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# Quarterly Bulletin



# Swiss National Bank Quarterly Bulletin

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## Overview

### **Monetary policy report (p. 6)**

The concerns voiced in mid-2005 regarding the resistance of the global economy dissipated again in autumn. On the one hand, the situation in the oil market eased following the price surges of August and September. On the other, demand in the major economic zones firmed and companies regained confidence. The main impetus for growth was once again provided by the robust US economy and dynamic economic development in Asia. The economic outlook also brightened in Europe.

Economic growth in Switzerland firmed significantly in the third quarter of 2005. Although driven mainly by the export sector, the domestic economy seems to be gradually picking up steam as well. Real GDP was up 4.3% on the previous period, thus exceeding the corresponding year-back level by 2.3%. The improved economic situation was also reflected in the company surveys which have once again been trending upwards since mid-year. There were hesitant signs of a recovery in the labour market. While the number of employed persons rose again slightly in the third quarter, the unemployment rate and number of job-seekers slipped marginally between August and November, to 3.7% and 5.4% respectively (seasonally adjusted figures).

The SNB expects that the recovery will continue across a broad front in 2006 and that real GDP will mount by just over 2% year-on-year. Considering the expected favourable income trend, private consumption remains an important component of economic momentum. Investment growth, on the other hand, is likely to shift from construction investment to capital investment. As a result of the robust global economy, we are likely to see continuous healthy growth in exports. As the economy recovers, demand for labour will also pick up and unemployment will ease somewhat.

On 15 December 2005, following its quarterly assessment, the Swiss National Bank increased the target range for the three-month Libor by 0.25 percentage points to 0.50–1.50%. The SNB intends to hold the rate in the middle of the target range for the time being. By lifting the target range, the SNB has brought its monetary policy course into line with the ongoing economic recovery, thereby ensuring that the inflation outlook remains favourable.

### **The economic situation from the vantage point of the delegates for regional economic relations (p. 38)**

The talks held by the SNB delegates for regional economic relations with around 140 companies and industry associations between September and November 2005 yielded a more favourable picture than in the preceding period. The economic upswing seems to have gained momentum and is gradually spreading to the domestic economy. Representatives of the export, financial services and construction industries were once again extremely upbeat. By contrast, retailers remain more cautious about the situation. The majority of those interviewed took an optimistic view of 2006. In many cases, this confidence was based on comfortably full order books that will ensure good capacity utilisation well into the new year.

### **Capital regulation of banks: Where do we stand and where are we going? (p. 42)**

Worldwide, capital adequacy requirements are at the heart of current banking regulation. Accordingly, capital requirements play an important role in contributing to the stability of the financial system. After many years of revising the international capital standards, a new capital adequacy framework (known as "Basel II") is about to be implemented. Against that backdrop, this article gives an overview of the current state of capital regulation. First, the rationale for capital rules is described. It is argued that unregulated banks have a tendency to hold too little capital from a welfare-maximizing point of view. Second, several instruments to regulate banks' capital – among them the increasingly popular "full-model approach" – are explained in more detail. Special emphasis is placed on the pros and cons of these instruments. And finally, three principles are identified that could lend themselves for decision-making on capital adequacy requirements in the future.

# Monetary policy report

This report is based primarily on the data and information available as at mid-December 2005. Sections 1–3 were drawn up for the December 2005 quarterly assessment of the Swiss National Bank's Governing Board.



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## About this report

The Swiss National Bank (SNB) has the statutory mandate to pursue a monetary policy serving the interests of the country as a whole. It ensures price stability while taking due account of economic development.

It is a particular concern of the SNB that its monetary policy be understood by a wider public. However, it is also obliged by law to inform regularly of its policy and to make its intentions known. This Monetary Policy Report performs both of these tasks. It describes economic and monetary developments in Switzerland and explains the inflation forecast. It shows how the SNB views the economic situation and what conclusions it draws from this assessment.

Sections 1–3 of the present report were drawn up for the Governing Board's assessment of December 2005. The introductory section "Key developments" and section 4 (inflation forecast) take due account of the Governing Board's monetary policy decision of 15 December 2005.

Unless otherwise stated, all rates of change from the previous period are based on seasonally adjusted data and are annualised.

## Key developments

The global economy strengthened in the second half of 2005. On the one hand, the situation in the oil market eased following the price surges in August and September. On the other, demand in the major economic zones firmed. At year-end, the upside potential and downside risk more or less balanced each other out. The monetary environment remained favourable, thus making it possible for the global economy to gain momentum despite falling oil prices. Nevertheless, considerable risks remained. These include the growing current account imbalances and the associated risk of sudden exchange rate corrections, a reversal in asset prices following a rise in long-term interest rates, and a renewed surge in oil prices.

Notwithstanding the high oil prices, the economic recovery also gathered momentum in Switzerland. Growth continued to be mainly driven by the export sector, but the domestic economy seems to be picking up steam gradually as well. Real GDP in the third quarter was up 4.3% on the previous period, thus exceeding the year-back level by 2.3%. Economic indicators for the fourth quarter pointed to a sustained and broad-based recovery. Averaged over the year, real GDP is set to grow by just over 1.5%.

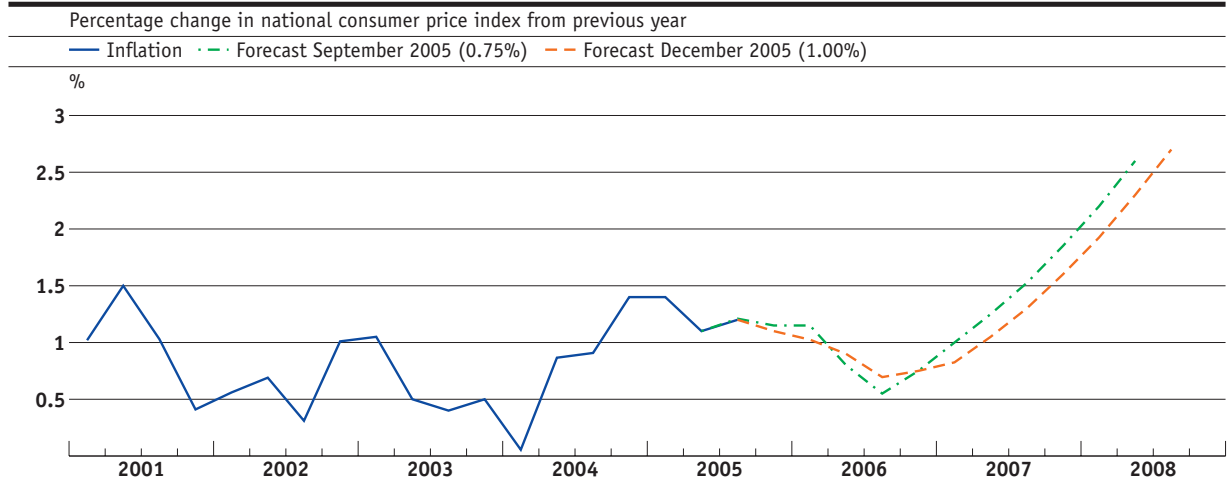
The SNB expects that the recovery will continue across a broad front in 2006 and that real GDP will mount by just over 2% year-on-year. While household consumption and exports remain important components of economic activity, investment

growth is likely to shift from construction investment to equipment investment. As the economy recovers, demand for labour will also pick up and unemployment will ease somewhat.

At its quarterly assessment in December, the SNB decided to lift the target range for the three-month Libor by 0.25 percentage points to 0.50–1.50% and to keep the rate in the middle of the target range for the time being. The reasons for this decision were two-fold. Firstly, the SNB's inevitable concerns in September with respect to the effect of the high oil prices on the economy and on inflation have been dissipated by the favourable developments in the economy. Secondly, the room for manoeuvre available to monetary policy has since diminished. By raising the target range for the three-month Libor, the National Bank wants to ensure that price stability can also be guaranteed in the future.

In its inflation forecast of December 2005, which is based on the assumption that the three-month Libor will remain steady at 1.0% over the next three years, the SNB predicts that the average annual inflation in 2006 will drop back to 0.8%. The improved economic outlook and the continued high supply of liquidity, however, give reason to expect that price pressure will increase significantly from 2007. Although the slight tightening of monetary policy will gradually absorb the surplus liquidity, price stability will be in jeopardy by mid-2008. If the economic upswing continues to gather pace, therefore, a three-month rate of 1% cannot be sustained.

**Inflation forecast of September 2005 with Libor at 0.75% and of December 2005 with Libor at 1.00%**



**Inflation forecast of December 2005 with Libor at 1.00%**

	2005	2006	2007
Average annual inflation in percent	1.2	0.8	1.2

# 1 Development of the global economy

The concerns voiced in mid-2005 regarding the resistance of the global economy dissipated again in autumn. On the one hand, the situation in the oil market eased noticeably following the price surges of August and September. On the other, demand in the major economic zones firmed and companies regained confidence. The increase in energy costs, meanwhile, pushed up inflation in most countries.

The main impetus for growth was once again provided by the robust US economy and dynamic economic development in Asia. Economic recovery in Europe has also picked up steam. At year-end, the upside potential and downside risk more or less balanced each other out. The monetary environment remained favourable, thus making it possible for the global economy to gain momentum despite continued falling oil prices. However, considerable risks still persist, as stressed by the OECD in its half-year report in December. These include the growing current account imbalances and the associated risk of sudden exchange rate corrections, a reversal in asset prices following a rise in long-term interest rates, and a renewed surge in oil prices.

In view of the December 2005 inflation forecast, the SNB left its assumptions for GDP develop-

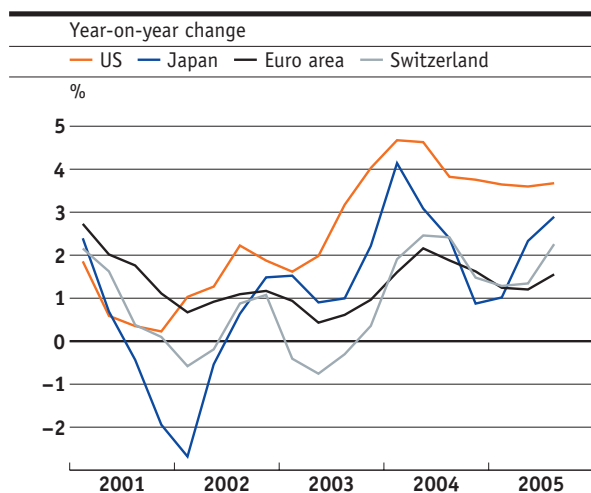
ment in the United States and Europe virtually unchanged. For 2006, the National Bank expects US GDP to increase by an average of 3.6% and European (EU15) GDP to climb by 2.0%. Its projections are thus slightly higher than the consensus forecasts (cf. table 1.1 and section 4.1).

## Robust economic growth in the US

The devastation left in the wake of Hurricanes Katrina and Rita in August and September in the southern United States had no immediate impact on US economic growth in the third quarter. Real GDP increased by 4.3% on the previous period, thus growing significantly faster than in the second quarter. Domestic demand, in particular household consumption, was once again a major growth driver.

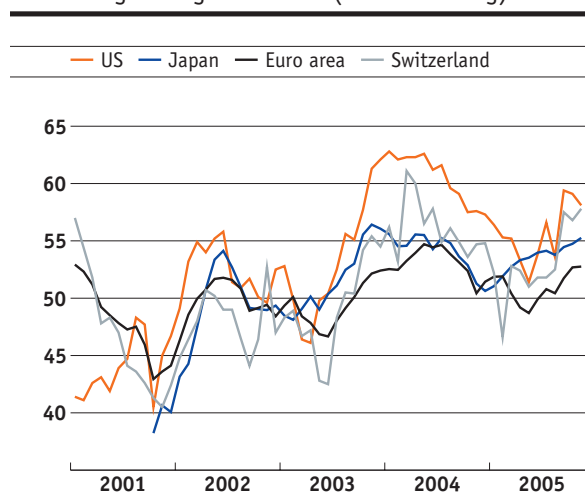
The hurricane damage is likely to put a temporary damper on economic growth in the fourth quarter. With reconstruction work about to begin, however, the situation should normalise quickly. Leading indicators suggest that the US can expect broad-based economic growth beyond the fourth quarter. The steady rise in employment is buoying up household consumption in particular. Given the very low savings rate in private households, however, it will remain susceptible to disruptions such as a decline in real estate prices or an increase in inflation.

Graph 1.1  
Real GDP



Sources: State Secretariat for Economic Affairs (seco), Thomson Datastream, SNB

Graph 1.2  
Purchasing managers' indices (manufacturing)



Source: Thomson Datastream

### European economy gathers momentum

Following moderate economic growth in the first half of the year, the situation in the euro area has visibly improved. After increasing by 2.6% on the previous period, third quarter real GDP growth was stronger than its long-term potential for the first time in over a year. Foreign trade and investments provided the main impetus for growth. The depreciation of the euro and brisk international demand thus more than compensated for the dampening effects of the higher energy costs. The upswing also observed in the major continental European countries is a particularly positive development. Although the recovery in France was broadly based, household consumption in Germany remained fragile. Since the second quarter, the Italian economy is also back on track for growth.

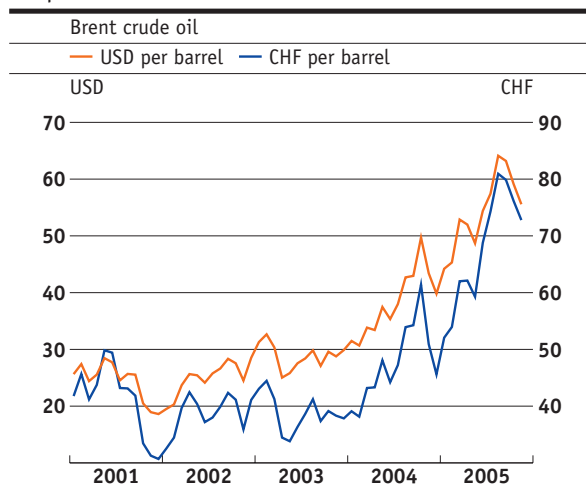
The improvement in the leading economic indicators gives grounds to expect that vigorous growth in the euro area will continue. As illustrated by the surveys, companies are once again increasingly prepared to employ new staff.

### Strong growth in Asia

Economic recovery in Japan continued in the second half of the year. Real GDP rose in the third quarter by 1.0% on the previous period. Consequently, growth was weaker than in the first six months of the year, when the catch-up effect in private sector spending had played a major role. Domestic demand remained robust, however, and exports picked up on the back of strong demand from Asia. Favourable foreign trade conditions, high corporate earnings and optimistic survey results suggest that investment activity is likely to expand further. The labour market situation is improving gradually; a development that is reflected in a rise in real wages.

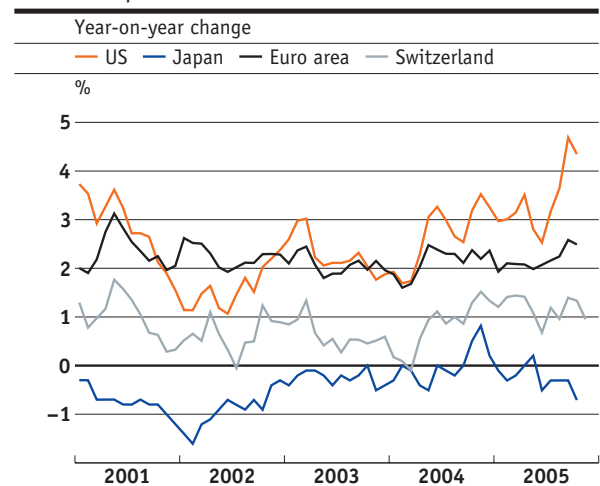
In the third quarter, real GDP in China again experienced healthy growth, exceeding the year-earlier level by 9.4%. Growth was primarily driven by investments and exports. Demand for loans and corporate earnings slackened off, however, suggesting that a slowdown in investment activity is on the cards. Thanks in particular to the growing demand for IT products from China, the East Asian Tigers – Hong Kong, South Korea, Singapore and Taiwan – saw a considerable increase in GDP. The sluggish growth, which was triggered by the recession in the IT sector in the second half of 2004, thus appears to have been overcome. Surveys reveal that economic recovery is likely to continue in the coming quarters.

Graph 1.3  
Oil prices



Sources: Reuters, SNB

Graph 1.4  
Consumer prices



Sources: Swiss Federal Statistical Office (SFSO), Thomson Datastream

### Increased inflation due to higher energy prices

The consumer price inflation rate of the G7 countries climbed to 3.3% in September, the highest it has been in over twelve years. Inflation in the United States moved up from 3.2% in July to 4.3% in October; an increase that was largely attributable to the higher energy prices. In the euro area, meanwhile, it increased from 2.2% to 2.5%. Average core inflation (which factors out food and energy prices) in the G7 countries remained unchanged however. The higher energy prices have thus not yet triggered any second-round effects.

### Oil price expectations falling

Having catapulted to USD 68 a barrel at the end of August, Brent crude prices had retreated back to almost USD 56 by early December, which was USD 8 higher than a year earlier. Movements in oil futures markets suggest that oil prices are likely to remain high for the next two years. The price of a futures contract traded on the New York futures exchange, NYMEX, on 6 December 2005 and maturing in December 2007, for instance, was USD 61.8 a barrel (light, sweet crude). In the long term, however, the markets expect oil prices to fall again, as evidenced by the contract falling due in December 2011 at USD 56.8. Assuming an average annual inflation in industrialised countries of 3% over the next six years, this corresponds to USD 48 a barrel in today's prices.

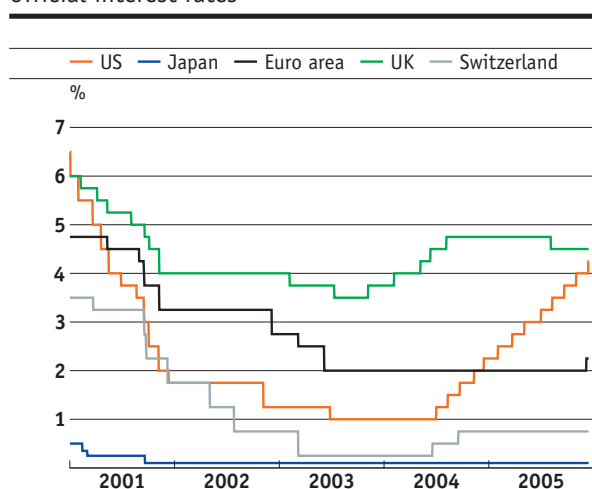
### Tighter monetary policy in the US and euro area

Given the favourable economic outlook and rising inflation rates, the US Federal Reserve continued its policy of gradually raising interest rates in the second half of 2005. In December, it hiked up its target for the fed funds rate for the thirteenth consecutive time by 0.25 percentage points to its present level of 4.25%. The European Central Bank (ECB) lifted its interest rate for main financing operations at the beginning of December by a quarter percentage point to 2.25%. This was the first key rate increase in almost five years.

### Consensus forecasts virtually unchanged

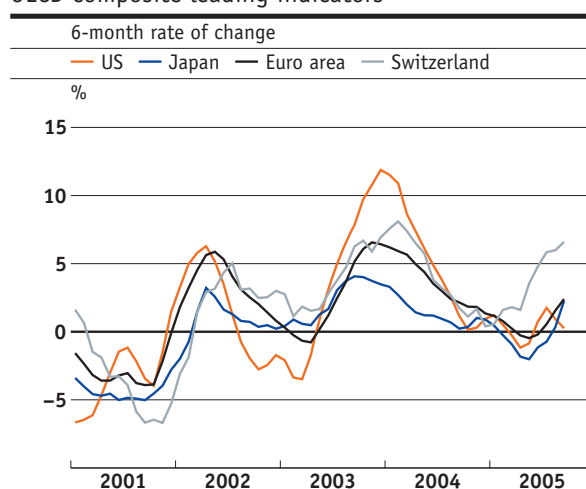
Consensus forecasts for real GDP growth in 2005 remained at 3.6% for the US and 1.3% for the euro area between August and November. The forecast for Japan, meanwhile, climbed to 2.2%. For 2006, forecasting institutions continued to expect GDP growth of 3.3% for the US and 1.7% for the euro area, while revising their growth forecasts for Japan slightly upwards since August to 1.9%. Consensus forecasts for inflation inched up for all three regions (cf. table 1.1).

Graph 1.5  
Official interest rates



Sources: Thomson Datastream, SNB

Graph 1.6  
OECD composite leading indicators



Source: OECD

	Economic growth <sup>1</sup>				Inflation <sup>2</sup>			
	August		November		August		November	
	2005	2006	2005	2006	2005	2006	2005	2006
United States	3.6	3.3	3.6	3.3	3.0	2.5	3.4	3.0
Japan	1.6	1.5	2.2	1.9	-0.2	0.2	-0.2	0.3
Euro area	1.3	1.7	1.3	1.7	2.0	1.7	2.2	1.9
Germany	0.9	1.3	0.8	1.2	1.7	1.5	2.0	1.8
France	1.6	2.0	1.6	1.8	1.7	1.6	1.8	1.8
Italy	-0.2	1.2	0.1	1.2	2.0	1.9	2.0	2.0
United Kingdom	2.0	2.2	1.8	2.2	1.9	1.9	2.1	2.0
Switzerland	1.1	1.6	1.2	1.7	1.2	1.0	1.2	1.0

1 Real GDP, year-on-year change in percent

2 Consumer prices, year-on-year change in percent

Source: Consensus Forecasts: August, November 2005 Survey. Consensus forecasts are monthly surveys conducted among over 240 companies and economic research institutes in more than 20 countries, covering predictions for the expected development of GDP, prices and other economic data. The results are published by Consensus Economics Inc., London.



## 2 Development of the Swiss economy

### 2.1 Aggregate demand and output

#### Economic recovery gathers momentum

The Swiss economy also gathered momentum in the second half of 2005. Growth continued to be mainly driven by the export sector, but the domestic economy seems to be picking up steam gradually as well.

According to estimates by the State Secretariat for Economic Affairs (seco), real GDP in the third quarter was up 4.3% on the previous period, thus exceeding the year-back level by 2.3%. GDP growth clearly surpassed the SNB's expectations. The data reveal that the strong growth was mainly output-driven. By contrast, after the robust increase in the second quarter, domestic demand (excluding inventories) contracted slightly as anticipated, while exports only registered a modest increase. At 1.7% and 5.7% respectively, year-on-year growth was nevertheless considerable in both cases.

The marked difference in the growth between GDP and final demand was reflected in a proportionally high contribution of inventories. These inventories are not recorded separately, however,

but calculated as a differential between production and demand. In other words, the inventory component also has errors in measurement, and caution is called for in interpreting it.

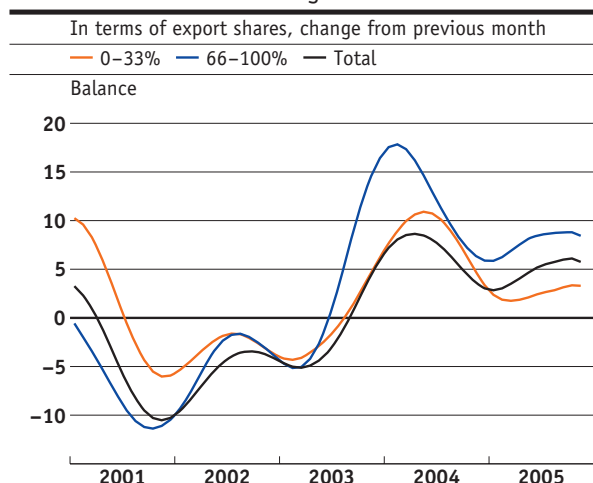
#### Upward revision of growth in first half-year

With the GDP estimate for the third quarter, seco also published revised figures for the first and second quarters of 2005. At 1.8% and 2.6% respectively, growth rates in both quarters were above their potential, rendering the previous lacklustre growth a thing of the past. Particularly striking, once more, was the sharply diverging GDP and demand development.

#### Broad-based upswing in industrial sector

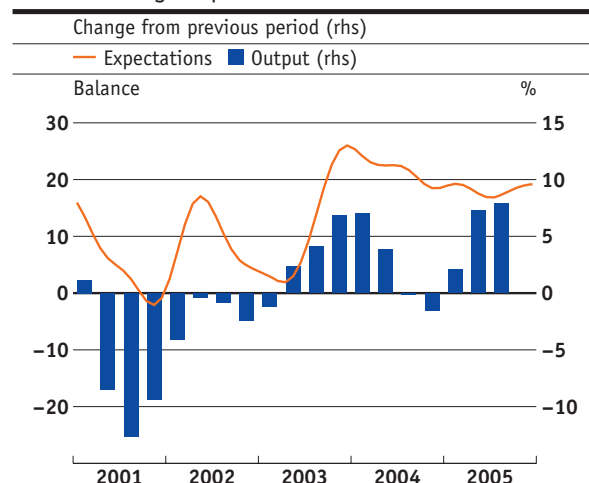
The situation in the manufacturing sector continued to brighten from July to October. The various surveys showed that the order intake was up and the volume of outstanding orders reached a satisfactory level again. The recovery was not only felt in the export industry, but also in the domestic sector. Data on developments in the manufacturing sector published by the Swiss Federal Statistical Office (SFSO) at the end of December confirmed the picture of a broad-based recovery. Accordingly, in the third quarter, manufacturing output was up by just under 8% on the second quarter figure, exceeding the corresponding the year-earlier level by 3.5%.

Graph 2.1  
New orders in manufacturing



Source: Institute for Business Cycle Research at the Swiss Federal Institute of Technology (KOF/FIT)

Graph 2.2  
Manufacturing output



Sources: SFSO, KOF/ETH

**Real GDP and components**  
Year-on-year growth rates, annualised

Table 2.1

	2001	2002	2003	2004	2003	2004					2005		
					Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	
Private consumption	2.0	-0.0	0.8	1.4	2.0	2.2	0.4	0.3	0.5	2.5	2.5	2.7	
Government consumption	4.2	1.7	2.2	1.4	1.9	1.5	-1.8	-0.1	1.2	6.0	1.7	-1.3	
Investment in fixed assets	-3.1	0.3	-1.3	3.3	8.5	-0.2	6.9	2.2	-6.1	-1.1	23.8	-10.8	
Construction	-3.4	2.2	1.8	4.1	5.5	8.2	1.2	1.0	-6.2	-3.8	46.5	-18.1	
Equipment	-2.9	-1.2	-3.8	2.7	11.1	-6.8	12.0	3.2	-5.9	1.4	6.7	-3.8	
<b>Domestic final demand</b>	<b>1.0</b>	<b>0.2</b>	<b>0.5</b>	<b>1.8</b>	<b>3.4</b>	<b>1.6</b>	<b>1.5</b>	<b>0.7</b>	<b>-0.9</b>	<b>2.1</b>	<b>6.9</b>	<b>-1.0</b>	
<b>Domestic demand</b>	<b>2.3</b>	<b>-0.5</b>	<b>0.4</b>	<b>1.0</b>	<b>4.1</b>	<b>-3.2</b>	<b>5.6</b>	<b>2.5</b>	<b>-4.8</b>	<b>7.7</b>	<b>-2.1</b>	<b>4.4</b>	
Total exports	0.2	-0.7	-0.5	8.9	13.5	16.2	-0.4	3.4	7.5	-10.2	27.9	0.4	
Goods	1.4	1.1	-0.1	7.8	11.7	17.4	-4.0	5.9	4.2	-7.4	36.7	-2.8	
Excluding valuables <sup>1</sup>	3.7	0.4	0.7	7.6	13.8	13.5	-3.4	9.2	0.3	-5.0	37.9	-1.5	
Services	-2.8	-5.7	-1.6	12.0	18.5	12.6	9.4	-2.7	16.2	-17.1	6.9	9.9	
<b>Aggregate demand</b>	<b>1.7</b>	<b>-0.5</b>	<b>0.1</b>	<b>3.5</b>	<b>7.0</b>	<b>2.8</b>	<b>3.6</b>	<b>2.8</b>	<b>-0.9</b>	<b>1.4</b>	<b>7.1</b>	<b>3.0</b>	
Total imports	3.2	-2.6	1.3	7.4	16.9	4.2	6.8	7.5	-3.4	0.3	19.2	0.0	
Goods	1.8	-3.0	2.1	6.4	18.2	-0.6	7.2	10.2	-5.0	-0.6	22.7	0.8	
Excluding valuables <sup>1</sup>	1.6	-2.2	2.7	6.6	14.0	6.2	0.7	13.0	-4.9	1.1	15.3	4.7	
Services	11.2	-0.7	-2.7	12.0	10.7	29.4	5.3	-4.4	4.3	4.6	4.7	-3.8	
<b>GDP</b>	<b>1.0</b>	<b>0.3</b>	<b>-0.3</b>	<b>2.1</b>	<b>3.4</b>	<b>2.4</b>	<b>2.4</b>	<b>1.0</b>	<b>0.1</b>	<b>1.8</b>	<b>2.6</b>	<b>4.3</b>	

<sup>1</sup> Valuables: precious metals, precious stones and gems as well as objets d'art and antiques  
Source: seco

### Confidence up again

Expectations showed a remarkable trend. Against the backdrop of the sharp rise in oil prices and the slack economic performance in the euro area, these expectations trended downward until August, making a quick recovery in industrial activity fairly unlikely. During autumn, however, companies grew decidedly more upbeat. According to the results of the October and November surveys, a renewed increase in incoming orders and production was expected.

The talks conducted by the SNB delegates for regional economic relations between September and November with about 140 representatives of different business sectors and industries indicated an increasingly broad-based economic recovery. Moreover, there were signs of a pick-up in investment activity. Most survey respondents felt that their expectations for 2005 had been well met and were confident of prospects in 2006.

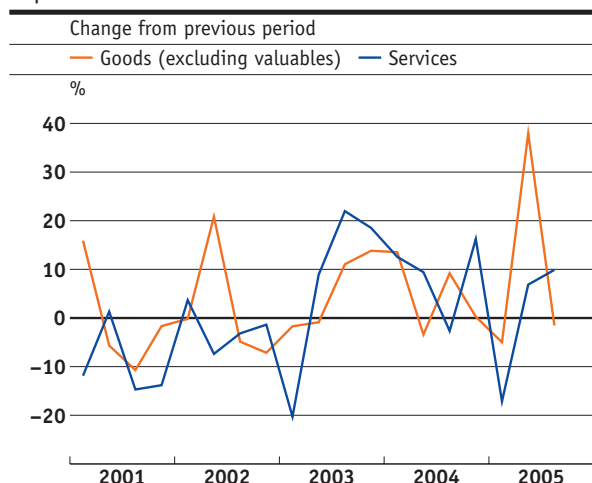
### Exports stagnating at a high level

In the third quarter, exports only expanded slightly vis-à-vis the previous quarter, surpassing the year-earlier level by 5.7%. The modest rise was solely attributable to exports of services which grew at a more rapid pace compared with the second quarter. The worldwide increase in turnover on the stock markets and a pick-up in foreign tourism led to a hefty rise in income from financial services and tourism.

By contrast, goods exports contracted slightly after having recorded a very sharp rise in the second quarter. Most industries, such as mechanical, electronics and metals as well as chemicals and pharmaceuticals were able to maintain the high level of exports of the previous quarter, however. Only a few, including the watchmaking industry, saw a slight downward revision. In October, deliveries of goods abroad were again high.

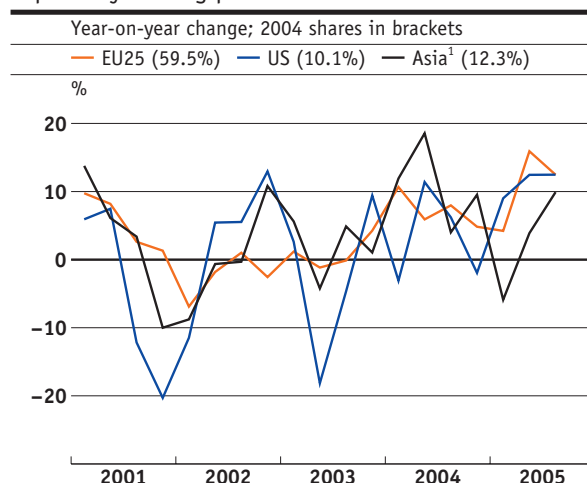
In terms of geographical markets, (nominal) exports to the three major regions of Europe, US and Asia exhibited a favourable trend, exceeding their year-earlier level by 10% each. Within Europe, deliveries of goods to the new EU members rose at an above-average rate again. Toward the end of the quarter, only demand from OPEC countries and a few smaller countries in Western Europe diminished.

Graph 2.3  
Exports



Source: seco

Graph 2.4  
Exports by trading partners



1 Asia: Japan, China, South Korea, Hong Kong, Singapore, Taiwan, Malaysia, Thailand, Philippines, Indonesia  
Source: Federal Customs Administration (FCA)

### Continued rise in imports

After registering robust growth in the second quarter, imports levelled off in the third quarter, rising by a mere 3.7% year-on-year. Imports of services receded compared with the previous quarter; according to the revised data series, this is the first decline in a year. This had an effect on tourism expenditure by Swiss residents abroad, financial services paid to other countries and expenditure for transport services.

Imports of goods continued to rise compared with the previous quarter, albeit at a slower pace than in the second quarter. Imports of raw materials and semi-manufactures, as well as of capital goods, registered a particularly steep fall. By contrast, imports of consumer durables, including automobiles and household appliances, increased.

### Private consumption remained robust

The robust growth trend in private consumption observed since the beginning of the year continued, climbing by 2.7% compared with the previous quarter (up by 2.1% year-on-year). As in the previous quarters, real turnover in the retail industry soared, exceeding its year-earlier level by 2.6%. Demand for durables expanded across a broad front.

The summer season was satisfactory for domestic tourism. SFSO random sampling shows that the number of overnight stays by Swiss guests

clearly exceeded the previous year's level in the third quarter. The third-quarter KOF/FIT survey in the hospitality industry and the talks conducted by SNB delegates for regional economic relations with the representatives of industry confirmed the upward trend. Expectations for the winter season are optimistic.

### Unchanged consumer sentiment

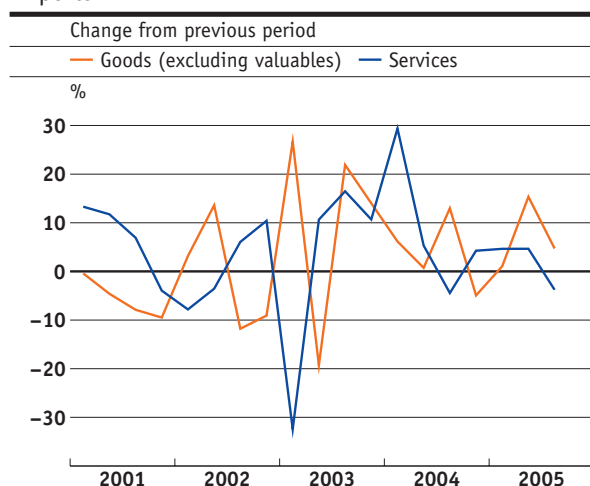
Persisting just under its long-term average, the consumer sentiment index presented a certain contrast to the increasing readiness to spend. In October, households surveyed continued to be cautious in their assessment of the economic development and their own financial situation. Moreover, they were still concerned about job security and considered the timing for major purchases to be unfavourable.

The SNB anticipates that the real income of employees will rise by 1.5% in 2006 – slightly more than in the previous year (0.9%), thus continuing to underpin private consumption.

### Construction investment stabilises

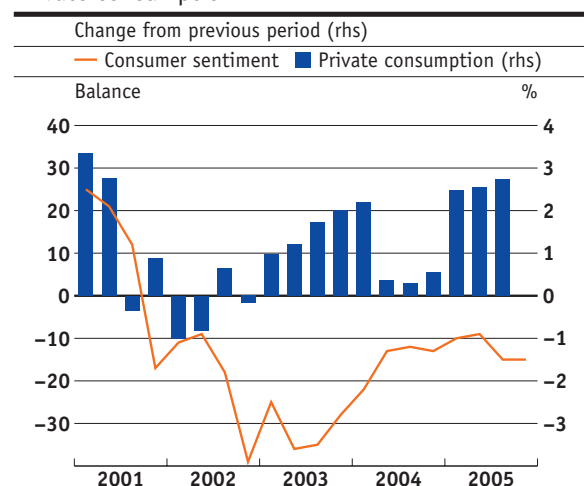
Following vigorous growth in the second quarter, reflecting weather-related catch-up effects, construction investment lost momentum in the third quarter, as anticipated. Compared with the previous year, it rose by a mere 2.0%.

Graph 2.5  
Imports



Source: seco

Graph 2.6  
Private consumption



Source: seco

Residential construction is likely to stabilise at a high level next year. As a result of brisk residential building activity in the last three years, excess demand seems to have receded for the most part. To some extent, this is reflected in a renewed rise in vacancies and the sale prices are no longer rising as fast. Accordingly, the average number of residential building permits for the first three quarters stagnated. Commercial building activity, which continues to be characterised by overcapacity, is not showing any sign of improvement. Civil engineering is also not expected to add any momentum just yet. Construction investment on the whole is likely to see very little expansion in 2006.

### Stagnating equipment investment

Third-quarter equipment investment receded slightly vis-à-vis the previous period, barely reaching the year-earlier level. According to seco, demand in information and communications technology grew briskly, while expenditure for machinery and vehicles declined.

The investment volume, which has remained almost unchanged for more than six quarters, was only barely sufficient to cover demand for replacements. As a result, technical capacity failed to increase to any noticeable extent. Given the fact that manufacturing output is growing vigorously again and economic prospects are favourable, cor-

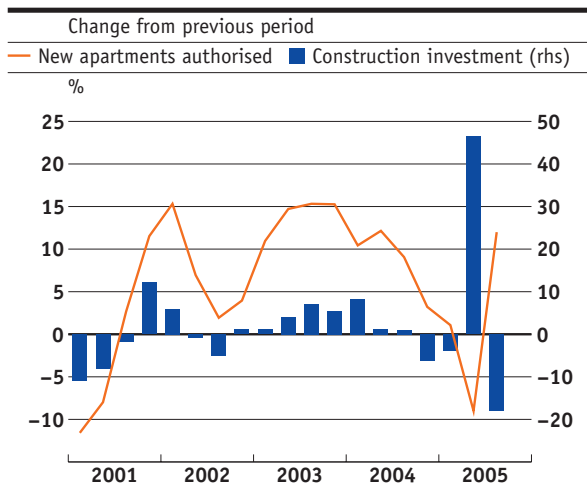
porate investment activity is likely to see a marked pick-up in the quarters ahead. The increase in capacity utilisation and the improved earnings situation also point in this direction.

### GDP forecasts for 2005 and 2006

The SNB anticipates real GDP growth to average a good 1.5% for 2005 as a whole, thus making an upward revision to its quarterly assessment of September ("just over 1.0%"). This correction partly reflects the seco revision of the GDP results for the first half of 2005.

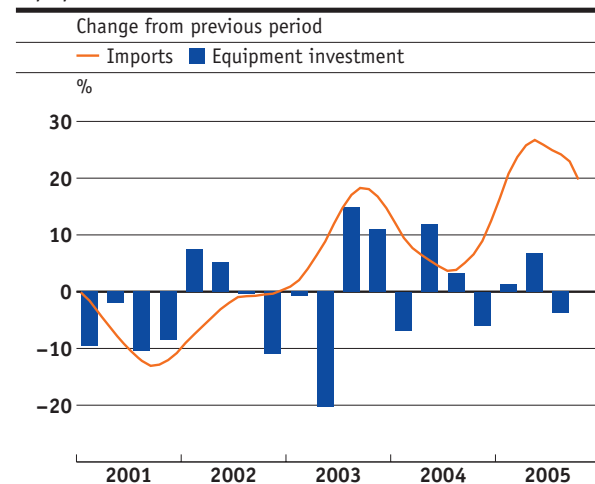
The SNB expects that the recovery will continue across a broad front in 2006 and that real GDP will mount by just over 2% year-on-year. Considering the favourable income trend, private consumption remains an important component of economic momentum. Investment growth, meanwhile, is likely to shift from construction investment to equipment investment. As a result of the robust global economy, we are likely to see continuous healthy growth in exports. In view of rising corporate investment activity, imports are likely to grow at an accelerated pace as well. As the economy recovers, demand for labour will also be stronger and unemployment will ease somewhat.

Graph 2.7  
Construction



Sources: SFSO, seco

Graph 2.8  
Equipment



Sources: FCA, seco

## 2.2 Capacity utilisation

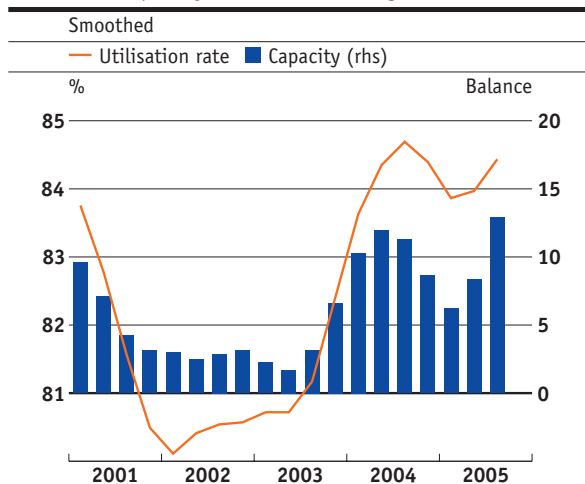
### Rising industrial capacity utilisation

According to the KOF/ETH survey of industry conducted in October 2005, utilisation of technical capacity increased from 84.0% to 84.4% in the third quarter and was therefore above the long-term average. Moreover, technical capacity expanded considerably in the third quarter. The survey indicated the highest level for 15 years. Although overall investment has been flat in recent quarters, investment in the manufacturing sector seems to have picked up.

### Output gap is closing faster

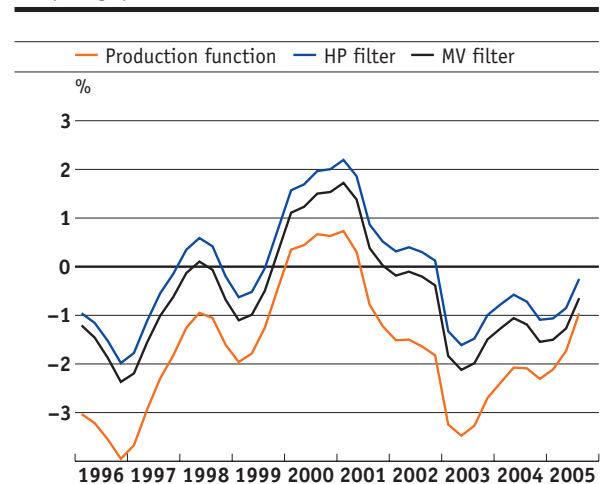
The rise in GDP growth in the first half of the year had an impact on the overall economic output gap, which is defined as the difference between real GDP and estimated production potential. Graph 2.10 shows three estimates of the output gap based on different methods of calculating production potential (production function, Hodrick-Prescott (HP) filter, multivariate (MV) filter). All three calculations still give negative values, indicating that the factors of production are underutilised. However, the most recent calculations suggest that during the year the gap has closed faster than originally anticipated. This trend was supported by strong GDP growth in the third quarter. Moreover, the difference between the three estimates of the output gap is narrowing.

Graph 2.9  
Technical capacity in manufacturing



Source: KOF/FIT

Graph 2.10  
Output gap



Source: SNB

## 2.3 Labour market

### Slight rise in employment

The economic recovery was reflected in the employment situation. In the third quarter, the number of employed persons rose for the second time in succession, by 0.4% on the previous quarter. As a result, the figure was slightly higher than a year earlier. In addition, the number of full-time jobs rose for the first time since 2001. Total hours worked were up by 0.5%, exceeding the year-back figure by a slight margin.

However, a breakdown by sector shows that there are still substantial differences. While employment increased significantly in manufacturing (0.7%) and in construction (3.3%), as compared to the previous quarter, and the chemical, metals, medical technology and watchmaking industries recorded higher rates of increase, the service sector saw a stagnation in employment. Important industries such as retailing and banking, which together account for some 12% of total employment, continued to reduce headcounts.

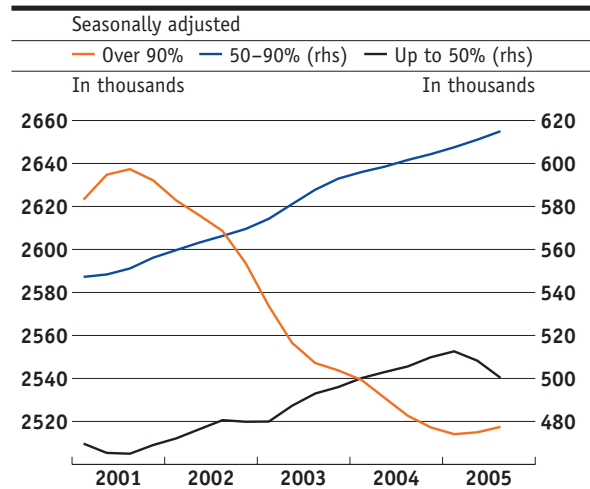
### Slight drop in unemployment

The number of jobless registered with regional employment offices rose to 146,800 (3.7% of the labour force) between August and November, while the number of job-seekers increased to 216,900 (5.5% of the labour force). By contrast, the more meaningful seasonally adjusted unemployment rate declined by 0.1 percentage point to 3.7% in the same period, while the equivalent figure for job-seekers decreased to 5.4%.

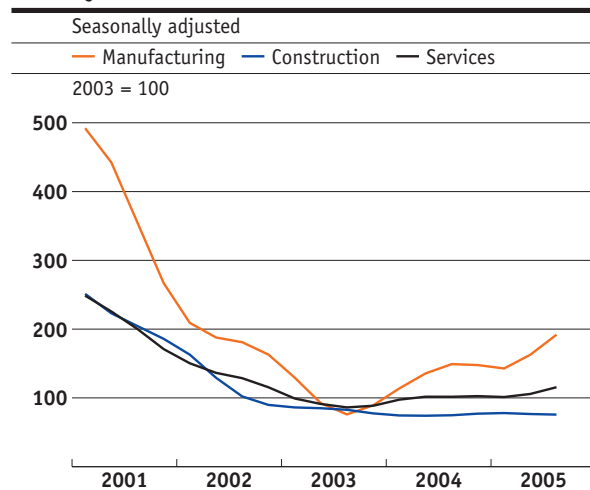
### Employment prospects improve

In the third quarter, the vacancies index for manufacturing and the service sector was pointing upwards, indicating a recovery in the employment situation. The SNB expects the number of employed persons to rise by 0.5–1% in 2006, following an estimated increase of 0.4% in 2005. By the fourth quarter of 2006, the rate of unemployment should have fallen to 3.2%.

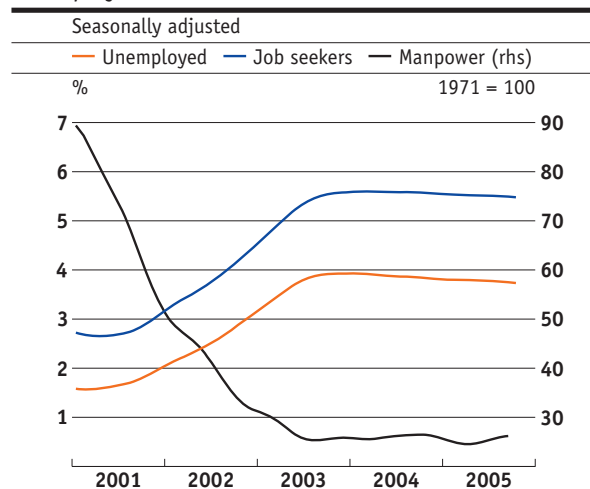
Graph 2.11  
Full-time and part-time employment



Graph 2.12  
Vacancy index



Graph 2.13  
Unemployment rates and vacancies



Graphs 2.11 and 2.12:  
Source: SFSO

Graphs 2.13:  
Unemployed and job seekers registered with the regional employment offices in percent of the labour force according to the 2000 census (labour force: 3,946,988 persons).  
Sources: Manpower, seco

## 2.4 Goods prices

### Moderate inflationary impetus coming from producer and import prices

The knock-on inflationary pressure exerted by producer and import prices on consumer prices remained low between July and October. The only major factor was petroleum products, where prices climbed almost 34% year-on-year. The annual inflation rate for goods manufactured in Switzerland was 0.9% in October, compared with 0.6% in July. By contrast, inflation in the imported products sector declined from 2.0% to 1.4% in the same period.

Prices of agricultural produce have been moving downwards since July 2004, although the rate of decline was lower in the third quarter of 2005. In October, these prices dropped 0.6% year-on-year (average of import and producer prices). The price of consumer and capital goods also declined, while the rate of inflation for intermediates dropped to 0.3%. By contrast, the annual inflation rate for energy sources, which include gas and electricity as well as petroleum products, remained high. In October it was 15.6%, compared with 17.1% in July.

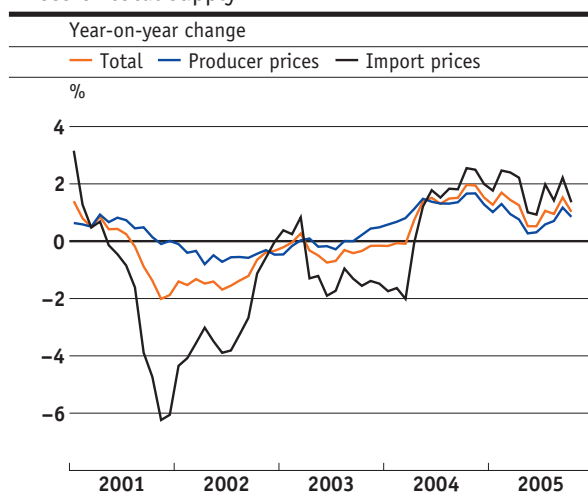
### Declining consumer price inflation

Annual inflation measured by the national consumer price index (CPI) slipped back to 1.0% in November, having risen to 1.4% in September and 1.3% in October. Inflation was still driven mainly by petroleum products (heating oil and fuel), which accounted for an average of just over 80% of consumer price inflation between August and November. Excluding oil products, consumer price inflation was unchanged at 0.2%. In the case of goods (as opposed to services), which account for 40% of the commodities basket, the rate of decline in prices slowed slightly.

### Further reduction in domestic inflation

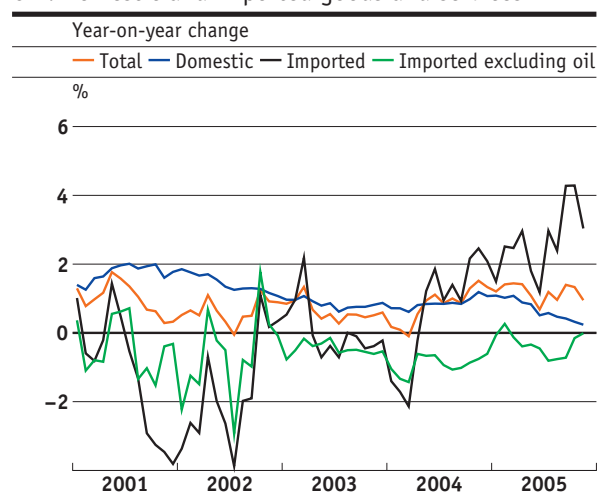
The annual inflation rate for domestic goods and services declined to 0.2% between August and November. The downward trend in the price of goods accelerated to 0.7% year-on-year, mainly because of a decline in the price of electricity and numerous foodstuffs. Moreover, the price of services rose less steeply, principally as a result of lower prices in the telecommunications and hotel sectors. The quarterly rentals index increased 0.5% in November compared with the previous quarter. As a result, the average annual rise in rents remained at 1.0%.

Graph 2.14  
Prices of total supply



Source: SFSO

Graph 2.15  
CPI: Domestic and imported goods and services



Sources: SFSO, SNB



**National consumer price index and components**  
Year-on-year change in percent

Table 2.2

	2004	2005						
		Q1	Q2	Q3	August	September	October	November
<b>Overall CPI</b>	<b>0.8</b>	<b>1.4</b>	<b>1.1</b>	<b>1.2</b>	<b>1.0</b>	<b>1.4</b>	<b>1.3</b>	<b>1.0</b>
Domestic goods and services	0.9	1.1	0.7	0.5	0.5	0.4	0.3	0.2
Goods	0.4	-0.2	-0.4	-0.4	-0.3	-0.5	-0.8	-0.7
Services	1.0	1.5	1.1	0.8	0.7	0.7	0.7	0.5
Private services excluding rents	0.6	1.1	0.7	0.3	0.3	0.3	0.3	0.0
Rents	1.2	1.9	1.6	1.2	1.0	1.0	1.0	1.0
Public services	1.9	1.9	1.3	1.5	1.5	1.5	1.3	1.3
Imported goods and services	0.6	2.2	2.0	3.2	2.4	4.3	4.3	3.0
Excluding oil products	-0.9	0.0	-0.4	-0.8	-0.8	-0.7	-0.2	-0.0
Oil products	9.3	14.0	14.7	23.5	18.2	29.4	26.0	18.1

Sources: SFSO, SNB

### Rising import price inflation

The inflation rate for imported consumer goods increased from 2.4% to 3.0% between August and November. This was due to imported goods (excluding petroleum products), where there was no further reduction in prices in November. The decline in the price of clothing was halted, and gas prices rose. By contrast, the price of home electronics goods continued to fall. The oil products included in the CPI (heating oil and fuel) remained well above the year-back level (18.1%).

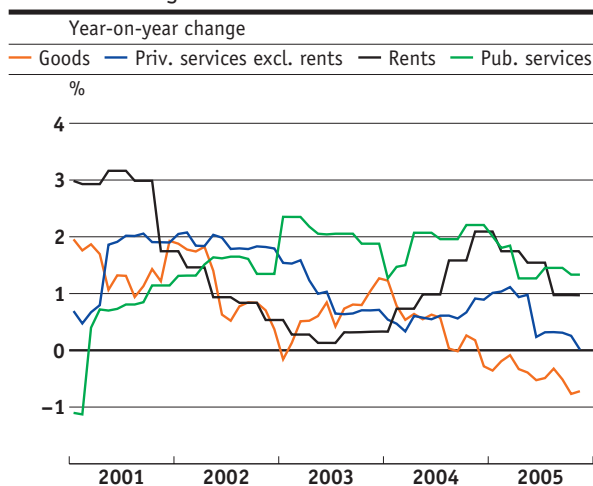
### Stable core inflation rates measured by the SNB...

Inflation, as measured by the CPI, is subject to numerous short-term influences which may distort the general, long-term price trend. The SNB therefore computes a measure for the core inflation rate which, for any given month, excludes those goods with the highest and lowest annual inflation rate (15% in each case). The core inflation rate calculated in this way was unchanged at 0.6% between August and November. This indicates a consistently low general inflation rate.

### ... and the SFSO

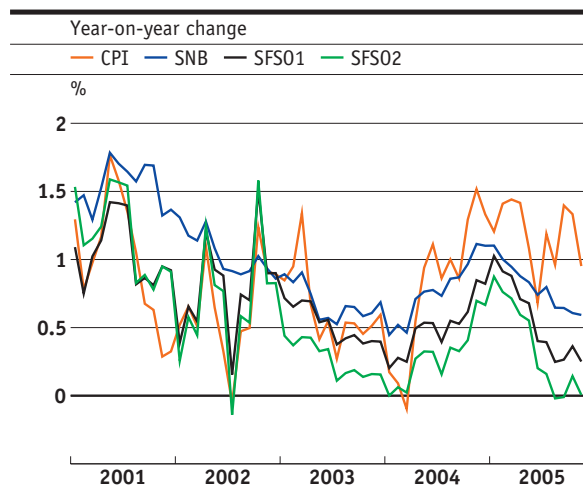
Unlike the core inflation rate calculated by the SNB, both of the two core inflation rates calculated by the SFSO exclude the same goods from the commodities basket in each period. In the case of core inflation 1 these are food, beverages, tobacco, seasonal products, energy and fuel. Core inflation 2 also factors out products with administered prices. Between August and November, core inflation 1 rose by 0.1 percentage point to 0.3% while core inflation 2 was unchanged (0.0%). The difference between the core inflation rates calculated by the SNB and the SFSO is basically attributable to the reduction in the price of electronics products and telecommunications services. In the SNB calculation, these are regarded as extraordinary effects that dampen inflation. They are therefore excluded from its commodity basket but are retained in both commodity baskets used by the SFSO to calculate core inflation rates.

Graph 2.16  
CPI: Domestic goods and services



Sources: SFSO, SNB

Graph 2.17  
Core inflation



Sources: SFSO, SNB

### 3 Monetary development

#### 3.1 Interest rates

At its quarterly assessment in September 2005, the SNB decided to leave the target range for the three-month Libor unchanged at between 0.25% and 1.25%. It announced that it would be aiming for the middle of the target range, i.e. 0.75%. This decision was based on two factors. Firstly, the inflation forecast for the period to mid-2006 remained low despite the high oil prices. Secondly, the economic outlook was less certain due to the rise in these prices. The SNB thus decided to adopt a wait-and-see approach. At the same time, it pointed out that it would have to adjust its monetary policy if the expected economic recovery were to be confirmed.

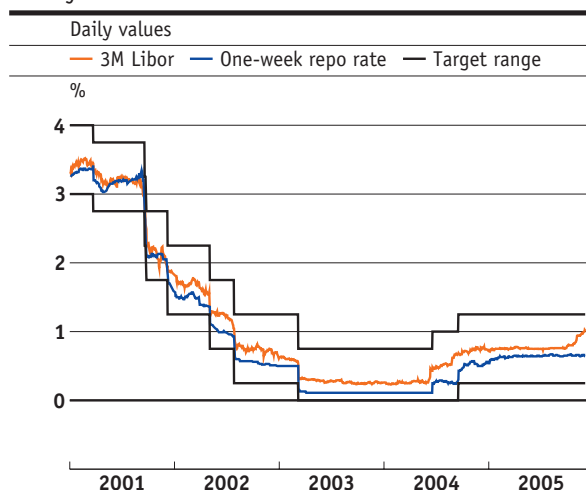
##### Hike in Swiss money market rates

Although repo rates, which the SNB uses indirectly to manage the three-month Libor, had been held virtually unchanged between 0.64% and 0.67% since the last monetary policy assessment, the three-month Libor rose from 0.76% in mid-September to 1.04% by mid-December. This indicated growing market expectations that the target corridor for the three-month Libor would be raised. The SNB allowed the rate to rise because the factors contributing to the wait-and-see stance adopted in September had become less significant.

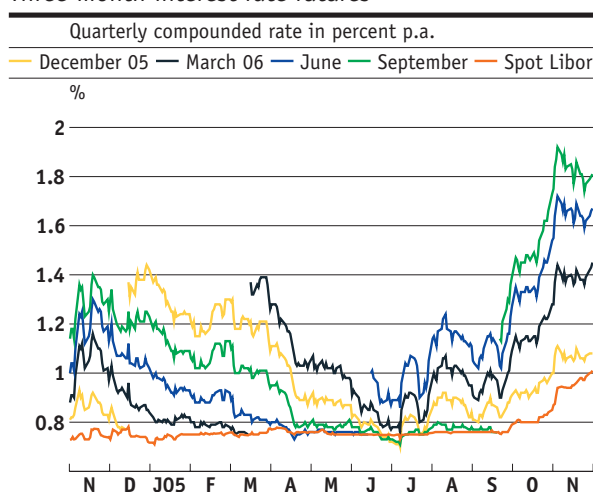
Expectations of an upcoming rise in interest rates were also reflected in futures contracts on the three-month Libor maturing shortly after the December assessment. The rates for the December 2005 contract rose to 1.10%, reflecting expectations of a 25 basis point rate rise, at least. The interest rates on futures contracts for March, June and September 2006 were considerably higher. This suggests the market expects a successive rise in short-term rates next year (cf. graph 3.2).

Nevertheless, the financial markets were very uncertain about interest rate trends. This is indicated by the difference between futures and forward contracts on the three-month Libor due in mid-March 2006 and the anticipated three-month Libor which can be derived from an interest structure model. This difference, which is essentially a risk premium, was more than 30 basis points on 7 November 2005 (cf. graph 3.3).

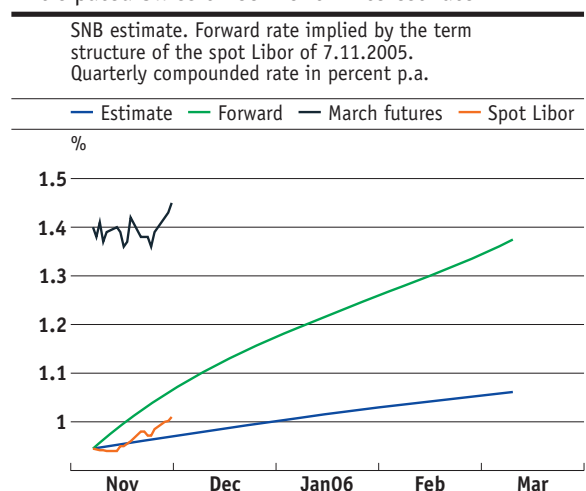
Graph 3.1  
Money market rates



Graph 3.2  
Three-month interest rate futures



Graph 3.3  
Anticipated Swiss three-month interest rate



Graphs 3.1, 3.2 and 3.3:  
Source: SNB

### International short-term rates are also rising

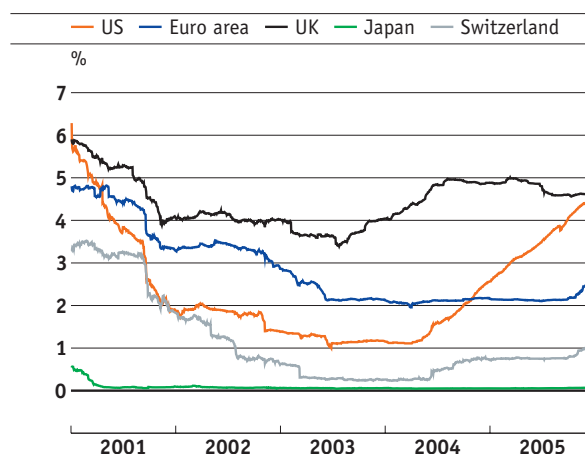
Short-term rates have risen in other countries as well as Switzerland. Growing expectations that the European Central Bank (ECB) would raise its key interest rate lifted the three-month Libor for euro investments from 2.14% in mid-September to 2.46% in mid-December. The yield spread between short-term Swiss franc and euro-denominated bonds thus remained virtually unchanged. In mid-December it was 1.41 percentage points. By contrast, short-term dollar rates rose comparatively steeply. The yield spread between dollar and Swiss franc bonds measured by the three-month Libor increased from 3.11 percentage points in mid-September to 3.45 percentage points in mid-December.

### Global rise in long-term rates

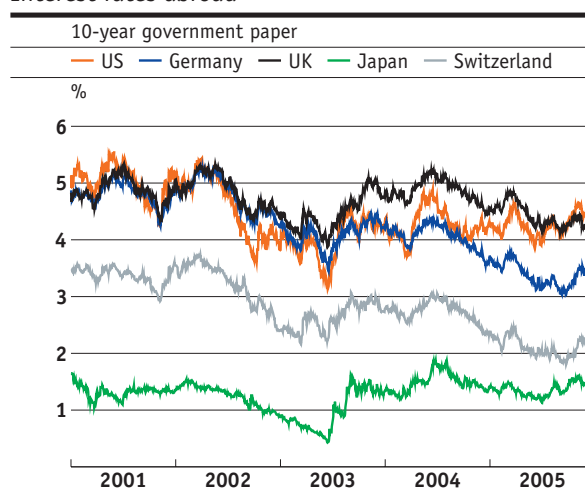
The decline in long-term yields on the world's key bond markets, which started in April 2004, reversed in September 2005 (cf. graph 3.5). Between mid-September and mid-December the yield on 10-year Swiss Confederation bonds increased by 28 basis points to 2.15%, bringing it back to the level registered in April 2005. The main factors driving the global rise in capital market yields were the improved economic outlook and expectations of rising inflation.

Graph 3.6, which shows the yields on nominal discount bonds issued by the Swiss Confederation with various maturities, reflects a substantial rise in yields at the short end of the maturity range. By contrast, there was little change at the long end of the market. The yield curve therefore flattened considerably (cf. graph 3.7).

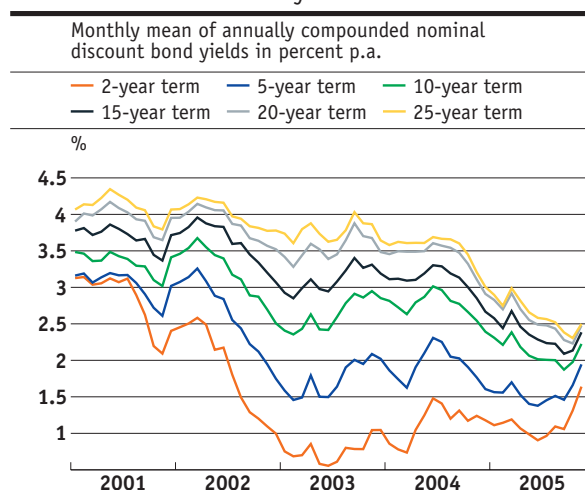
Graph 3.4  
International short-term interest rates (three months)



Graph 3.5  
Interest rates abroad



Graph 3.6  
Swiss Confederation bond yields



Graphs 3.4 and 3.6:  
Source: SNB

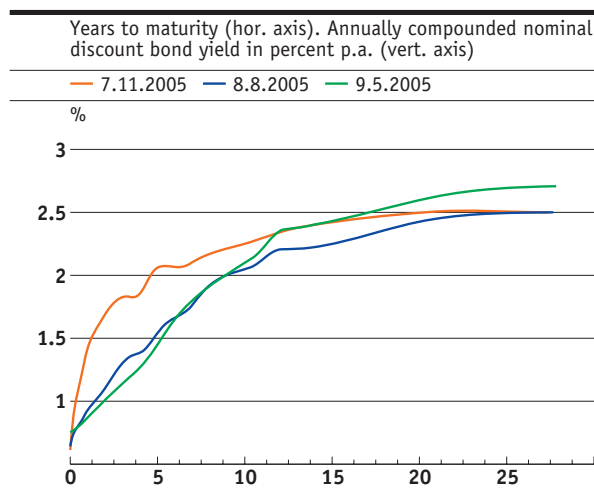
Graph 3.5:  
Sources: Thomson Datastream, SNB

### Lower credit spreads

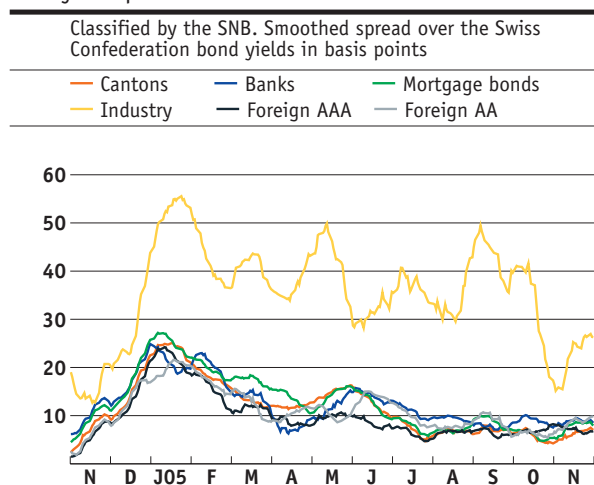
The development of financing conditions for bond issuers can be illustrated by credit spreads. This is shown by the difference between the yield on cantonal and corporate bond issues and that on government bonds and can be interpreted as a credit risk premium (cf. "Box: Assignment of bonds to ratings classes", p. 33, Monetary Policy Report 1/2004). Graphs 3.8 and 3.9 show that the credit spreads for both first-class and third-class borrowers have remained low since July. The credit spread on first-class industrials declined perceptibly from 50 basis points at the start of September to 20 basis points at the end of November. The yields used in these calculations relate to discount bonds with a five-year maturity.

In a phase of economic upswing, the risk of a company being unable to service its bonds is considerably lower than in a downswing. Historically low and in some cases declining credit spreads therefore point to a positive economic outlook.

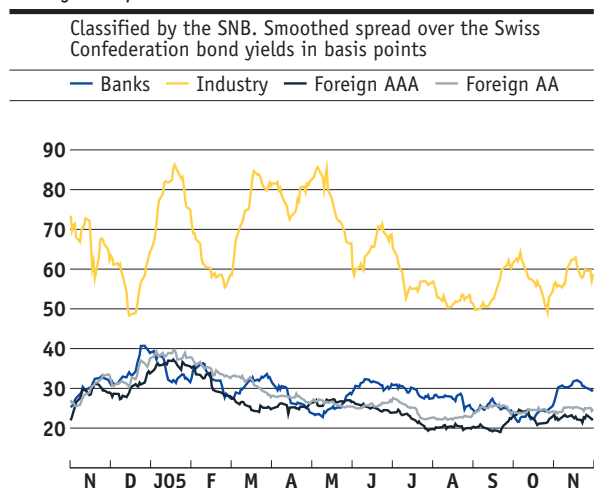
Graph 3.7  
Term structure of Swiss Confederation bonds



Graph 3.8  
Five-year spread of Swiss first-class bonds



Graph 3.9  
Five-year spread of Swiss third-class bonds



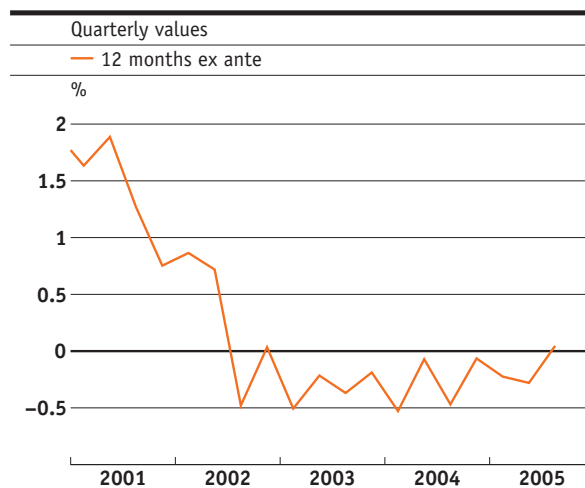
Graphs 3.7, 3.8 and 3.9:  
Source: SNB

### Short-term real interest rates are slightly positive

Graph 3.10 shows the development of short-term real interest rates, which are defined as the difference between the nominal interest rate for twelve-month money market investments and expected consumer price inflation in the same period. The underlying inflation expectations represent the average of the one-year forecasts published by a number of different institutions ("Consensus Forecast", September 2005).<sup>2</sup> The short-term real interest rate rose by 35 basis points to 0.1% in the third quarter, bringing it back into positive territory for the first time in nearly three years. One-third of the rise compared with the previous quarter was due to higher nominal rates and two-thirds was due to lower inflation forecasts. Measured by the short-term real interest rate, monetary policy was thus slightly less expansionary than in the previous quarter.

<sup>2</sup> Cf. table 1.1

Graph 3.10  
Estimated real interest rate



Source: SNB

## 3.2 Exchange rates

### Rise in the dollar

The dollar rose against the main currencies and was firmer than it had been for two years. This was partly due to higher growth momentum in the United States. The continued growth in the yield spread also made dollar investments more attractive and in turn strengthened the dollar. The markets seem to expect the Fed to raise interest rates further in the coming months. In mid-December the dollar was trading at CHF/USD 1.295, compared with CHF/USD 1.26 at the September assessment. In mid-November the dollar rose to its highest level against the Swiss franc since the start of May 2004. While the dollar had risen 14% since the beginning of 2005, the euro rate moved within a narrow range of CHF/EUR 1.55–1.54.

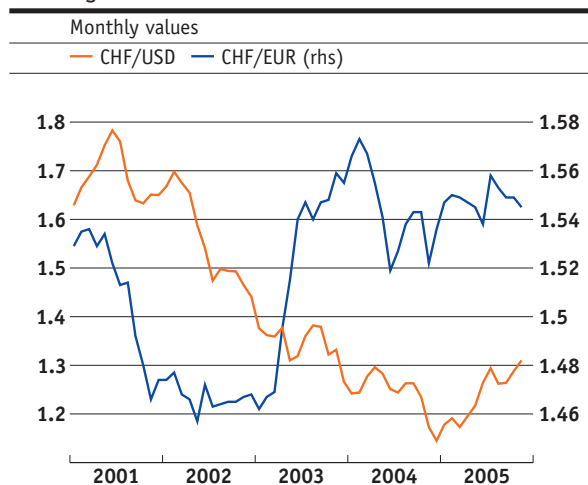
The export-weighted real value of the Swiss franc against the main trading currencies has risen slightly since September (cf. graph 3.12) but is still slightly lower than at the beginning of 2005. Against the euro, the index was unchanged from the start of the year but about 3.6% lower than when the single European currency was introduced at the beginning of 1999.

### Unchanged monetary conditions

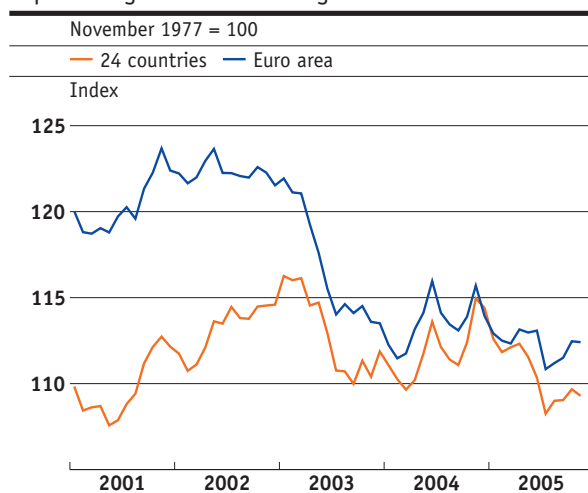
The Monetary Conditions Index (MCI) combines the three-month Libor and nominal trade-weighted external value of the Swiss franc. This provides a measure of monetary conditions facing the Swiss economy. In the indices shown in graph 3.13 the two components are weighted by 5:1 and 3:1. A rise indicates a tightening of monetary policy conditions while a decline corresponds to a relaxation in these conditions (cf. "Box: The Monetary Conditions Index", p. 27, Monetary Policy Report 1/2004). The indices are always set at zero at each quarterly assessment.

The MCI indicates that at the start of December monetary conditions in Switzerland were slightly more restrictive than in the September assessment.

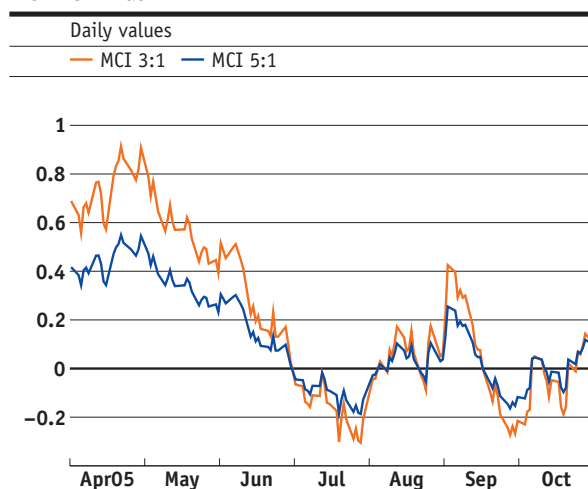
Graph 3.11  
Exchange rates



Graph 3.12  
Export-weighted real exchange rate of Swiss franc



Graph 3.13  
MCI nominal



Graphs 3.11, 3.12 and 3.13:  
Source: SNB

### 3.3 Share and real estate prices

#### Continued stock market rally

Following a downtick in October, the rally in European and Japanese share prices continued in November. The markets benefited from positive economic data, declining oil prices and good corporate results. Since the start of this year, the Eurostoxx 50 has risen 18% and the Nikkei 225 index in Japan has gained 36%. By contrast the S&P 500 in the US has hardly changed (+5%). The Swiss equity index (SPI) has registered above-average growth of 33%. This positive trend was driven by all subindices (cf. graph 3.15).

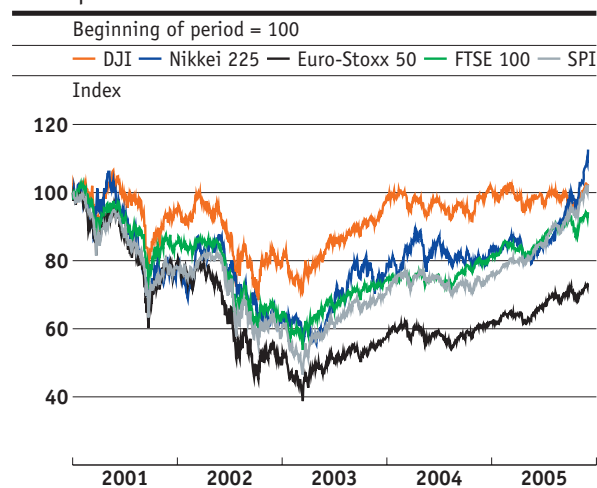
Graph 3.16 shows the annualised monthly standard deviation in the SPI against the S&P 500 for the past five years. This measure of volatility has shown a very similar pattern for both indices. Recently it has been low by historical standards, which can be interpreted as pointing to low market risk. The strong rise in the value of Swiss shares thus occurred in a market environment characterised by low levels of uncertainty. Another remarkable fact is that Swiss shares performed far better than US shares in 2005 although market risk was virtually identical.

#### Sharp rise in housing prices but no general sign that real estate market is overheating

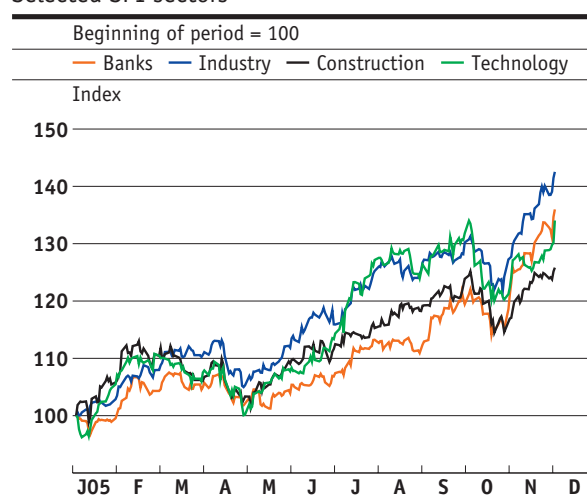
The economic impact of changes in interest rates can be seen, for example, on the real estate market. Since real estate is a consumer good with a very long useful life, changes in interest rates generate sharp shifts in demand for all types of property. However, since the supply of new property is very low relative to the overall stock, changes in demand lead to major price fluctuations. Demand for residential property tends to react more sharply than any other GDP component to a relaxation of the monetary reins. The long phase of expansionary monetary policy has led to the question of whether the Swiss real estate market is now showing signs of overheating.

Graphs 3.17 and 3.18 show the change in rents and property prices in the household and industrial sectors and the inflation rate measured by the consumer price index for the past 25 years. In the 1980s there were massive price rises in both sectors. The price of single-family homes and apartments doubled within a decade. Rents rose even faster. When the property bubble burst at the start of the 1990s

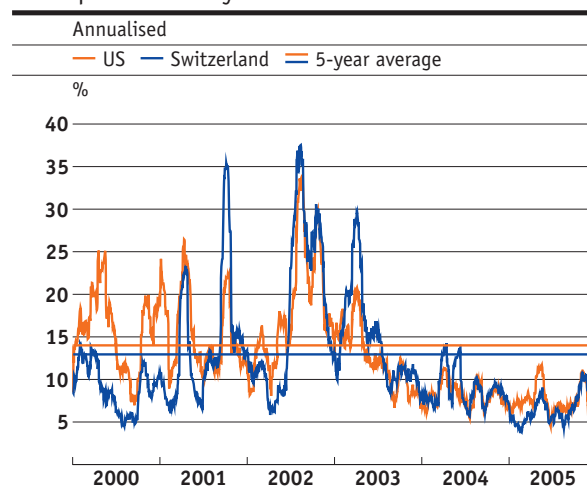
Graph 3.14  
Stock prices



Graph 3.15  
Selected SPI sectors



Graph 3.16  
Stock price volatility



Graph 3.14:  
Sources: BIS, Bloomberg

Graph 3.15:  
Source: Bloomberg

Graph 3.16:  
Sources: Bloomberg, Thomson Datastream



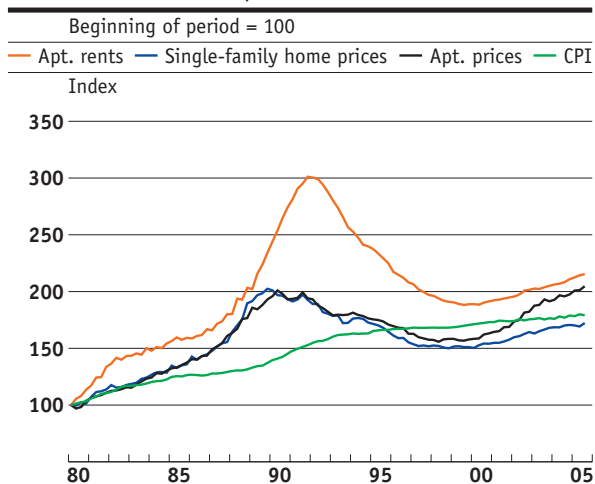
it ushered in a prolonged correction phase. Rents for residential properties and the price of houses and apartments only started to rise again shortly before the start of the new millennium (cf. graph 3.17). Viewed over Switzerland as a whole, though, the upward trend was only moderate. Generally, real estate prices are still well below the peaks reached in 1989/1990. However, this does not include the prices of owner-occupied apartments, which have risen significantly in recent years and this year topped the 1990 high. Factoring in inflation, prices of owner-occupied apartments, as well as rents, are higher than in 1980, whereas prices for single-family houses are slightly lower.

The picture is quite different in the industrial real estate sector (cf. graph 3.18). Office rents rose between the turn of the millennium and 2003, but have been declining since then. Moreover, for the past ten years it has not been possible to detect a trend in rental prices for commercial space. Factor-

ing in inflation, industrial rents are actually lower than in 1980.

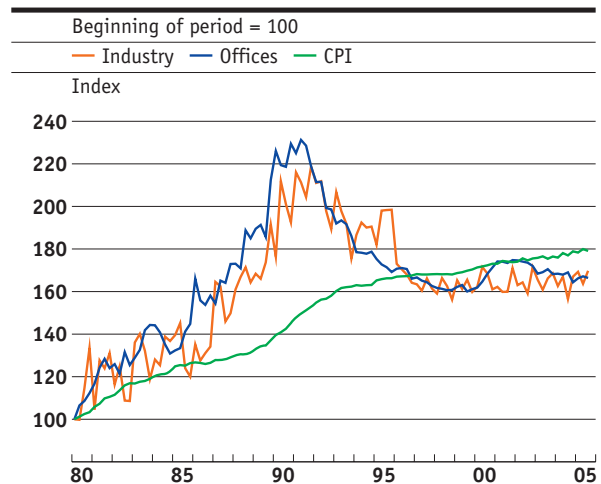
To sum up: the expansionary monetary policy has not resulted in a property bubble. This only occurs when market forces believe that values will rise in the future, thus boosting demand for real estate. However, the further prices move from the equilibrium level, the greater the risk of a correction. To offset this risk, prices rise increasingly quickly. Despite considerable regional differences, there are no signs of a bubble of this sort in Switzerland. On the contrary, prices in the housing sector (apart from owner-occupied apartments) are only rising moderately. By contrast, the commercial sector seems to be adapting to structural changes such as "just-in-time" production and the reduction in the space required by the service sector as a result of electronic storage capacity. The SNB continues to monitor developments on the real estate market very carefully.

Graph 3.17  
Rents and real estate prices in household sector



Source: Wüest & Partner

Graph 3.18  
Rents in industrial sector



Source: Wüest & Partner

## 3.4 Monetary aggregates

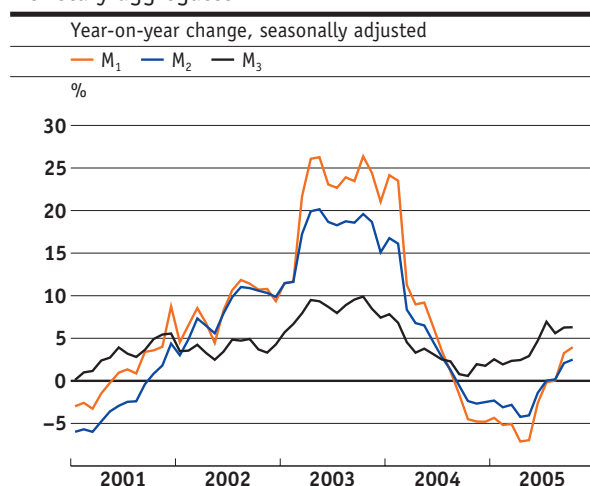
### Strong growth in $M_3$

In November the money stock  $M_1$  (note and coin circulation, sight deposits and transaction accounts) and  $M_2$  ( $M_1$  plus savings deposits) were up 4.2% and 2.6% respectively year-on-year. The strongest growth was registered by  $M_3$  ( $M_2$  plus time deposits), which increased by 6.4%. As in previous quarters, the high growth in  $M_3$  was mainly due to the strong rise in time deposits (29.7%). Until recently, the rise could be attributed partly to the restructuring of portfolios from sight to time deposits, but in November sight deposits also increased by 2.7%.

To assess the supply of money to the economy and the possible risk of inflation, an estimate is made of the money overhang (cf. "Box: Money sup-

ply growth and inflation", p. 33, Monetary Policy Report 1/2005). An equilibrium money supply is calculated on the basis of the transaction volume in the economy and the opportunity costs of holding money. This serves as a benchmark for an appropriate supply of money to the economy. If the current money supply exceeds this level, there is too much liquidity available. This could point to increased inflation in the next four to six quarters. Graph 3.20 shows the percentage deviation in the  $M_3$  monetary aggregate from its equilibrium. To allow for the uncertainties inherent in this model, estimates are made for two different model variants. Since the estimates for the third quarter showed little or no money overhang, the indicator constructed around the ECM concept suggests that there is little risk of inflation in the next twelve to eighteen months.

Graph 3.19  
Monetary aggregates

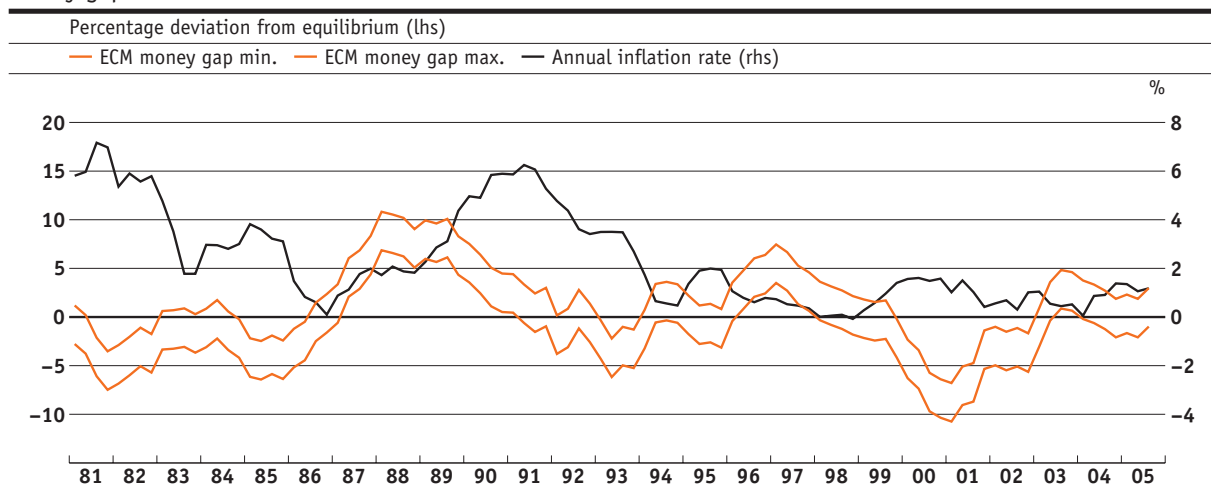


Source: SNB

	2003	2004	2004		2005			September	October	November
			Q3	Q4	Q1	Q2	Q3			
Monetary base <sup>2</sup>	40.4	41.7	41.1	41.8	42.1	41.6	41.2	41.2	41.5	41.7
Change <sup>3</sup>	5.3	3.2	0.2	0.7	-0.5	-0.2	0.3	0.7	1.9	0.9
M <sub>1</sub> <sup>2</sup>	273.5	288.5	281.9	279.1	283.0	279.0	284.8	287.2	289.4	294.3
Change <sup>3</sup>	21.9	5.5	1.0	-4.8	-4.9	-5.6	1.0	3.2	3.9	4.2
M <sub>2</sub> <sup>2</sup>	475.1	495.6	488.3	485.4	491.2	487.2	492.1	494.2	495.9	501.2
Change <sup>3</sup>	17.4	4.3	1.2	-2.6	-2.8	-3.2	0.8	2.1	2.5	2.6
M <sub>3</sub> <sup>2</sup>	544.9	562.5	557.9	564.8	576.6	582.4	593.0	593.2	595.5	603.2
Change <sup>3</sup>	8.3	3.2	1.9	1.4	2.3	3.3	6.3	6.3	6.3	6.4

1 1995 definition  
 2 Level in CHF billions  
 3 Year-on-year change in percent  
 Source: SNB

Graph 3.20  
 Money gap and annual inflation rate



Source: SNB

## 3.5 Loans

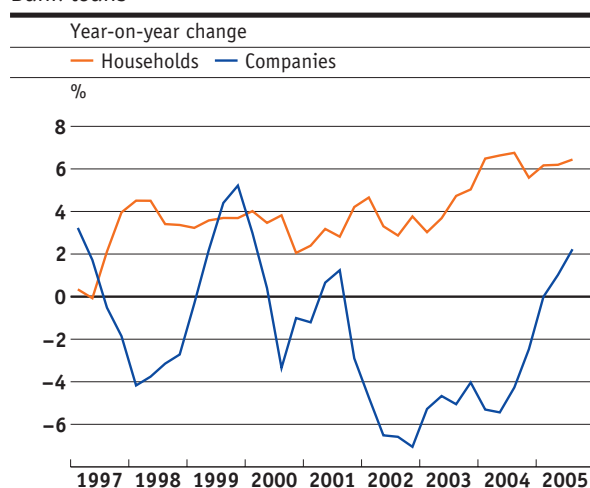
### Higher growth in lending

Bank loans have increased further and were up 4.4% year-on-year at the end of October.

Loans to households, which account for about two-thirds of all bank loans, continued to rise in the third quarter, increasing 6.4% year-on-year (SNB credit volume statistics). Loans to the corporate sector, which respond faster to economic trends, also maintained the upward movement that started this year, having previously declined for a long time. They increased 2.2% year-on-year.

Looking at loans by type, the trend is similar. Mortgages, which make up four-fifths of all bank loans, continued to rise in October. The volume of other types of loan has been almost unchanged since the spring (SNB Monthly Balance Sheet statistics). The contraction of recent years therefore seems to be over. However, trends in the two types of other loans are very different. Other secured loans have continued to rise since year-end 2003, exhibiting particularly strong growth year-on-year. Meanwhile, other unsecured loans stagnated at around the level reached in mid-2004. In October, this was the only category that was still contracting slightly year-on-year.

Graph 3.21  
Bank loans



Source: SNB

Bank loans  
Year-on-year change in percent

Table 3.2

	2003	2004	2004		2005			August	September	October
			Q3	Q4	Q1	Q2	Q3			
<b>Total</b>	<b>2.1</b>	<b>3.6</b>	<b>4.0</b>	<b>3.6</b>	<b>3.6</b>	<b>3.8</b>	<b>4.3</b>	<b>4.2</b>	<b>4.3</b>	<b>4.4</b>
Mortgage claims	5.6	5.4	5.4	5.2	5.1	5.1	5.3	5.3	5.4	5.4
Other loans	-8.7	-3.1	-1.2	-2.6	-1.9	-1.2	0.1	-0.4	-0.2	0.3
of which secured	-10.7	3.2	7.2	4.0	3.5	-0.1	3.2	2.5	3.2	4.6
of which unsecured	-7.4	-7.1	-6.6	-6.8	-5.7	-1.9	-2.2	-2.6	-2.7	-2.8

Source: SNB

## 4 Inflation forecast of the SNB

Monetary policy impacts on production and prices with a considerable time lag. In Switzerland, monetary policy stimuli have their maximum effect on inflation after a period of approximately three years. For this reason, the SNB's monetary policy is guided not by current inflation, but by the inflation rate to be expected in two to three years if monetary policy were to remain unchanged. The inflation forecast is one of the three key elements of the SNB's monetary concept, together with its definition of price stability and the target corridor for the three-month Libor.

### 4.1 Assumptions for global economic development

The SNB's inflation forecasts are embedded in an international economic scenario. This represents what the SNB considers to be the most likely development over the next three years. Table 4.1 summarises the main exogenous assumptions and compares them with the corresponding assumptions underlying the September forecast.

#### Global economic momentum expected to increase despite higher oil prices

The global economic assumptions have only altered slightly since September. GDP growth in the US is now expected to be slightly lower in the short term but slightly higher in the long term. Conversely, this year's recovery in Europe is expected to be somewhat faster while long-term growth is expected to be a little weaker. The assumptions on oil prices are virtually unchanged. However, the rise in oil prices to date is now expected to have a greater impact on foreign prices. The USD/EUR exchange rate is expected to be 1.20, almost exactly in line with the September forecast.

Assumptions for inflation forecasts

Table 4.1

	2005	2006	2007
<b>Inflation forecast of December 2005</b>			
GDP US <sup>1</sup>	3.5	3.6	3.5
GDP EU15 <sup>1</sup>	1.4	2.0	2.4
Exchange rate USD/EUR <sup>2</sup>	1.25	1.20	1.20
Oil price in USD/barrel <sup>2</sup>	55.0	59.0	59.0
<b>Inflation forecast of September 2005</b>			
GDP US <sup>1</sup>	3.6	3.6	3.4
GDP EU15 <sup>1</sup>	1.4	2.0	2.4
Exchange rate USD/EUR <sup>2</sup>	1.25	1.21	1.21
Oil price in USD/barrel <sup>2</sup>	53.3	58.0	58.0

1 Change in percent

2 Level

## Box: Inflation forecasting as part of the monetary policy concept

The Swiss National Bank (SNB) has the statutory mandate to ensure price stability while at the same time taking due account of economic developments.

It has specified the way in which it exercises this mandate in a three-part monetary policy concept. First, the SNB regards prices as stable when the national consumer price index (CPI) rises by less than 2% per annum. This allows it to take account of the fact that the CPI slightly overstates actual inflation. At the same time, it allows inflation to fluctuate somewhat with the economic cycle. Second, the SNB summarises its assessment

of the situation and of the need for monetary policy action in a quarterly inflation forecast. This forecast, which is based on the assumption of a constant short-term interest rate, shows the CPI development expected by the SNB over the next three years. Third, the SNB sets its operational goal in the form of a target range for the three-month Swiss franc Libor rate. The target range provides the SNB with a certain amount of leeway, enabling it to react to unexpected developments in the money and foreign exchange markets without having to change its basic monetary policy course.

## 4.2 Inflation forecast Q4 2005 to Q3 2008

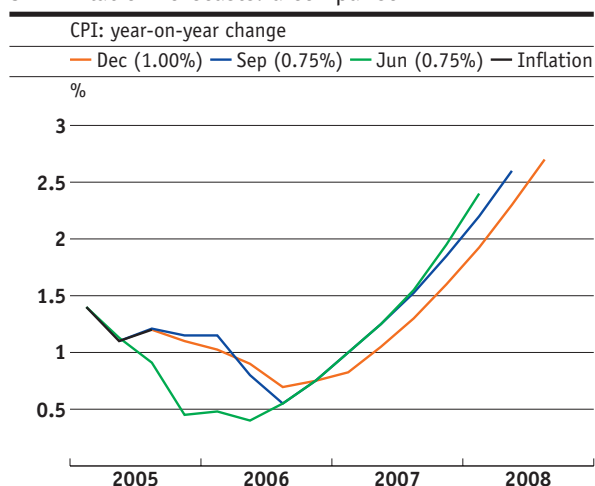
The inflation forecast is derived from the analysis of different indicators, model estimates and the assessment of any special factors. Graph 4.1 depicts the inflation forecast of December 2005 alongside those of September and June. The new forecast extends from the fourth quarter of 2005 to the third quarter of 2008. The June and September forecasts were based on a steady three-month Libor of 0.75%. The latest forecast shows the course of inflation with a three-month rate of 1.0%, the mid-range target value for the three-month Libor of 0.50–1.50%, which was lifted 25 basis points by the SNB on 15 December 2005.

The National Bank expects fourth-quarter inflation to be 1.1%, taking average inflation for 2005 to 1.2%. Annual inflation between the first and the third quarter of 2006 is likely to fall from 1.0% to 0.7%. Assuming a constant oil price of USD 59 a barrel (cf. section 4.1), the contribution of those oil products included in the consumer price index (fuel and heating oil) to the inflation rate will decrease over the course of the year, while the price increases for other goods and services should remain low. With competition remaining stiff in the

retail trade, there remains little scope for price increases, particularly for basic necessities. The SNB expects average annual inflation for 2006 to be 0.8%, which corresponds to the value forecast in September. Had the target range not been lifted slightly, however, inflation would have been somewhat higher. The reason for this can be found in the economic situation, which has developed more favourably than had been anticipated in September. The SNB expects real GDP to increase in 2006 by a good 2%.

As a result of the expansionary monetary policy and the economic upswing, monetary and credit aggregates also recorded a significant increase. The economy is well supplied with liquidity, which poses a risk to price stability in the future. Nevertheless, the new inflation forecast (as of 2007) lies below the previous one. This reflects the dampening effect of December's interest rate hike on inflation. Based on an unchanged three-month Libor of 1.0%, inflation in 2007 is expected to reach 1.2% on average. With inflation picking up from mid-2007, however, and thereby threatening price stability from the second quarter of 2008, it becomes evident that monetary policy at a constant three-month Libor of 1.0% would be too expansionary in the long term. Should the economic upswing continue, therefore, a revision of the monetary policy will be necessary.

Graph 4.1  
SNB inflation forecasts: a comparison



# The economic situation from the vantage point of the delegates for regional economic relations

Summary report to the attention of the Governing Board of the Swiss National Bank for its quarterly assessment of December 2005

The Swiss National Bank's delegates for regional economic relations are constantly in touch with a large number of enterprises from the different industries and economic sectors. Their reports, which contain the subjective evaluations of these companies, are an important additional source of information for assessing the economic situation. The main results of the talks held between September and November 2005 on the current and future economic situation are summarised in this section.



## Summary

The talks held with around 140 companies and industry associations between September and November 2005 yielded a more favourable picture than in the preceding period. The economic upswing seems to have gained momentum and is gradually spreading to the domestic economy. Representatives of the export, financial services and construction sectors were once again extremely upbeat. By contrast, the retail sector remains more cautious about the situation. The tough price competition was stressed in almost all talks.

Overall, investment increased and there was no more talk of a freeze on capital spending. However, tough competition meant the focus was still on modernisation and rationalisation. Nevertheless, investment to increase capacity also picked up. The majority of those interviewed took an optimistic view of 2006. In many cases, this confidence was based on comfortably full order books that will ensure good capacity utilisation well into the new year.

# 1 Production

## Manufacturing

The industrial companies surveyed were upbeat about business trends. They have achieved and in many cases exceeded the – often ambitious – sales targets set for 2005. High capacity utilisation has lengthened lead times. Asia (China), Central and Eastern Europe and the US remain particularly dynamic markets. By contrast, companies are less positive about business with other parts of Europe, although the situation does not seem to have deteriorated further.

Once again, the fastest growing industries included the chemical and pharmaceutical industries, medical technology, biotechnology, electrical and electronic engineering and watchmaking. Business prospects also seem to be brightening in other areas that have so far lagged behind the general upturn, especially general mechanical engineering and vehicle construction. Other areas such as the textile and apparel industry continued to contend with difficult conditions but even these industries were relatively optimistic about 2006.

## Services

The retail sector remained guarded about business trends, but there were isolated indications of a slight improvement. It was felt, however, that consumers were still cautious and price-conscious. Pressure to cut prices was especially prevalent in the wholesale sector. Although sales are surging in the newly created low-price segments, this is taking business away from other segments. Overall, therefore, sales are making little headway. Smaller, speciality businesses targeting the upper price bracket posted very good sales trends, partly thanks to the rebound in the tourist trade.

Despite bad weather and floods in late August, most representatives of the hotel industry felt that the summer season had been satisfactory to good. In many cases, good bookings in the autumn made up for loss of turnover in the summer, at least to some extent. City tourism increased substantially, due not least to rising numbers of visitors from Asia. By contrast, the catering industry still has to contend with tough competition and customer restraint, so it is far more pessimistic about the situation. Both private and corporate clients are still tending to economise, but financial services customers are returning to somewhat more generous spending patterns.

Corporate services – e.g. transportation, telecommunications, logistics and consultancy – registered an upturn in business. The advertising industry also picked up, mainly thanks to lavish advertisements placed by the real estate industry. In fact, advertising as a whole seems to be moving out of recession.

Banks again reported good trends. Mortgages and asset management are still the main sales drivers in this industry. Opinions are divided about trends on the mortgage market, with assessments showing strong regional differences. Some of those interviewed – including representatives of construction and real estate – pointed to local signs of overheating and a clear rise in the risk-tolerance of banks, while others were convinced that the risks were under control.

## Construction

Companies focusing on residential construction continued to rate the outlook as very good and saw little indication that the market would weaken in the near future. Order volumes look set to remain high for the time being and could even increase in some areas. Nonetheless, there was a general awareness that the sharp rise in residential building activity is likely to be followed by leaner times. Construction companies have not really expanded capacity in recent years, so utilisation rates should remain good even if demand tails off. Most of those interviewed in commercial and industrial construction saw little growth in business other than in the retail segment, while opinion on civil engineering remained pessimistic.

## 2 Labour market

Overall, recruitment remained subdued. Many companies only increased staff numbers on a temporary basis. The retail sector is continuing to reduce its headcount. Talks with representatives of a wide range of industries highlighted the substantial shortage of skilled employees, especially those with technical and commercial skills.

## 3 Prices, margins and earnings situation

Although business has picked up, high pressure on prices and margins has remained a dominant topic. In general, higher costs resulting from the rise in energy and raw material prices could not be passed on to customers, leading to a massive drop in revenues in some areas such as transportation (especially air transport). Often companies have endeavoured to offset the reduction in margins by cutting back in other areas. Many suppliers – especially in the food sector – are feeling the impact of the pressure on retail prices. In response to this trend, there was a clear consensus among both industrial and service companies about the need to raise productivity, cut costs and adopt innovative policies to gain access to lucrative lines of business. A few companies had been able to raise prices thanks to buoyant demand for their products, and an increasing number saw scope to increase prices in the coming year.

# Capital regulation of banks: Where do we stand and where are we going?

Robert Bichsel and Jürg Blum, Systemic Stability,  
Swiss National Bank, Zurich

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

For almost two decades now, capital adequacy requirements have been the focus of international banking regulation. After a period of worldwide liberalisation and deregulation, the Basel Capital Accord of 1988<sup>2</sup> ("Basel I") marked the beginning of a new phase of re-regulation with an attempt to bring about an international harmonisation of banking regulations. In June 2004, several years of revising and renegotiating Basel I have led to the endorsement of a new capital adequacy framework ("Basel II"), which is planned to come into effect by 2007. This important milestone is an opportunity for us to take stock of the current state of capital regulation.

The purpose of this paper is threefold. First, we take a step back and address the question of the economic rationale for capital regulation in the banking sector. Second, we give an overview of instruments currently available for determining the minimal level of required capital. And finally we identify three principles which we believe should guide the evolution of capital adequacy requirements in the future.

Our main message is that capital adequacy rules and, more specifically, "risk-weighted capital requirements" are socially desirable. However, risk-measurement and information-asymmetry issues, which are inherent to banking activities, prevent the implementation of first-best capital adequacy rules, i.e., capital requirements that fully and exactly reflect banks' underlying risks. In particular, we stress the fact that the hopes raised by the so-called "full-model approach", according to which risk-measurement issues could be addressed by delegating risk assessment to the banks themselves, are misplaced. A consequence of the inability of capital requirements to fully and exactly reflect banks' underlying risks is that any realistic capital adequacy scheme will leave banks some room for regulatory arbitrage. Acknowledging this, we claim that, as a safeguard against banks exploiting misaligned risk weights and choosing extremely risky portfolios, risk-sensitive capital requirements should be complemented by a capital floor which is independent of banks' risks.

1 We would like to thank Niklaus Blattner, Bertrand Rime, and an anonymous referee for helpful comments and discussions.

2 Basel Committee on Banking Supervision (1988).

## 2 Rationale for capital regulation

This section summarises the main motivation for the regulation of bank capital. After outlining the factors that determine banks' optimal capital structure, we discuss two reasons why banks' voluntary choices of capital structure may differ from a socially efficient structure. In particular, we argue that banks have a tendency to hold too little capital and too much debt. In this context, capital adequacy requirements should be viewed as an instrument to align banks' capital ratios with the socially optimal ones.

### The optimal capital structure of banks

Discussions about capital structure usually start with the seminal result by Modigliani and Miller (1958). They show that under the assumption of perfect markets, the financing choice between debt and equity does not affect the value of a firm, i.e., the financing mix is irrelevant and capital structure is not uniquely determined. This result provides a convenient starting point for further discussions about optimal capital structure. Not because it is realistic, as in reality capital structure clearly can matter, but because it highlights the factors that influence firms' financing choices.

Crucial for the result by Modigliani and Miller is the assumption of perfect, frictionless markets. This assumption implies, in particular, that there are no asymmetries of information and everybody is able to obtain credit at the market rate. In reality, however, there are two important deviations from this frictionless world: taxes and bankruptcy costs.<sup>3</sup> On the one hand, debt provides a "tax shield". As opposed to dividends paid to equity holders, interest paid to lenders is a tax-deductible expense. Therefore, increasing the level of debt lowers the taxes paid by a firm and increases its after-tax payout to debt and equity holders. On the other hand, increasing the level of debt raises the probability of default and thereby the expected bankruptcy costs. In this simple tradeoff theory, a firm will borrow up to the point where the marginal benefit of tax shields is equal to the marginal expected cost of financial distress.

3 These classic deviations were already analyzed by Modigliani and Miller (1958) themselves. In addition, a large body of literature has developed which explores other deviations from the perfect markets paradigm. See Myers (2001) for a survey of the various competing theories of capital structure.

Whatever determines the optimal debt-equity choice of firms in general,<sup>4</sup> there are two main reasons why debt is more attractive to banks than to other firms. First, a considerable share of banks' debt consists of demand deposits and other very short-term liabilities. Since depositors value the high liquidity of these claims, they are willing to accept a lower interest rate than they could receive by investing in less liquid assets. Due to this "liquidity premium", the marginal costs of (short-term) debt are lower for banks than other firms. Second, banks' debt holders are protected by an extensive safety net. Thanks to (explicit) deposit insurance and (implicit) government guarantees, banks' debt is perceived to be relatively safe – independent of the banks' actual risk. This "subsidy" also contributes to a higher preference for debt by banks. Indeed, while additional factors influence the capital structure decision, banks typically have very low capital ratios (see Box).

4 For an extensive survey of the literature on capital structure, see also Harris and Raviv (1991).

### The case for capital regulation

As discussed in the previous section, banks typically choose a positive capital ratio, even on a voluntary basis. Nevertheless, from an overall economic point of view, unregulated banks tend to hold too little capital. Two effects contribute to the divergence of a bank's privately optimal capital ratio from the socially optimal capital ratio.

First, banks fail to give attention to the negative externalities and costs to third parties that would occur if they went bankrupt. While this is true for all firms, it can be argued that the externalities in banking are especially severe. These negative externalities include disruptions to the payments system and a general loss of confidence in the banking system (with possible contagious bank runs on other banks). The reduction of credit due to a banking crisis can slow economic growth and lead to costs in terms of reduced GDP.<sup>5</sup> It is true that banks themselves have an interest in holding capi-

5 For an overview of the costs of banking crises, see Hoggarth and Saporta (2001).

## Box: Banks' capital ratios in perspective

The ratio of capital to total assets for banks worldwide is typically well below 10%. For instance, the two Swiss big banks – which are well-capitalised according to their risk-weighted capital ratios – have (unweighted) capital ratios below 3%.<sup>6</sup> The following comparisons help to put these numbers into perspective:

- Typical capital ratios of firms that are listed on a stock exchange range between 30% and 40%. Large, internationally successful companies such as Nestlé (40%) or Novartis (63%) also have high capital ratios.
- Historically, banks' (unweighted) capital ratios used to be much higher than nowadays. Around 1900, for instance, the capital to total assets ratios of the Swiss big banks were higher than 20% and those of the cantonal banks well exceeded 10%.

- Banks themselves usually consider their own borrowers creditworthy if these borrowers have minimal capital ratios in the order of magnitude of 30%. Depending on other characteristics of borrowers, this limit may be higher or lower.

These comparative figures illustrate that, as a percentage of their assets, banks' capital buffers are extraordinarily thin both from a historical perspective and when compared to other industries. However, this does not necessarily mean that banks' capital ratios are currently *too* low, i.e., below what would be desirable from the perspective of the social optimum.

6 On a consolidated basis, end of 2004. See section 3.2 for a definition of risk-weighted capital ratios.

tal in order to avoid bankruptcy and ensure their continued existence. Due to limited liability, however, they neglect the consequences of their insolvency as described above, and therefore hold too little capital relative to the socially optimal amount that would take these costs into account.<sup>7</sup>

Second, as described in the previous section, part of banks' preference for debt stems from the subsidy they enjoy on their debt. Due to generally underpriced deposit insurance and government guarantees, not all bank debt fully reflects the underlying risks. The costs of this safety net are borne by the deposit insurance, the government, or ultimately the taxpayer. Again, since banks do not take the true total cost of debt into account, they have a tendency to borrow more than socially optimal.<sup>8</sup>

Given the tendency of banks to choose capital ratios that are too low relative to first best, capital regulation can be viewed as an obvious attempt to correct this market failure.<sup>9</sup> By counteracting the described distortions, capital requirements aim to improve overall economic efficiency.

7 See, e.g., John, John and Senbet (1991).

8 See, e.g., Berger, Herring and Szegö (1995). Freixas and Rochet (1997) contains a general overview of the justification for banking regulation and of the adverse effects of the safety net on bank behaviour.

9 Of course, there are other ways to influence banks' behaviour and risk. They include investment restrictions, liquidity requirements, interest rate ceilings, and measures to ensure greater market discipline (e.g., by reducing the financial safety net). See Freixas and Rochet (1997) for a textbook treatment. Here we choose to ignore these instruments and to focus exclusively on capital adequacy requirements.

## 3 Capital adequacy rules

Capital requirements can take different forms. We distinguish three broad classes of capital adequacy schemes: The simple gearing-ratio limit, the traditional risk-weighted capital requirements, and the so-called full-model approach.<sup>10</sup>

### 3.1 Gearing-ratio limit

Imposing a "gearing-ratio limit" (GRL), i.e., setting an upper bound to a bank's debt-to-capital ratio, is probably the most obvious way to prevent a bank from holding excessive amounts of debt. From a prudential regulatory perspective, this instrument has three attractive features. First, a GRL guarantees a minimum buffer that protects a bank against the consequences of losses. The lower the gearing ratio, the bigger the shocks a bank can withstand without failing. Second, a GRL sets the minimum loss that has to be borne by shareholders. This affects the bank's risk-taking behaviour: the lower the gearing ratio, the smaller the moral-hazard effect due to limited liability and hence the smaller the risk-taking incentive – comparable to deductibles in insurance contracts. Third, the GRL is a simple and transparent rule. It is simple for banks to apply, while compliance is easily verified by supervisory authorities and market participants.

At the same time, however, the simplicity of the GRL is also its main drawback. A GRL is a capital adequacy rule which takes only one component of a bank's overall risk profile into account – its leverage. The second component – the riskiness of its assets – is ignored. As a consequence, imposing a GRL may provide an incentive to proceed to risk shifting, potentially leading to a higher risk of default. The underlying mechanism is as follows. From the bank's point of view, the uniform capital requirement imposed by a GRL is too high for very safe assets and too low for high-risk assets. This means that, in the absence of any regulation, a bank would hold less capital against low-risk assets and more capital against high-risk assets. Hence, the bank may be tempted to substitute high-risk assets, which seem relatively cheap in terms of required capital, for low-risk assets, which seem too "expensive".<sup>11</sup>

10 A number of alternative approaches have been proposed, but have only played a limited role in the regulatory discussion. They include the pre-commitment approach (Kupiec and O'Brien, 1995), the supervisory approach (Estrella, 1998), and the base-plus approach (Shepherd-Walwyn and Litterman, 1998). For further reading on capital requirements, see Dewatripont and Tirole (1994) or the survey by Santos (2001).

11 For a formal treatment of this argument, see Kim and Santomero (1988) or Rochet (1992).

As a consequence, the effect of a GRL on a bank's overall risk profile, i.e., its likelihood of failure, will depend on two effects. First, there is the buffer effect, which ensures that – for constant levels of risk – the higher a bank's capital the less likely it is to fail. Second, there is the indirect effect of a GRL on banks' risk-taking incentives. The sign of this second effect is ambiguous. Risk may decrease or increase, depending on the relative magnitude of the limited liability effect (risk reduction) and the asset substitution effect (risk increase). In theory, therefore, the net effect of a GRL on banks' probability of failure is also ambiguous. In practice, however, it is still an open question whether the possibility of a GRL increasing banks' overall risk profile is a plausible scenario or whether it is an unrealistically extreme case.<sup>12</sup>

12 See Bichsel and Blum (2004) for an empirical study of the relationship between risk and capital in banks.

## 3.2 Risk-weighted capital requirements

An obvious way to improve the GRL is to take into account the riskiness of banks' activities when determining the level of required capital. Banks holding more risky assets should be subject to higher capital requirements. This approach is generally referred to as "risk-weighted capital requirements" (RWCR), reflecting the fact that under this scheme, a lower bound to the ratio between a bank's capital and a weighted sum of its assets is defined, whereby a higher weight is attached to riskier assets.

While RWCR are conceptually simple and intuitively appealing, their practical implementation is hampered by a fundamental problem: the measurement of the riskiness of banks' assets. This difficulty stems mainly from the inherent opaqueness of banking activities. Banks are specialised in the financing of projects for which direct access to the capital market is limited as a result of information asymmetries. Outsiders, who do not possess the same information as the banks, are at a disadvantage and are not able to adequately measure the assets' riskiness.<sup>13</sup> As a consequence, the supervisory authority, as an outsider, faces two related difficulties: It has to define risk weights for assets or classes of assets whose risk it cannot measure precisely, and it has to verify whether banks correctly assign their assets to the pre-defined risk classes. This will generally lead to risk weights which do not accurately reflect the underlying risks and hence give rise to "regulatory arbitrage" opportunities: As under a GRL, banks will have an incentive to substitute assets whose risk weights are considered to be too high for assets whose risk weights are too low.

The Basel Capital Accord of 1988 (Basel I), which established internationally harmonised capital requirements, provides a good example of a RWCR scheme which provides room for regulatory arbitrage opportunities. Basel I is characterised by a small number of broad and heterogeneous risk classes. For example, corporate loans are all given the same risk weight of 100% – regardless of borrowers' credit standing and hence regardless of the underlying risk. More generally, under Basel I, risk weights that accurately reflect the underlying risks are the exception rather than the rule. Over time, it has become clear that banks have been finding (and actually exploiting) more and more ways to perform regulatory arbitrage.<sup>14</sup>

13 On the opaqueness of banks, see, e.g., Morgan (2002).

14 See, e.g., Basel Committee on Banking Supervision (1999).



The concern about regulatory arbitrage was the main motivation for revising Basel I. The new capital adequacy framework (Basel II)<sup>15</sup> aims to reduce the scope of regulatory arbitrage by improving the measurement of risk and better aligning risk weights with the underlying risks. The success of the revision appears somewhat mixed. On the one hand, substantial improvements have been made. Under the so-called “standard approach”, the increase in the number of risk classes, the use of external ratings, or the explicit taking into account of credit derivatives and asset securitisation undoubtedly reduce the scope for arbitrage opportunities at a reasonable cost in terms of complication. On the other hand, under the more sophisticated “internal ratings based (IRB) approach”, the degree of complication – and hence the administrative costs – has increased substantially without ensuring that the risk sensitivity of the requirements really improves. This is particularly true of the advanced IRB approach, where capital requirements are based on parameters estimated by the banks themselves (probability of default, exposure at default and loss given default in the banking book). The extended reliance on banks’ own judgment regarding the riskiness of their assets is a two-edged sword.

On the one hand, the reliance on the banks’ own judgment to solve the risk-measurement problem is *a priori* attractive. Banks have an incentive to collect detailed information on their risk profile and are in a better position to do so than outsiders. Therefore, it seems sensible for the supervisor to tap this source of information, in particular for those components of a bank’s portfolio for which no public information is available. On the other hand, however, this approach is problematic for two reasons. First, in most cases it is an illusion to believe that the risk measurement undertaken is really precise. This is due to the fact that the banks themselves often lack the data that would enable them to measure the riskiness of their assets in a satisfactory manner. For instance, data on long-term loans are typically inadequate in terms of volume and frequency for estimating sufficiently precise risk measures. Hence, banks may in good faith underestimate or overestimate the riskiness of their assets. Second, it is difficult for supervisory authorities to validate the information provided by the banks. Based on a given set of data, the supervisory authority will usually be unable to make the crucial distinction between the profile of a risky

bank and the profile of a safe but unfortunate bank. This uncertainty can be systematically exploited by banks.<sup>16</sup> Hence, with the IRB approach, Basel II gives banks a new opportunity for regulatory arbitrage which is potentially more harmful than the one it was supposed to address. We will return to this problem of so-called validation in greater detail in the next section.

To sum up, in theory, capital adequacy rules which take the riskiness of banks’ activities into account are better suited to aligning banks’ capital ratios to socially desirable levels than a simple GRL. In practice, however, the problems associated with the measurement of banks’ riskiness limit the usefulness and applicability of this approach.

16 See Prescott (2004) for a formal treatment of this point.

15 Basel Committee on Banking Supervision (2004).

### 3.3 Full-model approach

A full-model approach to capital regulation takes the logic of RWCR to its extreme. Under this approach, banks calculate their total risk exposure and their required capital based on a model that takes into account all correlations across positions in their entire portfolio. In the process, each position is implicitly given an individual risk weight according to its marginal contribution to the riskiness of the banks' whole portfolio. For regulatory purposes, instead of trying to design a complicated set of rules, supervisors can simply rely on the banks' own calculations. In this case, the main task of the supervisory authorities is to ensure the quality of the models. Specifically, they need to ensure that the models accurately reflect the actual exposures of banks and their underlying risks.

An advantage of this approach is its cost effectiveness. Independent of any regulation, banks determine their risk position and calculate their desired "economic capital" anyway. Furthermore, this approach aligns regulatory capital with economic capital. In contrast to the more or less arbitrary risk weights set by a regulator, the full-model approach is flexible enough to fully reflect the true risk of banks' assets. Hence, portfolio distortions due to wrong risk weights can be avoided.

While a full-model approach seems very attractive at first sight – which might explain the growing number of supporters of this approach – it suffers from three major drawbacks. First, there are problems associated with **missing or inadequate data**. In comparison with RWCR à la Basel II, where only certain parameters have to be estimated by banks, in the context of full models the problems are further aggravated by a virtual lack of data on extreme events and on their correlations. However, in order to determine the default probabilities of banks – and hence the adequate capital requirements – precisely this type of data is essential. The missing data can only be replaced by ad-hoc assumptions whose appropriateness can generally neither be proved *ex ante* nor be falsified *ex post*. As a consequence, banks' models and their risk estimates can deviate substantially from the correct ones. Some banks may systematically underestimate their risk exposure without being aware of it.<sup>17</sup>

Second, the described data constraints pose a formidable challenge for **validation** by supervisory

authorities. Not only are supervisors confronted with the problems that exist in connection with the validation of single parameters (see Section 3.2), they also have to assess the appropriateness of whole models. This represents a difficult task since there is no uniquely correct model and no generally accepted method to measure risk. In addition to testing the banks' models based on the available data, supervisors also have to verify the quality of the data provided by the banks themselves. Given the opaqueness of banks' assets, this is only possible to a limited extent. Overall, it is difficult or even impossible for supervisors to identify a bad model. And it is even more difficult for them to *prove* that a model or a risk estimate is wrong. Hence, banks may be tempted to exploit this uncertainty about the true parameters and models. They may choose their models and assumptions about underlying parameters in order to minimise their required capital.

Third, there is a potential **conflict with the regulatory motive**. Capital regulation is based on the idea that banks hold too little capital on a voluntary basis (see Section 2). Therefore, at least in its pure form, where regulatory capital is set equal to the banks' economic capital, a full-model approach is useless. To take into account the fact that unregulated banks tend to hold too little capital, the regulatory minimum has to be set higher than whatever the banks consider to be their desired economic capital. However, an appropriate mark-up over a bank's economic capital would depend on, for instance, the bank's risk profile and the quality of its risk management. As argued in the previous paragraph, however, such an assessment would be very demanding, both on supervisory authorities and on banks. Even if feasible, the approach would lose much of the cost effectiveness that constitutes its attractiveness.

To summarise, a full-model approach to capital regulation seems attractive because it minimizes distortions due to inappropriate risk weights and because it is compatible with banks' internal capital allocation systems. However, this approach suffers from major drawbacks, most notably those associated with the estimation and validation of banks' models. Until these issues are satisfactorily resolved, a full-model approach does not represent a feasible option for the regulation of bank capital.

<sup>17</sup> As Rebonato (2003, p. S11) has put it: "The percentiles often quoted in the economic capital context (99.75, or 99.90) are virtually impossible to estimate in a statistically robust manner, and of dubious relevance for the purpose of strategic decision-making."

## 4 The future of capital regulation: Three guiding principles

We have argued that, when left on their own, banks have a tendency to hold too little capital and to choose leverage ratios that are too high relative to the welfare-maximising optimum. This distortion is due to banks' limited liability, the presence of financial safety nets, and externalities in the event of bank failures. Hence, capital adequacy requirements are desirable from a collective point of view.

We have stressed that risk sensitivity is a desirable property of capital requirements, i.e., the amount of required capital should be a function of banks' asset risks. However, risk-measurement issues together with information asymmetries restrict the degree of precision in risk measurement that can be achieved and, as a consequence, the precision of risk weights. Furthermore, we have claimed that the risk-measurement problems cannot be solved by fully delegating risk measurement to banks, i.e., by relying on a full-model approach. Based on these observations, we identify three principles on which, in our view, future developments of capital adequacy rules should be based.

### **Principle 1: Optimal capital adequacy requirements are not necessarily perfectly risk sensitive.**

Capital requirements should be risk sensitive. However, the costs as well as the benefits associated with a higher level of precision in risk measurement – and hence in risk sensitivity – should be taken into account when designing capital adequacy rules. On the one hand, improvements to risk-weighting schemes generate decreasing marginal benefits, in terms of both reduced opportunities for regulatory arbitrage and a lower incentive to take advantage of these opportunities. On the other hand, the marginal costs – including design, implementation, compliance, and monitoring costs – related to an improvement of the risk-weighting scheme are positive. Hence, optimal capital adequacy rules reflect the underlying risks only imperfectly – even if perfect risk measurement were possible. For practical purposes this implies that instead of aiming for perfect (but excessively costly) risk weights, it is more important to base future refinements in capital rules on careful cost-benefit analyses.

### **Principle 2: Risk assessment should only be delegated to banks to the extent that banks' assessments can be accurately verified by supervisors.**

From a cost-efficiency perspective, it would be desirable to base capital requirements on banks' own risk assessments. However, while banks generally have an incentive to measure their own risks accurately, they also have an incentive to hold less capital than socially optimal. This creates a conflict of interest for the banks: If they truthfully report their risks to the supervisory authorities, they have to hold more capital than they would if they were free to choose. Banks can only be prevented from understating their actual risks if supervisors are able to verify the banks' reports and impose penalties in case of misrepresentation. As a consequence, capital requirements for a given asset or asset class should be based on the banks' own assessment if, and only if, (i) banks are able to assess the underlying risks adequately, and (ii) the supervisors are able to verify with sufficient confidence whether banks are reporting an appropriate risk measure for the assets concerned. The assumption that banks always behave in a socially efficient manner (against their own interests) and therefore truthfully report their non-verifiable risks, would contradict the motive for capital regulation.

### **Principle 3: Risk-sensitive capital requirements should be complemented by a capital floor which is independent of banks' risks.**

As should be clear from Principles 1 and 2, capital adequacy rules will always be imperfect in the sense that they will always leave banks with some room for regulatory arbitrage. While such imperfections may generally be relatively harmless, they can have serious consequences whenever banks operate at very low levels of capital. First, due to the moral-hazard effects induced by limited liability, the higher a bank's leverage, the higher the discrepancy between the bank's privately optimal level of risk and the socially optimal level of risk. As a consequence, the incentive to take advantage of regulatory arbitrage opportunities and to incur excessive risks will be strongest at low levels of capital. Accordingly, the supervisory authority is most likely to underestimate the true

riskiness of banks precisely when their capital bases are low. Second, the consequences of underestimating the riskiness of banks are particularly damaging when the capital base is low, i.e., when the buffer that protects a bank against the consequences of losses is small. For these reasons, it is essential that optimal risk-sensitive capital requirements be complemented by a capital floor which does not depend on the riskiness of banks' activities.<sup>18</sup> By setting a floor to banks' absolute (unweighted) capital ratio, a limit can be set to the consequences arising out of the shortcomings of a risk-weighted capital requirement scheme.<sup>19</sup>

18 Such a combination of risk-weighted capital requirements and a gearing-ratio limit is in effect in the US. A similar approach is planned in the insurance sector, where the introduction of a sophisticated risk-based capital requirements scheme should be complemented by a simple capital floor. For a discussion of the future solvency framework ("Solvency II") in the insurance sector, see [http://europa.eu.int/comm/internal\\_market/insurance/](http://europa.eu.int/comm/internal_market/insurance/).

19 For a detailed analysis of the combination of risk-weighted capital requirements and a gearing-ratio limit, see Bichsel and Blum (2001).

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# Chronicle of monetary events

## Increase in the target range for the three-month Libor

On 15 December 2005, following its quarterly assessment, the Swiss National Bank increased the target range for the three-month Libor with immediate effect by 0.25 percentage points to 0.50–1.50%. The SNB intends to hold the rate in the middle of the target range for the time being.

## Cosa initiative and indirect counter-proposal

The people's initiative "National Bank profits for Old Age and Survivors' Insurance (AHV/AVS)", better known as the Cosa initiative, which was submitted in October 2002 and demands that the National Bank's net profit be allocated to the AHV/AVS (minus an annual amount of CHF 1 billion to be distributed to the cantons), was blocked for several months in 2005 in the Federal Parliament. On 23 October 2005, a proposal that had been discussed among Federal Council parties was submitted to the National Council's Committee for Economic Affairs and Taxation. This proposal foresees channelling the Swiss Confederation's share in the proceeds from the sale of the National Bank gold reserves no longer required for monetary policy (roughly CHF 7 billion; cf. Quarterly Bulletin 1/2005, p. 61) to the AHV/AVS. Based on this, the Commission drafted a federal act on the use of the Confederation's share of the National Bank gold. The act is seen as an indirect counter-proposal to the Cosa initiative, only entering into force should the people's initiative fail to get a "yes" vote. It was passed by the National Council and subsequently by the Council of States in the December session and approved in both councils in the final vote of 16 December 2005. At the same time, the two councils agreed to recommend that the electorate and the cantons reject the initiative.

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