

## Switzerland: Financial System Stability Assessment Update

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## SWITZERLAND

### **Financial System Stability Assessment Update**

Prepared by the Monetary and Capital Markets Department and the  
European Department

Approved by Jaime Caruana and Michael Deppler

May 2, 2007

This report presents the conclusions of the IMF Financial Sector Assessment Program (FSAP) update mission, which visited Switzerland in November 2006. The FSAP findings and recommendations were discussed with the authorities during the Article IV Consultation mission in February/March 2007.

The FSAP team comprised R. Barry Johnston (Mission chief), May Khamis, Su Hoong Chang, and Francisco Vazquez (all MCM); and Teresa Rutledge (Banking supervision expert, U.S. Office of the Comptroller of the Currency), Paul McCrossan (Insurance/actuarial expert), and Hans Popping (Pension supervision expert, De Nederlandsche Bank). The mission received excellent cooperation and support from the authorities. The main findings of the FSAP are:

- Current domestic macroeconomic and financial sector conditions are favorable, and the main downside risks to the financial sector are external. Stress tests confirm the banking system's resiliency but that some insurers are vulnerable to market risks. Several pension funds are underfunded and need to strengthen their funding levels.
- Impressive progress has been made to strengthen the financial sector supervisory framework since the 2001 FSAP, but further attention should be devoted to:
  - The capital and liquidity requirements applied to the two large and systemically important banks;
  - The new regulatory and supervisory authority, which requires stronger independence and funding, and deeper supervisory staff resources;
  - Inspections and capital adequacy of high risk insurers; and
  - Supervision of occupational pension schemes.

The main authors of this report are R. Barry Johnston and May Khamis, with contributions from the rest of the FSAP update team.

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### ACRONYMS

AML/CTF	Anti-money laundering and combating the financing of terrorism
BCP	Basel Core Principles for Effective Banking Supervision
CAR	Regulatory Capital to Risk-Weighted Assets
CS	Credit Suisse
DB	Defined Benefits
DC	Defined Contributions
DD	Distance-to-default
EU	European Union
FDF	Federal Department of Finance
FED	Federal Reserve System
FINMA	Federal Authority for Financial Market Oversight
FOPI	Federal Office of Private Insurance
FOSI	Federal Office for Social Insurance
FRBNY	Federal Reserve Bank of New York
FSA	Financial Services Authority
FSAP	Financial Sector Assessment Program
FSSA	Financial System Stability Assessment
GDP	Gross Domestic Product
IAIS	International Association of Insurance Supervisors
IAS	International Accounting Standards
ICP	Insurance Core Principles
IOSCO	International Organization of Securities Commissions
IAA	International Actuarial Association
ISL	Insurance Supervisory Law
LOLR	Lender of Last Resort
LGD	Loss-Given-Default
MOU	Memorandum of Understanding
NPL	Nonperforming loan
OCC	Office of the Comptroller of the Currency
PD	Probability of Default
ROAA	Return on average assets
ROAE	Return on average equity
RWA	Risk-Weighted Assets
SFBC	Swiss Federal Banking Commission
SNB	Swiss National Bank
SRO	Self-Regulatory Organization
SST	Swiss Solvency Test
SwF	Swiss franc
SWX	Swiss Exchange
VaR	Value-at-Risk

## EXECUTIVE SUMMARY

**The Swiss financial system is large, well developed, and plays an important role in the Swiss economy and internationally.** The two large Swiss banks dominate the domestic market and are important intermediaries in global financial markets. The Swiss insurance and reinsurance industry also comprises a few players that are significant internationally. Other institutions operate mainly domestically and are not systemically important. The dualistic nature of the system implies significant differences in the risk profile and counterparty exposure across segments.

### Financial system strengths and vulnerabilities

**The current macroeconomic and financial sector environment is favorable.** Financial soundness indicators are strong and market indicators are positive. The main near-term downside risks for the financial sector are external. Nonetheless, the domestic banking sector faces medium-term restructuring pressures, and a deceleration in economic growth would likely renew consolidation pressures.

**The Swiss banking sector appears resilient to shocks.** Top-down stress tests of the banking sector and bottom-up stress tests of the two large banks confirm their resiliency to the most relevant macroeconomic stress events.

**Data from the direct insurance field tests of the Swiss Solvency Test (SST) suggest that market risks in some Swiss insurance entities need attention.** In particular, a moderate drop in interest rates and a fall in share prices and property values could cause distress for some Swiss insurers.

**Pension funds are recovering from earlier under-funding.** Nevertheless, stress tests indicate that funding levels are not yet adequate.

### Mitigation of risk in the financial system

**Switzerland has been actively upgrading its regulatory and supervisory arrangements and strengthening cooperation and information exchange with foreign regulators.** It has addressed most of the recommendations in the earlier FSAP report (see Appendix 1). The tripartite arrangement for supervisory cooperation between the Swiss Federal Banking Commission (SFBC), the Federal Reserve Bank of New York (FRBNY), and the U.K. Financial Services Authority (FSA), covering the two large Swiss banking groups, is a model of supervisory cooperation.

**Effective supervision of the major Swiss financial institutions requires a strong, independent regulator.** The draft Federal Authority for Financial Market Oversight (FINMA) Act is intended to achieve this. However, provisions in the draft act intended to balance the public benefits with the costs of regulation to industry may go too far in giving a

weight to the latter, which would limit the capacity of FINMA to be an effective regulator. (See Table 1 for a list of priority policy recommendations.)

**While the SFBC has made impressive progress in strengthening Switzerland's banking supervisory framework, a key area that remains to be addressed is liquidity supervision.** This is especially critical for the two large banking groups. In addition, the SFBC's oversight of external auditors needs to be strengthened, and the SFBC should continue to increase its resources and expertise.

**The SFBC should review in depth the capital adequacy of the two large banks and pillar II capital requirements in the context of Basel II implementation.** Given the complex nature of these two institutions and their systemic importance, care will be needed to understand and evaluate their complex models and risk exposures and management. Pillar II capital requirements should reflect both institution-specific and systemic risks.

**Reforms since 2003 have updated the regulation and supervision of the insurance industry.** The newly introduced SST is at the forefront of risk-based liability measurement. While the updated framework has a very high level of observance with the Insurance Core Principles (ICPs), the reform process is not yet complete. For successful implementation of the reform and effective supervision of the large and internationally diversified insurance industry, it is critical that the supervisor has adequate resources.

**The authorities need to upgrade pension sector supervision, which is fragmented and uneven.** The proposal under consideration involving regional consolidation of cantonal supervisors should be strengthened; a centralized approach should be considered instead, which could provide multiple benefits including economies of scale and uniform supervision and enforcement. Pension regulations should also be improved, particularly regarding risk-based funding requirements and governance regulations.

**The authorities have made significant progress in developing lender of last resort and crisis management arrangements, and are at the forefront of countries in their efforts to operationalize this framework.** Notwithstanding this progress, solvency and liquidity failures in the important global banks could pose significant risks and therefore there is still a need for cooperation with supervisors and central banks in other jurisdictions in responding to such events.





<p>b. Strengthen supervision of the two large banks' liquidity risks to include advanced analysis of potential risks such as contingency funding plans, disruptions in cross-border funding, and incremental default risk.</p> <p>c. Conduct focused audits to evaluate the two banks' risk management vis-à-vis hedge funds.</p> <p>d. Further improve oversight of bank external auditors.</p>	<p>Short-term</p> <p>Short-term</p> <p>Medium-term</p>
<p><b>3. Address vulnerabilities in the (re)insurance sector:</b></p> <ul style="list-style-type: none"> <li>• Conduct focused inspections of high risk insurers. If needed, require an increase in capital and reserves or a reduction in risk exposures</li> <li>• Continue to work closely with the (re)insurers concerned to bring down intra-group balances, which are relatively high.</li> </ul>	<p>Short-term</p> <p>Medium-term</p>
<p><b>4. Upgrade the pension sector's supervisory and regulatory frameworks:</b></p> <ul style="list-style-type: none"> <li>• Upgrade the proposed supervisory framework by establishing a centralized body with supervisory responsibility.</li> <li>• Strengthen funding requirements by adopting a risk-based standard solvency test after an agreement on adequate coverage margins, and enhance the procedures in the case of under-funding.</li> <li>• Enhance standards on governance, structure of investments, and risk management.</li> </ul>	<p>Medium-term</p>
<p><b>5. Consider measures to ensure that cantonal banks operate according to market-based incentives:</b></p> <ul style="list-style-type: none"> <li>• The governance structures of cantonal banks could be strengthened. The cantonal banks could be given the overriding goal of profit maximization while dedicating part of their profits through the fiscal process to achieve their social function.</li> </ul>	<p>Medium-term</p>

## I. INTRODUCTION

1. **This report presents conclusions of the FSAP update mission, which took place during November 9–20, 2006.** The update took place against the background of a number of regulatory and supervisory initiatives in the banking, insurance, securities, and pension sectors. The update focused on: (i) financial sector stability; (ii) regulatory and supervisory developments; and (iii) progress made in implementing the 2001 FSAP recommendations.

## II. FINANCIAL SECTOR STRENGTH AND SOURCES OF POTENTIAL RISK

### A. Structure of the Financial System and Major Counterparty Exposures

2. **The Swiss financial system is well developed and plays an important role in the global and Swiss economies.** Switzerland ranks fifth worldwide in bank assets, with the two large banks (UBS and Credit Suisse (CS)) positioned among the top ten. Swiss reinsurance groups account for more than 15 percent of global premiums, ranking third worldwide after Germany and the United States. Switzerland is a global leader in private wealth management, with a one-third share of assets among global cross-border private wealth managers. The Swiss financial system contributes about 15 percent to Swiss GDP and employs 5 percent of the labor force.

3. **The banking system is large with a dualistic structure as follows:**

- ***The two large banks are important intermediaries in global financial markets and domestically.*** They account for about two-thirds of the Swiss banking system's global assets in 2006, up from one-half in 1995 (Appendix 2, Table 4). Internationally they rate among the ten largest counterparties worldwide in the credit derivative markets, and are important intermediaries in the markets for global equities, leveraged buyouts, and mergers and acquisitions. They have also increased their exposures to hedge funds as the latter have become major counterparties in the credit derivatives market.<sup>1</sup> The two banks are systemically important domestically as well with a share of local market assets of some 35 percent.
- ***Other participants operate primarily in the domestic financial market and are not individually of systemic importance.*** Foreign banks and private banks are heavily involved in cross-border private banking, while other banks tend to focus on traditional retail—mostly mortgage finance—frequently within specific geographical regions. Cantonal banks are largely owned by the cantons and have a public service

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<sup>1</sup> In addition, hedge funds have become important partners to the large banks in equities, commodities and FX trading and account for an important proportion of the large banks' business, both with respect to volumes and profits.

mandate, while benefiting from public guarantees and preferential treatment in capital requirements.

4. **The dualistic nature of the banking system involves significant differences in the risk profile and exposure of institutions.** The large banks are outward-oriented, internationally diversified, and more exposed to developments in global financial markets, risk factors, and counterparties. The domestically-oriented banks are more focused on the local market and susceptible to shocks in the Swiss economy.

5. **The private insurance industry is also dualistic.** It comprises a few international players in insurance and reinsurance, plus a large number of smaller companies.<sup>2</sup> As in banking, the Swiss insurance industry has a significant and outwardly-oriented first-tier segment. More than two-thirds of total premiums are booked abroad, and 95 percent of reinsurance premiums relate to foreign business.

## B. Macroeconomic and Market Environment and Risks

6. **The current macroeconomic environment and the medium-term outlook are favorable.** Economic activity has rebounded since 2004 and GDP growth was 2.7 percent in 2006, well above its long-term potential. Inflation remains low and policy interest rates at 2.25 percent are low by historical comparison. The fiscal accounts recorded surplus in 2006. The Swiss franc has weakened against the euro. Swiss equity markets have outperformed most international equity markets and volatility remains low. House price increases have been moderate and there are no signs of overheating in the real estate market. The corporate sector appears healthy, with the bankruptcy rate well below its peak in the early 1990s, and companies' debt ratios are at their lowest levels in fifteen years.

7. **Against this background, the main downside risks for the financial sector appear to be external.** Given their large trading portfolios, the two large banks are potentially exposed to market downturns and significant increases in volatility, associated for example with a disorderly unwinding of global imbalances that could put further pressure on U.S. exchange and interest rates, and induce a potentially severe drop in global equity markets and turbulence in financial markets. Risks would be compounded by a hard landing of housing markets in the U.S. and other key industrial countries via direct exposures and also indirectly through feedback to real economic activity. Similarly, a domestic slowdown in economic activities would most likely originate from external influences. An additional domestic risk is associated with the increasing share of fixed-rate mortgages to households and the potential increase in interest rate risk in the domestically-oriented banking system if banks relaxed their hedging strategies. Risks from the use of the Swiss franc in carry trades would be manifested mainly in counterparty and credit risks, associated with any abrupt adjustment in the Swiss franc exchange rate.

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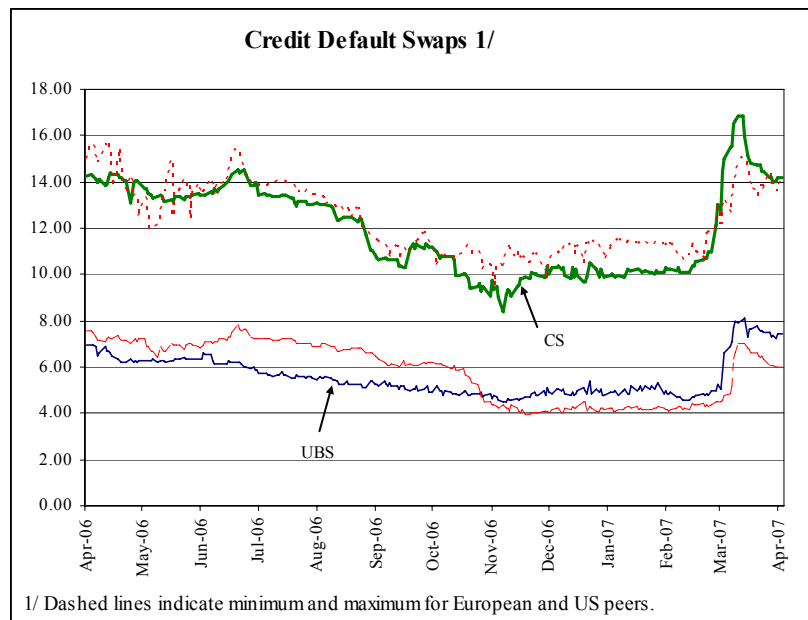
<sup>2</sup> The international players include Swiss Re, Converium, and Zurich Financial Services.

## C. Strengths and Vulnerabilities of Financial Institutions

### Banking sector

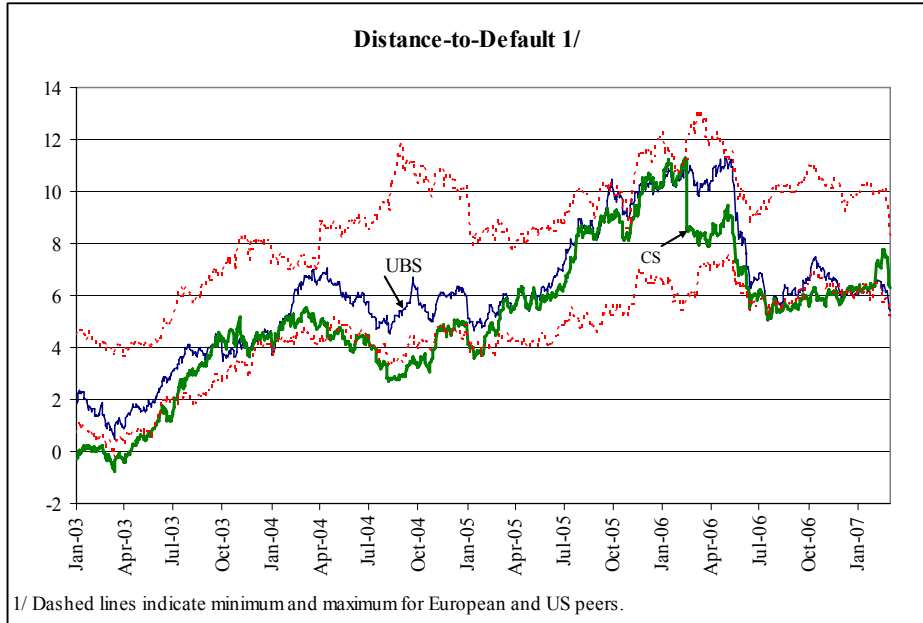
8. **Current financial soundness indicators for the banking sector are strong (Appendix 2, Tables 5 and 6).** Profitability has been on an upward trend across all bank segments. The return-on-assets was broadly similar across bank segments, but the return-on-equity was diverse at some 25 percent for the large banks and around 7 percent for other groups, reflecting lower equity to assets ratios in the large banks. Asset quality, as measured by non-performing loans (NPLs), is high by historical standards. The overall credit risk in the domestic loan portfolios—principally mortgages—appears to be low. The above is consistent with the Swiss National Bank’s (SNB) Financial Stability Report analyses.<sup>3</sup>

9. **The soundness of the two large banks is reflected in their positive market indicators.** The yield spread on their bonds and prices of their credit default swaps have moved in line with their peers in other industrial countries.<sup>4</sup> Credit ratings have been stable or improving. Although the distance-to-default indicators (DD) fell significantly around mid-2006 reflecting market turbulence, they remain well above their lows in 2002–2003.

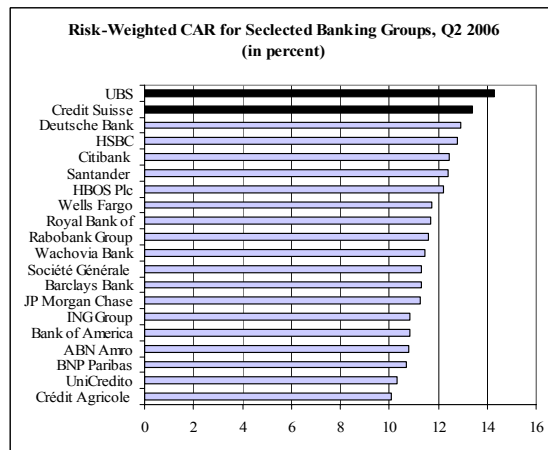
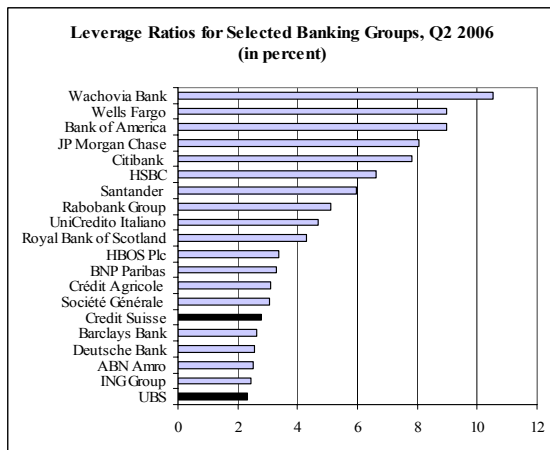


<sup>3</sup> The SNB publishes an annual *Financial Stability Report* focusing on the banking sector and financial market infrastructure. The annual reports are comprehensive and provide up-to-date analyses of risks facing the Swiss banking sector.

<sup>4</sup> European and US peers in the two text figures include HSBC, Santander Central Hispano, Royal Bank of Scotland, BNP Paribas, ABN Amro, Deutsche Bank, Barclays, Société Générale, Citi Group, and Bank of America.



10. While capital adequacy ratios (CARs) of the two large Swiss banks are ample by current regulatory standards, other indicators suggest somewhat weaker positions. The banks have internationally comparable high risk-weighted CARs under Basel I, but their leverage ratios (equity to assets) are relatively low by international comparison (see charts below). The quantitative impact studies for Basel II indicate that the Basel I ratios underestimate asset risk for the two large Swiss banks.<sup>5</sup>



Source: Credit Suisse data are based on published balance sheets. Bankscope data is used for all other groups.  
 Notes: CARs for Barclays, HSBC, ING, and Société Générale are for end-2005. CAR is based on Basel I. The CARs reported for UBS and Credit Suisse elsewhere in this paper are based on SFBC-specific risk weights that tend to be stricter than Basel I for the two large banks. Accordingly, the CARs reported in these figures for the two Swiss banks are larger than those quoted elsewhere in the report.

<sup>5</sup> The CARs of the two banks would be lower if Basel II methodology was used.

11. **Stress tests and scenario analysis indicate that the Swiss banking sector is resilient to the most relevant macroeconomic shocks.** The scenarios involve both a global and a domestic stress event (Appendix 3). The tests were conducted in a top-down exercise on the whole banking sector, carried out by the SNB, and bottom-up stress tests, carried out by the two large banks using their internal models. Top-down stress tests indicated that the effect of the international scenario on the banking sector was the most significant.<sup>6</sup> The international scenario wiped out the sector's profits but its effect on the sector's capitalization level was negligible since the banking sector suffered only minor losses. Sensitivity analysis to evaluate banks' resiliency to market risk in view of the high share of fixed-rate mortgages indicate that banks continue to be adequately hedged against such a shock.

12. **Bottom-up results from stress tests performed by the two large banks also show their resiliency to stress presented in the international scenario.** Overall, the results indicate that while the stress event has a significant effect on the two banks (as indicated by the large effect on excess capital), the two banks remain above the regulatory minimum for capital. The after-stress CAR of the two banks would be lower, however, if Basel II methodology was used to calculate the CARs. Box 1 elaborates on additional risks that were not captured in the stress tests, including major market disruptions and contagion risks.

13. **Liquidity stress tests indicate that the two banks are highly liquid.** Stress tests incorporating a combined scenario of asset illiquidity and liability withdrawals were also conducted by the two large banks. The results indicate that the two banks are resilient to a liquidity shock. The tests were conducted on a consolidated basis and do not take into account possible ring-fencing action by host regulators or correlations between liquidity and default or contagion risk due to systemic events.

*The domestically-oriented banks: medium-term challenges*

14. **A study by the mission on efficiency in the Swiss banking system indicates that, while bank productivity has increased steadily since 2002, further consolidation could lead to efficiency gains in some sectors.** The study examined the cost-efficiency, scale-efficiency, and productivity change in the Swiss banking system, using information on the input-output mix of Swiss banks between 1995–2005. The results indicate that large banks tend to be more efficient than other banks, and the productivity gap has increased between 1995 and 2005. There is also evidence that cantonal, Raiffeisen, and regional banks could further exploit cost efficiencies.

15. **There are medium-term challenges to the profitability of banks oriented to the domestic retail business.** Under the current benign macroeconomic environment, banks

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<sup>6</sup> Reflecting the impact on, and large weight of, the two large banks in the system.

have been posting robust results across the board, easing immediate pressures for additional cost-cutting measures. Over the medium-term, however, competitive pressures are expected to resume, given the expected slow-down in economic activity induced by population aging, which could increase pressures for mergers or exits. Expected future consolidation pressures are unlikely to pose a threat to systemic financial stability, particularly if the process occurs over an extended period.

16. **There is a public policy consideration related to cantonal banks, given their public ownership and the contingent public liability associated with their deposit guarantees.** Specifically, the governance structure of these banks should be strengthened to improve productivity and to ensure that they are focused on profit maximization rather than their public service mandate.<sup>7</sup> Banks could instead distribute their profits to cantonal governments to fund budgetary social functions. The planned phasing out of preferential treatment in capital requirements by 2011 is welcome.

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<sup>7</sup> For example, the charters of the cantonal banks could be revised to exclude the public service mandate, and bank boards could be reconstituted.

### Box 1. Systemic Risks of the Large Banks

**While the stress tests of the large banks show resiliency to shocks, this box considers their vulnerability to systemic market events that were not captured in the stress tests.** The two large banks are large players in derivatives and equity markets, where they intermediate large volumes of transactions. These are low risk for capital purposes since the assets remain on the banks' balance sheets for short periods of time. However, the transactions are not without risk. Transaction margins are low, while the spreads on the assets have been compressed to historically low levels. The banks have compensated for low margins by increasing volume, reflected in the rapid growth on their balance sheets. The trades are conducted in "over the counter" derivatives and major counterparties to the transactions are hedge funds. The "Fed 14" initiative has highlighted the problems with back offices keeping up with the volumes of these transactions and the many risks this creates, particularly in the credit derivatives markets. In addition, a systemic or institution-specific event that would disrupt market liquidity, particularly in markets with crowded trading, creates contagion risk and also could make it difficult for the banks to trade out of their positions, forcing them either to hold on to the assets in their portfolio with increasing volatility or to liquidate them in falling markets. In these circumstances the asset class would require much higher levels of regulatory capital, while the banks could be faced with trading losses and sharply compressed earnings.

**There is still, however, the question whether an additional capital charge should apply to the large banks.** The additional charge should consider the specific risks in their operations that are not adequately covered in Pillar I requirements of Basel II, and the systemic importance of the banks to the Swiss economy and financial system. In view of their size and importance, serious financial problems in the two large banks would have significant implications for the Swiss economy and its reputation as a financial center. For the large banks, Pillar II capital requirements should be thoroughly evaluated and considered. These need to be re-assessed on an annual basis for each bank to reflect the institution-specific risk profile and supervisory/regulatory concerns. This approach would require the SFBC to intensify its oversight, particularly in market risk and would provide flexibility in the capital charges to keep up with the banks' changing risk profile.

**The Swiss supervisory system already provides for a form of buffer by introducing a "threshold" of regulatory capital plus 20 percent as a trigger for supervisory action.** If an institution's capital falls below 120 percent of regulatory capital, it is placed under closer supervision by the SFBC. However, this buffer is uniform across banks and does not take into account the specific risk profiles of the two large banks. Peer comparisons indicate that highly-rated internationally active banks hold significantly larger buffers to maintain their ratings in international markets (see charts in paragraph 10), which underlines the fact that Basel capital requirements reflect *minimum* capital standards.



## Insurance

17. **During the last cyclical market low in early 2003, several major Swiss insurers experienced financial difficulties.** However, these problems seem to have been resolved, in part reflecting the favorable financial conditions since 2003.

18. **Data from the direct insurance field tests of the SST, while preliminary, suggest that some Swiss insurance entities need to address their market risks.**<sup>8</sup> In particular, a moderate fall in share and property values, with interest rates somewhat lower than the prior cyclical lows, *could cause distress to five out of nine life insurers, two of twelve non-life insurers, and two of nine health insurers* that participated in the 2006 SST field tests (Appendix 4). This suggests the need for focused inspection of high-risk insurers and potentially an increase in capital and reserves or reduction in risk exposures. Stress testing of the reinsurance sector will commence soon in the context of the SST implementation.

19. **The proportion of insurers' intra-group assets, both in the form of intra-group lending and equity, is relatively high (Table 2).**<sup>9</sup> This increases contagion risk within group entities and could also pose potential liquidity and solvency issues should restrictions be imposed on the free movement of assets between entities in different jurisdictions. The FOPI is aware of this issue and has been working closely with the (re)insurers concerned to bring down the intra-group balances.

**Table 2. Switzerland: Intra-group Loans and Investments as Share in Total Assets in the Insurance/Reinsurance Industry**  
(In percent)

	2003	2004	2005
Direct Insurance	12.4	12.5	12.4
Life	5.3	4.8	5.1
Non-life	30.7	31.4	29.1
Reinsurance	22.5	18.9	17.4
Total (insurance and reinsurance)	14.3	13.8	13.5

Source: Swiss Federal Office of Private Insurance.

<sup>8</sup> It should be noted the SST field test was conducted on legal entities basis and does not take account of capital and risk transfer instruments within a group.

<sup>9</sup> Regulators typically subject intra-group balances that are higher than a specified threshold to an additional capital charge. Current Swiss regulations do not include such a charge.

## Pensions

20. **Although pension funds have largely recovered from underfunding some issues arise regarding the adequacy of current coverage ratios.** This is confirmed by the results of sensitivity analysis (Table 3). The stress tests involve an evaluation of the effect of a number of market and mortality shocks on the coverage ratio of pension funds. The results indicate that even under a mild scenario (scenario 1) both defined benefit (DB) and defined contribution (DC) schemes would become underfunded, although the effect on DC schemes would be milder. In view of the initial lower coverage ratios of state-guaranteed pension funds, their after-stress coverage ratios would be the lowest, potentially putting pressure on local government finances. The above indicates that, notwithstanding recent improvements, coverage ratios need to be improved further.

**Table 3. Switzerland: Results of Sensitivity Analysis for Pension Funds' Coverage Ratios 1/**

(In percent, unless noted otherwise)

	coverage ratio, end-2005 2/	Applied Single Factor Stress				Coverage ratio after stress
		Interest rate	Equity price	Life expectancy	Other risks 3/	
<b>Scenario 1</b>						
		<b>- 50 bp</b>	<b>-25%</b>	<b>1 yr at 65</b>	<b>-5% on assets</b>	
DC Schemes	114	114	106	112	108	98
DB Schemes	113	110	105	110	108	89
Guaranteed public funds	93	90	86	91	88	76
<b>Scenario 2</b>						
		<b>- 50 bp</b>	<b>-45%</b>	<b>1 yr at 65</b>	<b>-5% on assets</b>	
DC Schemes	114	114	99	112	108	91
DB Schemes	113	110	98	110	108	85
Guaranteed public funds	93	90	80	91	88	71
<b>Scenario 3</b>						
		<b>-100 bp</b>	<b>-25%</b>	<b>1 yr at 65</b>	<b>-5% on assets</b>	
DC Schemes	114	114	106	112	108	97
DB Schemes	113	107	105	110	108	89
Guaranteed public funds	93	88	86	91	88	74

1/ There are about 2,900 pension funds in Switzerland. DC plans cover 77 percent of beneficiaries (85 percent of private-sector and 38 percent of public-sector employees) and account for about 85 percent of the total number of occupational plans. Tests were applied to 246 DC schemes, 86 DB schemes, and 35 guaranteed public schemes. Tests were not based on a stochastic model and therefore correlations between variables were not taken into account. All tests, except for "other risks" were calculated by FOSI consultant Complementa Controlling SA.

2/ The average coverage ratio (i.e., the ratio of assets to liabilities) at end-2005 for all the pension funds was 113 percent. Around 111 pension funds still had underfunding of SwF 19 billion, of which around SwF 16 billion was attributed to 37 public pension funds guaranteed by the cantons. The average coverage of these funds is about 83 percent with three funds below 50 percent. The persistence of under-funding in this segment creates a de-facto pay-as-you-go system, which is an undesirable feature for the second pillar.

3/ The rate is applied to all assets and intends to capture other risks such as exchange rate, real estate, and credit spreads risk.

### III. MITIGATION OF RISKS IN THE FINANCIAL SYSTEM

#### A. Cross Sectoral Regulatory and Supervisory Issues<sup>10</sup>

##### Federal Authority for Financial Market Oversight

21. **The mission supports the objective of the draft FINMA Act to have a strong unified and independent financial sector regulator.** The authorities have submitted to Parliament the draft FINMA Act. In a relatively small country, it makes very good sense to have one financial regulator who can bring together the expertise and budgetary resources necessary to supervise large and internationally active financial institutions. Nevertheless, some provisions in the draft FINMA Act should be clarified or elaborated to support this objective.

22. **While economic regulation involves balancing the public benefits with the costs of regulation to industry, the draft Act may give a weight to the latter, which could limit the capacity of FINMA to be an effective regulator.** Article 7 sets out four regulatory principles for the new entity. Although the authorities view the objective of these provisions as to ensure that regulatory effort is proportional to the risks posed, some provisions could give industry representatives excessive leverage and could lead to regulatory forbearance on the part of FINMA. In 2005, the Federal Department of Finance, SFBC, and FOPI issued “Guidelines for Financial Market Regulation” to achieve practical, proportionate, and effective financial regulations. These guidelines and current practices should provide sufficient assurance to the industry. Accordingly, staff recommend that the provisions in Article 7 of the draft FINMA Act be revised to ensure that an appropriate balance is maintained between the private costs and public benefits of regulation.

23. **Certain provisions in the draft FINMA Act could inhibit the independence of FINMA.** These provisions include the federal oversight of (i) the strategy and policy issues applicable to the financial center; (ii) the remuneration scale of FINMA employees; and (iii) approval of the oversight tax to fund FINMA. The authorities assured staff that the intention of these provisions was not to interfere with the independence of FINMA but to provide a channel for the exchange of views and the necessary checks and balances.

24. **Additionally, to bolster its independence, FINMA should be given the powers to impose civil money penalties.** The FINMA Act introduces an explicit sanctioning regime for breaches of the law and regulations but does not provide FINMA with the legal powers to impose these sanctions. This power would therefore continue to lie with the Ministry of Finance, which investigates charges on recommendations by FINMA.

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<sup>10</sup> Switzerland undertook in 2005 a Financial Action Task Force assessment of anti-money laundering and combating the financing of terrorism (AML/CFT). The results are included in a recent report on observance of standards and codes (ROSC).

## Cooperation and information exchange

25. **In recent years, Switzerland has actively promoted cooperation and information exchange with foreign regulators.** The tripartite arrangement with the U.S. and U.K. regulators on the supervision of the two large Swiss banking groups is a model for supervisory cooperation.<sup>11</sup> The new insurance law empowers the regulator to exchange information and conclude Memoranda of Understanding (MoUs) with both domestic and foreign supervisory authorities. In 2006, the FOPI executed a MoU with some 28 members of the European Union (EU) and the European Economic Area that recognizes the equivalence of the Swiss insurance regulatory regime.<sup>12</sup>

26. **Restrictions on cross-border exchange of confidential client information for the enforcement of securities regulations were eased by the 2005 amendment to the Securities and Exchange Act.** The sharing of confidential client information with foreign supervisors continues to be subject to prior client notification and consent: a peremptory clause give clients a 10-day period to challenge the transmission of information by means of administrative court appeal. The information required for the enforcement of regulations on stock exchanges, securities trading, or securities traders, may be retransmitted by the foreign supervisor to other authorities, courts, or bodies, without the specific approval of the SFBC. One of the key modifications is that the relevant information may be publicly disclosed, if required by the legislation of the foreign regulator to enable its use in court cases in foreign jurisdictions.

## B. Sectoral Issues

### Banking

27. **The SFBC has made impressive progress both organizationally and in its supervisory practices to strengthen Switzerland's banking supervisory framework.** The SFBC has addressed most of the areas in the "Recommended Action Plan—Basel Core Principles" from the 2001 FSAP. Some of the noteworthy changes include the addition of several important functional areas: risk management, on-site review, and external audit review. The SFBC has nearly doubled its staff in recognition of the need to have the resources to oversee an increasingly complex banking sector. Noteworthy improvements in

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<sup>11</sup> The U.K. FSA and the FRBNY indicated that the arrangement has been extremely effective with "untethered" communications. The tripartite meetings are conducted 2-3 times a year in Zurich, New York, and London. The SFBC is also regularly invited by both host regulators to participate in exams. On-site exam information is shared in meetings. Meetings are also conducted between senior bank management and triparty supervisors. The arrangement has been viewed as having worked well for the banks by lowering the regulatory burden.

<sup>12</sup> Regulatory equivalence with the EU is a condition for the FOPI to be recognized as the lead supervisor/co-supervisor for cross-border supervision of insurance group and conglomerates.

supervisory practices include the implementation of continuous supervision for the large banking groups and the implementation of a more risk-based approach for the supervision of the rest of the sector. Policies have been strengthened in the important areas of auditing, AML/CFT, Basel II and consolidated supervision. Nevertheless, two areas that remain a concern are (i) the SFBC's budgetary independence; and (ii) the need to address liquidity monitoring.

28. **Supervision of bank-specific liquidity risks needs to be strengthened.** The approach to liquidity regulation and supervision outlined in an SFBC Banking Ordinance should be updated to be aligned with the Basel Committee's paper on managing liquidity in banking organizations. Indeed, the analysis needs to go beyond this, given the systemic relevance of the large banks as global market players to cover, for example, contingency funding plans, the relationships between liquidity and incremental default risk, and stress testing of resilience to disruptions in cross-border funding. The SFBC noted its plans to monitor liquidity more closely and is working with the SNB to develop an enhanced liquidity supervision framework.

29. **Switzerland participates regularly in the various international initiatives to analyze and address developments in the fast growing hedge fund industry.** The SFBC works closely with the relevant international supervisors on this issue, particularly the U.S. Federal Reserve and the U.K. FSA.<sup>13</sup> In addition, the SFBC monitors exposures of the two large banks to hedge funds on a regular basis and now conducts a detailed annual review of their overall exposures.<sup>14</sup> The large banks have reportedly strengthened the corresponding control processes in recent years and have clear policies in place as regards their relationships with hedge funds and assessment of each fund's risk. In view of the growing exposure to hedge funds, it is important for the SFBC to conduct focused audits of banks' risk management vis-à-vis hedge funds.

30. **While the SFBC has taken a number of steps to improve oversight of external bank auditors, further measures are recommended.** The effectiveness of the "dual" supervisory system has improved with the addition of the new quality assurance performed by the SFBC on the external auditors. The strengths of this system include the ability of a major auditing firm to contribute expertise and resources that a supervisory body may not possess. However, the SFBC also needs to remain alert to the risks of such a system, such as how to assure the independence of the auditors. In this regard, it is recommended to involve different international experts and audit firms in the special examinations. The SFBC should also consider the periodic rotation of audit firms (rather than audit partners only). For the two

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<sup>13</sup> Recently, the SFBC participated with the U.S. and U.K. supervisory authorities in an exercise that also included the two large Swiss banks along side other internationally active banks to investigate more closely lending standards applied to the hedge fund industry.

<sup>14</sup> This includes positions held on the banks' own books and on behalf of clients.

large banks, the SFBC should continue to gain expertise and engagement by performing more on-site discovery work itself.

**31. The SFBC has devoted significant attention to Basel II implementation.**

The mission noted the Swiss authorities' desire to maintain the current capital base and their recognition of how essential strong capital levels are for confidence in the Swiss system. Most banks will be subject to either a Swiss or international version of the simpler, standardized approaches under Basel II. The two large Swiss banks will adopt the more advanced approaches. It is therefore essential to understand and evaluate fully their complex risk profiles and models (see Box 1). Pillar II capital requirements would also need to be evaluated for the two large banks; this is expected to be implemented over the next 2–3 years.

**32. The SFBC needs to continue developing the depth of its staff expertise and skills.**

Given the global and complex nature of the two large banks and the systemic risk they pose, the SFBC should be on the forefront of innovative supervisory techniques, such as advanced early warning analysis. To meet this objective, the SFBC should continually ensure that it has the necessary resources, expertise, and advanced skills to supervise risks in two of the most sophisticated, globally active banks in the world.

## **Insurance**

**33. Regulatory reforms since 2003 have improved Switzerland's regulation and supervision for the insurance industry in line with international best practice.**

The ISL, which came into effect on January 2006, has reoriented the regulatory focus and expanded the scope to include group/conglomerate supervision, corporate governance, risk management and market conduct of insurance intermediaries. The ISL also provides for a range of corrective and preventive regulatory measures and empowers the FOPI to exchange information with both domestic and foreign regulators. Active consultation with industry participants has contributed to practical, proportionate, and effective regulations.

**34. In January 2006 the FOPI introduced the SST, one of the most modern solvency regimes in the world.**

The SST is at the forefront of risk-based liability measurement regimes. It is now mandatory for large insurers as a pillar 2 requirement.<sup>15</sup> Reinsurers and small insurers are expected to perform the SST by 2008. Full implementation of the SST by all insurers, reinsurers and insurer-led financial conglomerates is planned for 2010.

**35. While the regulatory framework largely observes the Insurance Core Principles (ICPs), implementation of the reforms is in transition until 2010.**

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<sup>15</sup> The SST adopts the Solvency II framework that comprises three pillars: assessment of minimum and "extended" solvency capital requirements; enhanced supervisory review; and public disclosure and regulatory reporting.

of the ICPs for the reinsurance industry and the review of the regulatory and supervisory practices for the insurance sector indicate a high degree of observance of these standards. The risk- and principles-based approach to regulation and supervision is aligned with the dualistic structure of the Swiss insurance industry. While the broad legislative framework has been established, the FOPI has recently issued, or is drafting, the implementing decrees and guidelines in key areas such as corporate governance, regulatory intervention, role of external auditors and actuaries, and intra-group transactions. Effective implementation of the measures will bring the Swiss regime to full observance with the ICPs.

36. **The FOPI should focus on inspections to strengthen risk management practices among high risk insurers, as identified by the 2006 SST field test, to reduce their vulnerability to market risks.** If needed, the FOPI should require a reduction in market risks and exposures or an increase in capital and reserves. Concurrently, the FOPI should continue its active dialogue with reinsurers to guide them to prepare for the implementation of the SST and in formulating robust internal and group models for this purpose.

37. **For effective supervision of the large and international Swiss insurance industry, it is critical that the FOPI is equipped with adequate regulatory resources.** There is a need to review the adequacy of the FOPI's staff resources with a view to retain experienced key personnel and to rapidly develop regulatory capacity. In particular, the effective implementation of the SST requires the FOPI to have good understanding of company-specific internal models, and to strengthen further direct supervision of (re)insurers.<sup>16</sup> In addition, regulatory equivalence with the EU will require that FOPI be capable of undertaking more functions as lead supervisor/co-supervisor for cross-border supervision of insurance groups and conglomerates.

## Securities

38. **There has been substantial progress in various areas of securities regulation, in line with the 2001 FSAP recommendations.** As noted, restrictions on the cross-border sharing of confidential client information for securities regulation were eased after a legal amendment passed in 2005. The jurisdiction of the supervisor over secondary markets has been widened by imposing a licensing requirement on the managers of Swiss collective investment schemes under the Collective Investment Schemes Act, which is came into force in January 2007. Further, the managers of foreign collective investment schemes will be allowed to apply for a license from the SFBC and therefore voluntarily come under the supervision of SFBC. The new act also strengthens the regulation of hedge funds (Box 2). The draft FINMA Act aims to bring securities regulation more closely in line with IOSCO principles, and strengthen the budgetary independence, staffing, and enforcement powers of

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<sup>16</sup> Due consideration should be given to more comprehensive and timely regulatory reporting to facilitate off-site surveillance as well as risk-focused on-site examinations.

the supervisor. Rules on unfair trading practices are currently under revision to correct existing weaknesses and align Swiss regulations on market abuse with other major financial markets. One earlier recommendation that remains unaddressed is the call for a higher level of involvement of the SFBC in the supervision of the securities exchanges.

#### Box 2. Hedge Fund Regulation and Supervision in Switzerland

**Switzerland is the second largest market of funds of hedge funds (FoHF) worldwide after the United States, with the bulk of assets invested in off-shore hedge funds.** There are close to 256 registered and supervised hedge funds in Switzerland approved for public distribution (up from 39 in 2001) with total assets around US\$9.4 billion in 2005 (compared to US\$273.8 billion invested in all regulated Swiss funds). Almost all of these funds are structured as FoHF. The bulk of assets invested in hedge funds in Switzerland are in off-shore funds that are not registered or regulated in Switzerland. These funds, however, are available for distribution in Switzerland only to qualified investors.<sup>1</sup>

**For hedge funds and FoHF registered in Switzerland, the licensing process and supervision appear to be well focused.** In general, the licensing procedures for hedge funds and FoHF are stricter than those that apply to traditional funds. They emphasize the professional quality of fund management and entail interviews with fund representatives and a qualitative assessment of fund managers, risk management systems, reporting lines, and internal risk controls. Albeit not formally specified in the regulations, registered hedge funds are also subject to a stricter audit regime during the first two years after inception.

**The protection of hedge fund investors is pursued through transparency requirements.** Prospectuses are required to include a special risk-warning clause that has to be approved by the SFBC, and detailed information on the fund investment policy, characteristics, and special risks. Target funds are always shown in the annual and semi-annual reports of FoHFs, and investors have to be given the right of redemption at least four times per year. Statutory restrictions on the operations of hedge funds are minimal and mainly oriented to safeguarding the special structure of the FoHFs. For example, short sales or investments in another FoHF are not allowed. A 6:1 limit on leverage is imposed in addition to a 30 percent limit on a fund's assets invested in target funds managed by the same manager.

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<sup>1</sup> Estimates indicate that there are more than 150 hedge funds and FoHF offered by Swiss financial companies domiciled abroad, with an asset volume of about US\$200 billion, against an estimated US\$1.4 trillion worldwide.



## Pensions

39. **Supervision of pension funds is divided between FOSI and the cantons and continues to be fragmented and uneven.** This structure has resulted in significant differences in supervisory practices and inadequate supervision. Weakness in the supervisory framework is recognized by several partners in the pension fund sector and is largely attributed to the dispersion of supervision in a large number of cantonal supervisory authorities that have modest resources. Neither FOSI nor the cantonal offices have the instruments to carry out adequate supervision. However, FOSI is relatively better resourced. The authorities are considering the creation of a High Supervisory Board responsible for issuing uniform *regulations* for the industry while leaving the cantons the responsibility for pension fund *supervision*. This framework would involve a regional consolidation of cantonal supervisors. While this proposal would represent an improvement, there would also be benefits from adopting a centralized approach to *supervision*, particularly regarding consolidating human resources and financial knowledge and uniform supervision and enforcement.

40. **Funding requirements need to be strengthened.** Current requirements for valuation reserves (i.e., surpluses above a 100 percent coverage ratio) are not risk-based and therefore do not always take into account asset and other risks, potentially overestimating coverage ratios and reserves adequacy.<sup>17</sup> Also, pension liabilities are valued based on a discount rate that does not necessarily reflect a market interest rate corresponding to the duration of the pension liabilities, which could underestimate liabilities and lead to inappropriate contribution rates, conditional indexation of pensions, and benefits. Required funding levels should be determined by a market- and risk-based standard solvency test after an agreement on desired minimum coverage margins, and procedures and measures in the case of underfunding should be strengthened. The discount rate used for valuing pension liabilities should be market-based.<sup>18</sup>

41. **Restrictions on investments should be repealed but only after pension funds and supervisors develop and implement a proper risk-based approach with clear rules.** Because of the existing weaknesses in supervision and the lack of a proper risk-based

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<sup>17</sup> For example, calculations made by Publica, the largest pension fund in Switzerland, indicate that it would need a valuation reserve of around 29 percent for their defined benefit pension liabilities if valuations of both assets and liabilities were risk-based. This implies a shortfall of current reserves by SwF 6.3 billion.

<sup>18</sup> For example, the Netherlands uses a risk free market interest rate, while the U.K. and U.S. use a high-quality corporate bond or swap rate of the appropriate duration for the liabilities of the scheme. A degree of averaging can be applied (as in the U.S.) to reduce volatility to end-of-year valuation effects. In Switzerland, many funds still use a technical discount rate of 4 percent despite the recommendation by the Swiss organisation of actuaries to use a lower rate.

approach for determining adequate coverage ratio, at this stage the restrictions probably have more advantages than disadvantages.

42. **Other regulatory inadequacies raise governance concerns.** Governance regulations have been strengthened but more needs to be done. A code of conduct based on high and legally binding governance standards need to be introduced. The lack of standards covering the structure of investments and risk management should also be addressed.

### C. Safety Nets and Crisis Management

43. **The depositor protection scheme has been improved.** As part of the revisions to the Banking Act implemented in 2004, the deposit protection scheme is now mandatory. The amendment also improved protection for small depositors and reduced the possibility of repayment delay for this segment. Coverage includes domestic and foreign currency deposits of all banks operating in Switzerland. Coverage is compatible with EU requirements.

44. **Progress has been made on modernizing crisis management and lender of last resort frameworks and safety nets.** The 2006 Banking Law amendments provide legal powers to the SFBC to intervene in problem banks, including imposing temporary management or forced merger. The new National Bank Act, which came into effect on May 1, 2004, allows the SNB flexibility to decide on the form of accepted collateral for emergency liquidity provision. Consistent with best international practice, the Act requires that liquidity assistance be fully collateralized. As regards implementation, the SNB has been explicit in defining the conditions under which emergency liquidity support would be provided, particularly that the bank must be systemically relevant and solvent.

45. **The authorities are at the forefront of countries in their efforts to operationalize this framework but there are significant challenges, similar to those facing other major financial centers.** Discussions are underway between the SNB and the SFBC on conditions, procedures, personnel, contacts, and specific bank information that would be needed in crisis conditions. The authorities have developed an information framework to enable them to make an informed view of bank solvency under these conditions. Discussions have also advanced with foreign authorities on cross-border liquidity crisis management. These discussions should also include the likely host authorities' responses in terms of possible ring-fencing during crisis situations. Notwithstanding this progress, solvency and liquidity failures in the important global banks could pose significant risks and therefore underscores the need for cooperation with supervisors and central banks in other jurisdictions in advance of any such events.

Appendix 1. Status of Implementation of the 2001 FSAP Recommendations

2001 FSAP Recommendation	Status of Implementation
<p><b><i>I. Banking Supervision</i></b></p> <ul style="list-style-type: none"> <li>• The reduction in reliance on external auditors and the implementation of a formal quality assurance program for external auditors.</li> <li>• Increasing the frequency of special audits and on-site visits to banks in general.</li> </ul>	<p>Implemented.</p> <p>A formal quality assurance program for external auditors has been implemented. An on-site review unit was formed for the large banking groups.</p>
<p>The removal of the exception of the Banking Act that allows non-bank employer-sponsored deposit taking entities that are not licensed as financial institutions.</p>	<p>Not implemented.</p> <p>The Banking Act was amended but this exception was retained. The Federal Council and Parliament determined that the systemic risk emanating from the very few remaining instances was negligible. The BCP Methodology allows for such exceptions if negligible.</p>
<p>Strengthening the legal powers of the SFBC to enable it to conduct more effective supervision. This includes:</p> <ul style="list-style-type: none"> <li>• Safeguarding the budgetary independence of the SFBC.</li> <li>• Providing the SFBC with the authority to conduct consolidated supervision.<sup>19</sup></li> </ul>	<p>Partially implemented.</p> <p>The draft FINMA Act provides for improvements in establishing the financial independence of the supervisors but could be further strengthened. As the Act is still in draft, the situation has not changed from 2001.</p> <p>The amendments to the Banking Law, which came into effect in January 2006 provide for explicit powers for the SFBC to conduct consolidated supervision.</p>

<sup>19</sup> The legal powers of the SFBC did not extend to bank holding companies. However, the SFBC established through the courts its right to carry out consolidated supervision of banking groups, including affiliates that are effectively supported by the bank.

<b>2001 FSAP Recommendation</b>	<b>Status of Implementation</b>
<ul style="list-style-type: none"> <li>• Providing the SFBC with the authority to impose financial penalties and public sanctions.</li> </ul>	<p>The draft FINMA Act does not give powers to FINMA to impose monetary penalties.</p>
<p>The elimination of a 12.5 percent capital reduction for cantonal banks.</p>	<p>Partially implemented.</p> <p>The SFBC and the association of Cantonal banks agreed on a staggered voluntary reduction of this capital exemption starting after the implementation of Basel II in 2007 with full elimination by 2011.</p>
<p>Improving the supervision of bank-specific liquidity by the SFBC.</p>	<p>Not implemented.</p> <p>The supervisory framework for bank-specific liquidity risks has not yet been improved, although action is pending.</p>
<p>The FSAP supported the plans for integrating banking and insurance supervision and noted that it saw advantage in making such an authority also responsible for the supervision of pension funds in Switzerland.</p>	<p>Partially implemented.</p> <p>The Draft FINMA Law is being discussed by the Parliament. Supervision of pension funds was not included in FINMA.</p>
<b>II. Crisis Management and Safety Nets</b>	
<p>Modernizing the LOLR and crisis management regime.</p>	<p>Implemented.</p> <p>The revised SNB Act no longer specifies acceptable collateral.</p> <p>The 2006 Banking Law amendments provide legal powers to the SFBC to intervene in problem banks, including imposing temporary management in a forced merger.</p> <p>The banking deposit protection scheme was made compulsory.</p>
<b>III. Insurance Supervision</b>	
<p>A rapid adoption of the new law on insurance, which</p>	<p>Implemented.</p>

<b>2001 FSAP Recommendation</b>	<b>Status of Implementation</b>
would bring the rules for insurance supervision in line with those in the European Union (EU).	Law has been adopted and came into effect in February 2006.
<b>IV. Securities</b>	
Improving the legal basis for information sharing with foreign supervisors.	Implemented.  The Securities Law was amended to strengthen the legal basis for information sharing.
The inclusion of unregulated independent asset managers and investment advisors under the SFBC.	Implemented with minor exceptions.
Establishing contact with the U.S. Securities and Exchange Commission (SEC), in light of the SEC's primary responsibility for the U.S. investment banking arms of the major Swiss banks, as well as contacts with appropriate foreign insurance supervisors.	Implemented.
<b>V. Pension Regulations and Supervision</b>	
Mandatory rates of return and payout ratios on pension assets should be revised.	Not implemented.  Reforms in this area are under discussion.

## Appendix 2. Financial System Structure and Financial Soundness Indicators

**Table 4. Switzerland: Structure of the Financial System**

	2001	2002	2003	2004	2005	2006
	(Number of institutions)					
Banks	369	356	342	338	337	331
Cantonal banks	24	24	24	24	24	24
Large banks	3	3	3	3	2	2
Regional and savings banks	94	88	83	83	79	78
Raiffeisen banks	1	1	1	1	1	1
Branches of foreign banks	25	25	26	25	28	29
Private bankers	17	15	15	14	14	14
Other banks	205	200	190	188	189	183
Trading banks	12	11	9	8	7	7
Stock exchange banks	61	62	55	53	56	52
Other banks	7	5	4	4	4	4
Foreign controlled banks	125	122	122	123	122	120
Insurance companies - Life	29	24	24	24	...	...
Insurance companies - General	106	123	124	124	...	...
Pension funds	...	8,134	...	...	...	...
<b>Concentration</b>						
Banks 1/	63.6	64.1	63.0	66.0	67.1	72.4
	(In SwF billions)					
<b>Assets</b>						
Banks	2,227,416	2,251,874	2,237,043	2,490,768	2,846,455	3,193,799
Cantonal banks	304,779	312,804	310,664	314,331	326,997	343,080
Large banks	1,415,981	1,444,462	1,408,660	1,643,506	1,910,445	2,198,373
Regional and savings banks	77,682	78,820	80,619	81,492	83,878	85,942
Raiffeisen banks	82,409	92,684	102,140	106,098	108,187	113,998
Branches of foreign banks	17,010	16,436	16,013	14,925	17,427	23,465
Private bankers	17,374	16,222	17,427	16,807	17,207	18,561
Other banks	312,180	290,447	301,519	313,610	382,315	410,379
Insurance companies - Life	300	301	311	303	...	...
Insurance companies - General	495	507	530	536	...	...
Pension funds	...	441	...	...	...	...
<b>Deposits</b>						
Banks	937,158	931,828	974,339	1,043,790	1,210,912	1,374,173
Cantonal banks	154,767	164,234	169,092	179,541	186,111	192,163
Large banks	528,741	506,473	526,180	576,588	699,724	833,818
Regional and savings banks	44,912	46,468	49,680	51,327	53,573	54,114
Raiffeisen banks	52,893	58,804	65,395	70,724	72,609	75,371
Branches of foreign banks	2,134	2,321	2,001	2,014	2,172	2,080
Private banks	11,157	11,546	12,529	10,734	11,324	11,027
Other banks	142,554	141,982	149,461	152,861	185,398	205,601

Source: Swiss National Bank.

1/ Share in percent of three largest banks in total assets of the sector.

**Table 5. Switzerland: Core Financial Soundness Indicators**

	2001	2002	2003	2004	2005	2006
<b>Banks</b>						
<b>Capital adequacy</b>						
Regulatory capital as percent of risk-weighted assets	12.4	12.6	12.4	12.6	12.4	13.4
Cantonal banks	11.0	10.9	12.6	13.8	14.9	15.1
Large banks	11.0	10.9	10.1	10.0	10.0	11.4
Regional and savings banks	12.1	12.1	12.4	12.9	13.3	13.6
Regulatory Tier I capital to risk-weighted assets	12.6	13.1	13.5	13.3	13.0	13.4
Cantonal banks	10.8	10.9	12.9	14.1	15.2	15.6
Large banks	12.1	12.7	12.9	12.2	11.6	12.4
Regional and savings banks	11.1	10.8	11.1	11.6	12.0	12.2
Non-performing loans net of provisions as percent of capital 1/	2.0	0.6	-0.5	-1.2	-1.0	-1.0
Cantonal banks	-1.7	-2.6	-4.5	-6.3	-4.0	-4.6
Large banks	5.6	3.0	1.3	1.4	1.3	1.4
Regional and savings banks	-2.8	-5.1	-4.8	-7.1	-1.6	-3.0
<b>Asset quality and exposure</b>						
Non-performing loans as percent of gross loans	2.1	1.8	1.3	0.9	0.5	0.3
Cantonal banks	2.9	2.9	2.4	1.8	1.3	0.9
Large banks	2.2	1.7	1.0	0.6	0.3	0.2
Regional and savings banks	2.1	1.8	1.5	1.1	0.9	0.6
Sectoral distribution of bank credit to the private sector (percent) 2/, of which:						
Households	58.1	60.8	63.7	65.2	66.6	68.5
Cantonal banks	59.2	60.8	62.3	63.1	64.2	64.5
Large banks	53.4	57.7	63.2	65.7	68.2	68.4
Regional and savings banks	65.7	67.0	67.7	68.6	69.4	69.9
Industry and manufacturing	4.7	4.5	4.1	3.7	3.4	3.0
Cantonal banks	3.9	3.9	3.7	3.5	3.2	3.3
Large banks	5.6	5.2	4.2	3.6	3.2	2.7
Regional and savings banks	5.1	4.9	4.6	4.3	3.9	3.7
Construction	2.7	2.5	2.2	2.1	1.9	1.7
Cantonal banks	3.0	2.8	2.6	2.6	2.4	2.2
Large banks	2.2	1.9	1.5	1.2	1.1	0.9
Regional and savings banks	4.7	4.4	4.1	3.8	3.7	3.6
Other financial activities	3.9	3.0	2.2	2.2	2.4	3.1
Cantonal banks	2.3	1.9	1.4	1.6	1.8	1.8
Large banks	5.7	4.1	2.8	2.6	2.5	5.0
Regional and savings banks	1.2	1.0	0.9	0.9	1.0	1.0

**Table 5. Switzerland: Core Financial Soundness Indicators (concluded)**

	2001	2002	2003	2004	2005	2006
Insurance sector	1.0	0.7	0.5	0.5	0.4	0.4
Cantonal banks	1.0	0.6	0.5	0.4	0.4	0.4
Large banks	1.2	0.9	0.6	0.6	0.5	0.4
Regional and savings banks	0.4	0.3	0.3	0.3	0.2	0.2
Commercial real estate, IT, R&T	12.8	12.5	12.3	12.2	12.1	11.0
Cantonal banks	11.1	11.8	11.9	12.2	12.4	12.8
Large banks	16.0	14.9	14.3	13.9	13.2	12.0
Regional and savings banks	9.2	8.8	9.1	9.1	9.6	9.6
<b>Earnings and profitability</b>						
Gross profits as percent of average assets (ROAA)	0.6	0.5	0.7	0.8	0.9	0.9
Cantonal banks	0.1	0.1	0.7	0.8	1.0	1.1
Large banks	0.5	0.5	0.5	0.7	0.8	0.7
Regional and savings banks	0.7	0.6	0.7	0.7	0.8	0.9
Gross profits as percent of average equity capital (ROAE)	10.0	8.9	11.7	14.3	18.0	17.7
Cantonal banks	1.1	2.2	10.3	11.1	12.4	13.0
Large banks	10.4	10.8	11.8	16.1	21.9	19.2
Regional and savings banks	10.4	8.4	10.6	10.9	12.1	13.1
Net interest income as percent of gross income	34.8	34.9	40.2	36.4	30.9	27.4
Cantonal banks	67.3	67.4	64.2	62.2	60.3	58.4
Large banks	31.4	30.8	41.1	35.0	26.1	20.1
Regional and savings banks	77.3	78.7	77.3	76.7	74.6	74.0
Non-interest expenses as percent of gross income	63.3	61.7	63.5	62.7	59.2	63.0
Cantonal banks	57.2	56.6	53.9	52.8	50.4	48.4
Large banks	63.8	59.5	64.9	63.4	58.7	66.5
Regional and savings banks	54.4	56.1	55.8	54.6	52.8	51.7
<b>Liquidity</b>						
Liquid assets as percent of total assets	11.8	10.9	12.1	11.2	11.4	11.2
Cantonal banks	6.4	6.5	7.3	7.0	7.5	8.2
Large banks	12.9	11.0	12.0	11.3	11.4	11.2
Regional and savings banks	7.0	7.7	7.9	7.3	7.3	6.1
Liquid assets as percent of short-term liabilities	64.1	62.6	64.5	60.7	60.3	60.4
Cantonal banks	56.8	55.5	54.1	52.0	55.1	58.5
Large banks	62.3	61.6	65.0	61.4	60.6	59.9
Regional and savings banks	50.1	48.2	44.2	40.6	41.5	41.7

Source: Swiss National Bank.

1/ Until 2004, general loan-loss provisions were made; as of 2005, specific loan-loss provisions have been carried out.

2/ As percent of total credit to the private sector.

3/ Mining and extraction, production and distribution of electricity, natural gas and water, financial intermediation, social security, ex-territorial bodies and organizations, other.



**Table 6. Switzerland: Encouraged Set of Financial Soundness Indicators**

	2001	2002	2003	2004	2005	2006
<b>Capital adequacy</b>						
Capital as percent of assets (leverage ratio)	5.6	5.5	5.7	5.3	5.1	4.9
Cantonal banks	6.2	6.2	7.1	7.7	8.0	8.2
Large banks	4.5	4.3	4.4	3.8	3.6	3.6
Regional and savings banks	6.6	6.5	6.6	6.8	7.0	7.1
Tier 1 capital as a percent of total regulatory capital	101.1	103.7	109.2	105.8	104.9	99.8
Cantonal banks	98.9	100.7	101.8	102.1	102.3	102.8
Large banks	110.0	116.2	128.6	121.6	115.9	108.4
Regional and savings banks	91.0	89.2	89.4	89.9	89.7	89.7
<b>Asset quality and exposure</b>						
Foreign currency loans as percent of total loans	50.7	48.7	49.4	52.5	57.1	60.8
Cantonal banks	5.1	4.9	5.4	5.8	6.8	7.9
Large banks	69.3	68.8	69.4	72.0	76.1	78.9
Regional and savings banks	0.9	0.7	0.9	1.0	0.9	1.1
Foreign currency assets as percent of total assets	56.5	55.2	54.6	57.2	61.3	63.6
Cantonal banks	5.0	5.2	5.6	6.1	7.0	8.5
Large banks	73.8	73.0	72.7	74.0	77.7	79.1
Regional and savings banks	0.9	0.8	0.9	1.1	1.1	1.2
Foreign currency liabilities as percent of total liabilities	59.1	57.9	57.6	59.1	62.9	66.4
Cantonal banks	4.6	4.8	6.2	6.2	7.4	10.0
Large banks	75.6	75.1	75.0	75.9	78.5	81.3
Regional and savings banks	1.5	1.8	1.6	1.7	2.0	2.1
<b>Geographical distribution of bank credit as percent of total bank credit</b>						
Switzerland	48.6	49.0	48.3	45.2	40.8	37.3
Cantonal banks	92.8	91.6	91.9	92.4	92.0	91.3
Large banks	31.7	30.6	29.8	26.7	22.7	20.2
Regional and savings banks	99.1	99.1	99.1	99.3	99.2	99.3
EMU countries	10.6	10.7	8.1	7.7	8.4	7.7
Cantonal banks	4.6	5.5	5.3	4.9	4.0	4.6
Large banks	7.4	9.3	5.4	5.6	6.7	5.0
Regional and savings banks	...	...	...	...	...	...
Other developed countries	36.3	35.6	38.6	41.6	44.3	47.5
Cantonal banks	1.6	2.0	2.0	1.9	3.1	2.8
Large banks	56.4	55.5	59.7	62.2	64.4	67.0
Regional and savings banks	...	...	...	...	...	...

**Table 6. Switzerland: Encouraged Set of Financial Soundness Indicators (continued)**

	2001	2002	2003	2004	2005	2006
Geographical distribution of bank credit as percent of total bank credit (continued)						
Central and eastern European countries	0.3	0.3	0.3	0.3	0.4	0.7
Cantonal banks	0.2	0.2	0.3	0.4	0.4	0.4
Large banks	0.3	0.2	0.2	0.2	0.2	0.7
Regional and savings banks	...	...	...	...	...	...
Emerging markets and developing countries	4.2	4.3	4.8	5.2	6.1	6.9
Cantonal banks	0.7	0.7	0.5	0.5	0.6	0.8
Large banks	4.3	4.4	4.8	5.3	6.0	7.1
Regional and savings banks	...	...	...	...	...	...
<b>Earnings and profitability</b>						
Trading income as a percent of gross income	14.2	12.3	7.3	11.8	15.9	18.1
Cantonal banks	4.5	5.4	7.9	8.2	10.3	12.3
Large banks	19.7	15.5	4.6	13.9	20.2	24.2
Regional and savings banks	3.5	3.3	4.4	4.6	5.8	5.4
Income from commissions and fees as a percent of gross income	33.4	30.8	33.3	34.8	33.3	33.6
Cantonal banks	17.4	16.1	17.7	19.6	19.6	19.7
Large banks	30.2	27.1	31.1	33.1	31.1	31.3
Regional and savings banks	13.5	11.9	11.7	12.4	13.4	14.5
Personnel expenses as percent of non-interest expenses	56.8	57.0	59.7	60.8	60.6	58.5
Cantonal banks	54.5	55.1	58.2	58.4	58.5	59.4
Large banks	57.5	57.8	61.5	63.7	63.3	58.7
Regional and savings banks	54.7	54.1	53.8	53.0	53.7	53.4
<b>Liquidity</b>						
Customer deposits as percent of total (non-interbank) loans	74.8	77.3	79.5	78.6	73.7	78.8
Cantonal banks	57.0	59.6	62.7	64.5	63.3	63.4
Large banks	83.3	86.7	87.1	84.8	77.0	85.3
Regional and savings banks	62.4	63.9	67.1	67.0	60.8	57.5
<b>Exposure to derivatives</b>						
Gross asset position in derivatives as a percentage of tier I capital	174.9	242.1	244.8	263.5	268.6	244.0
Cantonal banks	23.5	49.1	31.4	30.0	34.0	32.1
Large banks	321.0	440.5	456.6	514.7	520.6	453.3
Regional and savings banks	1.3	3.6	2.1	2.8	2.1	1.6
Gross liability position in derivatives (as % of tier I capital)	174.8	246.0	261.3	289.2	286.4	254.0
Cantonal banks	26.6	41.9	33.3	30.9	35.1	38.3
Large banks	318.2	448.4	486.2	565.2	556.1	467.0
Regional and savings banks	1.5	3.5	1.6	3.5	2.0	1.4

**Table 6. Switzerland: Encouraged Set of Financial Soundness Indicators (concluded)**

	2001	2002	2003	2004	2005	2006
<b>Pension funds</b>						
Under-funding as percent of total liabilities	...	22.6	19.6	...	...	...
Share of underfunded funds in total pension funds	...	19.8	11.9	...	...	...
<b>Households</b>						
Household debt to banks as a percentage of GDP	100.3	103.4	108.1	109.9	114.4	115.5
<b>Corporate sector</b>						
Total debt to equity (percent, w/o financial corporations)	54.2	63.8	59.0	...	...	...
<b>Real estate markets</b>						
Annual increase of real estate prices	3.1	5.6	4.9	2.6	1.8	1.8
Annual increase in housing prices	...	...	...	...	2.0	1.8
Annual increase in commercial real estate prices	...	...	...	...	-0.7	1.3
Total real estate loans as percent of total loans:						
Switzerland	66.7	70.4	71.8	73.1	74.9	75.0
Cantonal banks	74.8	77.0	79.1	80.2	80.7	80.6
Large banks	61.6	66.8	68.4	69.8	76.1	75.2
Regional and savings banks	85.3	86.1	86.1	86.8	86.6	86.5
Global level	32.8	34.9	35.7	33.8	32.0	29.1
Cantonal banks	69.6	70.6	72.7	74.1	74.3	73.7
Large banks	20.0	20.9	21.9	19.7	19.2	16.5
Regional and savings banks	84.5	85.4	85.4	86.3	86.1	86.1
Residential loans as a percent of total loans to households (Global)						
Cantonal banks	...	...	...	...	59.2	58.9
Large banks	...	...	...	...	16.3	13.8
Regional and savings banks	...	...	...	...	68.0	68.3
Commercial real estate loans as percent of total loans ( Global)						
Cantonal banks	...	...	...	...	5.3	4.9
Large banks	...	...	...	...	15.2	14.8
Regional and savings banks	...	...	...	...	3.0	2.7
Regional and savings banks	...	...	...	...	18.1	17.8

Sources: Swiss National Bank and Social Security Administration.

### Appendix 3. Banking Sector Stress Tests

#### Methodology

46. **The general objective of the stress testing exercise is to assess the resilience of the Swiss banking sector to a variety of relevant risks.** This appendix describes the sources of risk, shocks, models, and instruments used in these tests, and reports on the results. It focuses on credit, market, and liquidity risks. Scenarios and other assumptions used are based on discussions by the mission, the authorities, and the two large banks, UBS and Credit Suisse. The exercises are based on financial information as of end-June 2006. A description of the stress tests conducted is summarized below.

47. **The stress tests comprised two approaches.** The first involved top-down stress tests for the whole banking sector. These tests were conducted by the SNB using the Bank's own stress testing model. The tests included two macroeconomic scenarios and additional analysis to assess the banking sector's resiliency to interest rate risk, given the increasing share of fixed rate mortgages in banks' portfolios. The SNB's model uses a set of macroeconomic and individual bank variables to capture the effect of shocks on bank profitability through the effect on banks' provisions, net interest income, and income from commissions, fees and trading.<sup>20</sup> The model predominantly incorporates domestic macroeconomic data because of the existence of multicollinearity between Swiss and international variables.<sup>21</sup> Data for the banking system is based on accounting information for individual institutions on a consolidated basis.<sup>22</sup> The model uses annual data and covers the period 1987–2005.

48. **The second approach comprised bottom-up stress tests conducted by the two large banking groups.** These tests were conducted by the banks themselves applying their own internal models and included the two macroeconomic scenarios noted above in addition to liquidity stress tests and sensitivity analyses incorporating market (interest rates, exchange rates, equity prices, credit spreads, and market volatility) and credit risks. The test results were provided in advance to the mission and were discussed with the SFBC, the SNB, and the two banks in detail during the mission. It should be noted that the assumptions used in the stress scenarios are restrictive. Consistent with other FSAPs they do not allow for the banks

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<sup>20</sup> For more details on the SNB model, see: Hans-Jörg Lehmann and Michael Manz, *The Exposure of Swiss Banks to Macroeconomic Shocks – an Empirical Investigation*, SNB Working Paper 2006-4; [http://www.snb.ch/en/i/about/pub/oecpub/id/working\\_papers](http://www.snb.ch/en/i/about/pub/oecpub/id/working_papers).

<sup>21</sup> The model therefore captures the effect of movement in global variables to the extent that these variables are correlated with domestic macroeconomic variables. If the shock is purely domestic, it is only applied to banks' domestic portfolio, if the shock is assumed to be global, it is also applied to banks' international portfolios.

<sup>22</sup> In view of the recent sale of Credit Suisse of its insurance subsidiary, Winterthur, this subsidiary was not included in the consolidated data used for the group.

to rebalance their portfolios in response to the stress event; the losses due to the shocks occur immediately; and valuation effects from shocks are assumed to translate to net losses.<sup>23</sup>

### Macroeconomic Scenarios

49. **Macroeconomic scenarios included a global and a domestic event.** The scenarios incorporated extreme but plausible macroeconomic conditions. The first involved a scenario of a disorderly unwinding of global imbalances based on the simulations of the Fund's General Equilibrium Model, projected over a three-year horizon and compared to a baseline scenario consistent with current economic considerations (Table 7).<sup>24</sup> This scenario considered a sudden and permanent nominal depreciation of the U.S. dollar in effective terms. This shock was assumed to have a severe effect on global equity prices and U.S. growth, and a significant (but less severe) effect on the Euro-area and Swiss real economic growth rates. While short-term interest rates were expected to be tightened significantly in the U.S. in response to capital outflows, short-term interest rates in the Euro area and Switzerland were not expected to be affected. The baseline scenario for Switzerland and the effect of the global scenario on Switzerland was modeled by the SNB using its international model.

50. **The second scenario incorporated the domestic risk of an effective nominal appreciation of the SwF that was assumed to bring about a severe slowdown in Swiss real GDP growth.** Real GDP was projected to shrink 2 percent in the domestic scenario compared to a mild growth of 0.5 percent in the global scenario, a drop in the Swiss Market Index, and a relaxation of short-term interest rates (Table 8). The domestic scenario was calibrated by the SNB based on historical data after discussions with the mission. The exercises simulated the impact on relevant components of the profitability of banks. The effects were measured against the results obtained for the baseline scenario. Finally, in view of the significant share of fixed rate mortgages in the domestic banking system, the effect of an increase in interest rates of 200 basis points (single factor shock) on the profitability of the banking sector was analyzed.

### Bottom-up stress tests

51. **The two large banks' bottom-up stress tests comprised individual factor and scenario analyses.** The latter was based on the above scenarios after conducting the necessary mapping (agreed with the mission) from macroeconomic variables into banks' specific parameters (such as effect on probabilities of default (PDs) and loss-given-default (LGD)). The two banks used different approaches, depending on their internal models and

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<sup>23</sup> It is assumed that there are no offsetting positive profits from other operations of the bank and therefore portfolio losses related to the assumed shocks would have a direct impact on the banks' capital base.

<sup>24</sup> These projections were included in the Fund's *World Economic Outlook* (September 2006), available at [www.imf.org](http://www.imf.org).

methodologies, to map the macroeconomic scenarios into bank specific parameters. Single factor shocks were also agreed upon by the mission and the two banks following extensive discussions and were based on a historical evaluation of the relevant data and expert judgment. Sensitivity analysis comprised market risks applied to all assets and liabilities and off-balance sheet items and credit risk (Table 9). Credit risk was based on separate shocks to the PDs and LGDs on the credit portfolios of the two banks, based on the banks' own internal datasets. Banks reported two severities: a 1-in-10 year event (i.e., 90<sup>th</sup> percentile confidence level) and a 1-in-25 year event (i.e., 96<sup>th</sup> percentile confidence level). Stress tests were conducted at the consolidated group level. Stress tests for liquidity risk were also conducted and were carried out considering two timeframes: transactions maturing within one week and transactions maturing within one month. The exercise was based on three scenarios: (i) asset illiquidity; (ii) deposit withdrawals; and (iii) a combination of both stress events (Table 10). These scenarios were evaluated against a "going concern" scenario assuming a steady balance sheet.

**52. The approaches, models, and assumptions were discussed with the mission in detail and efforts were made to bring assumptions used by the two banks as close as possible.** For the global scenario, it was agreed that the global credit conditions under this scenario should mirror the changes in credit conditions in 2001. Shocks were applied to the two banks' relevant portfolio segments and included: (i) investment bank "take and hold" portfolios;<sup>25</sup> (ii) investment bank temporary exposure; (iii) wealth management Lombard lending (collateralized international lending); and (iv) private equity. Credit portfolios in Switzerland were also included but only a mild recessionary effect was applied for the purpose of calibrating default parameters. On the other hand, the domestic scenario was interpreted as a severe recession scenario for Switzerland, impacting Swiss enterprises, private equity exposures in Switzerland, and a spill-over to mortgages. Stress factors for PDs and LGDs for the domestic scenario were based on internal bank methodologies derived from historical internal and external data.

**53. Market risk for the macroeconomic scenarios was modeled for the first year of impact only by both banks, in view of the envisaged recovery in markets after the first year.** Banks used the market risk shocks provided by the macro scenarios for 2007 as an instantaneous shock. This was clearly a conservative approach since it ignored any opportunities for banks to rebalance their portfolios or undertake risk mitigating actions over the timeframe in which the scenario unfolded. Complementary assumptions for the scenario on market volatility and credit spreads (including corporate credit spreads and spreads on commercial, residential and asset backed securities) were based on assumptions used in

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<sup>25</sup> For this portfolio, Bank 1 used the defaults observed on the Moody's data base where PD stress factors were calibrated to obtain an overall portfolio stress loss level (i.e., stressed PDs) corresponding to the actually observed Moody's default rates per rating class for 2001. Bank 2 used its internal models to calculate credit risk under the global scenario; observed PDs in its own portfolio for 2001, which correspond to a 1 in 25 year scenario, were used and were reportedly close to Moody's values.

banks' internal stress tests, close to those proposed by the SNB and the mission. The results of the stress scenarios were calculated either by applying the shock directly to the banks' portfolios or scaling the results from existing internal stress test scenarios.

## Results

54. **Stress tests results indicate that the Swiss banking sector is resilient to a variety of macroeconomic shocks.** Top-down stress tests indicate that the effect of the international scenario on the banking sector is the most significant (Table 11).<sup>26</sup> The international scenario wiped out the sector's profits, but its effect on the sector's capitalization level was negligible since the banking sector suffered only minor losses. Additionally, the analysis of the effects of a 200 basis points increase in interest rates indicate that banks continue to be resilient to such a shock.

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<sup>26</sup> Reflecting the impact on, and large weight of, the two large banks in the system.

**Table 7. Switzerland: Baseline and Global Scenario Projections 1/**  
(in percent, unless otherwise indicated)

	Baseline Projections				Global Scenario Projections			
	2006	2007	2008	2009	2006	2007	2008	2009
<b>Switzerland</b>								
Exchange rate, USD/national currency	0.78	0.79	0.80	0.81	0.78	0.96	0.92	0.91
Exchange rate, Euro/national currency	0.64	0.65	0.67	0.68	0.64	0.65	0.66	0.67
Short-term interest rate	1.60	2.10	2.10	2.20	1.60	1.70	0.80	1.10
Long-term bond yield	2.80	3.20	3.30	3.30	2.80	2.90	2.90	3.00
Unemployment rate	3.30	2.90	2.90	2.90	3.30	3.20	4.10	4.30
Real GDP growth	3.00	2.00	1.70	1.80	3.00	0.50	0.10	1.90
Inflation	1.45	1.30	1.30	1.30	1.45	0.58	0.60	0.60
<b>Euro Area</b>								
Exchange rate, USD/national currency	1.19	1.20	1.20	1.20	1.19	1.47	1.39	1.35
Short-term interest rate	3.26	3.63	3.75	3.85	3.26	3.62	3.27	3.40
Long-term bond yield	4.36	4.69	4.81	4.85	4.36	4.51	4.63	4.72
Unemployment rate	8.26	8.12	7.80	7.58	8.26	8.44	8.75	9.17
Real GDP growth	1.96	1.90	2.12	2.24	1.96	0.29	0.20	1.46
Inflation	2.13	2.23	1.92	1.86	2.13	2.46	1.76	1.71
<b>Japan</b>								
Exchange rate, USD/national currency	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Short-term interest rate	0.32	0.94	1.37	1.70	0.32	0.94	1.13	1.47
Long-term bond yield	2.65	3.27	3.49	3.61	2.65	3.18	3.40	3.55
Unemployment rate	4.13	3.96	3.97	3.99	4.13	4.28	4.92	5.58
Real GDP growth	2.80	2.07	1.74	1.69	2.80	0.46	-0.17	0.90
Inflation	0.33	0.62	1.15	1.53	0.33	0.86	1.00	1.39
<b>United Kingdom</b>								
Exchange rate, USD/national currency	1.75	1.77	1.78	1.80	1.75	2.17	2.07	2.03
Short-term interest rate	4.63	4.79	4.80	4.74	4.63	4.78	4.32	4.28
Long-term bond yield	4.12	4.28	4.29	4.23	4.12	4.09	4.11	4.10
Unemployment rate	4.88	4.76	4.85	4.85	4.88	5.16	5.99	6.69
Real GDP growth	2.52	2.67	2.61	2.57	2.52	1.46	1.18	1.98
Inflation	1.90	1.92	2.00	2.00	1.90	2.09	1.89	1.89
<b>United States</b>								
Exchange rate, USD/national currency	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Short-term interest rate	4.90	5.05	5.05	5.05	4.90	8.16	7.33	5.88
Long-term bond yield	5.03	5.73	6.04	6.05	5.03	6.47	6.50	6.32
Unemployment rate	4.93	5.10	5.03	4.98	4.93	6.18	7.24	7.60
Real GDP growth	3.42	3.34	3.30	3.26	3.42	0.76	1.09	2.83
Inflation	3.20	2.54	2.50	2.50	3.20	4.11	3.38	2.57
<b>For all regions</b>								
Bond spreads (bp)	40	50	60	70	40	100	90	70
Equity prices: yearly return	10	10	10	10	10	-30	10	10
Equity prices: yearly volatility	15	15	15	15	15	25	15	15

1/ All numbers are in levels.



**Table 8. Switzerland: Baseline, Global, and Domestic Scenario Projections 1/**  
(in percent, unless otherwise indicated)

	Baseline Projections				Global Scenario Projections			Domestic Scenario Projections		
	2006	2007	2008	2009	2007	2008	2009	2007	2008	2009
<b>Switzerland</b>										
Exchange rate, USD/SwF	0.78	0.79	0.80	0.81	0.96	0.92	0.91	0.98	0.88	0.85
Exchange rate, Euro/ SwF	0.64	0.65	0.67	0.68	0.65	0.66	0.67	0.72	0.71	0.70
Short-term interest rate	1.6	2.1	2.1	2.2	1.7	0.8	1.1	0.6	0.7	1.6
Long-term bond yield	2.8	3.2	3.3	3.3	2.9	2.9	3.0	2.7	2.9	3.2
Unemployment rate	3.3	2.9	2.9	2.9	3.2	4.1	4.3	4.9	4.9	4.3
Real GDP growth	3.0	2.0	1.7	1.8	0.5	0.1	1.9	-2.0	-0.4	2.0
Inflation										
Bond spreads (bp)	40	50	60	70	100	90	70	120	100	80
Equity prices: yearly return	10	10	10	10	-30	10	10	-30	10	10
Equity prices: yearly volatility 2/	15	15	15	15	25	15	15	30	15	15

1/ All numbers are in levels.

2/ Calculated over a 250-day period.

**Table 9. Switzerland: Market Risk Shocks in Bottom-Up Sensitivity Analyses**

<b>Risk Factors</b>	<b>Size of Shock</b>
<b>Interest Rates</b> (applied to main exposures)	
Interest rate increase; parallel shift	short: 60 bp; long: 60 bp
Interest rate increase; negative tilt	short: 100 bp to long: 0 bp
Interest rate increase; positive tilt	short: 0 bp; medium 15-40 bp; long: 100 bp
Interest rate decrease; parallel shift	short: -60 bp; long: -60 bp
Interest rate decrease; negative tilt	short: 0 bp; medium -15 to -40 bp; long: -100 bp
Interest rate decrease; positive tilt	short: -100 bp; long: 0 bp
Increase in volatility of short-term interest rates	Short +24% to +55%; to long +8% to 20%
<b>Increase in corporate bond spreads</b>	Bank 1: 10-20 bp for AAA; +30 bp for AA1 to +400 bp for Caa. Bank 2: AAA 25 bp to BBB +80 bp; BB -5% to NR -20%.
<b>Equity Price</b>	
Across the board drop in equity prices	-30 percent
Increase in the volatility of market indexes	short +8% to +14% percent; to long +1.5% to +7% percent
<b>Exchange rate 1/</b>	
Appreciation of U.S. dollar/euro; euro/SwF stable	10%; 0%
Appreciation of U.S. dollar/euro; depreciation of euro/SwF	10%; 10%
Appreciation of U.S. dollar/euro; appreciation of euro/SwF	10%; 10%
Depreciation of U.S. dollar/euro; euro/SwF stable	10%; 0%
Depreciation of U.S. dollar/euro; appreciation of euro/SwF	10%; 10%
Depreciation of U.S. dollar/euro; depreciation of euro/SwF	10%; 10%
Increase in the volatility U.S. dollar/euro	short +3% to +4%; to long +1% to +2%
1/ Bank 2 sensitivity tests on foreign exchange risk only included two scenarios that incorporated a weakening of the USD against the SwF of 10 percent and a strengthening of the USD against the SwF of 10 percent.	

**Table 10. Switzerland: Liquidity Stress Test Assumptions**


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<b><u>Going concern scenario</u></b>	
<b>Liabilities on demand and due within one week/one month:</b>	<b>Expected outflow (percent):</b>
Money market paper issued	10
Due to banks 1/	10
Due to customers 1/	5
Bonds issued	0
<b><u>Asset illiquidity scenario</u></b>	
<b>Assets on demand and due within one week/one month:</b>	<b>Haircut as percent of book/market value:</b>
Cash and due from banks	20
Unencumbered collateral: fixed income 2/	10
Unencumbered collateral: equities	30
Loans 2/	100
<b><u>Deposit withdrawals scenario</u></b>	
<b>Liabilities on demand and due within one week/one month:</b>	<b>Expected outflow (percent):</b>
Money market paper issued	100
Due to banks 1/	40
Due to customers 3/	10
Bonds issued	100

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1/ Includes all demand deposits and time deposits maturing within the period.

2/ unencumbered collateral is defined as the net unencumbered marketable securities position.

3/ Includes all demand and time deposits, not only those maturing within the period.

**Table 11. Switzerland: Top-Down Stress Tests—Estimated Effect of Macroeconomic Scenarios on Bank Profits 1/**  
(in percent of excess capital)

<b>2007</b>	<b>Baseline</b>	<b>Global Scenario</b>		<b>Domestic Scenario</b>	
GDP growth shock	+29.5	+16.4	<i>-13.1pp</i>	+17.8	<i>-11.7pp</i>
Interest rate shock	+29.5	+31.0	<i>+1.5pp</i>	+32.0	<i>+2.5pp</i>
Exchange rate shock	+29.5	+20.9	<i>-8.6pp</i>	+25.8	<i>-3.7pp</i>
Equity price shock	+29.5	+19.4	<i>-10.1pp</i>	+28.4	<i>-1.1pp</i>
Combined shock	+29.5	-3.3	<i>-32.8pp</i>	+15.6	<i>-13.9pp</i>
<b>2008</b>		<b>Global Scenario</b>		<b>Domestic Scenario</b>	
GDP growth shock	+28.1	+18.2	<i>-9.9pp</i>	+22.1	<i>-6.0pp</i>
Interest rate shock	+28.1	+32.3	<i>+4.2pp</i>	+29.2	<i>+1.1pp</i>
Exchange rate shock	+28.1	+29.0	<i>+0.9pp</i>	+28.6	<i>+0.5pp</i>
Equity price shock	+28.1	+28.1	<i>+0.0pp</i>	+28.1	<i>+0.0pp</i>
Combined shock	+28.1	+23.7	<i>-4.4pp</i>	+23.9	<i>-4.1pp</i>
<b>2009</b>		<b>Global Scenario</b>		<b>Domestic Scenario</b>	
GDP growth shock	+27.1	+21.0	<i>-6.1pp</i>	+25.9	<i>-1.2pp</i>
Interest rate shock	+27.1	+29.6	<i>+2.5pp</i>	+27.0	<i>-0.1pp</i>
Exchange rate shock	+27.1	+27.0	<i>-0.1pp</i>	+26.8	<i>-0.3pp</i>
Equity price shock	+27.1	+27.1	<i>+0.0pp</i>	+27.1	<i>+0.0pp</i>
Combined shock	+27.1	+23.5	<i>-3.6pp</i>	+25.5	<i>-1.6pp</i>

1/ The results are based on the weighted average effects, based on the share of banks' excess capital in the total excess capital of the banking sector. The first column under each scenario presents estimated profits of the banking sector (as share of excess capital) after shock. A positive number indicates that the banking sector is expected to post positive profits even after the applied shock. The second column under each scenario (in italics) indicates the decrease (-) or increase (+) in percentage points of the level of profits compared to that under the baseline scenario. When shocks are applied together, the combined shocks might result in losses profits, although separate shocks might not cause losses. This could be explained by the fact that under individual shocks, banks are still able to generate positive profits from their other operations.

## Appendix 4. Insurance Sector Stress Tests

### Scenario and assumptions

55. The FOPI simulated the effects of an integrated scenario for a modest global recession on the 30 direct writing insurers that participated in the 2006 SST field tests. The simulated effects were based on results obtained from the 2006 SST field tests. Reinsurers did not participate in these tests but are scheduled to participate in the SST process later this year. Participating companies included nine life insurers, twelve non-life insurers, and nine health insurers.

56. In the short-term, the main downside risks for the Swiss financial sector appear to be mainly driven by external factors. A similar global scenario as that used for the banking sector stress tests of a disorderly unwinding of global imbalances was applied for the stress tests. Data on asset concentration for non-life, life, and health insurance companies indicate significant interest rate exposures (through exposure to bonds) and also moderate exposures to real estate, equities, and investment funds. The interest rate exposures were further examined by stressing the effects of falls of interest rates.

57. Accordingly, for purposes of stress testing the insurance industry, the incremental effects of five changes in market conditions were examined. These changes were applied to companies' portfolios overnight:

- A fall in interest rates by 25 bps (short-end) to 75 bps (long-end) lower than the low in the last economic cycle (Table 12);
- A widening of credit spreads by 50 bps (half the amount used in the 2006 SST stress test) as a “flight to quality” in the bond market;
- An increase of 20 percent in the value of the Swiss franc, euro and British pound against the U.S. dollar;
- A 30 percent fall in international equity markets; and
- A 20 percent fall in the value of real estate.

**Table 12. Lowest Interest Rates in the Last Economic Cycle for Major Currencies 1/**

	O/N	1M	3M	6M	1Y	2Y	3Y	5Y	7Y	10Y	20Y	30Y
US\$	1.25	1.16	1.11	1.09	1.13	1.33	1.58	2.30	2.87	3.37	4.36	...
UK £	3.75	3.71	3.68	3.60	3.33	3.29	...	3.78	...	4.17	...	...
EURO	...	2.56	2.41	2.31	2.23	2.49	...	3.21	...	4.09	...	...
SwF	...	0.24	0.28	0.32	0.40	0.60	0.90	1.43	1.85	2.36	3.34	3.81

Source: Federal Office of Private Insurance.

1/ The rates for the US\$ and the SwF are for May 30, 2005. Rates for the UK £ and the Euro are for February 28, 2003.

**Stress test results**

58. Stress tests results indicate that the scenario described above could cause distress to five out of nine life insurers, two of twelve non-life insurers, and two of nine health insurers that participated in the 2006 SST field tests.

***Life insurance***

59. The results of the stress scenario indicate that, of the nine life insurers, three insurers would experience significant financial distress under the combined effect of the shocks under the scenario by losing over two-thirds of their RBC (of which one would lose 100 percent of its RBC) and two other insurers would experience financial distress by losing over one-third of their RBC.

60. RBC losses by individual shocks indicate that the most vulnerable insurance firm maintains the largest market risk concentration in every one of the areas tested. Similarly, of the four life insurers that would experience financial distress or significant financial distress under the global scenario, all have well above average exposures to the relatively illiquid real estate sector and two of the four also have high exposure to the relatively volatile equity markets. Finally, the remaining four life insurers that do not experience financial distress are insurers that have not taken an aggressive investment strategy in any one of the areas tested.

***Non-life insurance***

61. The results of the stress tests on non-life insurers indicate that, overall, only two non-life insurers would experience financial distress (losing more than one-third of their RBC) under the combined effect of the shocks under the scenario. Both insurers have the highest relative exposure to the relatively illiquid real estate market and the volatile equity market.

***Health Insurance***

62. The results from the stress tests indicate that only two health insurers would experience financial distress (losing more than one-third of their RBC) under the combined effect of the shocks under the global scenario. Both have among the highest exposure to the volatile equity markets and the relatively illiquid real estate markets.