF of 2006, except the variable *Total loans*, which is in 10 Mio of CHF of 2006. The data sources are the annual reports of the banks, the webpage of the Federal Department of Finance, the online database at www.badac.ch, and the Atlas of the political landscapes in Switzerland. Standard errors in brackets are corrected for heteroscedasticity and autocorrelation (clustering). *N* refers to the total number of observations over all the years. An *F*-test is performed for the simultaneous significance of all coefficients. Time dummies and constant included. ***, **, and * denotes statistical significance at the 10%, 5%, and 1% level.

Table 7 reports the results for the highest individual board compensation. Similar to board compensation, the change in the ROE before taxes from (*t*-1) to *t* has a positive and significant impact on the level of the highest compensation, but this effect vanishes after we include the canton-specific variables. In contrast, the effect of the change in performance on the change in compensation, as reported in the right-most colums of Table 7, is positive and highly significant. The impacts of the other explanatory variables on both the level of compensation and the change in compensation are a near match to the model specification with the lag of the performance measure.

Overall, our regression results provide evidence that a change in performance has a positive effect on the compensation level as well as the change in board compensation over time.

Table 7: Pay-for-performance of the highest board compensation

	Highest board compensation			*ΔHighest board compensation*		
	(1)	(2)	(3)	(1)	(2)	(3)
ΔROE before taxes	3.45***	1.29	1.22	3.75***	3.35***	3.18***
	(0.83)	(1.05)	(1.44)	(0.43)	(0.30)	(0.33)
Bank size (total loans)	1.16*	1.17**	1.19**	0.16	0.16	0.19
	(0.65)	(0.53)	(0.64)	(0.18)	(0.16)	(0.20)
Excess capital ratio	1.47	2.88	2.94	0.45	0.70	0.78
	(1.61)	(2.06)	(2.44)	(0.45)	(0.64)	(0.69)
Financial power of canton	-	-0.87	-0.89	-	0.10	-0.04
		(0.58)	(0.71)		(0.16)	(0.20)
Compensation of cantonal governors	-	147.61*	152.60	-	12.38	20.78
		(75.50)	(103.24)		(23.83)	(31.08)
Political spectrum (from left to right)	-	-39.93	-44.51		-18.31	-25.98
		(46.42)	(74.42)		(16.68)	(24.44)
Ownership share of canton	-	-3.04*	-3.06*	-	-0.35	-0.41
		(1.66)	(1.77)		(0.32)	(0.43)
Decision power canton	-	107.12		-	30.24	20.77
		(126.59)			(17.92)	(13.64)
Market concentration	-	-	0.01	-	-	0.01
			(0.05)			(0.01)
Observations	97	97	97	74	74	74
Adjusted R-squared	0.22	0.38	0.37	0.07	0.03	-0.07
F	113***	17.13***	24***	128***	185***	200***

This table reports estimates from OLS regressions of the *Highest board compensation* as well as the change in the *Highest board compensation* from (*t-1*) to *t* on the following pay determinants: the change in the *Return on equity before taxes (ROE)* from (*t-1*) to *t*, which is the ratio of profits before transfers to reserves for general banking risk and before taxes over the book value of equity; *Total loans;* the *Excess capital ratio*, which is defined as current equity holdings relative to the required equity holdings; the *Financial power of the canton* (average over all cantons=100); the *Compensation of governors*, which is a dummy variable for the level of compensation of the cantonal governors and takes the value of one if the compensation of the governors in 2001 is above the median value of all Swiss cantons, and zero else; the *Political spectrum* is an indicator of the political orientation of the canton, ranging from left (smallest value) to right (highest value); *Market concentration* is the Herfindahl-Hirschman index of the cantonal mortgage market. The period covers the years from 2002 to 2006. The data are expressed in 1'000 CHF of 2006, except the variable *Total loans*, which is in 10 Mio of CHF of 2006. The data sources are the annual reports of the banks, the webpage of the Federal Department of Finance, the online database www.badac.ch, and the Atlas of the political landscapes in Switzerland. Standard errors in brackets are corrected for heteroscedasticity and autocorrelation (clustering). *N* refers to the total number of observations over all the years. An *F*-test is performed for the simultaneous significance of all coefficients. Time dummies and constant included. ***, **, and * denotes statistical significance at the 10%, 5%, and 1% level.

4.2.2 Pay-for-Performance and Executive Compensation

Table 8 reports the effects of a change in performance on executive compensation. Interestingly, a change in performance is negatively related to the level of executive compensation over time. This result stands in contrast to our former findings concerning board compensation. In the context of our specific setting, where, on average, bank performance increased steadily over the period considered, the executives of cantonal banks have not been compensated for the improved performance. True, the executives did receive more money over time, but the higher average compensation does not seem to be driven by the improved bank performance. The results for the change in compensation and, in particular, the lack of a significant effect from the change in performance, as reported in the right part of Table 8, confirm this observation.

Concerning the other pay determinants, bank size, the financial power of the canton, the compensation level of the cantonal governor, the political orientation of the canton, and a higher degree of competition in mortgage markets all have a positive effect on board compensation. These findings accord well with the regression results reported in Table 5, where we used the lagged ROE as a performance measure. For the years considered, the change in executive compensation is driven mainly by bank size and the compensation of cantonal governors, as can be seen from the three right-most columns right part of Table 8.

Overall, our results provide evidence for a missing positive link between performance and executive compensation in cantonal banks over the years under consideration. These findings are surprising because they stand in sharp contrast to the predictions of the principal-agent theory.

Table 8: Pay-for-performance of executive compensation

	Executive compensation			*ΔExecutive compensation*		
	(1)	(2)	(3)	(4)	(5)	(6)
ΔROE before taxes	-1.83***	-1.44**	-1.30**	-0.22	-0.55	-0.64
	(0.57)	(0.57)	(0.61)	(0.43)	(0.58)	(0.59)
Bank size (total loans)	1.86***	1.53***	1.48***	0.18***	0.18**	0.20**
	(0.20)	(0.12)	(0.11)	(0.06)	(0.07)	(0.08)
Excess capital ratio	1.79*	1.53	1.45	0.13	0.27	0.28
	(1.02)	(0.94)	(0.92)	(0.42)	(0.44)	(0.41)
Financial power of canton	-	0.85***	1.05***	-	-0.09	-0.19
		(0.25)	(0.19)		(0.12)	(0.13)
Compensation of cantonal governors	-	72.00**	57.15**	-	33.98**	39.80**
		(24.39)	(24.33)		(14.92)	(15.33)
Political spectrum (left to right)	-	41.71***	52.54**	-	-10.08	-14.42
		(17.82)	(18.70)		(8.87)	(10.31)
Ownership share of canton	-	-0.32	-0.28	-	-0.07	-0.10
		(0.81)	(0.70)		(0.25)	(0.27)
Market concentration	-	-	-0.04**	-	-	0.01
			(0.01)			(0.01)
Observations	79	79	79	62	62	62
Adjusted R-squared	0.76	0.88	0.88	-0.04	-0.08	-0.09
F	16.9***	95.21***	99.82***	20.91**	13.86	12.96

This table reports estimates from OLS regressions of the *Executive compensation* as well as the change in the *Executive compensation* from (*t*-1) to *t* on the following pay determinants: the change in the *Return on equity before taxes (ROE)* from (*t*-1) to *t*, which is the ratio of profits before transfers to reserves for general banking risk and before taxes over the book value of equity; *Total loans;* the *Excess capital ratio*, which is defined as current equity holdings relative to the required equity holdings; the *Financial power of the canton* (average over all cantons=100); the *Compensation of governors*, which is a dummy variable for the level of compensation of the cantonal governors and takes the value of one if the compensation of the governors in 2001 is above the median value of all Swiss cantons, and zero else; the *Political spectrum* is an indicator of the political orientation of the canton, ranging from left (smallest value) to right (highest value); *Market concentration* is the Herfindahl-Hirschman index of the cantonal mortgage market. The period covers the years from 2002 to 2006. The data are expressed in 1'000 CHF of 2006, except the variable *Total loans*, which is in 10 Mio of CHF of 2006. The data sources are the annual reports of the banks, the webpage of the Federal Department of Finance, the online database www.badac.ch, and the Atlas of the political landscapes in Switzerland. Standard errors in brackets are corrected for heteroscedasticity and autocorrelation (clustering). *N* refers to the total number of observations over all the years. An *F*-test is performed for the simultaneous significance of all coefficients. Time dummies and constant included. ***, **, and * denotes statistical significance at the 10%, 5%, and 1% level.

4.3. Robustness Tests

In addition to the results reported above, we carry out a set of sensitivity tests to check the robustness of our results with respect to the included variables and the sampling procedure. We use alternative variables for performance, size, and risk. In particular, we use the return on assets before taxes as a performance measure, the number of employees as proxy for firm size, and the leverage ratio as an alternative risk indicator. In addition, we include the market share of cantonal banks in the mortgage markets instead of the market concentration in mortgage markets as competition indicator. The results with the alternative explanatory variables confirm our findings.

Given that our sample is rather small, we repeat our estimations by applying the bootstrap technique to get bootstrap confidence intervals. The bootstrap involves repeated re-estimation of a parameter using random samples with replacement from the original data. Because the

sampling is with replacement, some items in the data set are selected two or more times and other are not selected at all. When this is repeated a hundred or a thousand times, we get pseudo-samples that behave similarly to the underlying distribution of the data. Without reporting the explicit results, the findings reported above are also robust with respect to the sampling procedures.[25]

5 Conclusions

The paper provides a recent overview of board and executive compensation practices in state-owned banks in Switzerland over the period from 2002 to 2006. We use a multivariate regression framework to explain board and executive compensation as a function of commonly used firm-specific factors, such as bank performance, bank size, and risk. As an important new aspect of the paper, we additionally consider canton-specific factors related to the political economic factors, which have a measurable impact on board and executive compensation in state-owned banks in Switzerland.

Our sample includes 23 state-owned or cantonal banks over the period from 2002 to 2006. On average, a board member of a Swiss cantonal bank earns 73'000 CHF per year, and the yearly compensation of an executive amounts to 555'000 CHF. There are, however, large differences among the cantonal banks with respect to the compensation of their directors and executives. Our regression analyses further show that the canton-specific factors related to the political economic processes, in addition to the commonly used firm-specific pay determinants, are important for explaining board and executive compensation in state-owned banks. In addition, board and executive compensation are driven partly by different factors. Finally, our results are not entirely in accord with the principal-agent theory, which predicts a positive link between pay and performance.

We believe that our study reveals some potentially interesting aspects of compensation practices in state-owned banks in Switzerland. However, our results are limited from several points of view. First, although our sample includes 23 out of the 24 existing cantonal banks, our data set is small. This is because some of the banks that should be included in our analysis do not report their compensation figures. In addition, the banks in our sample have published compensation data since 2002 only. Furthermore, it would be interesting to have more information about the compensation figures, such as details on the structure of the compensation, i.e., cash vs. non-cash, equity vs. non-equity based, or on equity holdings of managers and board members.

[25] The results of the robustness tests are available from the authors upon request.

We are aware that our study deals with a sensitive topic, but the objective of our work is not to change cultural elements in Switzerland, nor is it some form of modern voyeurism. Instead, our aim is to make a substantial contribution to a transparent compensation culture in Swiss cantonal banks. This information could be important to more than just financial analysts and the business press; the information could also be important to the citizens of the respective cantons, who are, in the end, the owners of the cantonal banks.

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6 Appendix

The Swiss Banking System

The Swiss banking system is based on the concept of universal banking, where all banks can offer the full range of banking services. In reality, however, several bank groups have become fully or partially specialized in certain areas and offer only a limited number of services. Swiss banks can be classified into the following groups:[26]

(1) ***Big banks***: UBS AG and the Credit Suisse Group are the two largest banks in Switzerland. Together, these two 'big banks' account for over two thirds of the balance sheet total of all banks in the Swiss market.

(2) ***Cantonal banks***: There are 24 cantonal banks,[27] which are semi-governmental organizations with a state guarantee. In accordance with cantonal law, their objective is to promote the economy of the respective canton. They are involved in all banking activities, but have an emphasis on the lending and deposit business. Despite their close connection to the state, cantonal banks must comply with commercial principles in their business activities. It is possible that ongoing liberalization processes are likely lead to an abolishment of the state guarantee.

(3) ***Regional banks and savings banks***: These banks are smaller universal banks with an emphasis on the lending and deposit business. They voluntarily restrict their activities to one region, which gives them the advantage of customer proximity and a good knowledge of local circumstances and regional business cycles.

(4) ***The Raiffeisen Group***: It consists of affiliated independent banks organized as a cooperative, with strong local roots and a history of more than one century. The Raiffeisen banks have the highest number of branches in Switzerland. Most banks in the Raiffeisen Group are affiliated with the Swiss Union of Raiffeisen Banks, which is responsible for the strategic leadership of the entire group as well as for the risk management. The Raiffeisen Group is one of Switzerland's leading association of retail banks, and it has significantly increased its market share over the past few years.

[26] See also http://www.swissbanking.org.
[27] There are 26 cantons in Switzerland. For historical reasons, three of these cantons consist of two half-cantons, namely Appenzell (Apenzell Ausserrhoden and Appenzell Innerrhoden), Basel (Basel-Stadt and Basel-Landschaft), and Unterwalden (Obwalden and Nidwalden).

(5) ***Private banks***: These institutions are among the oldest banks in Switzerland. They are either individually owned firms, or collective and limited partnerships. Private bankers are subject to unlimited subsidiary liability with their personal assets. Their field of activity is asset management, mainly for private clients. As a rule, private banks do not publicly offer to accept saving deposits.

(6) ***Foreign banks***: A foreign bank is a bank for which over half of the company's votes are held by foreigners with qualified interests. Origin of banks: Europe, predominantly EU (over 50%), Japan (around 20%). Their fields of activity are foreign business and asset management.

(7) ***Other banks***: This group includes banks with various business objectives, such as institutes specializing in the stock exchange, the securities and asset management business, commercial banks, and consumer credit institutes.

Table A1: Number and size of Swiss banks (Dec. 31st 2006)

Bank group	Number of institutes	Total assets in Mio. CHF	in %
Cantonal banks	24	343'080	10.74
Big banks	2	2'198'373	68.82
Regional and Savings banks	78	85'942	2.69
Raiffeisen Banks	1	113'998	3.57
Others (Handelsbanken, Börsenbanken, Kleinkreditbanken, andere Banken und ausländisch beherrschte Banken)	183	410'586	12.85
Subsidiaries of foreign banks	29	23'657	0.74
Private bankers (Privatbankiers)	14	18'561	0.58
Total	331	3'194'197	100%

This table shows for each bank category as defined by the Swiss National Bank (SNB) the number of banking institutions, their total assets as well as their relative share of total assets compared to all the banks in Switzerland. The data refer to Dec. 31, 2006. The data source is the SNB publication 'Die Banken in der Schweiz 2006,' Schweizerische Nationalbank.

Table A2: Correlation matrix

	Board comp.	*Highest board comp.*	*Execut. Comp.*	*L1.ROE*	*L1.RORE*	*L1.ROA*	*Total loans*	*Empl.*	*Excess cap. ratio*	*Leve-rage*	*Fin. power canton*	*Comp. cant. gov.*	*Pol. spec-trum*	*Owner-ship canton*	*Dec. power canton*	*Mark. conc.*
Highest ind. board comp.	0.88***															
Executive Comp.	0.45***	0.46***														
L1.ROE	-0.30***	0.01	0.14													
L1.RORE	-0.09	0.12	0.14	0.93***												
L1.ROA	-0.42***	-0.07	0.13	0.94***	0.97***											
Total loans	0.55***	0.48***	0.86***	-0.07	-0.02	-0.17										
Employees	0.59***	0.55***	0.82***	-0.09	-0.10	-0.17	0.97***									
Excess Cap. ratio	-0.12	-0.03	-0.09	0.29**	0.39***	0.51***	-0.38***	-0.34***								
Leverage	0.19**	0.06	-0.05	-0.44***	-0.41***	-0.65***	0.26**	0.21**	-0.81***							
Fin. power canton	0.06	0.10	0.50***	0.03	0.01	0.09	0.35***	0.34***	-0.14	0.04						
Comp. cant. governors	0.55***	0.44***	0.49***	-0.11	-0.09	-0.22*	0.51***	0.47***	-0.36***	0.30***	0.37***					
Political spectrum	-0.11	-0.21*	0.51***	0.19**	0.14	0.24**	0.03	-0.04	0.11	-0.25***	0.11	0.03				
Ownership of canton	-0.33***	-0.27**	0.15	0.12	0.07	0.27**	-0.02	-0.03	0.15	-0.31***	-0.21**	-0.30***	0.32***			
Dec.power canton	-0.20**	-0.12	-0.37**	0.01	-0.04	0.02	-0.21**	-0.20*	-0.07	0.05	-0.15	-0.28***	-0.13	0.29***		
Market conc.	-0.40***	-0.38***	0.12	0.01	-0.07	0.08	-0.29***	-0.31***	0.04	-0.16*	0.02	-0.36***	0.56***	0.31***	0.21**	
Market share	-0.35***	-0.33***	0.24**	0.02	0.01	0.16	-0.20***	-0.22**	0.16*	-0.31***	0.12	-0.36***	0.64***	0.37***	0.18*	0.93***

This table reports Pearson correlation coefficients between all variables included in the empirical investigations of this study (Section 4). The data refers to the reporting period from 2002 to 2006. ***, **, and * denotes statistical significance at the 10%, 5%, and 1% level.