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SWISS NATIONAL BANK



# Financial Stability Report

Bericht zur Finanzstabilität  
Rapport sur la stabilité financière



# Swiss National Bank Financial Stability Report

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## Vorwort

Der vorliegende Bericht setzt sich mit den unter dem Aspekt der Stabilität massgebenden Tendenzen des schweizerischen Finanzsektors auseinander. Es ist das vierte Mal, dass die Schweizerische Nationalbank (SNB) einen Jahresbericht zur Stabilität veröffentlicht. Die SNB übermittelt auf diese Weise ihre Einschätzung der Stabilität des Finanzsystems und stellt der Öffentlichkeit eine Übersicht an Informationen und Indikatoren zur Verfügung. Der Stabilitätsbericht gibt der SNB die Möglichkeit, auf Spannungen oder Ungleichgewichte hinzuweisen, die ein Risiko für die Stabilität darstellen könnten. Der Bericht ist Teil der Beurteilung der Stabilität des Finanzsystems, zu der die SNB gemäss Art. 5 Abs. 2 Bst. e. Nationalbankgesetz beizutragen hat. Der Bericht dient nicht dazu, die Solvenz einzelner Finanzinstitute zu beurteilen. Einzelne Banken werden nur betrachtet, wenn dies für das Gesamtbild wesentlich ist. Ein stabiles Finanzsystem zeichnet sich dadurch aus, dass dessen Komponenten ihre Funktion erfüllen und sich gegenüber Schocks als widerstandsfähig erweisen. Dieser Bericht beschränkt sich auf zwei wesentliche Komponenten des Finanzsystems: den Bankensektor und die Finanzmarktinfrastruktur.

## Bankensektor

Die Einschätzung der Stabilität des Bankensektors erfolgt in zwei Schritten. Zuerst wird die Entwicklung der Risikofaktoren analysiert, die im makroökonomischen Umfeld und auf den Finanzmärkten für die Stabilität des schweizerischen Bankensystems relevant sind. Anschliessend erfolgt die Beurteilung der Widerstandsfähigkeit des Bankensystems in Bezug auf diese Risikofaktoren. Dazu werden die Rentabilität, die eingegangenen Risiken sowie die Eigenmittelausstattung im Bankensektor gemessen. Ergänzend werden Modelle berücksichtigt, die den auf den Bankensektor ausgeübten Stress und dessen Bezug zum makroökonomischen Umfeld quantifizieren.

Im Jahr 2005 war das Umfeld des schweizerischen Bankensektors mehrheitlich durch positive Entwicklungen geprägt. Die Wirtschaftslage präsentierte sich sowohl in der Schweiz als auch in den für den Schweizer Bankensektor wichtigen Wirtschaftsräumen mehrheitlich freundlich. Gleichzeitig blieb das Zinsniveau tief, insbesondere in der Schweiz. Parallel dazu verzeichneten die Börsen mehrheitlich eine deutliche Aufwärtstendenz bei weiter sinkender Volatilität. Aus den verfügbaren Indikatoren geht hervor, dass diese Situation die Bonität insbesondere der grossen in- und ausländischen Unternehmen positiv beeinflusst hat. Die Ratings haben sich allgemein verbessert, und die Risikoprämien auf den Schulden sind weiter zurückgegangen.

In diesem Umfeld konnten im schweizerischen Bankensektor die hohen Gewinne der beiden Vorjahre nicht nur gehalten, sondern überwiegend sogar gesteigert werden. Da dieser Gewinnanstieg mit einer beinahe proportionalen Erhöhung der Bilanzsumme einherging, erhöhte sich die Rentabilität (Return on Assets) im Vergleich zu 2004 auf einem relativ hohen Niveau nur leicht (vgl. Grafik 1).

Wie bereits im Vorjahr sind die guten Ergebnisse bei zum Teil stark gestiegenen Kosten in erster Linie auf gesteigerte operative Erträge – insbesondere aus dem Kommissions- und Handelsgeschäft – zurückzuführen. Auch die guten Vorjahresergebnisse im Zinsgeschäft konnten bei allen Bankgruppen – mit Ausnahme der Grossbanken – nochmals leicht gesteigert werden.<sup>1</sup> Zudem reduzierten die meisten Banken ihre im historischen Vergleich sehr niedrigen Rückstellungen weiter.

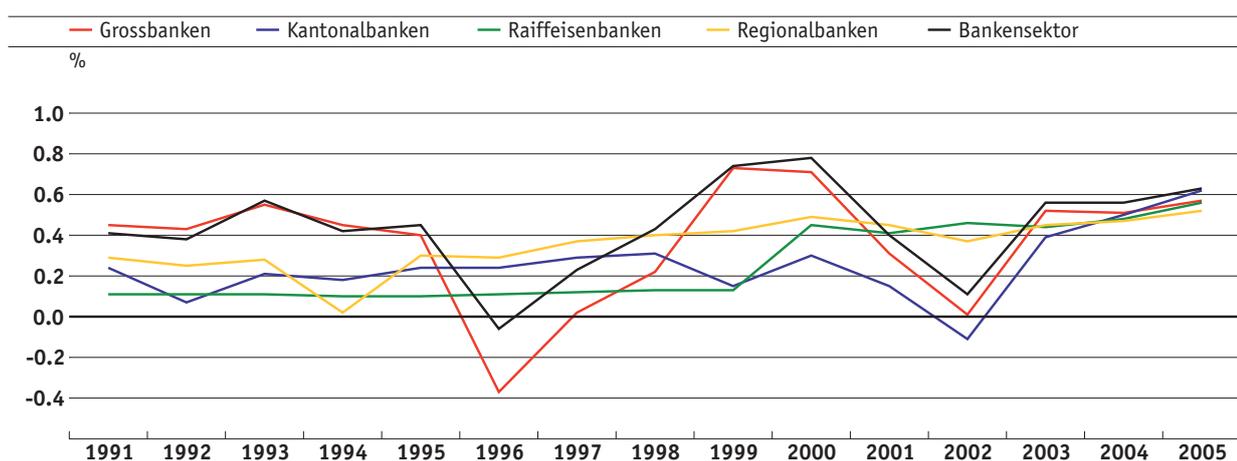
<sup>1</sup> Vgl. Box 1, S. 28, für eine Beschreibung der Struktur des Schweizer Bankensektors.

Die hohen Gewinne führten bei den meisten Banken zu einer Verbesserung der Eigenmittelausstattung. Entsprechend hat sich bei diesen Banken die Fähigkeit, Schocks abzufedern, weiter verbessert. Eine Ausnahme diesbezüglich stellen die Grossbanken dar: Die durchschnittlichen Eigenmittelquoten dieser Bankengruppe sanken trotz der hohen Gewinne leicht (vgl. Grafik 2). Dies ist insbesondere auf das starke Wachstum ihrer Bilanzsummen zurückzuführen. Aufgrund der für die Regulierung massgeblichen *risikogewichteten Eigenmittelquote* (Verhältnis zwischen Eigenmitteln und risikogewichteten Positionen) liegen sie im internationalen Vergleich allerdings weiterhin auf den vorderen Rängen. Wird dagegen die *ungewichtete Eigenmittelquote* (Verhältnis zwischen Eigenmitteln und Bilanzsumme) als Massstab herangezogen, ist die Eigenmittelausstattung der Grossbanken im internationalen Vergleich nach wie vor niedrig. Die ungewichteten Eigenkapitalquoten, die in der Schweiz keiner formellen Regulierung unterliegen, erlauben eine ergänzende Beurteilung der Solidität der Eigenkapitalbasis einer Bank, da Eigenmittelvorschriften nie sämtliche Risiken perfekt abdecken können.

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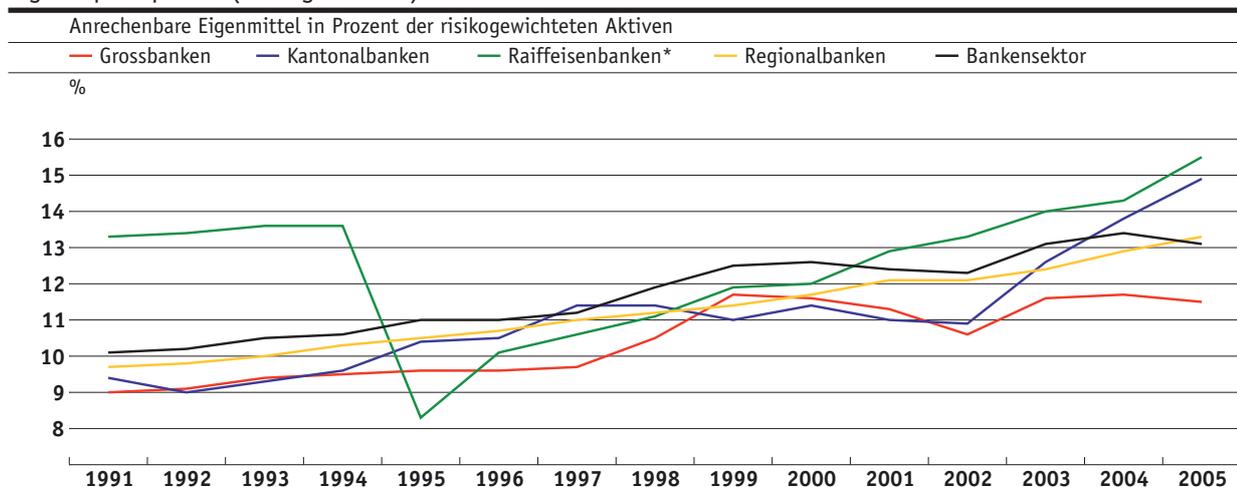
Return on Assets (nach Bankengruppen)

Grafik 1



Eigenkapitalquoten (risikogewichtet)

Grafik 2



Grafiken 1 und 2: Quellen: Eidgenössische Bankenkommission (EBK), Schweizerische Nationalbank (SNB)

Grafik 2

\* Einen wesentlichen Teil der Eigenmittel der Raiffeisenbanken bildet die Nachschusspflicht der Genossenschafter. Seit 1995 kann diese nur noch teilweise angerechnet werden, was zu einem Einbruch bei den Eigenmitteln führte.

Die Einschätzung der Verfassung des Bankensektors, basierend auf den Gewinnen und der Eigenmittelausstattung der Banken, steht im Einklang mit den Indikatoren, welche die Bewertung der Finanzmärkte widerspiegeln. Der schweizerische Bankensektor erscheint aufgrund der Spreads auf Bankenobligationenrenditen und der Credit-Default-Swap-Preise sowohl im historischen wie auch im internationalen Vergleich als robust. Anders als aufgrund der risikogewichteten Eigenmittelquoten lässt sich jedoch aufgrund der Aktienkurse sowie der Ratings der einschlägigen Agenturen nicht ableiten, dass der Markt die Schweizer Banken im internationalen Vergleich systematisch als überdurchschnittlich sicher einschätzt. Auch der SNB-Stressindex, der eine Vielzahl von Informationen über mögliche Stresssymptome zusammenfasst, bestätigt den Eindruck, dass der Schweizer Bankensektor schon seit Mitte 2003 eine Periode mit deutlich unterdurchschnittlichem Stress erlebt (vgl. Grafik 3).<sup>2</sup>

Die Zukunftsaussichten für die Stabilität des schweizerischen Bankensystems beurteilen wir als günstig. Erstens wird die Konjunkturentwicklung in der Schweiz wie auch in den anderen für den Schweizer Bankensektor relevanten Wirtschaftsräumen als positiv eingeschätzt. Zweitens scheinen sich die meisten Unternehmen in einer genügend robusten finanziellen Lage zu befinden, um sich gegenüber möglichen Schocks als widerstandsfähig zu erweisen. Und drittens verfügen wir über keine Indikatoren, die Hinweise darauf geben, dass der relativ starke Wettbewerbsdruck im Hypothekarmarkt gesamtschweizerisch destabilisierend wirken würde, was eine Gefahrenquelle für den Bankensektor darstellen könnte. Zudem scheint die Gefahr einer durch Ansteckung übertragenen Krise für den Schweizer Bankensektor zurzeit relativ klein zu sein, da sich die weltweit wichtigsten Banken momentan ebenfalls in einer ziemlich robusten Verfassung befinden. Schliesslich erachten wir auch den schnell wachsenden Markt der Credit-Risk-Transfer-Produkte (darunter werden insbesondere Kreditderivate und Verbriefungen verstanden) als keine unmittelbare Gefahr für den Schweizer Bankensektor (vgl. Box 2, S. 32–33).

Trotzdem bestehen potenzielle Gefahrenquellen. Insbesondere gibt es Anzeichen dafür, dass der

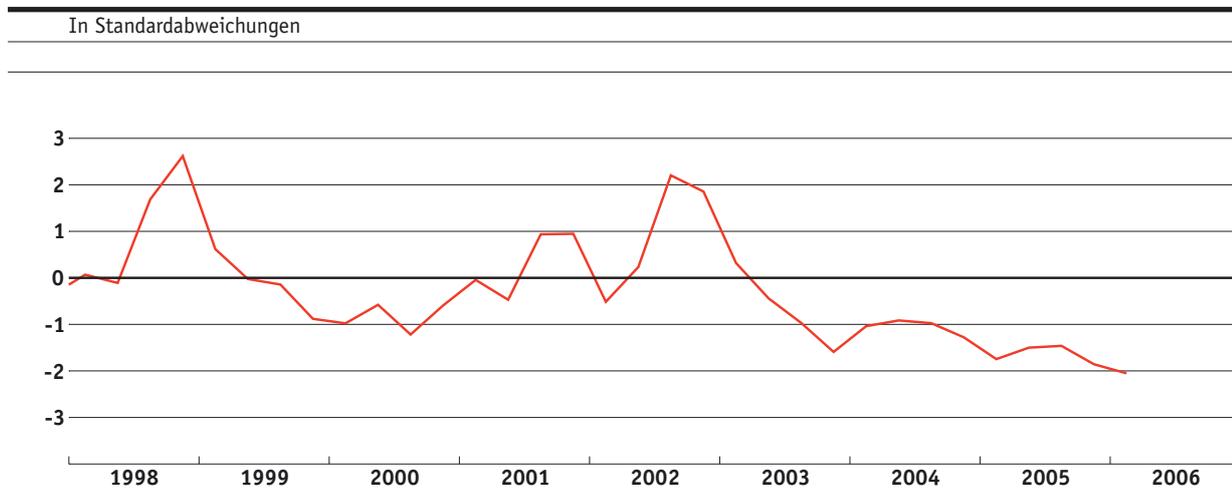
Risikoappetit der Investoren, unter anderem auch der Schweizer Banken, gestiegen ist. Erstens hat das Kreditvolumen der Grossbanken stark zugenommen, was in erster Linie auf ein deutlich gesteigertes Auslandengagement zurückzuführen ist (vgl. Grafik 4). Zweitens ist bei den Grossbanken eine starke Zunahme der Handelsbestände zu verzeichnen die, gemäss verschiedenen Indikatoren, zu höheren Exposures gegenüber Marktrisiken geführt hat. Und drittens ist das Zinsrisiko bei allen Bankgruppen gestiegen und hat für einzelne Institute ein beträchtliches Ausmass angenommen (vgl. Grafik 5).

Ferner gibt es in der momentanen Lage praktisch kein Potenzial mehr für eine weitere Verbesserung des Umfelds. Die Spreads und – insbesondere im längerfristigen Bereich – die Zinssätze bewegen sich weiterhin auf einem im historischen Vergleich tiefen Niveau. Zudem sind die Aktienkurse trotz des jüngst erfahrenen Rückgangs in den letzten Jahren stark gestiegen. In der Schweiz haben sie sich seit dem Tiefpunkt von 2003 mehr als verdoppelt. Zudem hat sich in der Vergangenheit in ähnlichen Situationen gezeigt, dass sich ein gutes Umfeld auch überraschend schnell und markant verschlechtern kann. Obwohl wir diesbezüglich keine konkreten Anzeichen erkennen, kann insbesondere nicht ausgeschlossen werden, dass die Spreads und Zinssätze innert Jahresfrist auch über ihre Mittelwerte steigen könnten.

Für die verschiedenen Bankgruppen können unterschiedliche Risiken abgeleitet werden. Die primär im Schweizer Kreditgeschäft tätigen Kantonal-, Raiffeisen- und Regionalbanken scheinen in erster Linie gegenüber einem starken Zinsanstieg exponiert zu sein. Die Grossbanken dürften infolge ihrer grossen und rasch steigenden Handelsbestände und Kreditvolumen relativ stark gegenüber einer Verschlechterung der Lage auf den internationalen Kapital- und Kreditmärkten exponiert sein. Aus unseren Szenario-Analysen geht allerdings hervor, dass der schweizerische Bankensektor in der Lage sein sollte, eine deutliche Verschlechterung des Umfelds zu verkraften (vgl. Box 3, S. 35, und Kapitel 6, S. 42).

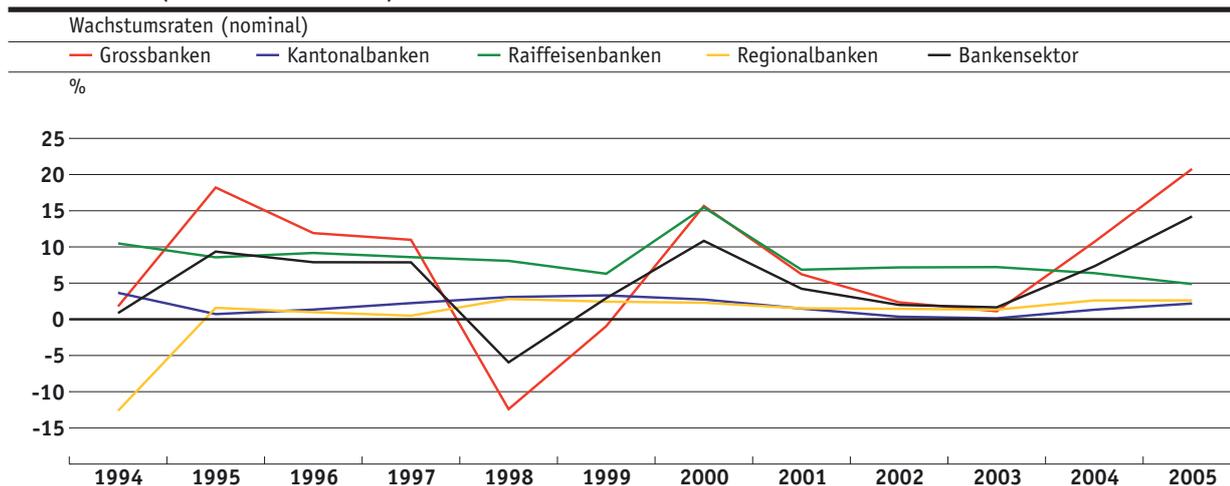
<sup>2</sup> Für eine detaillierte Beschreibung dieses Indikators siehe Kapitel 6, S. 42.





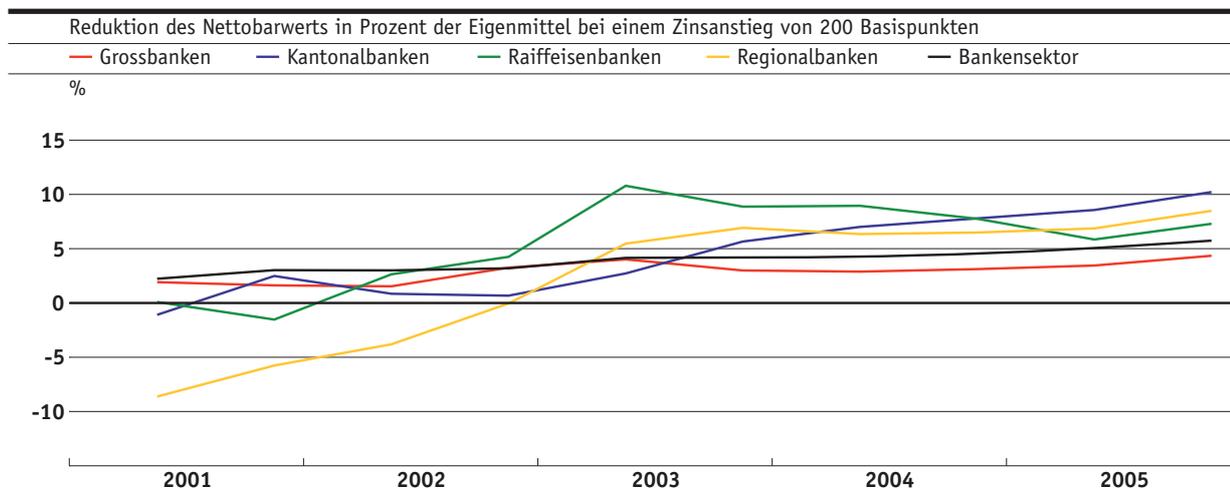
Total Kredite (Inland und Ausland)

Grafik 4



Zinsrisiko

Grafik 5



Grafik 3: Quellen: EBK, SNB, Thomson Datastream

\* Je höher das Niveau des Index, desto grösser ist das Stressniveau des schweizerischen Bankensektors. Der Index ist in Standardabweichungen von seinem historischen Durchschnitt (1987–2005) bemessen. Ein positiver (negativer) Wert bedeutet, dass der Stress grösser (kleiner) ist als der historische Durchschnitt. Der Stressindex im ersten Quartal 2006 beruht auf provisorischen Daten.

Grafiken 4 und 5: Quellen: EBK, SNB

## Finanzmarktinfrastruktur

Für die Abrechnung und Abwicklung von Zahlungen und Geschäften mit Wertschriften und anderen Finanzinstrumenten verfügt der Finanzplatz Schweiz über eine reibungslos funktionierende Finanzmarktinfrastruktur. Gemessen an internationalen Standards sind die Sicherheit und die Effizienz der schweizerischen Finanzmarktinfrastrukturen hoch. Für die Stabilität des schweizerischen Finanzsystems besonders bedeutsam sind die innerhalb der so genannten «Swiss value chain» miteinander verbundenen Zahlungs- und Effektenabwicklungssysteme. Dazu zählen das Zahlungssystem Swiss Interbank Clearing (SIC), das Wertschriftenabwicklungssystem SECOM und die zentrale Gegenpartei x-clear. Auch das Mehrwährungszahlungssystem Continuous Linked Settlement (CLS), welches die Abwicklung von Devisengeschäften ermöglicht, ist für die Stabilität des schweizerischen Finanzsystems von grosser Bedeutung. Aus der Perspektive der Finanzstabilität sollten diese Finanzmarktinfrastrukturen vor allem zwei Eigenschaften aufweisen. Zum einen sollten die Regeln und Verfahren, nach welchen die Transaktionen abgerechnet und abgewickelt werden, geeignet sein, die verschiedenen inhärenten Abwicklungsrisiken zu begrenzen. Zum anderen sollten angemessene organisatorische und technische Vorkehrungen bestehen, um die operationellen Risiken zu reduzieren und die Widerstandsfähigkeit in Krisensituationen zu stärken.

Die Regeln und Verfahren von SIC, SECOM, x-clear und CLS tragen erheblich zur Minimierung der Abwicklungsrisiken bei. SIC eliminiert die Kreditrisiken durch die sequenzielle Abwicklung der einzelnen Zahlungen in Giro Guthaben bei der SNB in Echtzeit. Die Gewährung von Intraday-Liquidität durch die SNB und verschiedene andere Massnahmen, etwa ein zentraler Warteschlangenmechanismus oder ein Mechanismus zur Auflösung von Abwicklungstaus, reduzieren die Liquiditätsrisiken. Die Verbindung zwischen SIC und SECOM ermöglicht die Echtzeit-Abwicklung von Wertschriftengeschäften gemäss dem Prinzip Lieferung-gegen-Zahlung. Dadurch wird das Risiko eliminiert, dass eine Partei ihre Verpflichtung erfüllt, während die andere dies nicht tut (Erfüllungsrisiko). Liquiditätsrisiken bei der Abwicklung von Wertschriftengeschäften werden durch die Wertschriftenleihe bzw. -ausleihe sowie Tri-Party-Repos reduziert. Das Wiederbeschaffungsrisiko, welches bei Wertschriftengeschäften aufgrund der Verzögerung zwischen dem Handel und der Abwicklung besteht, kann durch die Dazwischenschaltung einer zentralen Gegenpartei eliminiert werden. Seit ihrer Betriebsaufnahme im Jahre 2003 erbringt die zentrale Gegenpartei x-clear ihre Dienstleistungen ausschliesslich für die Handelsplatt-

form virt-x, auf welcher überwiegend jene Aktien gehandelt werden, die den Swiss Market Index bilden. Die geplante Ausdehnung der Dienstleistungen von x-clear auf die SWX-Plattform, auf der Aktien mit geringerer Börsenkapitalisierung gehandelt werden, wird es ermöglichen, die Wiederbeschaffungsrisiken weiter zu reduzieren. Schliesslich ermöglicht CLS durch die simultane Abwicklung der beiden Seiten eines Devisengeschäfts gemäss dem Prinzip Zahlung-gegen-Zahlung, die Erfüllungsrisiken im Devisenhandel in 15 Währungen zu eliminieren. Die kontinuierliche Zunahme der über CLS abgewickelten Devisengeschäfte in den vergangenen Jahren hat zweifellos zur weltweiten Finanzstabilität beigetragen.

Auch in Bezug auf die operationelle Zuverlässigkeit verfügt die schweizerische Finanzmarktinfrastruktur über einen guten Leistungsnachweis. Selbstzufriedenheit wäre jedoch fehl am Platz. Vielmehr bedarf es unaufhörlicher Anstrengungen, um die operationellen Risiken zu reduzieren und die Widerstandsfähigkeit des Finanzsystems in Krisensituationen zu stärken. Sowohl die Systembetreiber als auch die Behörden richteten ihre Bemühungen in den vergangenen Jahren deshalb verstärkt auf diese Aspekte. Beispielsweise wurden die Vorkehrungen für die Krisenvorsorge und -bewältigung, welche die wichtigsten Finanzinstitute und die Betreiber von Finanzmarktinfrastrukturen getroffen haben, von einer gemeinsamen Arbeitsgruppe sorgfältig überprüft. Obwohl sich zeigte, dass alle Institute gut auf grössere Störfälle vorbereitet sind, wurden verschiedene Massnahmen vereinbart, deren Umsetzung die Widerstandsfähigkeit des Schweizer Finanzsystems weiter erhöhen wird. Ein weiteres Beispiel ist die Zusammenführung der IT-Infrastrukturdienstleistungen der Telekurs Group und der SIS Swiss Financial Services Group, die in der zweiten Hälfte dieses Jahres abgeschlossen werden soll. Die Zusammenlegung der Rechenzentren erlaubt einerseits, die betriebswirtschaftliche Effizienz zu steigern, andererseits soll auch die Widerstandsfähigkeit der in der «Swiss value chain» integrierten Systeme erhöht werden.

## Daten und Datenquellen

Die Bankstatistiken, welche in diesem Bericht verwendet werden, basieren auf offiziellen Daten, die von den einzelnen Banken übermittelt werden. Von 1995 an werden die Grossbanken auf konsolidierter Ebene betrachtet. Vor 1995 sowie für die anderen Banken verwenden wir eine individuelle (nicht konsolidierte) Betrachtung.

Dieses Dokument basiert auf Daten mit Stand vom 14. Mai 2006.

# Rapport sur la stabilité financière 2006 (Synthèse)

## Avant-propos

Le présent rapport met en évidence les grandes tendances, sous l'angle de la stabilité, dans le secteur financier suisse. Il s'agit du quatrième rapport (annuel) sur la stabilité financière publié par la Banque nationale suisse (BNS). En publiant un tel rapport, la BNS fait part de son évaluation de la stabilité du système financier, met à la disposition du public une synthèse d'informations et d'indicateurs et signale, le cas échéant, des tensions ou des déséquilibres susceptibles de constituer un risque en matière de stabilité. Ce rapport fait partie de l'appréciation de la stabilité du système financier, à laquelle la BNS a pour tâche de contribuer (art. 5, al. 2, let. e de la loi sur la Banque nationale). Il n'a pas pour objet d'évaluer la solvabilité d'établissements financiers pris individuellement. Des établissements ne sont considérés sur une base individuelle que lorsque cela joue un rôle déterminant pour la vue d'ensemble.

Un système financier stable est un système dans lequel les diverses composantes remplissent leur fonction et sont en mesure de résister à d'éventuels chocs. Le présent rapport se concentre sur deux composantes essentielles du système financier: le secteur bancaire et les infrastructures des marchés financiers.

## Secteur bancaire

Notre évaluation de la stabilité du secteur bancaire se fait en deux étapes. Nous analysons tout d'abord l'évolution des facteurs de risque qui, dans l'environnement macroéconomique et financier, sont pertinents pour la stabilité du système bancaire suisse. Nous évaluons ensuite la capacité de résistance du système bancaire face à ces facteurs de risque. Cette évaluation repose sur une mesure de la rentabilité, des risques encourus ainsi que de la dotation en fonds propres du secteur bancaire. Pour compléter notre analyse, nous utilisons des modèles qui permettent de quantifier le stress subi par le secteur bancaire et son lien avec l'environnement macroéconomique.

En 2005, le secteur bancaire suisse a opéré dans un environnement dans l'ensemble favorable. La conjoncture a évolué de manière positive, tant

en Suisse que dans la plupart des pays pertinents pour le secteur bancaire suisse. Parallèlement, le niveau des taux d'intérêt est resté bas, tout particulièrement en Suisse, et la plupart des marchés boursiers ont enregistré une nette tendance à la hausse, accompagnée d'une nouvelle baisse de la volatilité. Cette situation semble avoir eu une influence favorable sur l'état de santé des entreprises: leurs notations (ratings) se sont en général améliorées et la prime de risque sur leurs dettes a encore diminué.

Dans ce contexte, le secteur bancaire suisse a généré des bénéfices élevés. Pour la plupart des établissements, les bénéfices se sont inscrits en hausse par rapport aux niveaux déjà élevés atteints en 2003 et 2004. Cette augmentation s'étant accompagnée d'une hausse presque proportionnelle de la somme des bilans, la rentabilité des actifs (*Return on Assets*) n'a que peu progressé par rapport au niveau, relativement élevé, constaté en 2004 (cf. graphique 1).

Comme pour l'année précédente, ces bons résultats ont été obtenus en dépit d'une hausse parfois substantielle des coûts. Les bénéfices résultent en premier lieu d'un accroissement des produits opérationnels, notamment par le biais d'une nouvelle hausse des revenus des commissions et des opérations de négoce. Toutes les catégories de banques – à l'exception des grandes banques – ont en outre encore réussi à améliorer légèrement les bons résultats obtenus l'année précédente dans le domaine des opérations d'intérêts<sup>3</sup>. De plus, les provisions, dont le niveau était déjà faible en comparaison historique, ont à nouveau été réduites par la plupart des banques.

Les bénéfices élevés ont conduit à un renforcement de la dotation en fonds propres de la plupart des banques, accroissant leur capacité à absorber des chocs. Les grandes banques constituent une exception en la matière: malgré le niveau remarquablement élevé de leurs bénéfices, les ratios de fonds propres de cette catégorie de banques ont en moyenne légèrement diminué (cf. graphique 2). Cette situation s'explique notamment par l'accroissement substantiel de la somme de leurs bilans. Sur la base des *ratios de fonds propres pondérés en fonction des risques* (rapport entre les fonds propres et les actifs pondérés en fonction des risques), déterminants sur le plan réglementaire, elles occupent cependant toujours les premiers rangs en comparaison internationale. En revanche, à l'aune

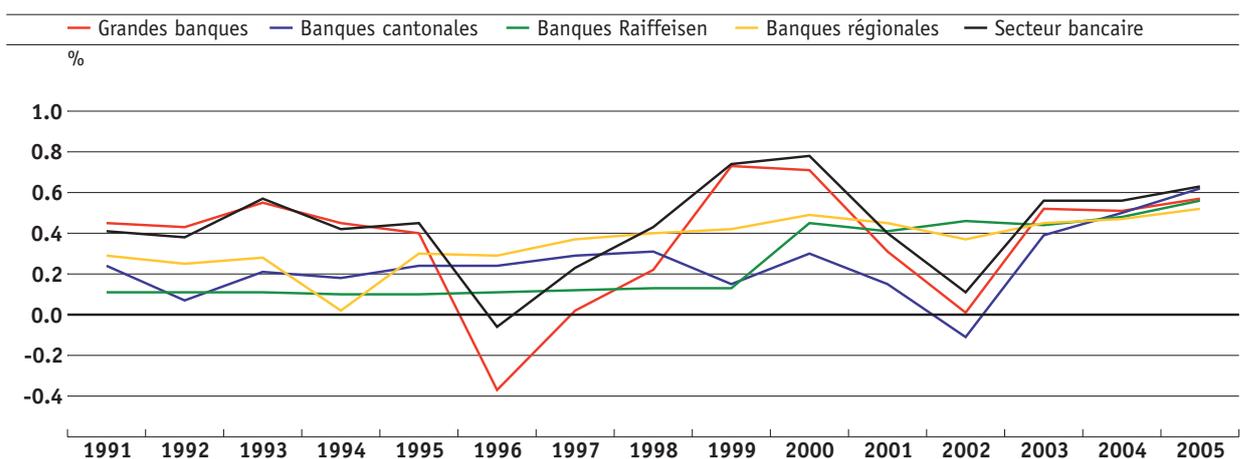
3 Pour une description de la structure du secteur bancaire suisse, voir l'encadré 1, p. 28.

des *ratios de fonds propres non pondérés* (rapport entre les fonds propres et la somme du bilan) la dotation en fonds propres des grandes banques reste faible en comparaison internationale. Les ratios de fonds propres non pondérés – qui ne font pas l’objet d’une réglementation formelle en Suisse – donnent une appréciation complémentaire en ce qui concerne l’adéquation de la dotation en fonds propres d’un établissement, dans la mesure où aucune norme de fonds propres n’est en mesure de couvrir parfaitement l’intégralité des risques auxquels est exposée une banque.

L’impression générale qui ressort des bénéfices et de la dotation en fonds propres des banques est dans l’ensemble corroborée par les indicateurs reflétant l’évaluation faite par les marchés financiers. Sur la base des écarts dans les rendements des obligations (spreads) ainsi que des prix des swaps sur défaillance (credit default swaps), le secteur bancaire suisse apparaît solide, tant en comparaison historique qu’en comparaison internationale. Les indicateurs dérivés des cours boursiers ainsi que les notations (ratings) attribuées par des agences spécialisées suggèrent cependant que,

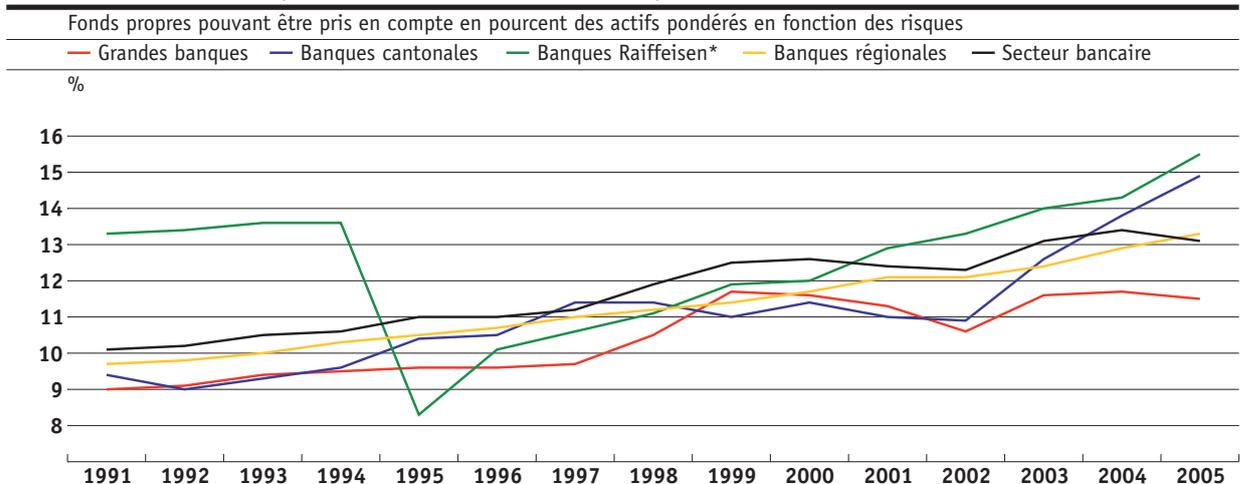
Rentabilité des actifs (par catégories de banques)

Graphique 1



Ratios de fonds propres (pondérés en fonction des risques)

Graphique 2



Graphiques 1 et 2:  
Sources: Banque nationale suisse (BNS),  
Commission fédérale des banques (CFB)

Graphique 2:  
\* Une part importante des fonds propres des banques Raiffeisen est constituée des versements supplémentaires auxquels se sont engagés les sociétaires. Depuis 1995, ces versements supplémentaires ne peuvent être comptés qu’en partie comme fonds propres, ce qui explique la forte diminution observée cette année-là.

d'après les marchés financiers, la solidité des banques suisses est comparable et non pas – comme le suggèrent les ratios de fonds propres pondérés en fonction des risques – supérieure à la moyenne internationale. L'indicateur de stress de la BNS, qui regroupe un ensemble de variables constituant des symptômes possibles de stress dans le secteur bancaire, confirme lui aussi l'impression générale que le secteur bancaire suisse traverse, depuis l'été 2003, une phase caractérisée par un niveau de stress très faible en comparaison historique (cf. graphique 3).<sup>4</sup>

Les perspectives pour la stabilité du système bancaire suisse apparaissent dans l'ensemble favorables. Premièrement, la conjoncture devrait rester bonne, tant en Suisse que dans les principaux pays importants pour le secteur bancaire suisse. Deuxièmement, la situation financière de la plupart des entreprises apparaît solide, ce qui devrait leur permettre de résister à d'éventuels chocs. Troisièmement, nous ne disposons d'aucun indicateur montrant que la concurrence relativement forte sur le marché hypothécaire domestique aurait entraîné des conséquences déstabilisantes pouvant constituer une source de risque pour le secteur bancaire. Le danger d'une crise par contagion semble lui aussi relativement faible, au regard de l'état de santé plutôt favorable affiché actuellement par les principales banques à l'étranger. Enfin, nous considérons que le marché des produits de transfert du risque de crédit (dérivés de crédit et titrisations),

qui est caractérisé par une croissance particulièrement forte, ne constitue pas une menace particulière pour le secteur bancaire suisse (cf. encadré 2, pp. 32–33).

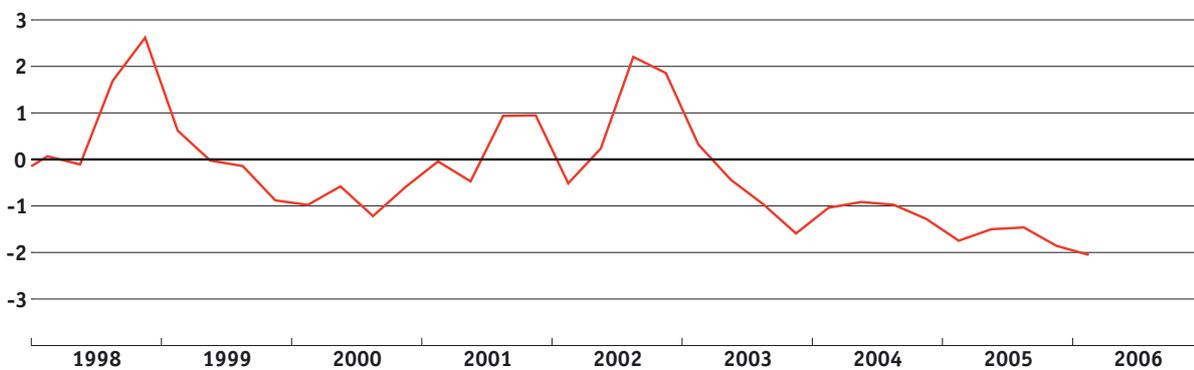
Il existe néanmoins des sources de dangers potentiels. En particulier, il existe plusieurs indices suggérant que l'appétit pour le risque des investisseurs, et en particulier des banques suisses, a augmenté. Premièrement, le volume des portefeuilles de crédits des grandes banques s'est fortement accru, principalement en raison du développement de leurs activités à l'étranger (cf. graphique 4). Deuxièmement, la taille des portefeuilles de négociation détenus par les grandes banques a elle aussi fortement augmenté, conduisant, d'après différents indicateurs, à une hausse de leur exposition aux risques de marché. Troisièmement, le risque de taux d'intérêt a augmenté dans toutes les catégories de banques, atteignant un niveau considérable pour certains établissements (cf. graphique 5).

Par ailleurs, dans la situation actuelle, il n'existe plus guère de marge pour une nouvelle amélioration de l'environnement. Les écarts dans les rendements des obligations (spreads) et les taux d'intérêts, spécialement ceux de long terme, restent bas en comparaison historique. De plus, malgré la récente baisse, les cours boursiers ont fortement augmenté durant les dernières années. En Suisse, les cours ont plus que doublé depuis la fin du 1<sup>er</sup> trimestre 2003. En outre, comme on a pu l'observer dans le passé, un environnement favorable peut

Indice de stress\*

Graphique 3

Déviations par rapport à la moyenne (écarts-type)



Graphique 3: Sources: BNS, CFB, Thomson Datastream

<sup>4</sup> Pour une description détaillée de cet indicateur, voir le chapitre 6, p. 42.

\* Une valeur élevée de l'indice correspond à un niveau de stress élevé dans le secteur bancaire suisse. Une valeur positive (négative) signifie que le stress est supérieur (inférieur) à sa moyenne observée entre 1987 et 2005. La déviation par rapport à la moyenne est exprimée en termes d'écarts-type. L'indice de stress pour le premier trimestre 2006 est calculé à partir de données provisoires.

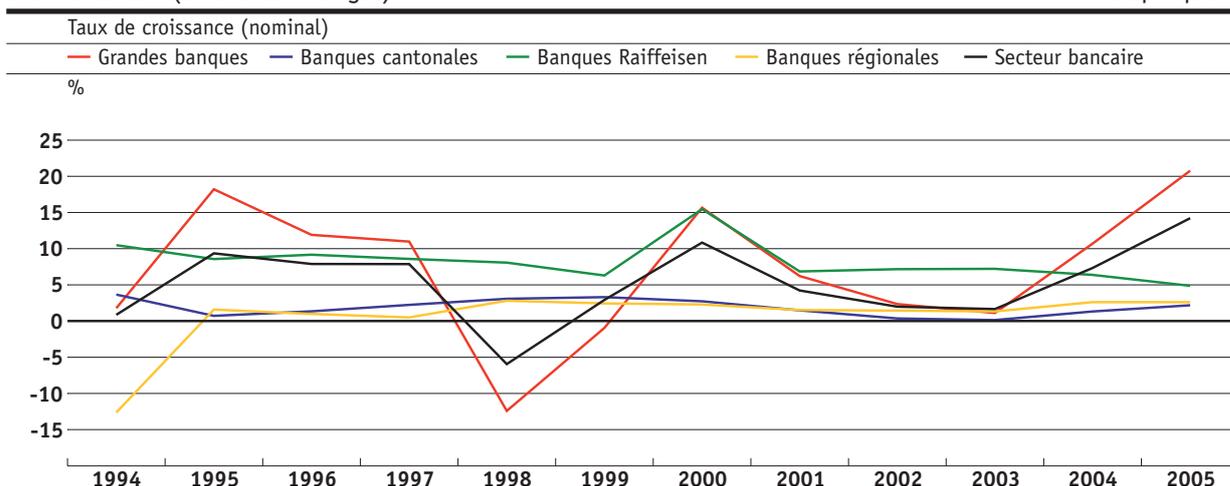
se dégrader de manière rapide et inattendue. Bien que nous ne disposions d'aucun indice concret à ce sujet, on ne peut en particulier pas exclure que les spreads et les taux d'intérêt se rapprochent voire dépassent leur moyenne historique en l'espace d'une année.

Les conséquences en termes de risque ne sont pas les mêmes pour toutes les catégories de banques. Les banques cantonales, les banques Raiffeisen et les banques régionales – dont les opérations de crédit en Suisse constituent la principale

activité – apparaissent avant tout exposées à une forte hausse des taux d'intérêt. Les grandes banques pourraient quant à elles s'avérer relativement sensible à une détérioration sur le marché des crédits et des capitaux internationaux en conséquence du niveau relativement élevé et en rapide augmentation de leurs portefeuilles de crédit et de négoce. Nos analyses de scénarios montrent cependant que le secteur bancaire suisse devrait être en mesure de résister à une dégradation notable de son environnement (cf. encadré 3, p. 35 et chapitre 6, p. 42).

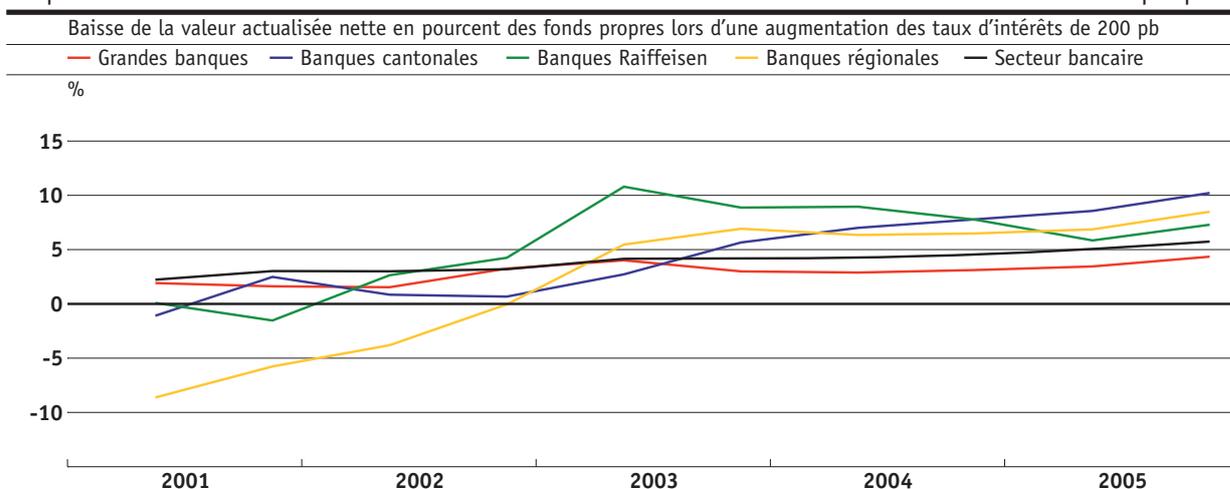
Crédits totaux (Suisse et étranger)

Graphique 4



Risque de taux d'intérêt

Graphique 5



Graphiques 4 et 5:  
Sources: BNS, CFB

## Infrastructure des marchés financiers

La place financière suisse dispose pour la compensation et le règlement des paiements et des opérations sur titres et autres instruments financiers d'une infrastructure qui fonctionne bien. Comparé aux standards internationaux, la sécurité et l'efficacité de l'infrastructure des marchés financiers suisse sont d'un niveau élevé. Interconnectés dans ce qu'on appelle la «swiss value chain», les systèmes de paiement et de règlement des opérations sur titres revêtent une importance particulière pour ce qui a trait à la stabilité du système financier suisse. Il s'agit surtout du Swiss Interbank Clearing (SIC), pour les paiements, du SECOM, pour le règlement des opérations sur titres, et de x-clear, la contrepartie centrale. Servant au règlement des opérations de change, le système de paiement multidevises Continuous Linked Settlement (CLS) est, lui aussi, de la plus grande importance pour la stabilité du système financier suisse. Du point de vue de cette stabilité, ces infrastructures doivent posséder deux caractéristiques. Première de ces caractéristiques: les règles et les procédures mises en œuvre pour la compensation et le règlement des transactions doivent être de nature à réduire notablement les différents risques de règlement. Seconde caractéristique: des mesures organisationnelles et techniques appropriées doivent permettre de réduire les risques opérationnels et de renforcer la capacité de résistance du système.

Les règles et les procédures régissant le SIC, le SECOM, x-clear et le CLS contribuent fortement à la réduction des risques de règlement. Dans le SIC, le règlement brut en temps réel en monnaie de banque centrale élimine le risque de crédit, tandis que le système de liquidités intrajournalières de la BNS ainsi que divers autres dispositifs, dont un mécanisme de fil d'attente avec priorités et un mécanisme réduisant les risques de blocage des paiements, limitent de leur côté le risque de liquidité. Pour ce qui est des opérations sur titres, l'interconnexion du SIC et du SECOM permet d'en assurer le règlement en temps réel, selon le principe livraison contre paiement, ce qui élimine le risque qu'une contrepartie s'acquitte de ses obligations et pas l'autre. Le risque de liquidité est réduit par les prêts et emprunts de titres ainsi que les services repo tripartites. Le risque de coût de remplacement, qui tient au décalage entre l'exécution et le règlement des opérations sur titres, peut être supprimé par l'interposition d'une contrepartie centrale. Cette contrepartie centrale a été créée en 2003, sous le nom d'x-clear, dont les services de compensation sont

uniquement accessibles aux participants de la plate-forme virt-x, qui sert essentiellement au négoce des blue chips suisses. L'extension prévue des services de contrepartie centrale d'x-clear aux actions à faible ou moyenne capitalisation boursière négociées sur la plate-forme SWX aura pour effet de réduire davantage encore le risque de coût de remplacement. Enfin, permettant de régler simultanément les opérations de change dans 15 monnaies selon le principe paiement contre paiement, le CLS supprime le risque de règlement sur le marché des changes. La constante augmentation des transactions dans le système CLS au cours des dernières années a certainement contribué à la stabilité globale du système financier.

L'infrastructure du marché financier suisse assure également un haut niveau de sûreté opérationnelle. Mais on ne peut se permettre de relâcher l'effort: la réduction des risques opérationnels et le renforcement de la capacité de résistance du système financier doivent rester une préoccupation constante. Cette tâche a bénéficié au cours des dernières années de toute l'attention des exploitants et des autorités publiques. Les principaux stakeholders de la place financière suisse ont par exemple soumis à un examen approfondi les plans de continuité des opérations des principaux établissements financiers et des principales infrastructures des marchés. Même si tous les établissements sont bien préparés à affronter des perturbations majeures, la mise en service des mesures proposées conjointement par les exploitants et les autorités permettra de renforcer encore la capacité de résistance du système financier suisse. Un autre exemple est la fusion des services d'infrastructure en technologie de l'information de Telekurs Group et de SIS Swiss Financial Services Group en une seule organisation. Le but de cette fusion, qui devrait s'achever durant la deuxième moitié de l'année, est d'améliorer l'efficacité et la résistance des systèmes formant la «swiss value chain».

## Données et sources des données

Les statistiques bancaires utilisées dans ce rapport sont basées sur les données officielles fournies par les banques. Les données relatives aux grandes banques sont analysées sur une base consolidée depuis 1995. Pour la période précédant 1995 ainsi que pour les autres banques, une approche individuelle (non consolidée) a été utilisée.

Ce rapport a été établi d'après les données disponibles le 14 mai 2006.

# 2006 Financial Stability Report



## Introduction

This report highlights the main trends in the Swiss financial system with respect to their impact on stability. It is the fourth annual *Financial Stability Report* published by the Swiss National Bank (SNB). Through this report, the SNB communicates its evaluation of the stability of the financial system and provides the general public with information and indicators. The report gives the SNB the opportunity to highlight tensions or imbalances that could jeopardise system stability. It forms part of the assessment of financial system stability, to which the SNB is required to contribute according to the National Bank Act (art. 5 para. 2 (e) NBA). It is not the purpose of this report to analyse the solvency of individual financial institutions, and individual banks are only considered if this is deemed relevant for obtaining an overall picture. A stable financial system can be defined as a system where the various components fulfil their functions and are able to withstand the shocks to which they are exposed. This report focuses on two vital elements in the system: the banking sector and financial market infrastructure.

## Overall assessment

### Banking sector

The analysis of the stability of the banking sector is divided into two steps. First of all, we analyse the development of risk factors in the macroeconomic environment and in the financial markets which are relevant to the stability of the Swiss banking sector. Then, we assess the resilience of the banking system with regard to these risk factors. This involves measuring profitability, risks taken and capital adequacy in the banking sector. To complete the analysis, we use models that quantify the level of stress experienced by the banking sector and its connection to the macroeconomic environment.

In 2005, most external factors affecting the Swiss banking sector were favourable. In Switzerland and in the countries of importance for the Swiss banking sector, economic developments were by and large auspicious. In addition, interest rates remained low, especially in Switzerland. At the same time, most stock markets reported a significant upswing, together with a further decline in volatility. The available indicators show that this

situation helped to improve the financial standing of borrowers both in Switzerland and abroad, especially in the case of large companies. In general, ratings improved, while risk premiums on debts dropped further.

In this environment, the Swiss banking sector maintained the high profit levels of the two previous years and in most cases even exceeded them. This rise in profits was accompanied by an increase in the balance sheet total of almost the same proportions, so that return on assets was up only slightly from the relatively high level of 2004.

As in 2004, the good results were mainly attributable to higher operating earnings, which more than compensated substantial cost increases. Revenues from commission business and trading were especially high. In addition, all bank categories, apart from the big banks, recorded further slight improvements in interest-differential business, thereby exceeding the good results of 2004.<sup>5</sup> Moreover, provisioning, which had already been at a historically low level, was further reduced by most banks.

At most banks, the high level of profits led to an improvement in capital adequacy. As a result, the ability of these banks to absorb shocks has been further enhanced. One exception were the big banks. On average, the capital ratios of this bank category decreased somewhat, in spite of the high profits. This is attributable, in particular, to the rapid growth in their balance sheet totals. On the basis of the risk-weighted capital ratio, which is the measure used for regulatory purposes, they still rank among the best when compared with their foreign competitors. However, if the ratio of bank capital to total assets – the unweighted capital ratio – is used as a benchmark, the capital base at the big banks remains low by international standards. Although there is no formal regulation of unweighted capital ratios in Switzerland, this measure provides an additional assessment of the soundness of a bank's capital base since no capital regulations can be expected to provide complete coverage of all possible risks.

In general, the indicators based on financial market valuations confirm the impression conveyed by the banks' profits and capital base. Looking at the yield spreads for bank bonds and the prices of credit default swaps, the Swiss banking sector appears healthy, both in historical terms and by comparison with the banking sectors of other coun-

<sup>5</sup> Cf. box 1, p. 28.

tries. However, indicators based on share prices as well as the ratings of major agencies suggest that the robustness of the Swiss banks is in line with and not higher than the international average – as risk-weighted capital ratios would suggest. The SNB stress index – which combines a number of variables representing potential stress symptoms in the banking industry – confirms the impression that the Swiss banking sector has been experiencing a particularly low stress episode since the middle of 2003 (cf. graph below).<sup>6</sup>

As far as the prospects for the future are concerned, our expectations regarding the stability of the Swiss banking sector are positive. In the first place, economic growth in Switzerland and in the other countries that are important for the Swiss banking sector is expected to remain relatively strong. Secondly, most companies appear to be in good financial shape, making them able to withstand potential shocks. Thirdly, so far we see no sign that the increasing competitive pressures in the Swiss mortgage market have had a destabilising effect that could represent a potential source of risk for the banking sector. Furthermore, there appears to be relatively little risk of contagion effects causing a crisis in the Swiss banking sector at present, since the world's major banks also appear fairly robust at present. Finally, we do not see any particular threat to the Swiss banking sector arising from the rapidly growing market for credit risk transfer products such as securitisation and credit derivatives (cf. box 2, pp. 32–33).

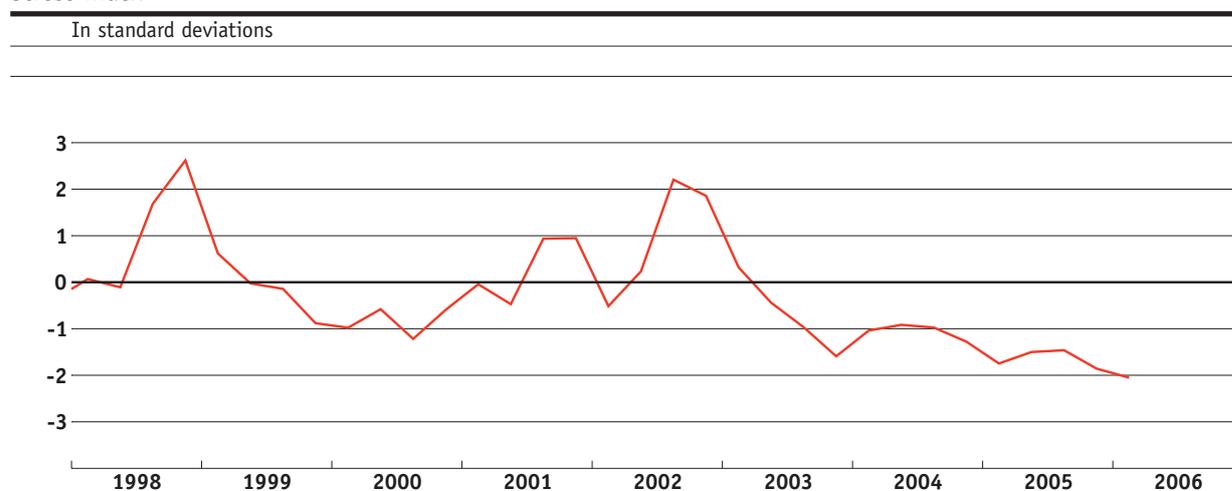
Nevertheless, there are a number of potential sources of risk. For instance, there are signs of in-

creased appetite for risk on the part of investors, including Swiss banks. The first sign is that the size of the big banks' loan portfolios has increased substantially, mainly as a result of the further development of their operations abroad. Second, the big banks have also recorded a strong increase in the size of their trading portfolios which, according to some indicators, have resulted in higher exposures to market risks. Third, the interest rate risk has risen for all bank categories, reaching significant levels in the case of a few institutions.

In addition, the potential for further improvement in the economic and financial environment is practically exhausted at present. Spreads and interest rates, especially those at the long end of the spectrum, are still low by historical standards. Furthermore, in spite of the recent decline, share prices have risen strongly over the last few years. In Switzerland they have more than doubled since the 2003 low. Moreover, as has been observed in similar situations in the past, a favourable environment can deteriorate surprisingly quickly and strongly. Although we see no tangible signs for such developments, it is not inconceivable that spreads and interest rates could return to or even exceed historical averages within no more than a year.

Considering these factors, differing risks can be derived for the different bank categories. The cantonal, Raiffeisen and regional banks, which operate primarily in the Swiss lending business, appear to be mainly exposed to a strong rise in interest rates. The big banks, in turn, could be relatively sensitive to a deterioration in conditions on

#### Stress index\*



Sources: Swiss Federal Banking Commission (SFBC), Swiss National Bank (SNB), Thomson Datastream

6 For a detailed description of this indicator, cf. chapter 6, p. 42, and box 5, p. 44.

\*The higher the level of the index, the higher the level of stress in the Swiss banking sector. The index is expressed in terms of standard deviations from its 1987–2005 average. A value above (below) zero indicates that the stress is above (below) its historical average. The stress index for the first quarter of 2006 is computed with provisional data. For a description of the underlying variables and the methodology, cf. box 5, pp. 44–45.

the international financial and credit markets, as a result of their relatively big – and rapidly growing – trading books and international loans portfolios. However, our scenario analyses indicate that the Swiss banking sector should be able to withstand a substantial deterioration in its environment (cf. box 3, p. 35 and chapter 6, p. 42).

### **Financial market infrastructure**

With regard to the clearing and settlement of payments and transactions involving securities and other financial instruments, the Swiss financial sector has a smoothly functioning financial market infrastructure. Overall, the Swiss financial market infrastructure enjoys a high degree of safety and efficiency by international standards. Of particular significance for the stability of the Swiss financial system are the payment and securities settlement systems, which are interlinked within the Swiss value chain. These include the payment system Swiss Interbank Clearing (SIC), the securities settlement system SECOM and the central counterparty x-clear. A further element of importance to the stability of the Swiss financial system is Continuous Linked Settlement (CLS), a multi-currency payment system for the settlement of foreign exchange transactions. From the financial stability point of view, these systems need to fulfil two criteria. First, rules and procedures for the clearing and settlement of transactions should be such that they mitigate the various inherent settlement risks. Second, adequate organisational and technical measures should be in place to reduce operational risks and to enhance resilience.

The rules and procedures of SIC, SECOM, x-clear and CLS contribute considerably to the minimisation of settlement risks. In SIC, credit risk is eliminated by real-time gross settlement of payments in central bank money, while liquidity risk is reduced by the SNB's provision of intraday liquidity and a number of other features, such as a central queuing mechanism with defined priorities or a mechanism to resolve gridlock situations. In the case of securities transactions, the link between SIC and SECOM permits real-time settlement in accordance with the delivery-versus-payment principle, thereby eliminating the risk that one party fulfils its obligation while the other party does not. Liquidity risk is reduced by securities lending and borrowing and tri-party repos. Replacement cost risk, which arises due to the lag between the execution and the settlement of securities transactions, may be eliminated by

interposing a central counterparty. So far, since its launch in 2003, x-clear has been providing its clearing services as central counterparty only for participants of the virt-x platform, which is used predominantly for trading in stocks included in the Swiss Market Index. The planned introduction of x-clear's central counterparty services for the stocks traded on the SWX platform will lead to a further reduction of replacement cost risk. Finally, by enabling the simultaneous settlement of both sides of foreign exchange transactions in 15 currencies in accordance with the payment-versus-payment principle, CLS makes it possible to eliminate settlement risk in the foreign exchange market. The steady growth of transactions settled in CLS in recent years has certainly contributed to global financial stability.

In terms of operational reliability, too, the Swiss financial market infrastructure has a good track record. But there is no room for complacency. Ongoing efforts are required to keep operational risks at bay and to enhance the resilience of the financial system. During the last few years, these issues have been very high on the agenda of both system operators and public authorities. For instance, in a joint effort, the main stakeholders of the Swiss financial community carefully reviewed the business continuity plans of major financial institutions and market infrastructure firms. While all the assessed institutions proved well prepared to deal with major disruptions, it was recognized that the resilience of the Swiss financial system needs to be further enhanced and a package of measures was put forward accordingly. Another example is the integration of the information technology infrastructure services of Telekurs Group and SIS Swiss Financial Services Group into a single organisation, scheduled to be completed in the second half of this year. The objective is to improve both the efficiency and the resilience of the systems integrated in the Swiss value chain.

### **Data and data sources**

The banking statistics used in this report are based on official data submitted by the individual banks. As of 1995, the data on the big banks are analysed on a consolidated basis. Before 1995 and for the other banks, individual (non-consolidated) figures are used.

This document is based on the data available as at 14 May 2006.

## Part I: Banking sector

# 1 General conditions

In 2005, most external factors affecting the Swiss banking sector were favourable.<sup>7</sup> In Switzerland and in the economic regions of importance for Swiss banking, economic developments were by and large auspicious. In addition, interest rates remained very low, especially in Switzerland. At the same time, most stock markets experienced a rising trend, together with a further decline in volatility. The available indicators suggest that this situation improved the financial standing of borrowers, particularly in the case of large domestic and foreign companies. The perspectives for 2006 are essentially advantageous.

## Favourable economic situation

In 2005, economic growth in Switzerland, at 1.9%, was slightly below that in 2004 (2.1%), but clearly above the average figure for the previous five years (1.2%; cf. graph 1). For the second time in a row, the rate of growth in Switzerland exceeded that of the European Monetary Union (EMU) countries which grew by 1.3% in 2005 (2004: 2.0%). In the US, economic growth slowed from 4.2% in 2004 to 3.5% in 2005, while Japan experi-

enced an increase from 2.3% in 2004 to 2.7%. The emerging economies grew by 5.2% on average in 2005.

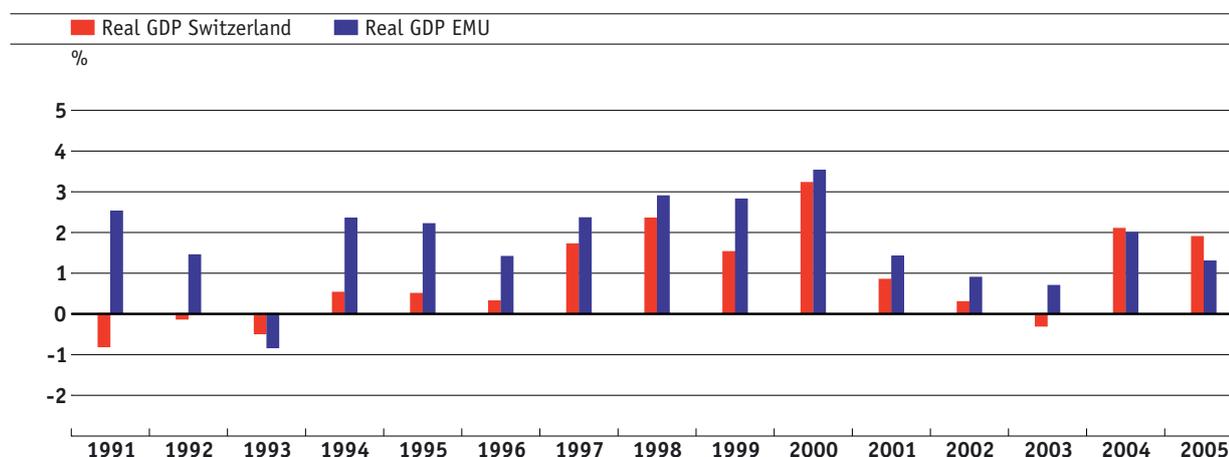
In 2006, we expect that GDP growth will rise to a good 2% in Switzerland and the EMU countries, while economic activity in the US and Japan should remain at a similar level to that experienced in 2005. Economic perspectives for the emerging economies also appear favourable.

## Interest rates remain relatively low

With the exception of the US, the general level of interest rates in 2005 remained as low as in the previous year. In Switzerland, there was a flattening in the interest rate curve as a result of a slight tightening in monetary policy and a further reduction in long-term interest rates (cf. graph 2, p. 20). Averaged over the year, the three-month Libor amounted to 0.8% and the yield on benchmark ten-year bonds came to 2.1%. Thus both rates were well below the average of the past fifteen years, which was 2.9% for the three-month Libor and 4.0% for ten-year bonds. Since the beginning of 2006, both short-term and long-term interest rates have risen substantially. In mid-May however, they were still well below their historical average.

Growth in GDP

Graph 1



Sources: OECD, SNB

<sup>7</sup> The analysis of the economic and financial environment is based on economic activity, interest rates, the credit standing of borrowers in general and of major insurance companies and foreign banks in particular, as well as the real estate market and the stock market. These risk factors have been singled out on the basis of an analysis of the sensitivity of the banking sector to a range of economic variables, and on the basis of information on its exposure to specific sectors of the economy.

Starting from low levels, foreign interest rates have risen by differing amounts. The most substantial increase since the beginning of 2005 has been recorded for short-term interest rates in the US. By mid-May 2006 they had reached 5.2%, thereby clearly exceeding the average of the past fifteen years (4.2%). In the EMU countries and in Japan, the rise in short-term interest rates has been weak by comparison. As for long-term interest rates, these remain at relatively low levels in the US, the EMU countries and Japan despite a slight upward trend in 2005 that has strengthened since the beginning of 2006.

It should be noted that the relatively low interest rates that still prevail, especially at the long end of the spectrum, cannot be explained by declining inflation alone. Real interest rates are also relatively low in historical terms, both in Switzerland and in other countries. To a considerable extent, temporary factors (excess supply of savings, insufficient investment opportunities, global accumulation of liquidity) are responsible for the low level of both nominal and real interest rates. Consequently, the possibility of a strong and rapid rise in medium and long-term interest rates cannot be ruled out. However, the timing and extent of a possible adjustment are difficult to assess. On the one hand, structural factors (demographic) might continue to promote relatively low long-term interest rates in the future. In addition, current real interest rate levels are not extraordinarily low when seen in a very long term perspective. On the other hand, there have been numerous occasions in the past when both medium

and long-term interest rates in the G10 countries rose by 150 to 200 basis points (bp) within just a year.

### Strong increase in share prices in Switzerland

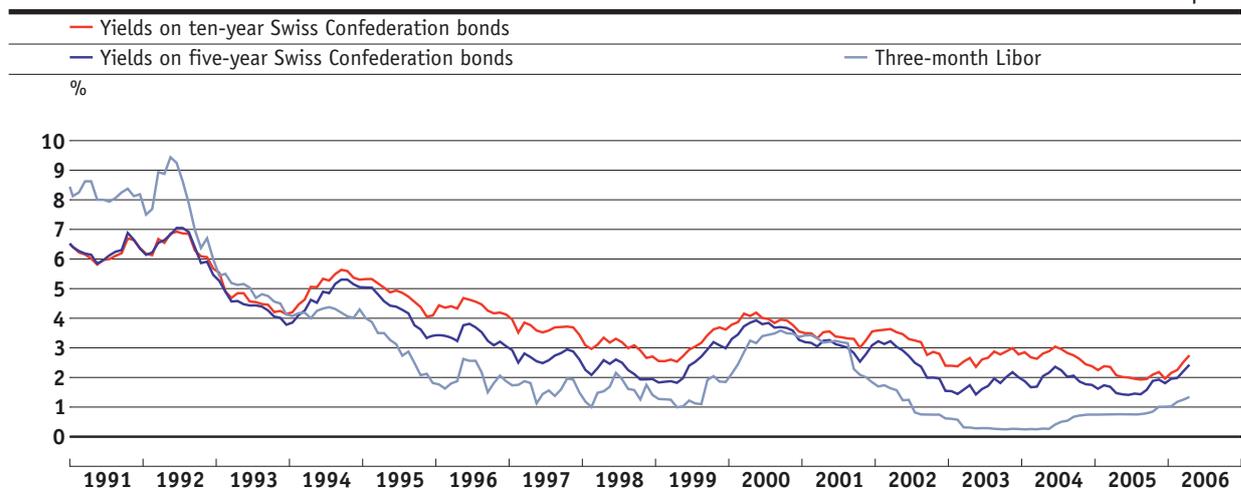
In 2005, prices on the most important stock markets moved upwards, although growth rates varied from one market to another. The increase was particularly marked in Switzerland, with the Swiss Performance Index (SPI) soaring by 36% to a level of 5742 at the end of December (cf. graph 3, p. 21). Share prices also grew markedly in Europe and Japan, with the DJ STOXX 50 advancing by 21% in 2005 and the Nikkei 225 rising by 40%. In the US, however, the S&P 500 index only added 5%.

At the same time, trading volume in Switzerland was again substantially higher than in the previous year (+21%). As in 2004, the volatility of the SPI declined further, dropping below the 15-year low, although it subsequently climbed somewhat. Thus, by comparison with the past fifteen years, the level of uncertainty in the stock market appears to have been particularly low in 2005. The same applies to the major foreign stock exchanges.

Since the beginning of 2006, share prices on all major markets have further increased, before dropping during the second quarter. In spite of the recent decline, the growth of share prices over the last three years has remained strong, in particular in Switzerland where share prices have more than doubled since the 2003 low. This rapid growth can be partly, though not fully, explained by the improvement in economic fundamentals.

Swiss interest rates

Graph 2



Sources: Reuters, SNB

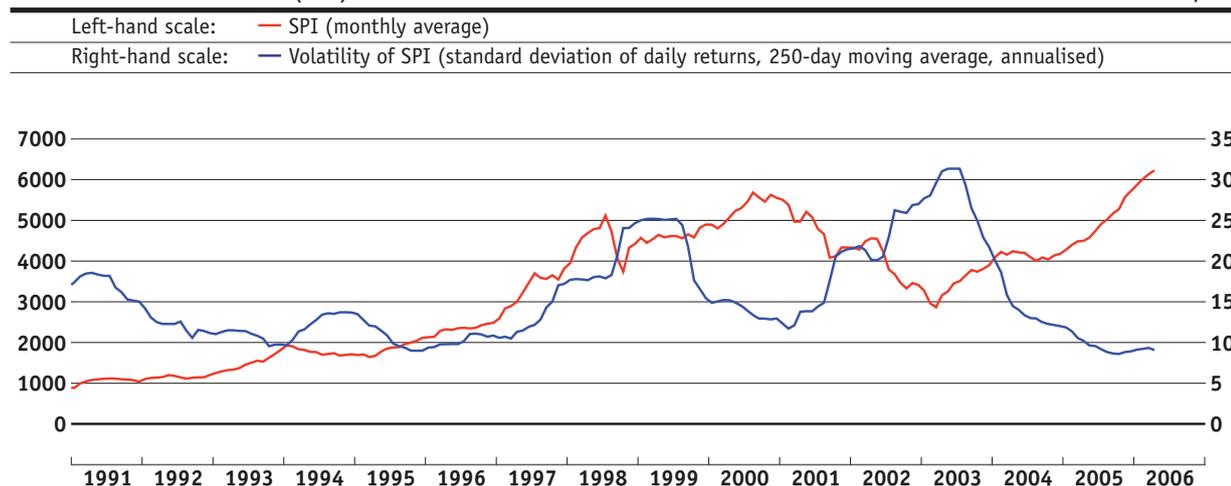
### Slow rise in Swiss real estate prices

In 2005, Swiss real estate prices grew only slowly (+1.2% in real terms, cf. graph 4). The largest increases in real estate prices (in real terms) occurred in western Switzerland (+2.8%), southern Switzerland (+2.5%) and central Switzerland (+1.4%). In Geneva, where real estate price growth had been particularly strong in the recent past, the growth rate decreased to 1.8% in real terms in 2005. For Switzerland as a whole, real estate prices at the end of 2005 were still about 30% below their peak level of 1989 and, even though local imbalances cannot be ruled out, no signs of major imbalances were visible.

In addition to the domestic market, a number of foreign markets are important for the Swiss banking sector, including, in particular, the US, the UK, Japan, Germany, France and the Netherlands. In these countries, movements in real estate prices varied considerably. In France, the Netherlands, the UK and the US, real estate prices (in real terms) have risen by between 57% and 104% since 1997, and are considerably higher than their former peak levels. In Germany, however, real estate prices have dropped by 10% in real terms since 1997, while in Japan they have tumbled by 29%.

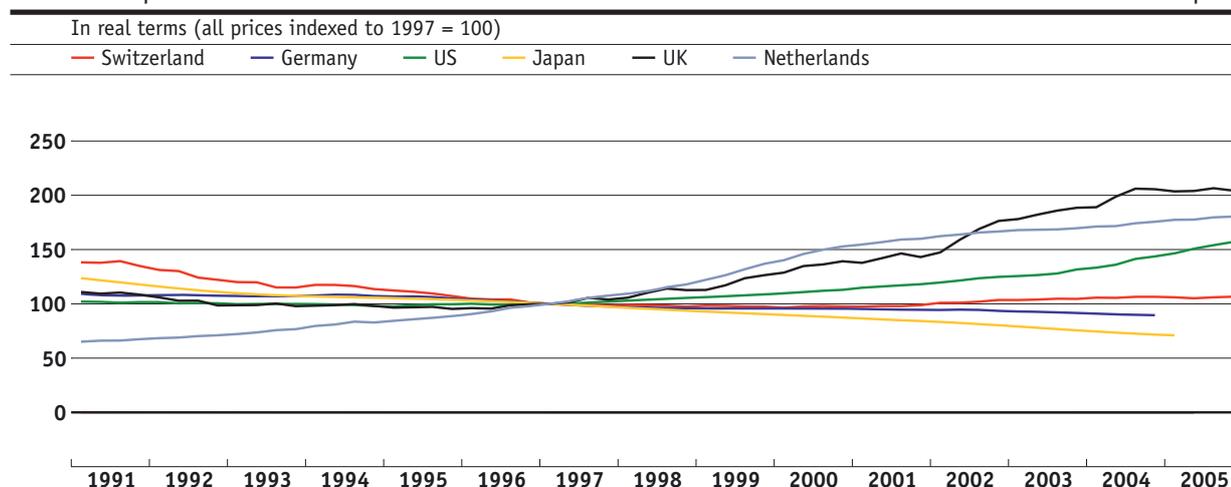
Swiss Performance Index (SPI)

Graph 3



Real estate prices

Graph 4



Graph 3: Source: SNB

Graph 4: Sources: Bank for International Settlements, Wüest & Partner (Single Family House Index)

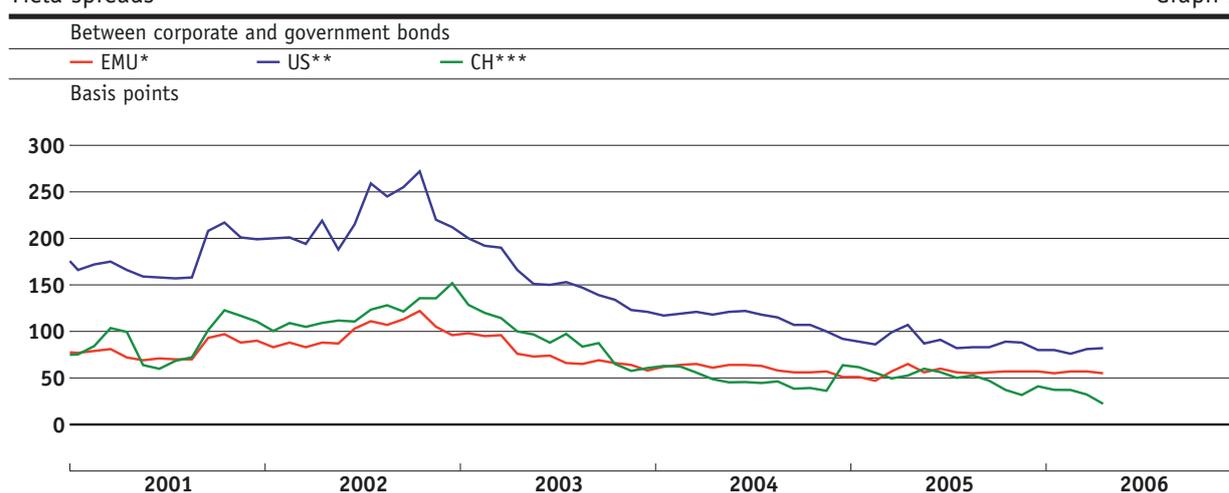
### Good credit standing of borrowers

Indicators of creditworthiness revealed a further slight improvement in 2005. In line with the favourable developments in the economy, the financial situation of many companies appears to have improved further. One indicator of this is the yield spread between corporate and government bonds. In 2005, the yield spread in Switzerland fell further to 32 bp, while in the US it dropped to 80 bp. In the EMU countries it remained stable at a low level of 55 bp (cf. graph 5). Although these spreads are low in historical terms, they do not necessarily reflect low borrower default risks alone. A fall in spreads can also be attributable to a rise in investors' appetite for risks. One sign that investors'

risk appetite is relatively high at present is the fact that company spreads have fallen within individual rating categories. However, other indicators confirm that the general credit risk is low and has trended downwards, both in Switzerland and abroad. First, Moody's reports a global relationship between upgrades and downgrades of 1.7, as compared to the long-term average of only 0.7. Second, total losses from corporate bankruptcies in Switzerland fell in 2005, while the bankruptcy rate (2.3%) remained unchanged at just below the average rate of the past fifteen years (cf. graph 6). Furthermore, the debt ratio of the largest companies in Switzerland fell for the fifth year in succession to 22%, reaching its lowest level in fifteen years.

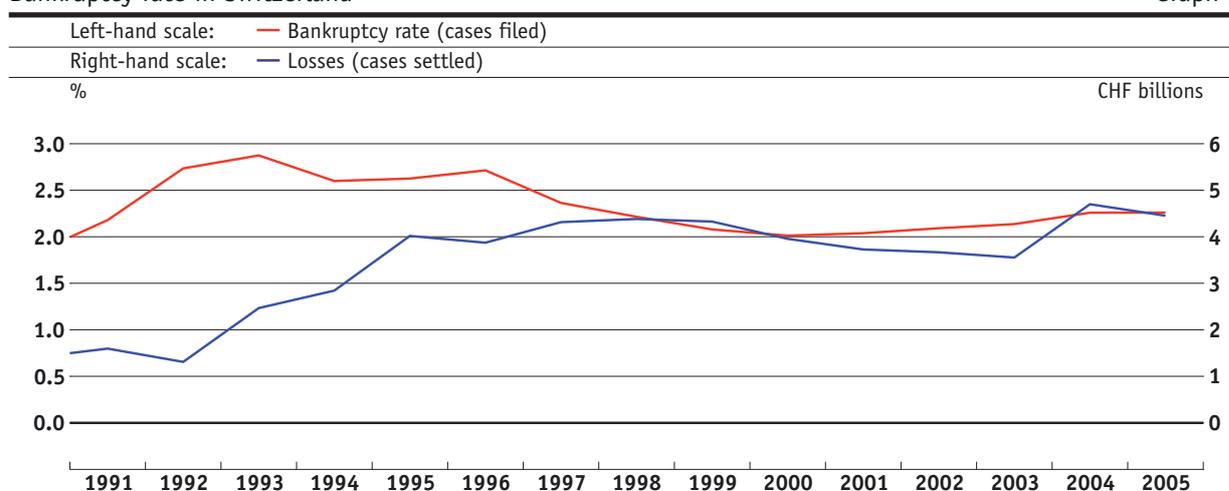
Yield spreads

Graph 5



Bankruptcy rate in Switzerland

Graph 6



Graph 5: Sources: SNB, Thomson Datastream

\* Euro Aggregate Corporate and Euro Aggregate Government indices, Lehman Brothers

\*\* US Aggregate Corporate Investment Grade and US Aggregate Government indices, Lehman Brothers

\*\*\* Yields (spot rates) for corporate bonds with a rating of at least BBB- and on Swiss Confederation bonds, calculated by the SNB

Graph 6: Sources: State Secretariat for Economic Affairs, Swiss Federal Statistical Office



Nevertheless, it should be noted that borrowers' credit standing can deteriorate fairly rapidly and significantly. First, in the last fifteen years, spreads on investment grade debts have often risen by 50 to 100 bp over a period of twelve months, even within an individual rating category. In the case of sub investment grade debts, fluctuations of more than 200 bp have often been observed. Second, the relationship between upgrades and downgrades tends to be volatile and has been known to fall by more than 50% within a year. The corporate bankruptcy rate in Switzerland, however, is less volatile, although increases of up to 25% cannot be ruled out, going by past experience.

**Very good business results for foreign banks**

In 2005, foreign banks recorded very good results, thereby reflecting the healthy position of not only corporate borrowers and those in the private household sector, but also the good performance of most stock markets. This contributed to stability in international financial markets. There are a number of indicators that reflect the healthy position of banks at the international level. First, a majority of big international banks recorded further growth in profits. Second, the number of banks upgraded by Moody's in 2005 was four times the number of downgrades. Third, in most large industrial countries, the prices of Credit Default Swaps (CDS) for bank debts persisted at or around the lowest level observed since mid 2002. Indeed, in the US they even fell a little (cf. graph 7).

However, a number of surveys suggest that the big international banks' appetite for risk remains high. Despite the low volatility of share prices, the value at risk (VaR) of many banks is above the average figure of the past five years. Exposures to stock market risk, in particular, increased further in 2005. In addition, there was no tendency for capital backing (as measured by the BIS ratio) to improve, despite the high level of profits. This was because risk-weighted assets grew faster than eligible capital at a majority of big banks (as did unweighted assets).

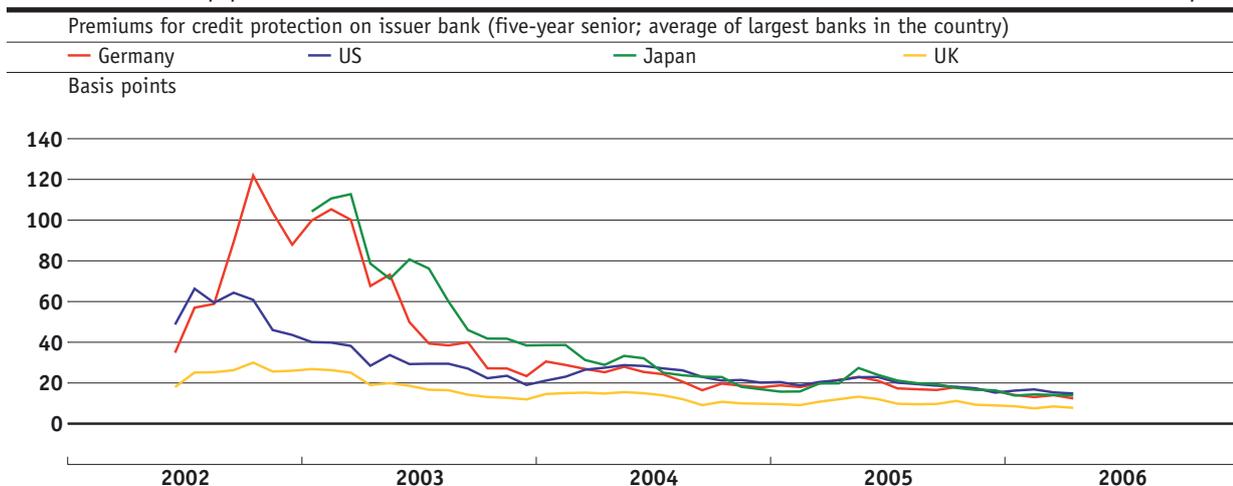
**Divergent results for insurance companies**

The situation of life insurers was very different to that of non-life insurers and reinsurance companies. In 2005, life insurance companies recorded good results with profits trending upwards. The number of life insurers upgraded by Moody's was four times the number of downgrades (as was also the case for banks).

Non-life insurers and reinsurance companies were heavily affected by natural disasters in 2005. In general, profits declined, and in some cases there was a reduction in the capital base. For non-life and reinsurance companies, the relationship between upgrades and downgrades by Moody's was two to three. At the consolidated level, all of the five largest Swiss insurance companies apart from Swiss Re posted better results in 2005. None of these companies specialises in non-life insurance alone. In terms of ratings, upgrades and downgrades were evenly balanced; average prices of CDS on Swiss insurers' debts dropped slightly.

Credit default swap prices

Graph 7



Source: Bloomberg

### **Relatively favourable prospects for 2006**

In general, prospects for 2006 are good. First, the growth outlook for Switzerland, the EMU countries, the US and Japan appears healthy. Second, the financial position of companies in Switzerland and abroad is trending upwards and their resilience is growing. Finally, we see no signs of major imbalances in the Swiss real estate market.

However, we consider it unlikely that general operating conditions will be better than in 2005. On one hand, spreads and interest rates – especially those at the long end of the spectrum – are low by historical standards. On the other hand, share prices have risen strongly in the recent past, in particular in Switzerland, where they have more than doubled since the 2003 low. Furthermore, and even though we see no tangible signs of such developments at the moment, past experience has shown how quickly and significantly a favourable environment can be transformed.

## 2 Profitability

In the Swiss banking sector, both profits and profitability increased in 2005. This result was driven mainly by profits from trading and commission business, as well as special factors relating to the big banks. Simultaneously, the cost/income ratio in the banking sector rose for the first time since 2002 because of developments at the big banks. For 2006, the outlook remains favourable.

### Profits surge at Swiss banks

In 2005, net profits in the Swiss banking sector rose by 32% to CHF 26 billion. This was twice the rate of growth recorded in 2004. The biggest increase was posted by the big banks (+35%). However, profits were also higher at the cantonal banks (+27%), Raiffeisen banks (+20%) and regional banks (+13%). At the same time, all bank categories reported higher balance sheet totals.<sup>8</sup> This was especially pronounced in the case of the big banks (+21%). As a result, although return on assets (ROA) in the banking sector as a whole increased from 56 bp to 63 bp, it grew less strongly than net profits (cf. graph 8).

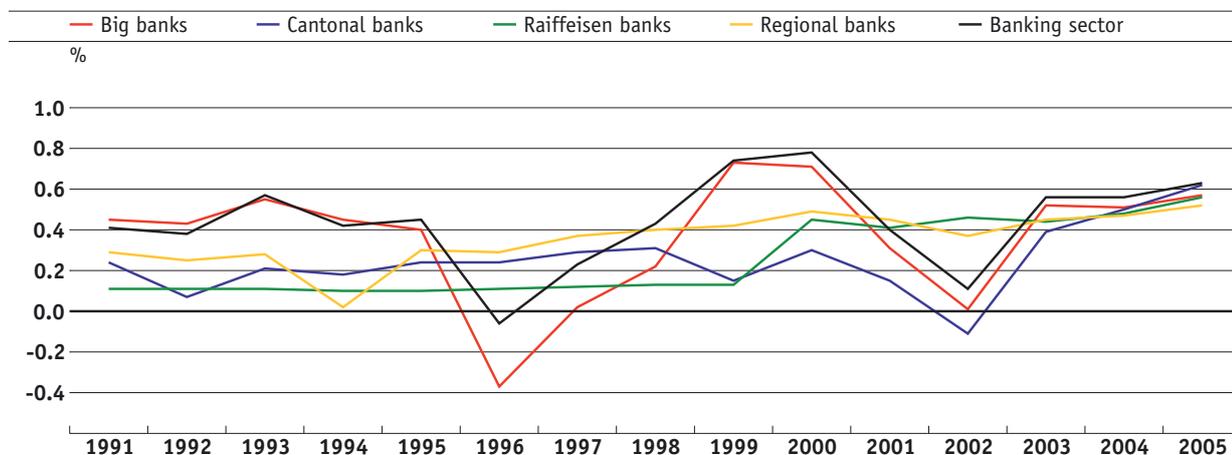
In terms of ROA, profitability in 2005 was very similar for the different bank categories. In terms of

return on equity (ROE), however, the situation looks a little different. The capital base at the big banks is relatively low as compared to their total assets, and for this reason their ROE is relatively high with respect to the other bank categories (cf. chapter 4, p. 36). In 2005, ROE was 25% for the big banks, but only about 7% for the cantonal, Raiffeisen and regional banks. ROE for the banking sector as a whole was 17%. At the same time, the volatility of ROE is much higher at the big banks than it is for the other bank categories.

At the big banks, a number of special factors played a role in the profit figures. These impacted on both income and costs and resulted, overall, in a situation in which gross profits at the big banks (+6%) grew less quickly than their net profits and also less quickly than gross profits recorded by other bank categories. All in all, gross profits in the Swiss banking sector were up by 9% in 2005. This rise was mainly attributable to increased operating income, although costs were also substantially higher in some areas. Overall, total income rose by 17% to about CHF 110 billion. The big banks recorded the greatest increase (+20%),<sup>9</sup> while the regional banks experienced the smallest improvement (+3%). The different fields of business made varying contributions to total income (cf. graph 9, p. 26).

Return on assets

Graph 8



Sources: SFBC, SNB

8 Cf. box 1, p. 28.

9 A large part of this substantial increase is attributable to the fact that the UBS holding in Motor Columbus (a financially-oriented holding company with participations in the energy sector) was fully included in the consolidated figures for 2005, whereas in 2004 it was only consolidated in the second half.

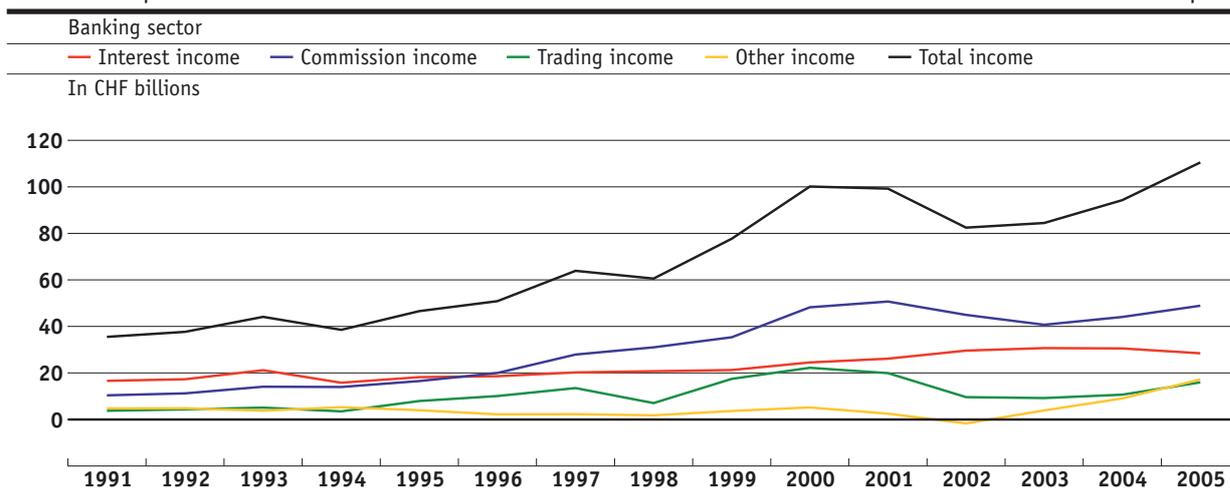
Due to the buoyant conditions on stock markets, there was a particularly marked rise in trading (+50%) and commission revenues (+11%). However, net interest income dropped by 7%. This was attributable to lower net interest income at the big banks, which recorded a 15% decline in 2005 despite a 20% growth in lending volume. Yet, lending volume at the big banks increased mainly in low margin business, such as securities lending and borrowing as well as repurchasing agreements. Traditional lending (loans) also grew, but since deposits grew even faster, there was a drop in net interest income earned by the big banks. By contrast, net interest income at the other banks was up by 7.5%, while total lending rose by 6%. This implies that

interest margins in Swiss lending business trended slightly upwards in 2005, as opposed to the situation in 2004. Finally, the *other income* category also rose strongly.<sup>10</sup>

One reason for the disparities between the overall results of the different bank categories were the diverse results achieved in the different fields of business. Total income at the big banks rose most markedly because of the relatively important role that commission and trading business plays at these banks. In the case of the cantonal banks, however, interest differential business is dominant, and this is even more the case at the Raiffeisen banks and the regional banks (cf. graph 10). Over the past 15 years, the relative importance of the

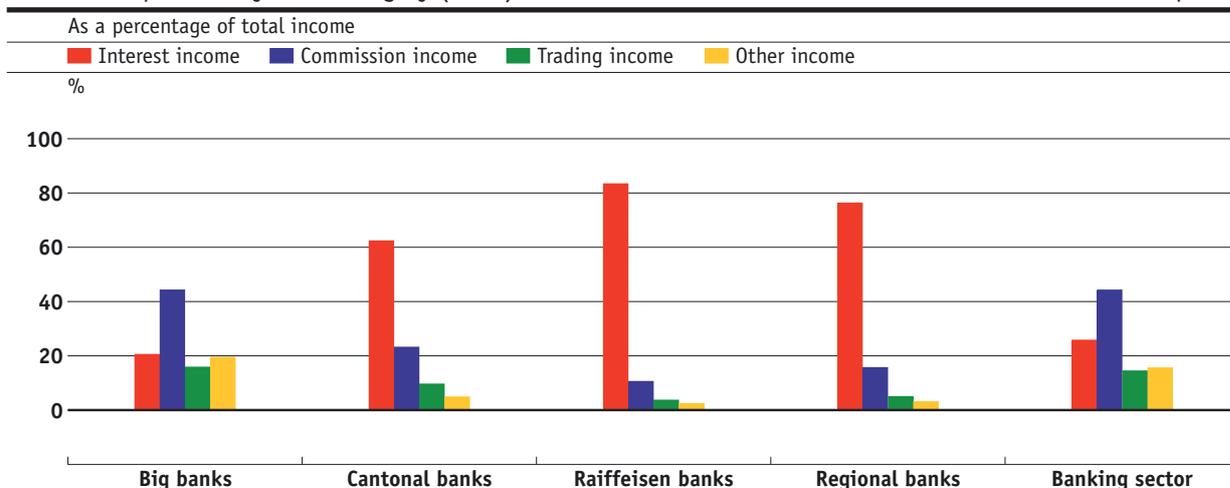
Income components

Graph 9



Income components by bank category (2005)

Graph 10



Graphs 9 and 10: Sources: SFBC, SNB

10 A major factor here was the fact that the Motor Columbus holding was fully included in UBS's consolidated accounts, and the Motor Columbus results were entered under this heading.

various income components has been fairly constant for the different bank categories. The only change has been a moderate increase in commission business at the big banks at the expense of interest-differential business.

In 2005, operating expenses rose considerably across the entire banking sector (+22%) due, in particular, to a strong increase at the big banks (+28%). Excluding special factors (inclusion of a participation in the consolidated figures [cf. footnote 9, p. 25] and a change in accounting procedures for staff remuneration), operating expenses would have been up by 16% at the big banks and by 13% for the banking sector as a whole. However, they remained relatively constant at the cantonal banks (+4.3%), the Raiffeisen banks (+ 0.1%) and the regional banks (-0.5%).

The cost/income ratio in the Swiss banking industry increased overall (from 64.1% to 66.5%). In the case of the big banks, it was up from 66.0% to 70.1%. Without the special factors mentioned above, which already had an impact in 2004, the ratio of costs to income at the big banks would have risen from 64% to 66%. For all the other bank categories, the ratio has dropped (cf. graph 11).

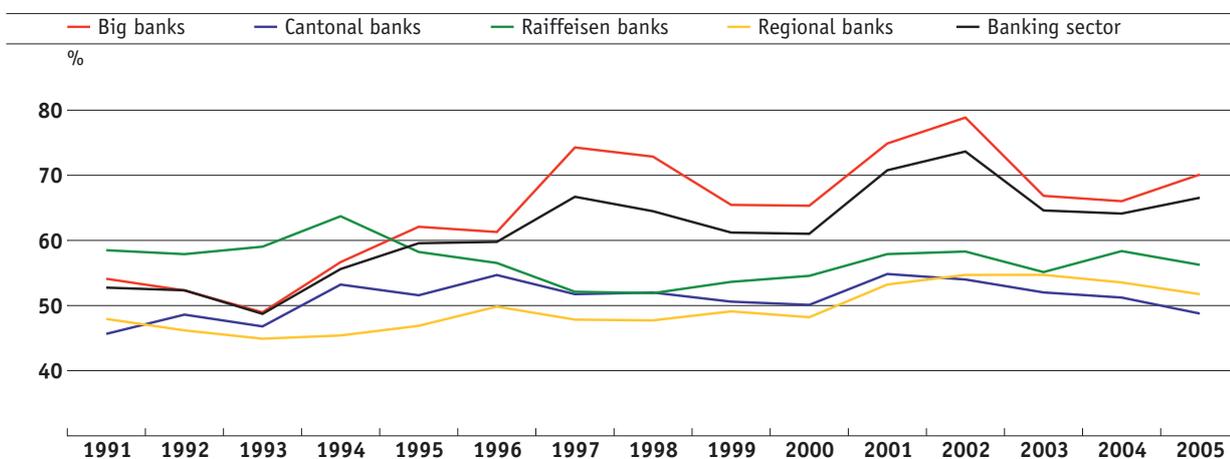
For the first time since 2002, the level of new write-downs and provisions set aside by banks was higher for the sector as a whole (+31%). However, the sole reason for this increase was a provision for litigation risks made by Credit Suisse, which resulted in a tripling of its write-downs and provisions as compared to 2004. At UBS, they fell 36% below their already low 2004 level, and similar developments were recorded at the cantonal banks (-21%), the Raiffeisen banks (-3%) and the regional banks (-30%).

### Outlook

The outlook for the profitability of the banking sector is good, given the expected developments in the operating environment. However, an unexpectedly large rise in interest rates would put pressure on the profitability of those banks that derive a substantial part of their income from domestic lending (cf. chapter 3, p. 29). A fall in share prices, in its turn, would lead to a sizeable decline in revenues, particularly for the big banks. Since write-downs and provisions are very low at present and the room for significant cost reductions appears relatively limited, this could result in a substantial decline in profitability.

Cost/income ratio

Graph 11



Sources: SFBC, SNB

## Box 1: The structure of the Swiss banking sector

The Swiss economy is characterised by a comparatively large banking sector, by international standards, and by the dominance of two banks, Credit Suisse and UBS. At the end of 2005, the banking sector's total assets exceeded CHF 4,100 billion or about nine times the size of Swiss GDP. This is by far the biggest ratio among the G10 countries, followed by Belgium where total bank assets are five times the size of GDP. Measured in absolute terms, the US has the largest banking sector. However, total assets of all banks are less than US GDP (cf. table below).

	Size of the banking sector (Ratio of total assets to GDP)	Concentration: (assets of the largest three banks as a percentage of total assets)
Belgium	4.9	87%
Canada	1.5	56%
France	2.4	66%
Germany	2.9	31%
Italy	1.3	47%
Japan	1.7	40%
Netherlands	4.4	88%
Sweden	2.8	83%
Switzerland	9.1	80%
UK	2.6	60%
US	0.8	38%

Switzerland: 2005 figures. Japan: 2003 figures.  
Sources: SNB, *The Banker* (2005), IMF.

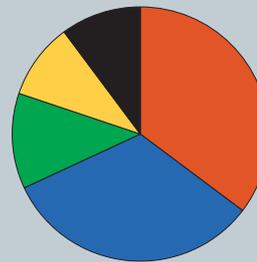
The Swiss banking sector is also large in historical terms. It has been growing rapidly and steadily over the last ten years, doubling the ratio of total assets to GDP. This rapid growth almost exclusively reflects the development of foreign business at the two big banks. The ratio of domestic assets to GDP remained comparatively stable at just over 200% (cf. graph below).

Market concentration in the Swiss banking market is high but not exceptional as compared to other countries. The market share (measured in terms of total assets) of the three largest banks (CR3) is a typical measure of market concentration. In Switzerland it amounts to 80%. This is lower than in

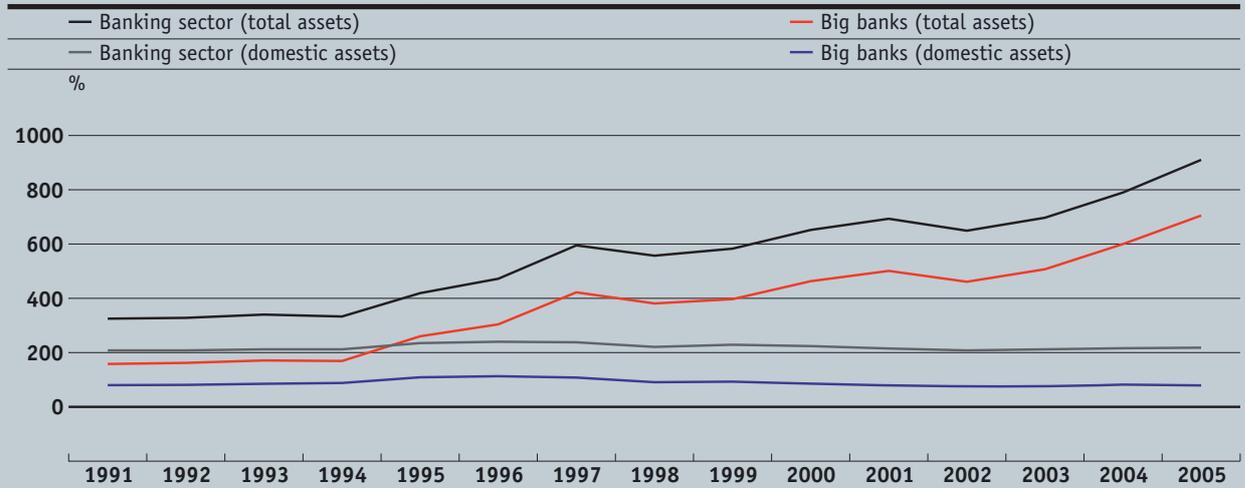
countries such as the Netherlands (88%) or Belgium (87%), but well above the G10 (unweighted) average (61%) (cf. table). However, Switzerland is exceptional in that the bulk of the CR3 (77 of the 80 percentage points) is made up by the two largest banks. The rest of the Swiss banking sector comprises 24 cantonal banks (8%), 420 independent bank members of the Raiffeisen group (3%) and 79 regional banks (2%). The remaining 231 banks (referred to as 'other banks' in this report and including private banks, foreign-owned banks and branches of foreign banks) have a 10% share of total assets.

Though the two big banks dominate the Swiss market in terms of total assets, their relative importance in the domestic credit market is much less significant. Their market share in the domestic credit market is approximately 35%, closely followed by cantonal banks (33%). The share for Raiffeisen banks is 12% and for regional banks 10% (cf. graph below). The market structure is very similar on the deposit side. These figures emphasise the importance of analysing all main bank categories – the big banks (Credit Suisse and UBS), cantonal banks, Raiffeisen banks and regional banks – when assessing financial stability in Switzerland. However, due to their size and international exposure, special attention is given to the two big banks in this report.

### Market share: Domestic lending



### Size of banking sector (as a percentage of GDP)



Sources for graphs: SFBC, SNB

### 3 Risks

The quality of loan portfolios at Swiss banks rose again in 2005. However, at the big banks there was also a sharp rise in the volume of lending, and this has considerably increased their exposure to credit risks. Market risks appear to have increased, especially at big banks. This mainly reflects the substantial growth in their trading portfolios. Interest rate risks have risen further for all bank categories. All in all, the big banks exhibit a greater willingness to take risks than in 2004, particularly in the form of higher exposures. For the other bank categories, the overall risk appears fairly low in historical terms – with the exception of interest rate risks.

#### Higher credit risk for the big banks

Credit risk measures the risk of default by the counterparty, in other words, the risk that the counterparty will fail to make the agreed interest and repayment instalments in full. For the cantonal, Raiffeisen and regional banks, the credit risk is a crucial parameter because these bank categories operate mainly in the lending business (cf. chapter 2, p. 25). The credit risk is also a major source of risk for the big banks, even though interest-differential business is less important for them.

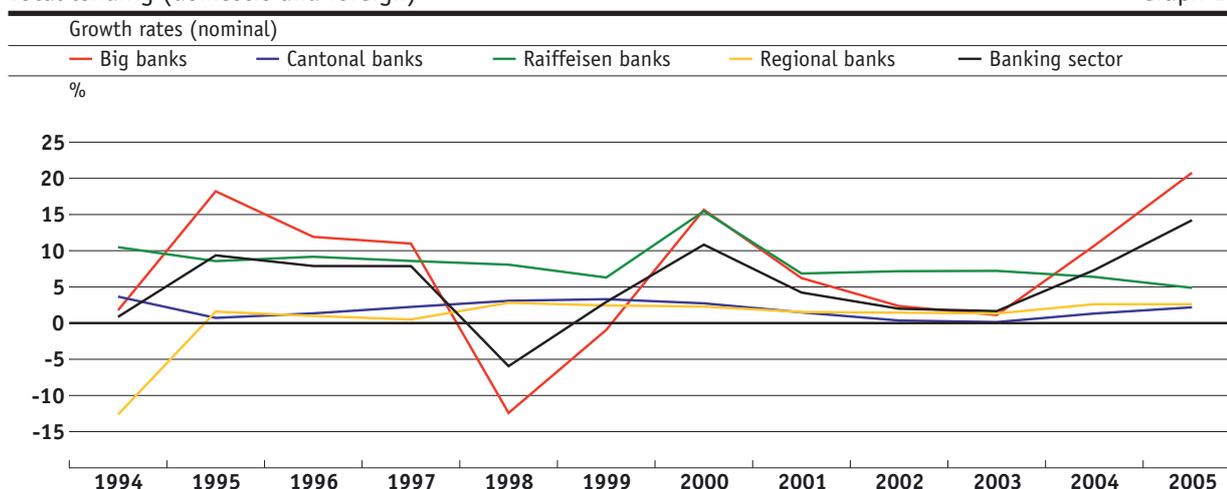
In conceptual terms, the absolute credit risk can be divided into two distinct components – the volume of lending and the average quality of loan portfolios. A rise in volume without any change in the quality implies a higher absolute credit risk, as does a deterioration in quality without any change in volume.

At most banks, the volume of lending grew moderately in 2005 (cf. graph 12). The rate of growth varied between 2% and 5%, depending on the bank category (cantonal, Raiffeisen and regional banks). The big banks were a notable exception, with the volume of lending soaring by 21%. This was entirely due to foreign business (+30%). In domestic business, by contrast, growth in the volume of lending by the big banks was similar to that recorded for other bank categories (+6%).

Simultaneously, loan quality trended upwards from a level that was already high. The higher the current level of quality, the lower the number of defaults that may be expected in future. In the banking statistics, loan quality is reflected by the figures for non-performing loans.<sup>11</sup> In addition, write-downs and provisions for default risks give indications of average borrower quality. In 2005, both of these indicators showed a clear improvement over the previous year. For all bank categories, the share of non-performing loans in total lending volume declined and for the banking sector as a whole, this share dropped from 1.3% to 0.8%. As a result, non-performing loans have reached the lowest level ever attained since collection of this particular statistic began (cf. graph 13, p. 30). The share of existing write-downs and provisions for default risks in the total lending volume provides a similar snapshot of the current position. This figure declined in all bank categories, as well as for the banking sector as a whole, dropping from 1.5% at the end of 2004 to 1.1% at the end of 2005.

Total lending (domestic and foreign)

Graph 12



Sources: SFBC, SNB

11 Non-performing loans are claims against customers and mortgage loans for which payments are more than 90 days overdue (BAG-SFBC, marginal number 248a).

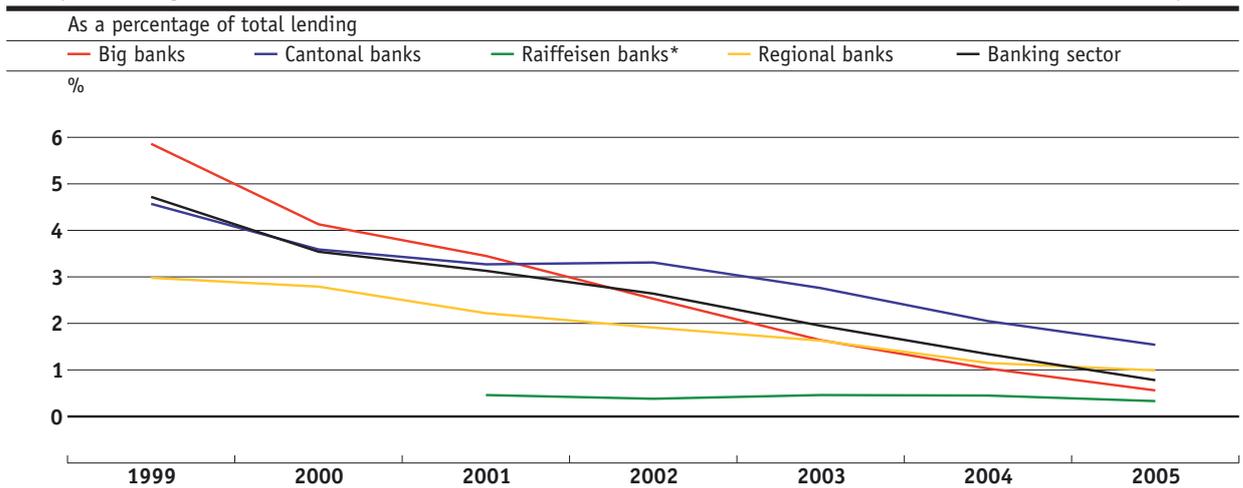
The high quality of loan portfolios is partially attributable to the advantageous operating environment, and in particular to the favourable economic situation and the generally high level of borrowers' credit standing (cf. chapter 1, p. 19). However, the relatively cautious lending policy of banks also played a role. For instance, more than 80% of all loans are collateralised, and the share of low-risk first mortgages<sup>12</sup> in total domestic mortgage claims is very high (more than 90% for all bank categories).

A further indicator of the relatively cautious lending policy is the moderate development in domestic lending volume, given the economic conditions that have prevailed over the past few years. First, over the past few years the growth rate of domestic claims against customers has been lower

than GDP growth (cf. graph 14). This suggests that, overall, the banks did not expand lending aggressively by lowering lending standards. Second, between 1995 and 2005, domestic mortgage loans rose by an average of 2.5% (2005: 5.2%), whereas real estate prices increased by an average of 0.3% p.a. over the same period. These growth rates appear moderate, in particular when compared to the developments of the late 1980s, when the Swiss real estate market experienced a speculative bubble accompanied by strong growth in mortgage claims. Neither can any signs of general overheating be detected on the basis of a more detailed analysis of the Swiss mortgage market. Accordingly, neither mortgages nor customer claims in Switzerland appear to show any structural imbalances that would reflect a divergence between the development of lending activity

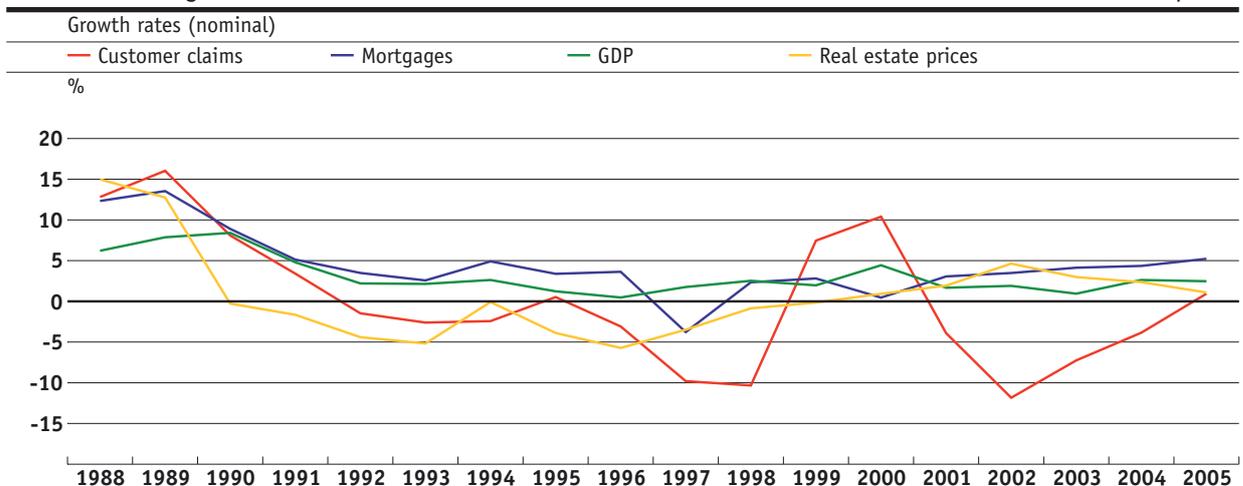
Non-performing loans

Graph 13



Domestic lending market

Graph 14



Graph 13: Sources: SFBC, SNB

Graph 14: Sources: SFBC, SNB, Wüest & Partner (Single Family House Index)

\* Statistics for the Raiffeisen banks only available from 2001.

<sup>12</sup> First mortgages are claims that do not exceed two-thirds of the market value of residential real estate or one-half of the market value of building land and commercial real estate. The limit is one-third for large industrial commercial properties or industrial real estate.



and economic fundamentals. However, it should be stressed that these statements refer to the overall banking sector and the whole of Switzerland. Problems at individual banks or local imbalances cannot be ruled out.

For the big banks, indicators that are more forward-looking show a mixed picture for movements in loan quality as compared to 2004. For instance, the share of loans with an investment-grade rating rose for the UBS (from 70% to 74%), while this same measurement fell at Credit Suisse (from 86% to 81%). Moreover, the average expected loss given default at UBS declined for almost all rating categories, while at Credit Suisse it mostly increased. These rating figures take all credit hedges into account. In particular, loans can be hedged by means of credit derivatives (cf. box 2, pp. 32–33).<sup>13</sup>

All in all, the credit risk appears to have remained relatively stable at a low level at most banks, with lending volume increasing moderately and an improvement in loan quality. In the case of the big banks, however, the credit risk has risen substantially despite an improvement in loan quality, due to strong growth in the volume of lending.

Estimates based on our profitability scenario analysis give an idea of the extent of the credit risk (cf. box 3, p. 35). The analyses predict that a recession with a 1% fall in GDP or a 200 bp rise in interest rates would result in a decline in bank profitability by 50% or 35%, respectively. While this overall effect also comprises direct interest rate change risks and valuation risks (cf. the next two sections), the main reason for the decline in profits is higher provisioning

and write-down requirements. Furthermore, sensitivity analyses carried out on our stress index predict a substantial rise in stress levels in the Swiss banking sector, should the economic environment deteriorate (cf. chapter 6, pp. 42–43).

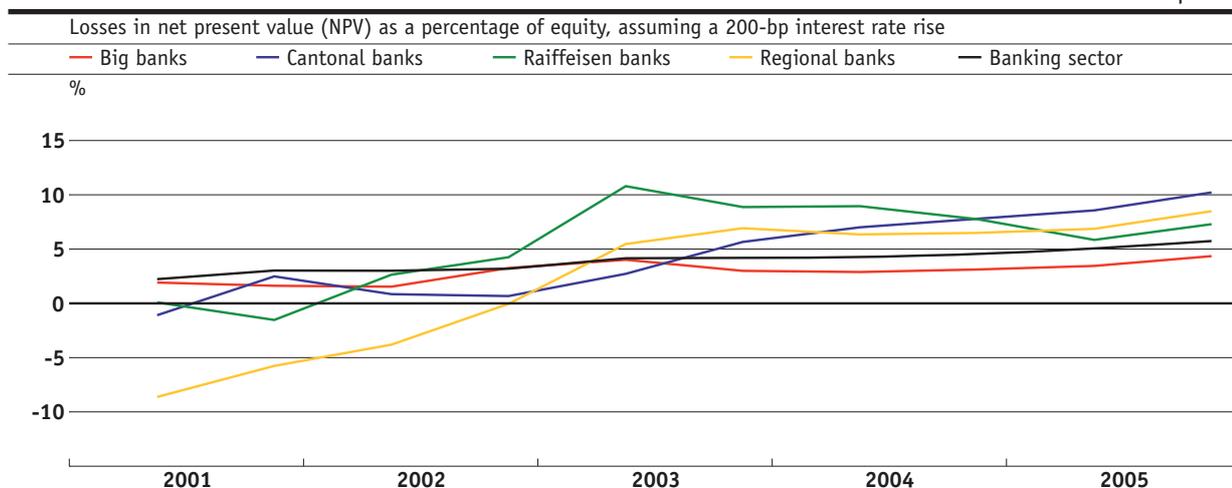
### Higher interest rate risk

A direct interest rate risk exists if there is serious mismatching between the repricing maturities<sup>14</sup> of a bank's assets and liabilities. Banks typically use short-term liabilities to refinance long-term loans. As a result of such maturity transformations, interest rates on assets may be locked in for a longer period than interest rates on liabilities. If a bank is in this position, a rise in interest rates will reduce the present value of its assets more substantially than the present value of its liabilities, and the net present value of the bank will fall. The interest rate risk statistics compiled by the SNB for the Swiss Federal Banking Commission (SFBC) measure the exposure of individual banks to changes in interest rates. Essentially, what is calculated is the change in the present value of individual on-balance and off-balance sheet items resulting from a change in interest rates. By adding the changes in the present value of assets and liabilities, the change in the net present value of the banks is derived.

Generally speaking, the greater the dependence of a bank on interest differential business, the greater the importance of the interest rate risk for this bank. Consequently, the interest rate risk is an important risk factor for cantonal, Raiffeisen and regional banks. As in the case of the credit risk,

## Interest rate risk

Graph 15



Sources: SFBC, SNB

13 Source: annual reports.

14 Time that will lapse until the next occasion on which interest rates can be adjusted.

## Box 2: Systemic aspects of credit risk transfers

Credit risk transfer (CRT) products, which primarily include securitisation and credit derivatives, make credits and credit risks tradable, thereby allowing better allocation of these risks in the financial system. From the viewpoint of system stability, it is central that, in principle, CRT instruments neither eliminate nor generate additional risks. Rather, they transfer or redistribute existing risks. In other words, the risks are only redistributed or converted, but remain in the financial system. Despite the lack of transparency and the very rapid expansion of the CRT market, CRT products do not appear to pose a particular threat to system stability at present.

### CRT market

Trading on the CRT market mostly takes place outside regulated exchanges, mainly directly between the trading partners. In other words, the CRT market is dominated by over-the-counter (OTC) transactions. This is largely due to the relatively recent development of the market and the non-standardisation of many of the products traded. The fact that most transactions are traded OTC rather than on exchanges has various implications for the assessment of this market from a system stability viewpoint. In this respect, the structure and development of the CRT market are of particular interest.

The CRT market has experienced very rapid growth in the last few years – albeit from a rather low initial level. At present, the CRT market is about the same size as the market for equity derivatives and roughly ten to thirty times smaller than the market for interest and currency derivatives. The CRT market accounts for approximately 20–35% of the underlying bond and credit markets respectively, which roughly corresponds to the ratio in the equity market.<sup>15</sup>

The CRT market is characterised by the large diversity of products, some of which are highly complex. Although the popularity of these complex products is steadily increasing, they still have a relatively small market share. Generally, a trend towards CRT products with low credit ratings has been observed, while there has been hardly any change regarding the major benchmark names. Around two-thirds of CRT products are still based on large companies, mainly from the automobile and telecommunications industries. In most cases, the underlying assets are bonds.

Large international investment banks and universal banks remain the most important market participants. As a result, CRT trading is highly concentrated, with the ten largest market participants claiming a combined market share of 70% (in relation to the gross volume of the protection purchased; Fitch 2005). Most credit risks are transferred within the global banking sector. According to a survey conducted by Fitch (2005), the global banking sector purchased net protection for a total of USD 427 billion in 2004, which only corresponds to around 8% of the total market volume of USD 5,100 billion. This means that only a relatively small portion of credit risks were transferred to non-banks.

The main advantage of CRT instruments is that they make credit risks negotiable, thereby allowing a better distribution of credit risks. Another advantage is that they increase the flexibility in credit extension. Last but not least, the CRT market also enhances transparency and information efficiency. It is difficult to gauge in what respect these

advantages actually increase the efficiency and stability of the financial market, but the rapid growth in CRT indicates that they do offer a number of benefits for the market participants.

### Risks to financial stability

While the CRT market has functioned smoothly so far under mostly good market conditions, we cannot say with certainty whether it would also function in periods of severe crisis. On the one hand, the rapid growth of the CRT market has mostly taken place in a favourable credit environment. The CRT market has not yet had to prove its resilience during a large macroeconomic shock. On the other hand, it did not have any difficulty withstanding the turbulences surrounding US car manufacturers in the spring of 2005 or the bad bond year in 2002. Similar OTC derivatives markets emerged unscathed from severe stress periods such as the 1987 stock crash or the Asia/Russia crisis at the end of the 1990s.

The most important bank-specific risk with regard to CRT is the inherent credit risk of the products and the counterparty risk arising from the OTC nature of CRT transactions. Another key challenge for the banks is the pricing of CRT instruments. Moreover, this problem is gaining in significance given the development of new, increasingly complex products and the growing share of these products in the overall market. Last but not least, the banks are also faced with considerable operational problems, and although these are on the decline thanks to various measures implemented by the financial industry, their economic relevance is still difficult to assess. This uncertainty and the negligence in the settlement of CRT transactions in particular are disquieting.

We consider the high concentration in the CRT market as the first source of systemic risks. Because of this high concentration, the default of a big dealer might significantly affect the rest of the market. A related problem is the potential for contagion. The use of CRT links the banks more closely, adding to the risk of a domino effect. By contrast, we do not consider the transfer of credit risks out of the banking sector to be problematic. First, only a relatively small portion of credit risks have been transferred to non-banks so far. Moreover, from the system stability point of view, it is essentially unimportant whether risks leave the banking sector. What is important in this regard, however, is that the credit risk transfers are indeed conducted in a proper manner. As a second group of systemic risks, we have identified potential market disturbances: a distortion in the underlying bond markets, spillovers to other markets and the danger of a sudden drop in liquidity. All in all, we consider these risks to be neither particularly high nor CRT-specific. Distortions in the underlying bond markets caused by CRT are conceivable, especially if the contracts stipulate a physical delivery. Apart from that, however, CRT rather contributes to stabilising the bond market, as evidenced in the past. And while it cannot be ruled out that market turbulences in the CRT market may damage confidence and trigger panic reactions in other markets, this risk is not limited to CRT nor is it very likely to occur. After all, it is basically possible that liquidity in the CRT market – as in any other market – could suddenly drop, but whether this would cause serious problems depends on how the market participants have factored this possibility into their decisions. Notwithstanding the rather moderate risks,

<sup>15</sup> The nominal amount of outstanding credit default swaps corresponds to one-third of the domestic credit volume in the G10 countries and to over 20% of total outstanding debt securities, i.e. bonds, promissory notes and money market instruments (BIS 2005a; BIS 2005b). The contract volume of OTC equity derivatives corresponds to just under 25% of the capitalisation of the MSCI World Index.

certain precautions are necessary. For instance, it is important that the market participants take account of a possible drop in liquidity in their decision-making. The third and last group of systemic risks we have identified are incentive problems. CRT causes various incentive problems: Due to hedging, banks might monitor loans insufficiently or refuse to restructure non-performing loans. Such behaviour would harm their reputation, though. Moreover, incentive problems are usually alleviated by the creditor bank retaining that part of the underlying with the highest risk.

#### **Importance of CRT for the Swiss banking sector**

In the Swiss banking sector, the main players in the CRT market are the big banks, which rank among the seven most important institutions worldwide. They act mostly as intermediaries. In addition, proprietary trading plays an essential role as does, to a lesser degree, hedging of the banks' own credit risks. The diversification of loan portfolios through CRT is insignificant, however. The significance of the CRT business for the big banks is assessed differently depending on the perspective. First, while the big banks report positive replacement values for outstanding credit derivatives that seem high compared to capital (accounting for one-third of eligible capital), these replacement values make up only a small part of total replacement values of all OTC derivatives. Second, the estimated receipts from CRT business still account for a relatively small proportion of income.

To sum up, we see the biggest challenge for banks in the difficulty to assess the risks posed by CRT. In addition, we consider the high concentration in the CRT market as a possible danger to system stability. In both regards, the quality of the banks' risk management is essential. The better their models and the monitoring of their positions and counterparties, and the better the collateral calls and hedging, the more precisely the banks can manage their risks and keep them at an adequately low level. Another decisive factor is that existing uncertainties regarding modelling and liquidity be given adequate consideration.

In addition to the banks' individual risk management, regulatory and oversight authorities play an important role. An important aspect in this context is that although the instruments in the CRT market are relatively new and often quite complex, the associated risks are known and do not represent a fundamentally new category of risks. Accordingly, there are instruments already available – notably the limitations on large credit exposures and capital adequacy requirements – which can take these risks into consideration. Of course, these regulations must be continuously reviewed and adjusted to take due account of newly introduced CRT instruments. With the implementation of Basel II, the accuracy and risk adequacy of the credit and counterparty risks of CRT instruments are enhanced in the capital adequacy rules. With regard to the limitations on large credit exposures, we note that those will remain relatively generous in spite of the modifications made in the context of the implementation of Basel II. Therefore, we believe that the evolution of large credit exposures at the big banks should be carefully monitored so as to recognise any dangerous trends early on. Finally, it is also essential that the models and processes related to the assessment of CRT instruments and their settlement be carefully reviewed.

the relative importance of the interest rate risk is lower for the big banks since their sources of revenue are more diversified.

Our primary analysis of the interest rate risks statistic rests on banks' assumptions with regard to the repricing maturity of all the different accounting items. This primary analysis shows that if the general level of interest rates were to rise by 200 bp, the average result for all banks would be a reduction in the net present value amounting to 5.7% of available capital (year-end 2004: 4.5%). According to this measurement, interest rate risks have risen constantly over the past few years (cf. graph 15, p. 31). One reason for this continued increase is the growth in fixed-rate mortgages. Four years ago, fewer than half of all mortgages charged interest at a fixed rate (44%), while now the figure is 75%. This has increased the average repricing maturity for bank assets, resulting in a higher interest rate risk, given an unchanged funding mix.

Exposure to interest rate risk varies considerably from one bank category to another. At the cantonal banks, in particular, it has attained a high level of above 10%. As a consequence, a sharp rise in interest rates might lead to a material reduction of these banks' capital base. We would qualify a further increase in the interest rate risk as critical.

The SNB performs a complementary interest rate risk analysis which is based on standard hypotheses regarding the repricing maturity of some items, in particular savings deposits and traditional variable-rate mortgages. While our standard hypotheses are close to the repricing maturity assumed by the average bank in the sample, they are significantly shorter than the average repricing maturities assumed by the larger banks. Based on these hypotheses, the average sensitivity to interest rates is 1.5 to 2 times as high as that measured on the basis of the banks' hypotheses.

Finally, it should be noted that the interest rate risk only takes into account the valuation risk resulting from fluctuations in interest rates. A significant increase in interest rates would also cause liquidity or solvency problems for borrowers – in particular those with variable-rate loan agreements. This, in its turn, implies a higher risk for the bank (cf. previous section on credit risk, p. 29). However, this risk is not included in the interest rate risk statistic, being reflected in a higher credit risk instead.

Our own calculations provide us with an assessment of the overall impact of an increase in interest rates. As mentioned in the previous section, the profitability scenario analysis (cf. box 3, p. 35) predicts that a rise in interest rates by 200 bp would bring about a 35% decline in bank profitability. Sensitivity analyses carried out on our stress index predict that a rise in interest rates would also have a strong impact (cf. chapter 6, p. 42). A 200 bp increase in interest rates would push the stress index up from its current value of -1.9 to -0.6, i.e. by roughly one standard deviation.

### Higher market risk for big banks

Market risk is the risk that changes in market prices will generate profits or losses. This price risk mainly affects banks' trading books, financial assets and unconsolidated stakes in other companies. Market risk also includes all currency risk and interest rate risk related to the banks' trading books.<sup>16</sup>

Market risk is particularly important for the big banks because they are heavily dependent on trading results: Trading portfolios account for just over a quarter of their total assets. The cantonal banks are also dependent on trading results, although to a lesser extent, while market risk plays a minor role for the Raiffeisen banks and the regional banks (cf. chapter 2, p. 25).

The big banks publish the market risk of their trading portfolios regularly, in the form of VaR figures. The VaR measures maximum losses within a given time span, for a given probability.<sup>17</sup> VaR figures indicate that market risks at the two big

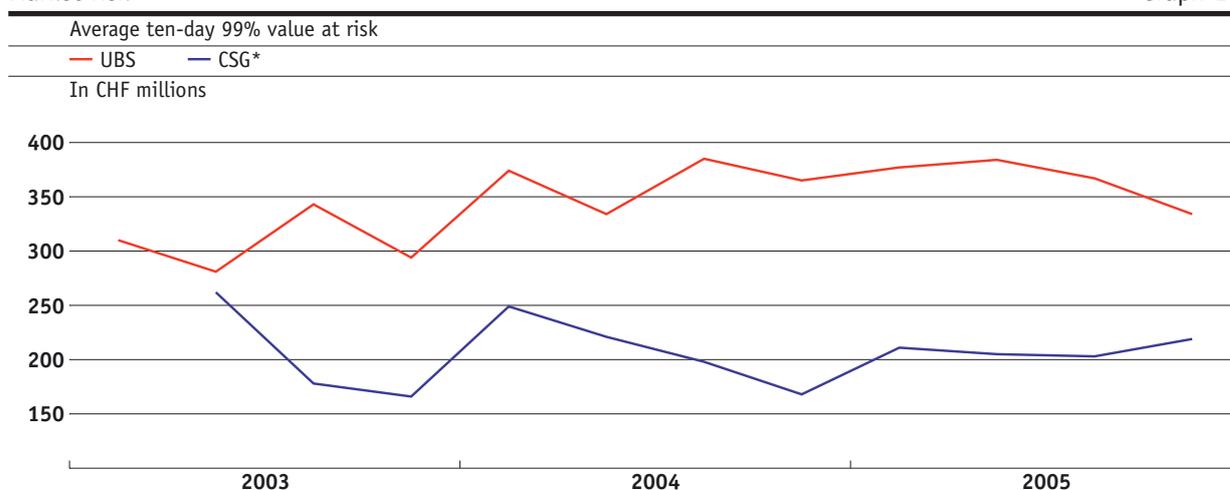
banks in 2005 were practically unchanged by comparison with 2004 (cf. graph 16). However, it should be borne in mind that the current level of volatility, which is low by historical standards, enters into the calculation of the VaR (cf. graph 3, p. 21). The lower the market volatility, the lower the VaR (assuming an unchanged portfolio composition). Consequently, the low VaR figures at present are largely attributable to the current low level of market volatility. Looking at the size of the trading portfolio, we note a substantial rise in exposures. Portfolio holdings are up by 25% over the previous year. In line with this increase, other risk measurements for the big banks suggest that market risks have risen significantly since 2004.

Since no VaR data are available for the other bank categories, we measure their market risk by using capital adequacy requirements calculated on the basis of items subject to market risk. In the case of the cantonal banks, market risk (measured in this way) remained virtually constant compared to 2004 (-0.1%). At the Raiffeisen banks it fell by 8.0% and at the regional banks, it was down by 7.3%.<sup>18</sup>

Our scenario analyses give us an idea of the potential overall effect of market risk on banking sector stability. Our estimates predict that a 30% slump in the Swiss stock market would result in a reduction of the banking sector's profitability of roughly 50% (cf. box 3, p. 35). According to the sensitivity analyses carried out on our stress index, such a fall in share prices would cause the stress index to shoot up from -1.9 at present to +1.4, i.e. a rise of more than 3 standard deviations (cf. chapter 6, p. 42).

Market risk

Graph 16



Sources: annual reports

\* One-day value at risk scaled to ten days.

16 For the big banks, there is some currency risk outside the trading book arising from the fact that some assets and liabilities are denominated in other currencies than the Swiss franc. These foreign currency exposures are not subject to regulatory capital requirements.

However, the big banks try to keep their non-trading currency risk low by match-funding (e.g. US dollar assets are funded in US dollars) or hedging strategies (e.g. using currency options).

17 For instance, a ten-day 99% VaR of CHF 100 million signifies a 99% probability that trading losses will not exceed CHF 100 million within the next ten days.

18 Market risks at cantonal banks account for 9.3% of total capital requirements (2004: 9.4%). The corresponding figure for the regional

### Box 3: Profitability scenario analysis<sup>19</sup>

The scenario analysis described in this box uses microeconomic methods and a set of macroeconomic and individual bank variables to reveal systematic relations between the macroeconomic environment and profitability in the Swiss banking sector. The objective of the analysis is threefold: (i) to identify macroeconomic factors which are systematically linked to the profitability of the banking sector, (ii) to simulate the present and future profitability of the banking sector on the basis of these variables and (iii) to provide an additional instrument to assess the resilience of the Swiss banking sector.

The profitability scenario analysis involves two steps. In the first step, three essential components of bank earnings – net interest income, provisions, and net earnings from trading and commissions – are regressed on a set of macroeconomic variables and individual bank characteristics in a panel regression. The set of macro variables includes short and long-term interest rates, real GDP growth, real estate prices, the unemployment rate, the spread between corporate and government bond yields as well as the volatility and return on the Swiss stock market. The parameters obtained from the regression, which are estimated over the 1987–2005 period, reflect the sensitivity of the banking sector's earning components to changes in the macroeconomic environment. Those parameters which are statistically significant are then used, in the second step, to simulate the banking sector's profitability under four macroeconomic scenarios. Firstly, an interest rate scenario characterised by an increase in the short and long-term nominal interest rate of 200 bp to a level of 280 bp and 400 bp respectively. Secondly, a recession scenario characterised by negative GDP growth (–1%), a relatively high unemployment rate (5%), a widening of the spread between corporate and government bond yields (+50 bp) as well as a decline in real estate prices (–10%). Thirdly, a stock market scenario where the SPI is assumed to decrease by 30%. And finally, a scenario which combines the shocks specified under scenarios 1 to 3. The size of the shocks used in each scenario is in line with the extreme variations observed during the period considered for the estimation.

Based on the first-step regression analysis, it appears, firstly, that net interest income is rather insensitive to macroeconomic developments. The expected negative relation between interest rate changes and the interest margin is supported by the data; however, it is relatively weak. These results are consistent with the evidence from banks' reporting on their direct interest rate risk (cf. chapter 3, p. 29). Secondly, bank provisions are positively related to the interest rate and the unemployment rate on the one hand and negatively related to GDP growth, the bond spread and real estate prices on the other hand. Finally, the results show that there is

a positive correlation between stock market prices and trading and commission income and a negative correlation between interest rates and trading and commission income.

The results from the second-step simulation are reported in the table below. The table contains two elements. Firstly, the profits for the banking sector measured as a percentage of the level of excess capital for each scenario. Secondly, the difference with respect to the baseline scenario which roughly represents the status quo. For example, according to the second scenario – which implies a 200 bp interest rate increase – the profits of the banking sector would amount to 27% of excess capital. Compared to the baseline scenario, this implies a decrease in profits representing 14% of excess capital.

As can be seen from the table, the resilience of the Swiss banking sector to potential macroeconomic shocks appears to be relatively high. For instance, an interest rate shock would lead to a decrease in profitability, through its impact on net interest income, provisions and the value of the bond portfolio. Under such a scenario, however, the banking sector would still be profitable. Similarly, both the recession and the stock market crash scenarios would entail substantially reduced profits without, however, negatively affecting the banking sector's capitalisation. Finally, the scenario assuming a joint occurrence of a strong interest rate increase, a recession and a stock market crash, would lead to a considerable decrease in excess capital in the banking industry as some banks – in particular the big banks – are predicted to suffer substantial losses. Due to their size, a weakening of the big banks could in turn reduce overall systemic stability in Switzerland.

The scenario analysis is subject to a number of limitations. In particular, the analysis is based on statistical inference, assuming that the observed structural relation is stable. For example, the speed of adjustment of the banking sector's exposure to a particular risk factor during a period of stress is assumed to be constant. As a consequence, the figures reported in the table would overestimate the impact of a macroeconomic scenario, should the speed of exposure adjustment be higher now than during the period considered for the estimation. Another limitation lies in the fact that the analysis does not account for possible non-linearities in the influence of macro variables on banks' profitability. In particular, synergy effects may amplify the impact on profitability of each macroeconomic variable when various shocks occur simultaneously. Because the period used for the estimation never saw the joint occurrence of a strong interest rate increase, a recession and a stock market crash, the model may underestimate the real effect of such a combination of shocks. Despite these reservations, the scenario analysis seems to corroborate the current assessment that the Swiss banking sector is quite robust with regard to reasonable macroeconomic shocks.

#### Estimated profits for 2006 (total banking sector)

Scenario	Profits (in percent of excess capital)	Difference with respect to the baseline scenario (percentage points)
1. Baseline scenario <sup>20</sup>	41%	
2. Interest rate increase (+200 bp; parallel shift)	27%	–14
3. Recession (GDP growth: –1%)	20%	–21
4. Stock market crash (SPI: –30%)	19%	–22
5. Combined scenario (2. to 4. combined)	–27%	–68

banks is 4.3% (2004: 4.8%) and for the Raiffeisen banks 2.3% (2004: 2.6%). The corresponding figure for the big banks (11.3%; 2004: 12.7%) is not very useful for comparisons with the other bank categories, due to the fact that the big banks use internal models for calculating their capital requirements. Because these internal models measure market risks more precisely, they arrive at a capital requirement which is considerably lower than the simple standard procedure (cf. arts. 12m–12o Banking Ordinance).

19 This box is based on Lehmann and Manz (2006), *The Exposure of Swiss Banks to Macroeconomic Shocks – an Empirical Investigation*, SNB Working Paper 2006-4.

20 The baseline scenario approximately corresponds to the status quo.

## 4 Capital base

At the majority of banks, risk-weighted capital ratios rose significantly in 2005. In the case of the big banks, however, the average capital ratios decreased somewhat despite high profits, as a result of the strong expansion of balance sheets. From a historical perspective, all bank categories have a high level of risk-weighted capital ratios. In an international comparison, the Swiss big banks lead the sector in terms of risk-weighted capital ratios, but bring up the rear in terms of unweighted capital ratios.

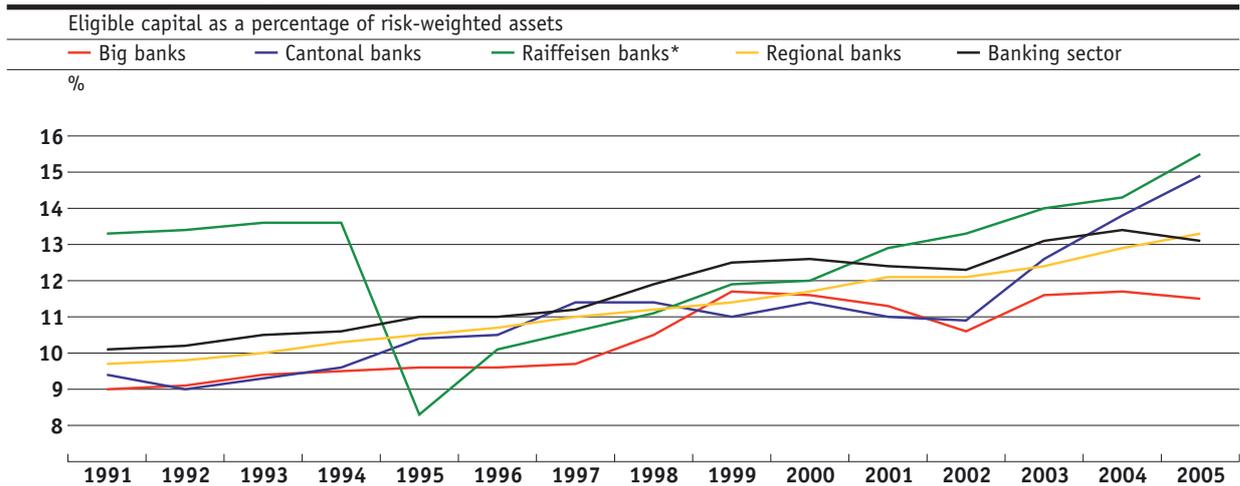
### Different trends in risk-weighted capital

In 2005, most bank categories increased their risk-weighted capital ratios again (cf. graph 17).

The rise was particularly pronounced at the cantonal banks (from 13.8% in 2004 to 14.9% in 2005) and the Raiffeisen banks (from 14.3% to 15.5%). At the regional banks, they grew at a somewhat slower pace (from 12.9% to 13.3%). At the big banks, meanwhile, the risk-weighted capital ratios decreased slightly from 11.7% to 11.5%, in spite of high profits. Looking at the individual big banks, UBS actually experienced an increase in its risk-weighted capital ratio, but this was more than compensated by a decrease at Credit Suisse. At the same time, the entire banking sector saw its ratio fall from 13.4% to 13.1%. Individually, all banks reported capital ratios in excess of the regulatory minimum of 8% at the end of 2005. The lowest risk-weighted capital ratio stood at 8.9%.

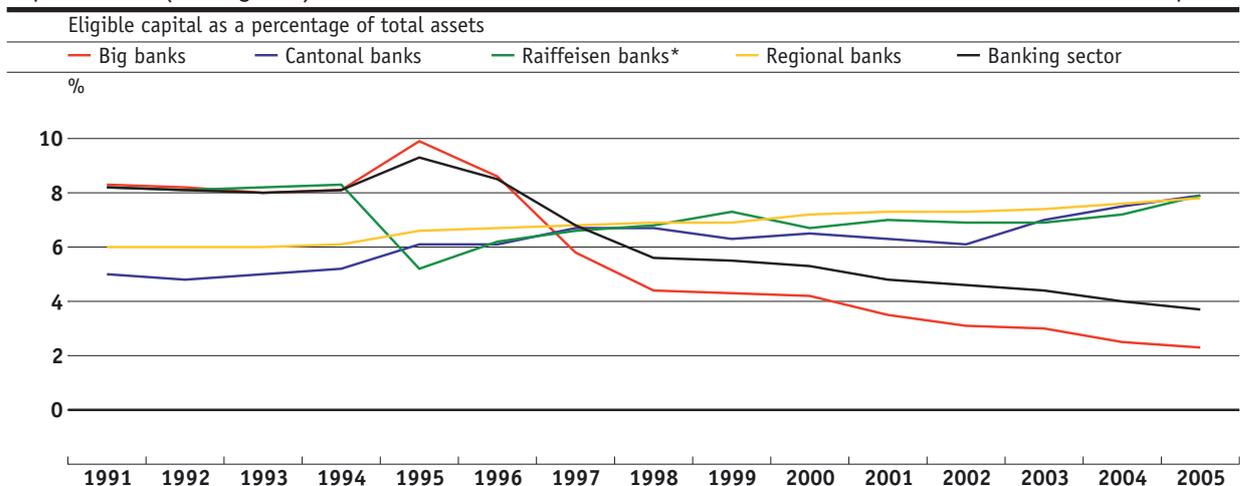
Capital ratios (risk-weighted)

Graph 17



Capital ratios (unweighted)

Graph 18



Graphs 17 and 18: Sources: SFBC, SNB

Graphs 17 and 18:

\* A significant proportion of capital at the Raiffeisen banks comprises the members' obligation to pay in additional capital. As of 1995, only part of this can be included in eligible capital, hence the sharp drop in capital at the Raiffeisen banks.

## Box 4: Regulatory framework

Swiss banking law prescribes minimum capital adequacy ratios (cf. arts. 11–14 Banking Ordinance). Essentially, capital backing is required for all on-balance-sheet assets, off-balance-sheet operations and other open items in the trading book and elsewhere. These items are of a diverse nature, however, and the underlying risks vary, depending on the counterparty and collateral provided. To take account of this, the various items are risk-weighted. Of these risk-weighted items, 8% must be backed by capital at all times (required capital). However, the SFBC can relax or tighten the regulations in specific cases (cf. art. 4 para. 4 Banking Act). Cantonal banks with a state guarantee are permitted to reduce required capital by up to 12.5% (cf. art. 13 (b) Banking Ordinance).

The eligible capital used to calculate capital adequacy comprises three components: core capital, supplementary capital and additional capital. Core capital comprises paid-up equity capital, reserves and profits. Supplementary capital comprises hidden reserves, subordinated debt papers and certain hybrid instruments (e.g. mandatory convertible bonds). Additional capital comprises unsecured, subordinated and fully paid-up liabilities that are subject to a lock-up clause, which prevents the payment of interest and repayment of the principal if this violates the capital adequacy requirements.

The risk-weighted capital ratio comprises eligible capital as a percentage of risk-weighted assets. The unweighted capital ratio comprises eligible capital as a percentage of total assets.

The Basel Committee on Banking Supervision of the Bank for International Settlements (BIS) has substantially revised the Basel Capital Accord over the last few years. The new Capital Accord (Basel II) is more flexible and risk-sensitive and consists of three pillars: (i) minimal capital requirements, (ii) supervisory review and (iii) the effective use of market discipline. The definition of eligible capital and the minimum capital ratio of 8% of risk-weighted assets have been retained. To determine their risk exposure, the banks can adopt a standardised approach or an internal ratings-based approach. In Switzerland, the standardised approach will enter into effect at the beginning of 2007 and the internal ratings-based approach at the beginning of 2008.<sup>21</sup>

### Rise in eligible capital and required capital

Thanks to high profits,<sup>22</sup> eligible capital was up 9% year-on-year in the banking sector as a whole. All bank categories saw a significant rise in their eligible capital: big banks (+11%; the slight decline at Credit Suisse being more than compensated by the substantial increase at UBS), cantonal banks (+9%), Raiffeisen banks (+12%) and regional banks (+5%). However, at the big banks, the increase in required capital (+14%) was even more sizeable, leading to the above-mentioned decrease in the risk-weighted capital ratio. The big banks' rise in required capital is primarily the result of the strong growth in total assets (+18%), which in turn reflects the growth of their credit volume and trading portfolios. As a result of this greater exposure to credit and market risk (cf. chapter 3, p. 29) the big banks' risk-weighted balance sheet items have increased by 13% since the end of 2004.<sup>23</sup> Cantonal, Raiffeisen and regional banks registered only a slight increase in required capital (+1%, +4% and +2%). All three bank categories registered modest growth of total assets in the range of 2% to 4%.

From a historical perspective, Swiss banks exhibit strong risk-weighted capitalisation (cf. graph 17, p. 36). The past fifteen years have seen a significant improvement in the capitalisation of all bank categories. Looking at each bank individually, there has also been marked improvement at most banks, both small and large.

Looking at the ratio between the banks' capital and total (non-weighted) assets – the unweighted capital ratios – the picture is less uniform (cf. graph 18, p. 36). Higher eligible capital accompanied by an only slight rise in total assets is reflected in the increase in unweighted capital ratios for the regional, cantonal and – in particular – the Raiffeisen banks: The unweighted capital ratios rose from 7.5% in 2004 to 7.9% in 2005 at the cantonal banks, from 7.6% to 7.8% at the regional banks and from 7.2% to 7.9% at the Raiffeisen banks. By contrast, due to strong growth in total assets, the unweighted capital ratios at the big banks deteriorated further, from 2.5% to 2.3%. Even though last year's decrease was driven by Credit Suisse only, this divergent development between the two big banks and the rest of the banking sector is in line with a longer-term trend. In the course of the last ten years, unweighted capital ratios have risen considerably at the cantonal banks (from 6.1% at the end of 1995 to 7.9% at the end of 2005;

<sup>21</sup> For further information on Basel II, cf. [www.ebk.admin.ch/e/dossiers/basel.html](http://www.ebk.admin.ch/e/dossiers/basel.html) and [www.bis.org/publ/bcbsca.html](http://www.bis.org/publ/bcbsca.html).

<sup>22</sup> Cf. chapter 2, p. 25.

<sup>23</sup> The rise in risk-weighted balance sheet items (+13%) is smaller than growth in total assets (+18%). First, this is due to the fact that not all on-balance-sheet assets are used for calculating required capital. Second, some of these balance sheet figures are converted into their credit equivalent using conversion factors and, third, the figures are weighted with a risk weighting between 0% and 250%. Therefore, risk-weighted balance-sheet items ultimately make up a mere 15% of total assets.

+30%), at the Raiffeisen banks (+53%) and at the regional banks (+18%). During the same period they saw a marked decrease at the big banks (-77%) and thus in the banking sector as a whole (-60%).

The divergence between the strong risk-weighted capitalisation and the weak, unweighted capitalisation at the Swiss big banks is also evident in a comparison with a group of major international banks. On the basis of country averages, Switzerland ranks first with regard to risk-weighted capital ratios. It comes in last, however, with regard to unweighted capital ratios (cf. graph 19). This discrepancy is attributable to the fact that the ratio of risk-weighted assets (including off-balance-sheet items) to total assets at Swiss big banks is very low. In other words, under the Basel Capital Accord, their off-balance-sheet items and trading and loan portfolios are rated as having lower risk than those of their foreign competitors.<sup>24</sup>

In Switzerland there are no regulatory restrictions on the ratio of capital to unweighted assets.<sup>25</sup> The regulatory capital adequacy requirements refer exclusively to risk-weighted assets (cf. box 4, p. 37). Nevertheless, unweighted capital ratios must be taken into account when assessing the soundness of the capital base. Since capital adequacy regulations can never cover all risks completely, unweighted capital ratios are a valuable addition to the risk-weighted ratios.

#### Profitability scenario analysis and market indicators point to adequate capital base

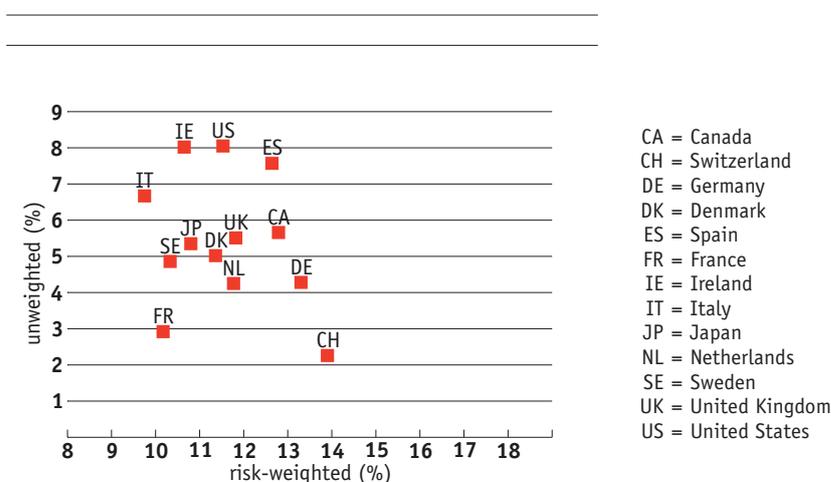
The comparison between risk-weighted and unweighted capital ratios presents a mixed picture

of the capitalisation of Swiss banks. To determine the adequacy of the capital base, a complete identification and appropriate coverage of all risks would be required. Since we do not have an accurate yardstick to measure the overall risk to which a bank is exposed, we include additional indicators. First, we conduct a profitability scenario analysis (cf. box 3, p. 35). According to this analysis, most Swiss banks seem to have quite a sound capital base and should be able to withstand even larger shocks. However, a joint occurrence of a strong interest rate increase, a recession and a stock market crash would lead to a considerable decrease in excess capital in the banking industry as some banks – in particular the big banks – are predicted to suffer substantial losses.

Second, we use a market assessment to evaluate the soundness of the banks (credit and financial strength ratings, spreads between bank bonds and Swiss Confederation bonds, etc).<sup>26</sup> The results obtained imply that the soundness of the Swiss big banks is somewhat lower than indicated by the risk-weighted capital ratios, but better than what the unweighted capital ratios suggest.

Third, we use the results of our risk analysis described in chapter 3 of this report. In the case of the big banks, these results include their own internal calculations. The risk analysis results suggest that, in 2005, overall risk at the big banks rose even more significantly than their capital cushion. Therefore, it appears that the capitalisation of the big banks has deteriorated somewhat year-on-year.

Capital ratios of major international banks Graph 19



Sources: 2004 and 2005 annual reports

26 Cf. chapter 5, p. 39.

24 For a more in-depth analysis of this topic, cf. pp. 36–37 of the SNB's 2005 *Financial Stability Report* ([www.snb.ch](http://www.snb.ch)).

25 Unlike Switzerland, capital adequacy regulations in the US govern both risk-weighted and unweighted capital ratios. For further information, cf. [www.fdic.gov/regulations/laws/rules/2000-4400.html](http://www.fdic.gov/regulations/laws/rules/2000-4400.html).



## 5 Market assessment

The market assessment of the soundness of a bank is reflected in yield spreads, share prices and credit ratings. These indicators suggest that the situation in the Swiss banking sector remained unchanged in 2005. According to market estimates, the risk of default by Swiss banks remains very low. By international standards, however, these market indicators present a less positive picture than the risk-weighted capital ratios suggest (cf. chapter 4, pp. 36–38). While the market positions UBS slightly above the international average, CSG is ranked somewhat below.

### Spreads on bank bonds and CDS prices: steady trend at a low level

The yield spreads between bank bonds and Swiss Confederation bonds as well as the prices of credit default swaps (CDS) reflect the market's assessment of the soundness of banks. The higher the credit risk for the lender, the higher the spread between the corresponding bank bond and a risk-free Swiss Confederation bond, and the higher the price of a CDS.

As in the previous year, the spread between the bank bond and Swiss Confederation bond indices remained more or less constant at a low level in 2005. The same trend can be observed at all banks: Spreads for individual institutions remained unchanged with levels far below the average of the last eight years in some cases. The same applies to Banque Cantonale

Vaudoise (BCV) and Banque Cantonale de Genève (BCGe), where spreads stabilised at the level reached prior to the rise which occurred between mid-2001 and end-2002 (cf. graph 20).

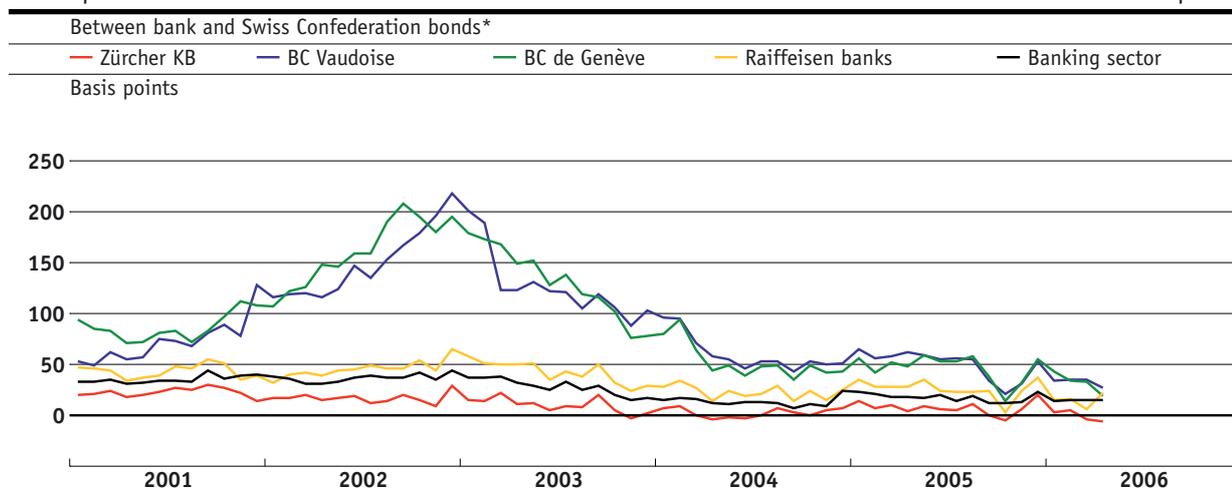
CDS prices for the two Swiss big banks and other international big banks also remained stable at a low level (cf. graph 21, p. 40). The premiums for UBS are low both in absolute terms and relative to other major international banks. By contrast, those of CSG are slightly above the average figure for the largest banks in the world. At present, however, the difference between individual institutions is minimal.

### Insolvency indicators derived from equity prices are low

Share prices provide an insight into the current situation and future profit prospects of a bank. They reflect, in particular, the market valuation of the bank's assets and of the risks embedded in those assets. These figures, which can be derived from a bank's share price using the option pricing theory, can then be used to assess the probability that the value of a bank's assets will fall below the value of its liabilities over a given time horizon. In other words, the option pricing theory can be employed to derive the probability of insolvency priced into shares and, hence, allows the construction of an insolvency indicator. However, caution is called for when interpreting insolvency indicators because their calculation is based on a number of simplifying assumptions.<sup>27</sup>

Yield spreads

Graph 20



Sources: SNB, Thomson Datastream

\* Average spread of all available securities satisfying the following conditions: fixed coupons, no options, CHF denominated, residual term of at least two years. End-month calculations.

<sup>27</sup> Option pricing theory essentially assumes a normal distribution of bank revenues. If the actual distribution is different and there are wide discrepancies between the banks, this indicator can be misleading. Moreover, bank share prices and thus the indicator are influenced by factors that have nothing to do with the banks' fundamental data.

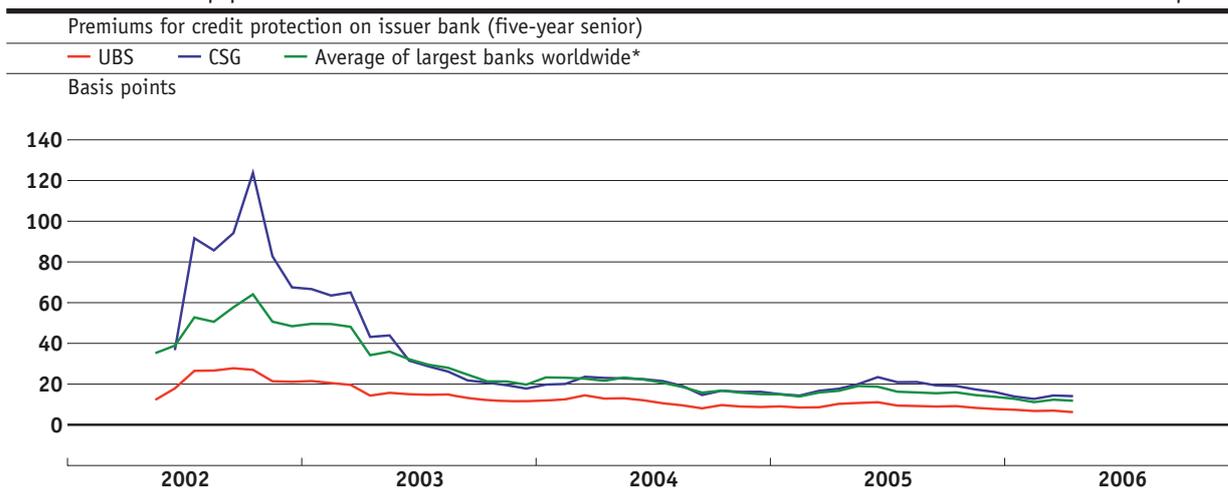
Graph 22 shows the insolvency indicator for the two Swiss big banks and for a sample of the biggest banks worldwide (mean value). The higher the indicator, the higher the implied risk of insolvency assessed by the market. Following a peak at year-end 2002, the insolvency indicators for both the Swiss and the foreign banks exhibited a downward trend and have been relatively constant since 2004. Based on share prices, it appears that the market currently considers the soundness of UBS and CSG to be broadly in line with the international average. As with CDS prices, the difference between individual institutions is minimal.

### Ratings in 2005 stable

Only a mere 7% of all institutions in the Swiss banking sector have a rating from Moody's, Standard & Poor's and/or Fitch, yet they account for nearly 90% of the sector's balance sheet total. In 2005, the ratings of these banks remained unchanged at a medium to very high level. The rating agencies also issue an outlook showing the anticipated medium-term trend in their ratings. This outlook remained virtually unchanged as well. The first four months of 2006, however, have been characterised by greater fluctuations with one upgrade (BCV) and a total of five improvements in the out-

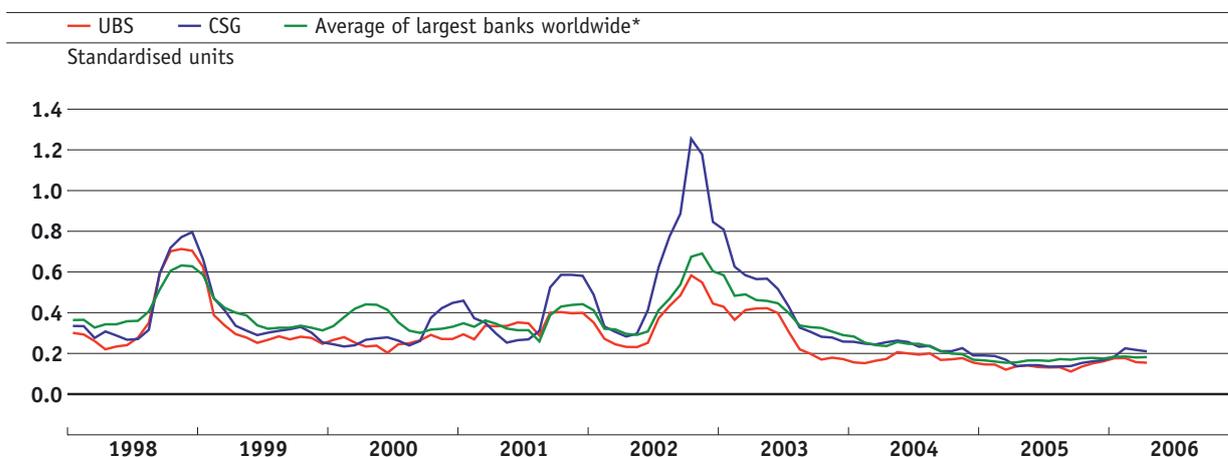
Credit default swap prices

Graph 21



Insolvency indicator

Graph 22



Graph 21: Source: Bloomberg

Graph 22: Sources: Bloomberg, SNB, Thomson Datastream

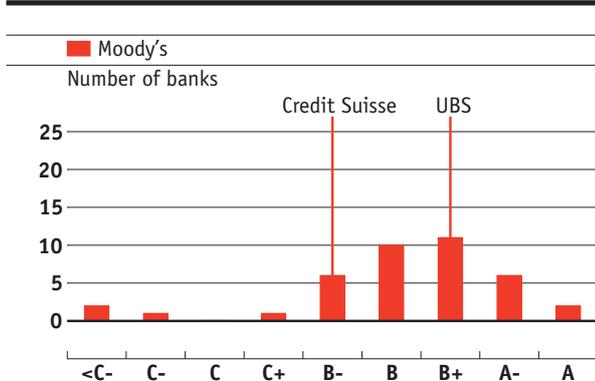
Graphs 21 and 22:

\* Comprises a sample of the world's largest banks in North America, Japan and Europe according to *The Banker* (2005).

look (among them CSG and two of its affiliates). Overall, the outlook reports by the rating agencies anticipate stable ratings in the medium term. From an international perspective, UBS still ranks above average while CSG is in mid-field.

In addition to credit ratings, Moody's and Fitch also issue 'bank financial strength ratings' or 'individual bank ratings' (FS ratings). From a financial stability perspective, these ratings are of particular interest in that they focus exclusively on the intrinsic financial strength of institutions. Therefore, any support by a third party, e.g. by owners, industry groups or official institutions, is not taken into consideration. In the Swiss banking sector, only half of the banks with a credit rating also have an FS rating. As in the case of the credit ratings, the FS ratings remained virtually unchanged in 2005.<sup>28</sup> Overall, the intrinsic financial strength of Swiss banks is rated as adequate to strong. Nevertheless, from an international perspective, the two Swiss big banks are rated worse in terms of intrinsic financial strength than in terms of their credit rating. Although UBS is still rated (slightly) above average, CSG (or, in the case of Moody's, Credit Suisse) only ranks in the lower middle field (graphs 23 and 24).

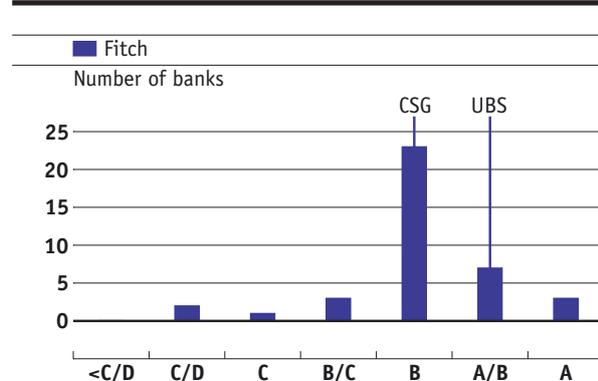
Bank financial strength ratings\* (Moody's) Graph 23



Graph 23: Source: Bloomberg  
Graph 24: Source: FitchRating

28 The sole exception was Credit Suisse. This rating change (Moody's), however, merely reflects the merger of Credit Suisse (previously rated B) and Credit Suisse First Boston (previously rated C). CSG does not have a FS rating from Moody's.

Individual bank ratings\* (Fitch) Graph 24



Graphs 23 and 24:

\* Comprises a sample of the world's largest banks in North America, Japan and Europe according to *The Banker* (2005), provided they are rated by Moody's, Standard & Poor's and Fitch. If a bank holding company is not assigned a financial strength rating, the corresponding rating of its largest affiliate is taken instead.

## 6 Stress index for the banking sector

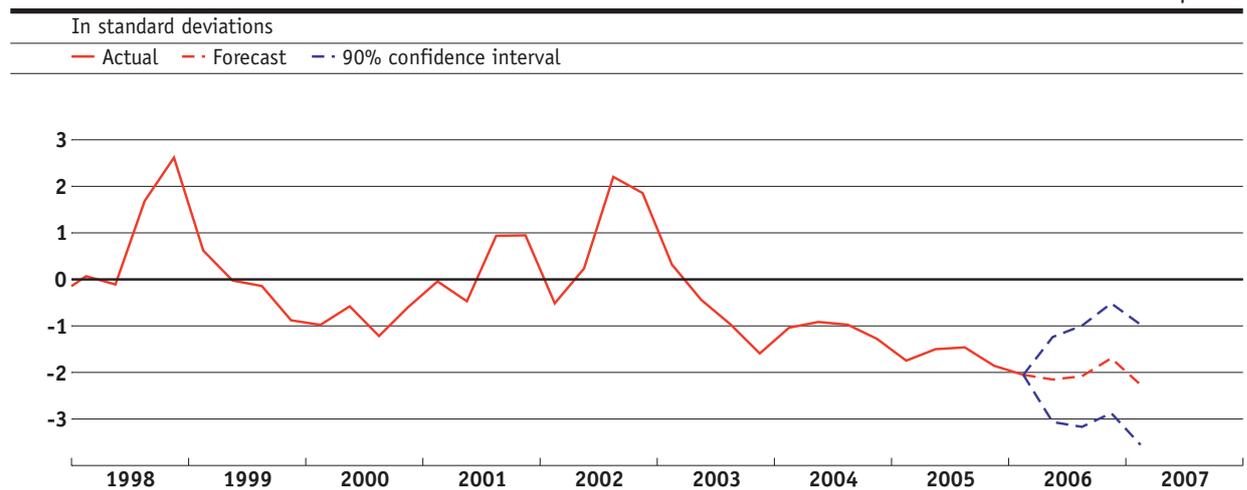
The previous chapters of this report cover different aspects of the banking sector, all of which are potentially relevant for its stability. In this chapter, we combine these pieces of information within a 'stress index' measuring the current degree of instability in the Swiss banking sector. According to this index, the level of stress in the Swiss banking sector is currently relatively low. Moreover, the level of stress should remain stable in the next year and, if the macroeconomic environment were to deteriorate, the Swiss banking sector should be able to withstand relatively large macroeconomic shocks without showing symptoms of acute stress.

### Stress index

The stress index measures the current degree of instability in the Swiss banking sector.<sup>29</sup> According to this indicator, 2005 was a particularly calm period in the banking sector (cf. graph 25). The level of stress remained stable throughout the year and was very low by historical standards. It is worth mentioning that the stress index has remained close to the record low levels observed since the end of 2003. It is the first time such a long period of low stress has been experienced since data for the computation of the index were first collected (1987). Moreover, aside from capital variations (temporary dip in bank capital in the third quarter of the year), all variables included in

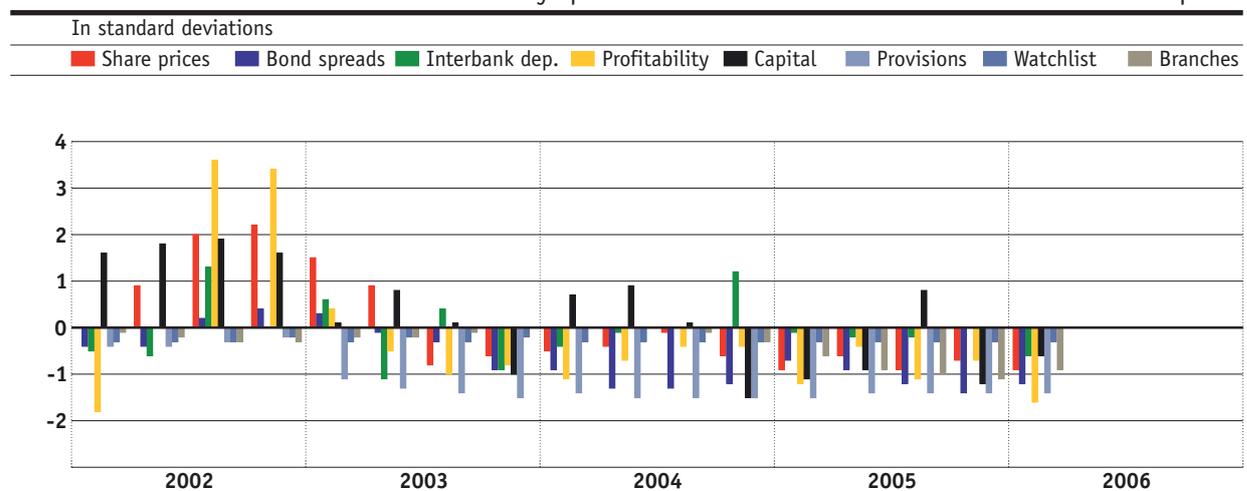
Stress index\*

Graph 25



Stress index: Contribution of individual stress symptoms to total stress\*

Graph 26



Graphs 25 and 26: Sources: SFBC, SNB, Thomson Datastream

Graph 25:

\*The higher the level of the index, the higher the level of stress in the Swiss banking sector. The index is expressed in terms of standard deviations from its 1987–2005 average. A value above (below) zero indicates that the stress is above (below) its historical average. The stress index for the first quarter of 2006 is computed with provisional data. For a description of the underlying variables and the methodology, cf. box 5, pp. 44–45.

29 Box 5 on pp. 44–45 outlines the methods used to produce the stress index, its forecast and the stress tests.

Graph 26:

\*The higher the intensity of an individual crisis symptom (e.g. the sharper the decrease of banks' share prices), the higher the level of the stress index. A value above (below) zero indicates that the intensity of an individual crisis symptom is above (below) its historical average. The stress index for the first quarter of 2006 is computed with provisional data. For a description of the underlying variables and the methodology, cf. box 5, pp. 44–45.

the index pointed to low levels of stress for 2005 (cf. graph 26, p. 42), which is also exceptional in historical terms.

### **Forecasts and scenario analysis**

We also develop i) a forecasting model for the stress index, using a set of general economic and financial variables reflecting potential economic imbalances, and ii) a scenario analysis which estimates the reaction of the index to various macroeconomic shocks. Both tools enable potential sources of future instability to be identified.

Our forecasting model suggests that the level of stress should remain stable in the next year (cf. graph 25, p. 42). This is due to the fact that the financial and macroeconomic variables in Switzerland which influence stress – the stock price index, the housing price index, GDP and the credit ratio – have been evolving close to or below their long-term equilibrium level during the last few years. A sudden downward correction in these variables in the short and medium term – and thus a rise in stress – therefore seems unlikely.

Should the macroeconomic environment nevertheless deteriorate, our simulations suggest that the Swiss banking sector would be able to withstand relatively large macroeconomic shocks without showing symptoms of acute stress. We simulated a range of scenarios based on the macroeconomic shocks that provoked the historical peaks in the stress index and on the profitability scenario analysis methodology (cf. box 3, p. 35). The stress levels induced by those scenarios remained significantly below the highest peaks observed in the past. In a worst case scenario, the stress would increase to levels of approximately 45% below the 1992 peak (regional bank crisis) and 30% below the 2002 peak (stock market crisis). It is important to emphasise that this robustness reflects the current low level of stress in the banking sector and does not indicate a particularly low sensitivity to shocks. In fact, the banking sector's sensitivity to shocks, and in particular to stock price movements, is currently relatively high by historical comparison. This is mainly due to the current high levels of exposure of the banking sector to stock markets.

## Box 5: Measuring the stress in the Swiss banking sector<sup>30</sup>

### Construction of the stress index

The index is a continuous indicator of the level of stress experienced by the Swiss banking sector at a given date. It is based on a set of variables – including market data, balance sheet data, non-public data from the supervisory authorities and structural data – all of which represent possible symptoms of stress in the banking sector.

These symptoms are:

- a fall in the banks' stock price index
- an increase in the banks' bond yield spreads
- a fall in interbank deposits
- a decrease in the banks' profitability
- a decrease in the banks' capital
- an increase in the banks' provisioning rate
- the share of total assets held by banks listed on the regulator's watchlist
- a decrease in the number of banks' branches

The higher the intensity of the individual stress symptoms, the higher the level of the stress index. To build the index, the eight variables described above are first normalised and then aggregated with identical weights. The index is expressed in terms of standard deviations from its historical average. A positive (negative) value indicates that the stress is above (below) its historical average.

Because the index is based on a large spectrum of potential symptoms of instability, it should appropriately reflect the different types of stress experienced by the banking sector. The values taken by the index between 1987 – the starting date of the index – and 2005 are consistent with this assumption. The index peaked three times and each peak corresponds to a period of significant stress for the Swiss banking sector with different sources and symptoms: (i) the early 1990s, which were characterised by a real estate crisis in Switzerland, (ii) 1998, when the Russian and LTCM crises occurred, and (iii) the 2001/2002 period, which was characterised by a stock market crash and an economic slowdown. More generally, the index shows that economic downturns, deteriorations in the situation of creditors and falls in stock or housing prices generate higher levels of stress in the banking sector.

### Stress index forecast

Past experience suggests that banking crises tend to follow the build-up of macroeconomic and financial imbalances. The (sudden) correction of these imbalances may eventually cause situations which generate stress in the banking system, such as recessions or stock market crashes. The forecast model presented here makes use of this fact and is based on the observation of macroeconomic imbalances.

The forecast model includes five macroeconomic and financial variables that are reliable predictors of banking crises according to several studies: the share price index, the housing price index, the gross domestic product (GDP), the investment ratio (investment/GDP) and the credit ratio (private credits/GDP). The measure of imbalance is defined as the gap between the variable and its trend, where the trend is computed using the Hodrick-Prescott filter. For example, a positive credit ratio gap means that credits are growing faster than their sustainable rate. This could be interpreted as a sign of lower lending standards of the banks. This imbalance

will start to unwind when borrowers find it more difficult to service their debt (e.g. because of an interest rate rise, a recession or a drop in asset prices). For the banks that are engaged in lending business, both non-performing loans and provisioning increase, which eventually leads to higher levels of stress. For the other four macroeconomic and financial variables, one can think of similar mechanisms in which the correction of an existing imbalance could lead to higher levels of stress.

The forecast is based on a linear regression of the stress index on the past gaps of the macroeconomic and financial variables. A positive gap – i.e. the build-up of an imbalance – signals that a future correction is likely to take place, which could lead to a higher level of stress for the banks. The regression is estimated with an autoregressive error term.

The results comprise forecasts for one to four quarters ahead. The lag between the stress index and the gap is of 25 quarters for the housing price index, 19 quarters for the share price index, 15 quarters for the investment ratio and 5 quarters for GDP. The model also uses combinations of the credit ratio with the stock price index, the housing price index and GDP. The model's results are relatively robust to changes in the lag structure.

With an average  $R^2$  of 56.4% over the four forecast horizons, the fit of the model can be considered as fairly good. The out-of-sample error ratio (percentage of errors in the forecast of the direction of the stress index evolution) equals 20.9%, suggesting satisfactory predictive power.

Although the forecast model for the stress index performs relatively well, it is subject to several limitations. First, the macroeconomic and financial imbalances are computed using a rather simple and mechanical Hodrick-Prescott filter. The main advantage of this approach is that it does not impose much structure on the model. However, it may not guarantee the most efficient use of the information available to assess the magnitude of the imbalances. Second, different studies have emphasised that banking crises are complex phenomena, which may involve non-linear interactions between the variables. Even if the model takes into account some degree of non-linearity by combining some variables, it might miss more complex interactions between them. Finally, other non-macroeconomic/financial factors that are not included in the model (e.g. deregulation) may also influence the level of stress experienced by the banking sector.

### Scenario analysis using the stress index

The stress index framework can also be used to build an alternative to a traditional scenario analysis on profitability (cf. box 3, p. 35), whereby the impact of macroeconomic scenarios on the banking sector's profitability are simulated. This analysis suggests that Swiss banks are resistant to relatively extreme macroeconomic scenarios, giving a fairly reassuring image of banking sector stability. Yet, in reality, the Swiss banking sector has experienced periods of distress in less extreme macroeconomic environments. More generally, profitability and stress are not always linked; some stressful episodes – characterised, for example, by a fall in the banks' stock prices – have occurred despite the fact that profitability remained in line with historical standards. In other words, due to short-term uncertainty regarding the effective impact

30 This box is based on Monnin (2004), *Measuring, Explaining and Forecasting Stress in the Swiss Banking Sector*, SNB, mimeo.

of macroeconomic shocks on banks, even shocks which do not materially affect the banks' profitability can potentially lead to a loss in confidence – and thus to high levels of stress – in the banking sector. Therefore, it is useful to assess the stress resilience of the banking sector in addition to its economic resilience. While the latter is achieved by conducting a traditional profitability scenario analysis, the former can be estimated by simulating the impact of macroeconomic scenarios on the stress index.

Such simulations involve two steps. First, we estimate a linear regression of the stress index on contemporary variables describing the macroeconomic environment. The results of this regression show that the stress index depends on its own past value, non-banks' stock prices and credit spread movements, exchange rate variations as well as on combinations of housing prices, GDP, the unemployment rate and interest rate changes with the banks' exposure to these variables. The model performs relatively well, accounting for about 80% of the variations in the stress index ( $R^2$  of 78.0%).

In a second step, the estimated regression coefficients are used to evaluate the impact of different scenarios on the stress level. These results are then compared to historical peaks in the stress index in order to assess the current resilience of the Swiss banking sector to adverse macroeconomic conditions.

This methodology has two main limitations. Firstly, the simulations are based on a stable relationship between the level of stress in the banking sector and the macroeconomic variables included in the model. If this ratio varies significantly over time and/or with the size of the shocks, the scenario analysis will give a biased picture of the banking sector's sensitivity to a deterioration in the macroeconomic conditions. Secondly, while these stress tests can indicate whether – and to what extent – stress is likely to rise in a given scenario, they cannot qualify the stress episode. In other words, the results do not indicate whether a stress episode reflects a loss of confidence in banks by investors, depositors or the authorities and/or whether it reflects a deterioration in the fundamentals (losses in the banking sector), nor do they indicate which type of banks might be affected. In this respect, the methodology should – as already mentioned – be seen as a complement to the profitability scenario analysis (cf. box 3, p. 35), which focuses on the relationship between the macroeconomic environment and profitability in the Swiss banking sector.

## Part II: Financial market infrastructure



# 1 Introduction

Safe and efficient financial market infrastructures are a key prerequisite for a stable financial system. Alongside stock exchanges, the financial market infrastructures mainly comprise clearing and settlement systems for payments and for transactions in securities and other financial instruments (subsequently referred to as payment and securities settlement systems). Of particular interest are those payment and securities settlement systems which are considered to be important to the stability of a country's financial system. A critical feature of these systems is that they may trigger or channel the spread of a systemic crisis and thus jeopardise the stability of the financial system. Moreover, the smooth functioning of the systemically important infrastructures, i.e. the above-mentioned clearing and settlement systems, is essential for the implementation of monetary policy and for the supply of liquidity to the economy.

At the centre of the analysis in this part of the *Financial Stability Report* are those risks inherent in payment and securities settlement systems which might give rise to financial instability, i.e. operational as well as credit and liquidity risks. Severe operational failures or malfunctions in systemically important infrastructures may cause widespread credit or liquidity problems for a large number of participants. Also, credit or liquidity problems affecting one participant could spread to others through the system. To reduce the likelihood and impact of such systemic events, adequate organisational and technical measures to mitigate operational risk are needed, as are suitable rules and procedures that limit the spread of credit and liquidity risks through payment and securities settlement systems.

The Swiss National Bank's (SNB) assessment of the financial market infrastructures in Switzerland is positive. The key payment and securities settlement systems are functioning well and their safety

and efficiency values are high by international standards. The core post-trade elements of the Swiss value chain, i.e. the Swiss Interbank Clearing (SIC) system for payments, the securities settlement system SECOM and the central counterparty x-clear, have proven their functional efficiency over the years, and their architectures and procedures contribute to reducing settlement risks and, ultimately, systemic risks. Moreover, the operators of these systems regularly review and assess the adequacy of their risk management frameworks and, in case of identified shortcomings, implement remedial measures.

To promote the objective of safe and efficient financial market infrastructures, the SNB oversees payment and securities settlement systems. Chapter 2 of this part provides a survey of the SNB's oversight framework, with specific focus on the recently established control objectives for the operators of systemically important payment and securities settlement systems. Chapter 3 reviews some of the most important recent developments in financial market infrastructures, including efforts to improve business continuity management in the financial sector, the merger of two providers of IT-related services, and system-specific developments such as x-clear's introduction of an enhanced risk management framework. Chapter 4 deals with the potential benefits for financial stability resulting from the central banks' acceptance of foreign securities as collateral in short-term and intraday credit operations. It summarises the key findings of a report on this topic published by the Committee on Payment and Settlement Systems, and outlines the SNB's respective policy. Finally, chapter 5 provides a survey of the arrangements for the cooperative oversight of SWIFT, a company that provides secure messaging services to financial institutions and financial market infrastructures in more than 200 countries. While not itself a payment or securities settlement system, SWIFT's services are of great importance to the stability of the global financial system.

## 2 Oversight of systemically important infrastructures

The SNB is responsible for the oversight of payment and securities settlement systems in Switzerland. This section provides a summary of the key characteristics and elements of the SNB's oversight framework, focusing particularly on the recently established control objectives for the operators of systemically important infrastructures.

### **Systemically important infrastructures must comply with minimum requirements**

The National Bank Act (arts. 19–21 NBA) contains the principles for the oversight of payment and securities settlement systems by the SNB. It empowers the SNB to impose minimum requirements on the operation of those systems from which risks for the stability of the Swiss financial system may emanate. The minimum requirements and other implementing provisions on oversight are set out in the National Bank Ordinance (arts. 19–39 NBO).

Currently, the SNB considers the following four systems to be systemically important: the payment system Swiss Interbank Clearing (SIC), the securities settlement system SECOM, the central counterparty x-clear and the multi-currency payment system Continuous Linked Settlement (CLS). The first three – SIC, SECOM and x-clear – are integrated in the Swiss value chain and, together with the electronic stock exchanges SWX and virt-x, form the core of Switzerland's financial market infrastructure. Due to their systemic importance, the operators of SIC, SECOM and x-clear have to comply with the minimum requirements stipulated in arts. 22–34 NBO. CLS, a settlement system for foreign exchange transactions, was exempted from compliance with the minimum requirements as the New York-based operator, CLS Bank International, is adequately overseen by the Federal Reserve System.

### **Three-step oversight methodology**

The SNB's ongoing oversight activities focus on ensuring that the systemically important infrastructures comply with the minimum requirements. The oversight methodology consists of three steps: (1) monitoring, (2) assessment and (3) inducing change. Monitoring serves to gather information and to enhance the SNB's understanding of the system's governance arrangements, structures, processes, and risk management procedures and controls that

enable it to effectively manage the potential risks to financial stability. Based on this information, the SNB assesses whether a system complies with the minimum requirements. If this is not the case, the SNB has various instruments at its disposal to induce changes, including the issuance of recommendations and instructions to system operators.<sup>31</sup>

### **Establishment of system-specific control objectives**

The minimum requirements are characterised by a relatively high level of abstraction. For this reason, the SNB has, for each of the overseen systemically important infrastructures, developed control objectives that put the minimum requirements in concrete terms. The control objectives are divided into three topic groups: (1) corporate governance and a system's legal foundations, (2) risk management and (3) information security.

For the system operators, the control objectives represent a further improvement in terms of transparency and clarity of regulatory requirements. At the same time, the control objectives allow the SNB a more thorough and objective assessment of whether the operators concerned are complying with the minimum requirements. Moreover, as the control objectives have been set up for each system individually, they make it possible to take better account of the different risks inherent in payment systems (SIC), securities settlement systems (SECOM) and central counterparties (x-clear) respectively. Box 6 illustrates the more concrete and system-specific nature of the control objectives compared to the minimum requirements.

### **Cooperation with other authorities**

The SNB cooperates closely with other authorities. Domestically, it works together with the Swiss Federal Banking Commission (SFBC), which is responsible for the supervision of SIS SegInterSettle AG and SIS x-clear AG, the operators of SECOM and x-clear, respectively. For systems that operate internationally, the SNB also cooperates with foreign authorities. In the case of x-clear, the SNB and the SFBC cooperate with the Financial Services Authority (FSA), which is responsible for supervision in the United Kingdom. This cooperative oversight arrangement was put into place after x-clear was recognised as an Overseas Clearing House in the UK. Together with other central banks, the SNB also participates in a cooperative oversight arrangement for CLS, with the Federal Reserve

31 For more detailed information on the SNB's oversight methodology, cf. SNB (2005), *Financial Stability Report*, pp. 49–51.

System acting as the authority with primary responsibility for oversight. Finally, the SNB is also engaged in a cooperative oversight arrangement for SWIFT, which maintains a global network for secure messaging services to financial institutions and market infrastructures (cf. chapter 5).

### Disclosure policy

The SNB has access to detailed information about the overseen systems, including non-public or confidential information such as internal documents and audit reports. Confidential information is needed to assess in detail a system's compliance with the minimum requirements. As a rule, the SNB publishes neither confidential information gathered through its oversight activities nor any de-

tailed assessments made. The non-disclosure of confidential information is considered a necessary prerequisite for a trust-based and open dialogue with system operators. However, based on the analysis of both public and confidential information, the SNB publishes its overall assessment of the safety and efficiency of the overseen payment and securities settlement systems in the annual *Financial Stability Report*. In addition, if the SNB identifies serious defects that could threaten the stability of the financial system and if the use of other instruments such as recommendations and instructions to the system operator do not lead to appropriate remedial action, the SNB may nonetheless consider the disclosure of detailed assessments.

## Box 6: More concrete and system-specific control objectives

The enhanced concreteness provided by the control objectives may be illustrated by the set of requirements for information security, and particularly those for system operators' business continuity management (BCM). BCM is a whole-of-business approach that includes policies, standards and procedures for ensuring that specified operations can be maintained or resumed in a timely fashion in the event of a major disruption. While the National Bank Ordinance includes some high-level minimum requirements for BCM such as the obligation of business continuity plans and regular testing, the control objectives are more specific. For instance, they contain specific time recovery objectives in case of major disruptions that were agreed by a task force on business continuity planning in the Swiss financial sector (cf. chapter 3).

The minimum requirements also say relatively little on risks specific to central counterparties. In contrast to the

operators of SIC or SECOM, x-clear faces substantial financial risks because – in its function as the central counterparty to all participants – it undertakes to discharge the relevant obligations in terms of cash or securities. To ensure that x-clear is able to meet its obligations towards its participants on time even if one or two of its largest participants default on their obligations towards x-clear, it must have in place a sophisticated risk management framework. Such a framework typically includes tools to measure its exposures at nearly real-time speed, adequate risk controls such as margin requirements and a default fund, recourse to liquidity facilities as well as legally enforceable procedures for timely close-out netting and liquidation of open positions in case of a participant's default. The control objectives for x-clear's risk management are geared to these system-specific financial risks.

### 3 Recent developments

This chapter highlights recent developments in the Swiss financial market infrastructure over the last 18 months, differentiating between sector-wide and system-specific developments. Our attention will be limited to developments with relevance to systemically important infrastructures and with potential impact on financial stability. These may be summarised as follows: At sector level, the main stakeholders of the Swiss financial community published a report on Business Continuity Planning (BCP); SWX Swiss Exchange announced the introduction of central counterparty services for the SWX equity market; and the two major operators of systemically important infrastructures in Switzerland initiated the merger of their IT infrastructure services. At system-specific level, the main developments were x-clear's introduction of a revised risk management framework and the significant growth in both users and settlement volumes in Continuous Linked Settlement (CLS). Table 1 at the end of this chapter summarises the key 2005 figures for the systemically important infrastructures.

#### Sector-wide developments

In autumn 2003, the main stakeholders of the Swiss financial sector set up a steering committee to review the business continuity plans of major financial institutions and market infrastructure firms and to make recommendations for further improvements. The key findings are summarised in the report *Business Continuity Planning in the Swiss Financial Centre*, published in February 2006.<sup>32</sup> The steering committee was chaired by the SNB and included representatives of the SFBC, the operators of key financial market infrastructures (SIS Swiss Financial Services Group, SWX Swiss Exchange and Telekurs Group) and major players in the world of Swiss finance (Credit Suisse, PostFinance and UBS). The steering committee concluded that the reviewed institutions are well prepared to deal with major disruptions. It also set standards for recovery time in the event of a major disruption and proposed measures to further strengthen the resilience of the Swiss financial sector. As a minimum standard, key financial market infrastructures must be in a position to restore operations within two hours in the event of a major disruption. Important market participants must be able to resume critical business processes within four hours. Proposed measures include an alarm and crisis management system spanning the

entire financial sector. This system has already been set up. It coordinates required actions in case of a major disruption and is subject to regular testing and training of the personnel involved. In addition, the steering committee recommends that operational concepts be adapted to incorporate the possible loss of staff in the event of a crisis. For example, adequately trained staff should be available at a secondary location to conduct critical activities if the primary site including its staff is put out of action by a disaster. Going forward, the steering committee will remain in place to drive the development of BCP standards in the Swiss financial sector and to monitor and control the implementation of the recommendations.

In March 2006, SWX Swiss Exchange announced the introduction of central counterparty (CCP) services for the SWX equity market in the second half of 2006. In analogy to the existing structure for the virt-x platform, CCP services will be offered by SIS x-clear and the London-based LCH.Clearnet. Adding CCP services for SWX equities to the Swiss value chain will simplify the risk management for SWX participants and should improve settlement performance. The CCP services for the SWX equity market are therefore expected to have a positive impact on financial stability.

The systemically important infrastructures Swiss Interbank Clearing (SIC) and SECOM are operated by subsidiaries of Telekurs Group and SIS Swiss Financial Services Group (SIS Group), respectively. At the end of 2005, Telekurs Group and SIS Group initiated a project to consolidate their IT infrastructure services into a single organisation. The envisaged operational concept ensures that the infrastructure and mission-critical staff will remain available even in the case of a regional disaster. This is to be achieved by distributing the technological equipment to three different data centres and having mission-critical staff run the infrastructure at two different locations. Two of the three data centres will enable a synchronous data-mirroring assuring highest operational availability. The third (out-of-region) data centre would be activated only in case of a major disaster that affected one or both of the other data centres. The objectives of the consolidation are to further improve efficiency of the Swiss value chain, to enhance the reliability of the key market infrastructures, and to increase availability of key staff for the systemically important payment and securities settlement systems in the event of a crisis.

32 The report is available on the website of the SNB, [www.snb.ch](http://www.snb.ch).

### System-specific developments

SIC is a real-time gross settlement system for both large-value and retail payments. It is a critical element of the Swiss value chain and is operated on behalf of the SNB by Swiss Interbank Clearing AG, a subsidiary of Telekurs Group and PostFinance. In 2005, SIC experienced a significant increase of more than 20% in the number of payments settled (cf. table 1, p. 52). This increase is largely attributable to a change in settlement procedures for the retail payment products DTA (Datenträgeraustausch, a direct credit solution) and LSV (Lastschriftverfahren, a direct debit solution). Until 2005, these transactions were settled by SIC in batch mode, i.e. up to 1,000 individual payments could be taken together in a single payment instruction. Starting in 2005, these transactions are entered and settled individually in SIC. On 2 May 2006, a record volume of more than 3.2 million payments was settled by SIC in a single day.

SECOM is the Swiss securities settlement system and central securities depository. It is part of the Swiss value chain and provides securities settlement on a delivery-versus-payment basis through its link with SIC. SECOM is operated by SIS SegInterSettle AG (SIS). In 2005, SIS introduced a service called CAES (Corporate Actions Enhanced Services) to automate the corporate actions processing for securities. CAES allows SIS participants to download notification letters for their clients with all relevant information concerning voluntary and special actions with regard to their securities.

SIS x-clear acts as central counterparty for virt-x transactions and is part of the Swiss value chain. It is licensed as a bank under Swiss law and has the status of a Recognised Overseas Clearing House in the United Kingdom. In the course of 2005, x-clear introduced a revised risk management framework. As before, x-clear relies on margins and a default fund to mitigate the risk of a default of one of its participants.<sup>33</sup> However, in the revised risk management framework, the margins are calculated using the down-side 99% value at risk (VaR), based on the volatility of securities over the last two years. The securities are allocated to risk buckets according to their VaR. Compared to the former 5% flat margin, the new margin calculation method is more sensitive to the actual exposure of the participants' open positions and reacts flexibly to changes in market volatility. In addition, x-clear has revised the stress testing procedures to assess

the adequacy of the default fund and the calculation method for the default fund contributions of the individual participants. The revised stress testing is based on actual stress periods that occurred over the last two decades. It includes scenarios which reflect the market movements in October 1987 and September 2001. The revised stress testing assesses the adequacy of the default fund under extreme but more realistic conditions.

CLS is a multi-currency payment system for the simultaneous settlement of both sides of a foreign exchange transaction on a payment-versus-payment basis. Since its launch in September 2002, the volumes and values of settled transactions in CLS have continued to grow steadily.<sup>34</sup> The 2005 increase in transactions was driven by four developments. First, in December 2004, four new currencies, the Hong Kong dollar, the New Zealand dollar, the South African rand and the South Korean won were added for settlement in CLS. Second, the overall foreign exchange market had experienced significant growth over the past few years. Third, the existing CLS participants settled a higher share of their trades through CLS, mainly due to a further streamlining of their back-office processes. Fourth, the number of indirect CLS participants (third-party users) have more than doubled from less than 300 at the end of 2004 to around 700 to date. From a Swiss perspective, Credit Suisse, UBS and Zurich Cantonal Bank are direct members, while various other Swiss banks access CLS as third party users.

In line with its target of increasing market share, CLS aims to expand its product and service range. However, despite the strong growth of CLS transaction volumes, a significant part of global foreign exchange transactions is settled outside CLS, i.e. using traditional settlement arrangements. To analyse the prevailing settlement risk in the foreign exchange market, the Committee on Payment and Settlement Systems (CPSS) conducted a survey on settlement procedures of banks active in the foreign exchange market in April 2006. The replies to the survey are currently being evaluated. Based on the results, central banks will decide whether or not there may be a need for further action to reduce the systemic risks inherent in the traditional arrangements still in use to settle foreign exchange transactions.

33 For a more detailed description of x-clear's previous risk management framework, cf. SNB (2004), *Financial Stability Report*, pp. 42–45.

34 For a more detailed overview of CLS, cf. SNB (2004), *Financial Stability Report*, pp. 46–48.

**Key figures of systemically important infrastructures**
**Table 1**

	System type	Value of transactions in CHF billions <sup>1</sup>			Number of transactions <sup>1</sup>		
		2005	2004	Change (%)	2005	2004	Change (%)
SIC	Large-value payment system	162	164	-1	1,009,000	816,700	+24
SECOM	Securities settlement system	42	37	+14	100,000	87,000	+15
x-clear	Central counterparty	1.6	1.4	+16	21,000	19,000	+9
CLS	Multi-currency	2,593 <sup>2</sup>	1,808 <sup>2</sup>	+43	197,000 <sup>2</sup>	133,000 <sup>2</sup>	+48
	payment system	113 <sup>3</sup>	83 <sup>3</sup>	+37	11,000 <sup>3</sup>	7,000 <sup>3</sup>	+45

1 Daily averages

2 All currencies settled in CLS

3 Swiss francs only

## 4 Use of cross-border collateral for central bank liquidity

The increasing emphasis on credit risk management in the design of financial market infrastructures is reflected in a shift towards real-time gross settlement (RTGS) in large-value payment systems and delivery versus payment in securities settlement systems. While eliminating or reducing credit risk in the settlement process, these mechanisms are typically associated with higher demand for central bank money by system participants. In addition, liquidity needs are becoming increasingly time-critical. For example, Continuous Linked Settlement requires time-critical pay-ins in domestic RTGS systems. Furthermore, some internationally active banks participate directly or indirectly in a variety of payment and securities settlement systems on a global scale. This leaves these banks with the challenge of managing liquidity in multiple currencies and jurisdictions. They may find it costly to hold enough liquid assets in every single market they operate in, and hence face a potential mismatch between the location where liquidity is needed and the location where it is held, particularly if liquidity management is centralised.

By far the most reliable source of liquidity is central bank money. Almost all central banks of the Group of Ten (G10)<sup>35</sup> provide liquidity only against collateral. In response to the liquidity needs described above, most of the G10 central banks have expanded the range of eligible collateral for central bank liquidity to include cross-border collateral.

A recent report by the Committee on Payment and Settlement Systems (CPSS)<sup>36</sup> evaluates the existing arrangements for accepting cross-border collateral for intraday and short-term liquidity<sup>37</sup> as well as the policy considerations. The key findings of the report and the SNB policy are summarised below.

### Current situation

With the exception of the Bank of Canada and the Bank of Japan, all G10 central banks today accept some form of cross-border collateral for their liquidity operations. Collateral is defined as foreign or cross-border if, from the perspective of the jurisdiction in which the assets are accepted, at least one of the following is foreign: the currency of denomination, the jurisdiction in which the assets are located, or the jurisdiction in which the issuer is established.

In some countries, including Switzerland, cross-border collateral makes up a significant part of total collateral delivered to the central bank. Central banks currently use various arrangements for accepting cross-border collateral, which in part reflects the existing financial infrastructure and the specifics of the domestic banking sector.

### Policy considerations

A central bank's decision to accept cross-border collateral is usually based on at least one of the following factors: (i) the size and international integration of the domestic financial sector and wholesale markets; (ii) the high liquidity and collateral demands of the domestic payment system relative to the size of the domestic market for debt instruments; and (iii) the participation of large internationally active banks in the domestic payment system.

Accepting foreign collateral to secure central bank liquidity operations can have two positive effects. First, cross-border collateral helps to mitigate global systemic risk by providing an efficient liquidity bridge across markets and increasing the flexibility of banks in obtaining central bank liquidity. Therefore, cross-border collateral arrangements can act as a natural 'shock absorber' in an emergency and have a positive impact on financial stability. The second positive effect is that it makes access to central bank money more efficient: Cross-border collateral arrangements reduce the cost of banks in obtaining central bank liquidity and facilitate access to central bank money.

### Potential central bank actions

The G10 central banks conclude that no single model for acceptance of cross-border collateral fits all needs. This is due to the variety of central bank collateral policies and practices, differing needs of the various participants, and different procedures and legal frameworks in the various countries. Thus, an 'à la carte approach' to cross-border collateral policies is suggested, i.e., a central bank might choose from a range of potential cross-border collateral arrangements, depending on its particular circumstances. However, further cooperation and coordination among central banks is desirable to make the actions of individual central banks more effective while also addressing possible common needs and ensuring readiness to address future challenges. Sharing assessments of critical infrastructures is one example of such a cooperation.

<sup>35</sup> The G10 is made up of eleven industrialised countries (Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, Sweden, Switzerland, the United Kingdom and the United States) which consult and cooperate on economic, monetary and financial matters. The G10 central banks also include the European Central Bank.

<sup>36</sup> Cf. CPSS (2006), *Cross-border collateral arrangements*, [www.bis.org/cpss](http://www.bis.org/cpss).

<sup>37</sup> In the context of this chapter, short-term liquidity describes central bank lending with a maturity ranging from overnight to a few weeks.

### SNB's collateral policy

The SNB implements monetary policy primarily by means of short-term repo transactions and uses intraday repos to facilitate the settlement of large-value payments in the Swiss Interbank Clearing (SIC) system. The range of eligible collateral to support these transactions has been continuously expanded over the last few years. To date, the SNB's eligible collateral pool reaches a combined value of around CHF 6,000 billion. The SNB accepts a wide range of bonds denominated in euros, US dollars, pounds sterling and Swiss francs, provided the bond issues are of high quality and significant size. The debt certificates may be issued by the governments of European countries, German territorial bodies and international organisations, or by individual borrowers with state guarantees.

The SNB's rationale for accepting cross-border collateral is threefold: First, by facilitating access of foreign banks to central bank money, the SNB can increase the number of counterparties with which to carry out monetary policy operations. Second, as the Swiss market for debt instruments is relatively small in view of the importance of the Swiss franc and the Swiss financial sector, there is strong demand by Swiss and non-Swiss financial institutions to accept cross-border collateral. Third, whenever the interbank repo market replaces unsecured interbank loans, systemic risk in the banking industry is reduced. Since banks rely extensively on the collateral baskets defined by the SNB, increasing the eligible collateral range was a prerequisite for the growth of the interbank repo market and the concomitant reduction of systemic risk.

In the future, the SNB will continue to periodically review its collateral policy and evaluate – in consultation with key market players – whether specific amendments to the eligible collateral pool are advisable.

## 5 Cooperative oversight of SWIFT

The SNB focuses its oversight activities on systemically important payment and securities settlement systems (cf. chapter 2). However, in cooperation with the other G10 central banks, the SNB is also engaged in an international oversight arrangement of the Society for Worldwide Interbank Telecommunication (SWIFT), a limited liability cooperative company registered in Belgium. SWIFT provides secure messaging services to financial institutions and financial market infrastructures in more than 200 countries. Swiss financial institutions are among the top users of SWIFT's services. Therefore, even though SWIFT is not a payment or securities settlement system itself, its services are of great importance to the stability and smooth functioning of both the global and the Swiss financial system. This chapter provides a short description of SWIFT and its main services and explains the rationale, objectives and practical arrangements for the oversight of SWIFT.<sup>38</sup>

### A short description of SWIFT

SWIFT was established in 1973 as a non-profit cooperative organisation, which is owned and controlled by its members. The objective was to underpin international banking activities by building and maintaining a global network for the safe and efficient exchange of messages between financial institutions. Since 1977, when the SWIFT network became productive, the number of users as well as the range of services offered by SWIFT have grown rapidly. At the end of 2005, SWIFT provided messaging services to more than 7,800 users worldwide, including banks, broker/dealers, investment managers, and over 100 financial market infrastructures with regard to payments, treasury, securities and trade.

Users may be classified as members, sub-members or participants. Each of the currently around 2,300 members has a number of shares proportional to its usage of SWIFT's message transmission services. Every three years, a share reallocation is implemented to reflect changes in each member's use of SWIFT. Countries or country constituencies are organised in national member groups and can recommend directors to the board according to the number of shares owned by all members in that country. For instance, the Swiss member group, which is one of the largest, nominates two out of a total of 25 directors. Through an ongoing dia-

<sup>38</sup> This chapter draws substantially on the National Bank of Belgium (2005), "Cooperative oversight of Euroclear and SWIFT", *Financial Stability Review*, pp. 95–103.



logue with the national member groups as well as other user groups and dedicated working groups, SWIFT ensures that its services are in line with the needs of its user community.

Every day, about ten million messages are exchanged through the SWIFT network. The bulk of messaging activity is related to the exchange of payment information between banks involved in correspondent banking. A smaller but rapidly growing part of messaging activity is connected with securities transactions. Moreover, in recent years, significant growth stemmed from the increasing reliance of financial market infrastructures on SWIFT's messaging services. Many stock exchanges, large-value payment systems, central securities depositories and central counterparties use SWIFT as a service provider for the messaging to and from its participants. However, while Swiss financial institutions use the SWIFT network intensively for cross-border activities, the bulk of messages related to domestic transactions settled in SIC or SECOM is exchanged over Finance IPNet, a proprietary network operated by Telekurs Services AG.

### **Oversight rationale, objectives and areas of interest**

While SWIFT is neither a bank nor a payment or securities settlement system and, as such, is not regulated by bank supervisors or central banks, a large and growing number of systemically important market infrastructures have become dependent on SWIFT, which has thus acquired a systemic character. If SWIFT were insufficiently protected against operational risk, a disruption in financial messaging could trigger further disruption amongst its users.

The objectives of oversight of SWIFT focus on the security, operational reliability, business continuity and resilience of the SWIFT infrastructure. To assess whether SWIFT is adequately pursuing these objectives, overseers require assurance that SWIFT has put in place appropriate governance arrangements, structures, processes, risk management procedures and controls that enable it to effectively manage the potential risks to financial stability and to the soundness of financial infrastructures.

Overseers review SWIFT's identification and mitigation of operational risks, and may also review legal risks, the transparency of arrangements and customer access policies. SWIFT's strategic direction may also be discussed with the board and senior management. While overseers take steps to

assess whether SWIFT is paying proper attention to the objectives described above, it is clear that SWIFT continues to bear the responsibility for the security and reliability of its systems, products and services.

### **International cooperative oversight arrangements**

The oversight of SWIFT is organised in accordance with the Lamfalussy principles for the oversight of cross-border and multi-currency payment and settlement systems.<sup>39</sup> As SWIFT is incorporated in Belgium, the National Bank of Belgium (NBB) is the central bank with primary responsibility for oversight. A protocol between SWIFT and the NBB lays down the common understanding of the oversight objectives and the activities that will be undertaken by overseers to achieve these objectives.

The NBB cooperates with other central banks that also have a legitimate interest in or responsibility for the oversight of SWIFT, given SWIFT's role in their domestic financial systems. In particular, the NBB cooperates with the other G10 central banks. The arrangements between the NBB and these central banks are laid down in bilateral Memoranda of Understanding. To meet the information needs of other central banks beyond the G10, regular exchange of information on SWIFT oversight activities may be arranged on a need-to-know basis.

A group of technical experts from the cooperating central banks monitors SWIFT developments on an ongoing basis and identifies relevant issues through the analysis of information provided by SWIFT and through discussions with the management. Identified issues as well as oversight strategy and policies are discussed within a senior policy group. On behalf of the senior policy group, an executive group regularly discusses the central banks' oversight policy and issues of concern with SWIFT's board and management. All the working groups are chaired by the NBB. The SNB is represented in both the technical and the senior policy group, but not in the executive group.

39 Cf. Bank for International Settlements (1990), *Report of the Committee on Interbank Netting Schemes of the Central Banks of the Group of Ten Countries*, and SNB (2005), *Financial Stability Report*, p. 50.





