

Financial Stability Report 2022

SCHWEIZERISCHE NATIONALBANK
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Financial Stability Report 2022

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Foreword

In this report, the Swiss National Bank presents its evaluation of the stability of the Swiss banking sector. The SNB is required to contribute to the stability of the financial system in accordance with the National Bank Act (art. 5 para. 2 (e) NBA). A stable financial system is defined as a system in which the various components fulfil their functions and are able to withstand severe shocks. This report focuses on Switzerland's banks, as experience from financial crises shows that financial stability depends primarily on the stability of the banking sector.

The SNB monitors developments in the banking sector from the perspective of the system as a whole and with a focus on systemically important banks, because the latter have the potential to affect the system at large. The SNB does not exercise any banking supervision and is not responsible for enforcing banking legislation. These powers lie with the Swiss Financial Market Supervisory Authority (FINMA).

This report is divided into five chapters. The executive summary (chapter 1) is followed by chapter 2, which tracks key domestic and global risks to the Swiss banking sector, focusing on credit quality, real estate and stock markets, interest rates, and developments in the international banking sector. Furthermore, the Swiss credit and real estate markets as well as climate risks are discussed in separate subchapters. Chapter 3 gives an overview of the structure of the Swiss banking sector. Chapters 4 and 5 assess the globally active banks (Credit Suisse and UBS) and the domestically focused commercial banks ('domestically focused banks'), respectively. They are analysed separately due to the differences in their size and business model. The three domestically focused systemically important banks (DF-SIBs) PostFinance, Raiffeisen Group and Zürcher Kantonalbank (ZKB) are analysed together with the other domestically focused banks.

The banking statistics used in this report are based on official data submitted and on data published by individual banks. Data on the globally active banks and the DF-SIBs are analysed at a consolidated level. This document is based on data as at 31 May 2022.

1

Executive summary

Macroeconomic environment

In the period following the publication of the last Financial Stability Report in June 2021, economic and financial conditions for the Swiss banking system were favourable until the end of the year. Since then, they have become more challenging, particularly due to the war in Ukraine.

Overall, the economic recovery from the pandemic has continued. GDP has returned to, or even exceeded, pre-pandemic levels in most countries and unemployment rates have receded globally. In this environment, corporate credit rating indicators have improved and non-performing loan ratios have remained low worldwide. In the major economies, residential real estate prices have continued to rise at a rapid pace.

However, since the end of 2021, economic and financial conditions have become more challenging. The economic recovery slowed at the turn of the year due to a renewed wave of the pandemic and a tightening of containment measures in Europe and China. At the same time, inflation has been trending upwards and remains high, and global interest rates have been rising. Against this backdrop, stock prices have come under pressure and have started to decline. Since Russia's invasion of Ukraine in February 2022, energy and commodity prices have surged due to supply disruptions and the effects of economic sanctions. These developments have fuelled fears of a further rise in inflation coupled with a slowdown in economic activity. In this environment, financial market volatility and credit spreads on corporate debt have increased, but they have remained below levels observed during past periods of financial stress.

The global macroeconomic outlook is subject to very high uncertainty. With respect to the war in Ukraine, the SNB's baseline scenario assumes no escalation of the conflict to other regions and no further significant and long-lasting disruptions to western imports of energy goods and other commodities. Under these assumptions, the impact of the war on global economic activity is moderate. As a result, the global economic expansion continues, albeit less dynamically than in previous quarters as the recovery from the pandemic is complete in many economies. Additional headwinds are generated by falling real incomes amid high inflation and by lockdowns in China. Inflation is high in the short term, but recedes thereafter. Global monetary policy normalisation continues. Economic conditions in Switzerland are in line with global developments.

However, significantly worse developments must also be considered. A further escalation of the war or a widening of sanctions could lead to a renewed increase in energy and commodity prices and severe energy supply disruptions. Higher uncertainty could also weigh on consumption and investment. Overall, a further escalation would entail the risk of higher inflation and of an economic slowdown, or even a recession. This could trigger a significant tightening of financial and monetary conditions and a further correction on stock markets.

The uncertainty surrounding the development of inflation, interest rates and economic growth carries risks for financial stability, particularly against the backdrop of the war in Ukraine. Existing vulnerabilities such as stretched valuations in real estate markets in various countries, including Switzerland, add to these risks. Moreover, stock valuations in some markets remain high despite recent corrections, and global corporate and sovereign debt levels rose significantly during the coronavirus pandemic. These factors increase the sensitivity of economies and of real estate and financial markets to adverse shocks.

To capture the risks to the Swiss banking sector, the SNB considers four stress scenarios. The first concerns a protracted recession in the euro area coupled with an extended period of low interest rates (protracted euro area recession scenario). The second describes the impact of high inflation, which triggers a global interest rate shock, a correction in real estate and financial asset prices, and economic stagnation (interest rate shock scenario). The third assumes a global recession coupled with a deterioration in financial market conditions (global recession scenario). The fourth involves a major crisis in emerging economies, comparable with those during the second half of the 1990s (emerging markets crisis scenario).

The first two stress scenarios offer a benchmark for substantially worse-than-expected economic and financial effects of the war in Ukraine. An escalation of the conflict could trigger a recession in the euro area and delay monetary policy normalisation. An alternative path would be that upward pressure on energy prices, other commodity prices and inflation leads to a significant global tightening of monetary and financial market conditions, triggering a correction in real estate and financial asset prices and stalling economic growth.

Globally active banks

Against the backdrop of the economic recovery and the favourable conditions that prevailed on the financial markets until the end of 2021, the two globally active Swiss banks developed differently in terms of profitability. Over the past four quarters, UBS has recorded a strong increase in profits and its return on assets (ROA) has been among the highest it has achieved in the past two decades. By contrast, Credit Suisse's ROA has been negative. This is on the one hand due to extraordinary items, such as provisions for litigation, and on the other to relatively low

operating performance. The latter partly reflects the reduction in risk and exposure of its investment banking unit, which Credit Suisse implemented following the losses associated with the US hedge fund Archegos. For both banks, losses directly related to the war in Ukraine were small, reflecting Credit Suisse's and UBS's limited exposure to Russia and Ukraine.

Credit Suisse and UBS have also fared differently in terms of market-based indicators such as credit default swap (CDS) premia and stock prices. As a result of the risks relating to the war in Ukraine and the sanctions against Russia, the market's assessment of the globally active Swiss banks and their international peers deteriorated overall. However, the market had already been drawing a stronger distinction between the two banks following the Archegos losses, and it continues to have a more positive assessment of UBS than Credit Suisse.

The capital position of both banks has improved further since the last Financial Stability Report. The capital ratios of Credit Suisse and UBS exceed the requirements under the Swiss 'too big to fail' (TBTF) regulations and are above average by international comparison. In the case of Credit Suisse, the improved capital position is attributable to a capital increase and a reduction in exposure, while at UBS it is due to retained earnings.

Thanks to these capital buffers, the two globally active Swiss banks are well placed to face the more challenging environment prevailing since the end of 2021 and to cope with the risks stemming from the war in Ukraine. The direct impact of the war should be limited given the comparatively low exposure of Credit Suisse and UBS to Russia and Ukraine. At the same time, the SNB's stress scenario analysis shows that the loss potential for both banks remains substantial – including under the two scenarios offering a benchmark for significantly worse-than-expected economic and financial effects of the war in Ukraine, i.e. the protracted euro area recession scenario and the interest rate shock scenario.

Taking on risk is an integral part of the banking business. From the financial stability perspective, it is crucial that these risks be backed by sufficient capital. The SNB's stress scenario analysis underlines that the TBTF capital requirements are necessary to ensure adequate resilience at the two globally active Swiss banks.

Domestically focused banks

Against the backdrop of the economic recovery, ongoing pandemic-related support measures and favourable conditions on financial markets, the domestically focused banks' profitability improved slightly in 2021. The banks reported lower provisions for credit losses, their net fee and commission income increased, and they were able to improve their cost efficiency. These developments offset a further decline in these banks' interest rate margins. By historical comparison, their profitability remains low. Going forward, however, profitability should gradually

improve as interest rate margins benefit from the recent increase in long-term interest rates.

As in previous years, the domestically focused banks retained a significant share of their earnings and further built up their capital base. Their risk-weighted capital ratio increased slightly, while their leverage ratio remained broadly stable. Their capital buffers in excess of the regulatory minima are substantial and high by historical comparison.

Sustainable profits and large capital buffers are essential for banks' ability to absorb losses and continue lending during periods of stress. Two sources of risk are of particular relevance for the domestically focused banks in the current environment. First, while their direct exposure to Russia and Ukraine is not material, the war could have stronger and longer-lasting economic effects than are currently expected. This could lead to a deterioration in the quality of domestically focused banks' credit portfolios. Second, domestically focused banks' exposure to the Swiss mortgage and real estate markets has increased further, and growth in their mortgage portfolios has been strong. As regards credit quality, the strengthening of banks' self-regulation in 2020 has led to a further reduction in the share of new mortgages with a high loan-to-value (LTV) ratio in the residential investment property segment. However, affordability risks as measured by the loan-to-income (LTI) ratio have increased in all segments.

The SNB's stress scenario analysis suggests that most domestically focused banks' capital buffers remain sufficient to cover the loss potential stemming from their exposures. This applies both in a scenario involving a severe recession (protracted euro area recession scenario) and a scenario involving a materialisation of risks on the Swiss mortgage and real estate markets (interest rate shock scenario). Under the latter scenario, domestically focused banks would incur substantial losses. However, most of them would be able to absorb these losses and continue to perform their role as credit providers to the real economy thanks to their capital buffers, i.e. without falling below regulatory minima.

The recent reactivation of the sectoral countercyclical capital buffer (CCyB) will first and foremost maintain the banking sector's resilience, and strengthen it where necessary. The SNB will continue to monitor developments on the mortgage and real estate markets closely, and to assess whether further measures are necessary to mitigate the risks to financial stability.

2 Macroeconomic environment

2.1 KEY DEVELOPMENTS

In the period following the publication of the last Financial Stability Report in June 2021, economic and financial conditions for the Swiss banking system were favourable until the end of the year. Since then, they have become more challenging, particularly due to the war in Ukraine.

Overall, the economic recovery from the pandemic has continued. GDP has returned to, or even exceeded, pre-pandemic levels in most countries and unemployment rates have receded globally. In this environment, corporate credit rating indicators have improved and non-performing loan ratios have remained low worldwide. In the major economies, residential real estate prices have continued to rise at a rapid pace.

However, since the end of 2021, economic and financial conditions have become more challenging. The economic recovery slowed at the turn of the year due to a renewed wave of the pandemic and a tightening of containment measures in Europe and China. At the same time, inflation has been trending upwards and remains high, and global interest rates have been rising. Against this backdrop, stock prices have come under pressure and have started to decline. Since Russia's invasion of Ukraine in February 2022, energy and commodity prices have surged due to supply disruptions and the effects of economic sanctions. These developments have fuelled fears of a further rise in inflation coupled with a slowdown in economic activity. In this environment, financial market volatility and credit spreads on corporate debt have increased, but they have remained below levels observed during past periods of financial stress.

Due to the war in Ukraine, the global macroeconomic outlook is subject to very high uncertainty. While the SNB's baseline scenario assumes that the global economic recovery continues, albeit subdued, significantly worse outcomes are possible, including a further rise in inflation and adverse effects on economic activity.

The uncertainty surrounding the development of inflation, interest rates and economic growth carries risks for financial stability, particularly against the backdrop of the war in Ukraine. Existing vulnerabilities such as stretched valuations in real estate markets in various countries, including Switzerland, add to these risks. Moreover, stock valuations in some markets remain high despite recent

corrections and global corporate and sovereign debt levels rose significantly during the coronavirus pandemic. These factors increase the sensitivity of economies and of real estate and financial markets to adverse shocks.

Global economic recovery continues: The economic recovery from the pandemic continued in 2021 but slowed at the beginning of 2022. Thanks to the relaxation of containment measures, and to accommodative monetary and fiscal policies in many countries, global GDP returned to, or even exceeded, pre-pandemic levels and unemployment rates receded globally (cf. chart 1). Russia's invasion of Ukraine – and new waves of infection in many regions in early 2022 causing all large euro area member states and China to tighten containment measures – led to a moderate slowdown in global GDP growth.

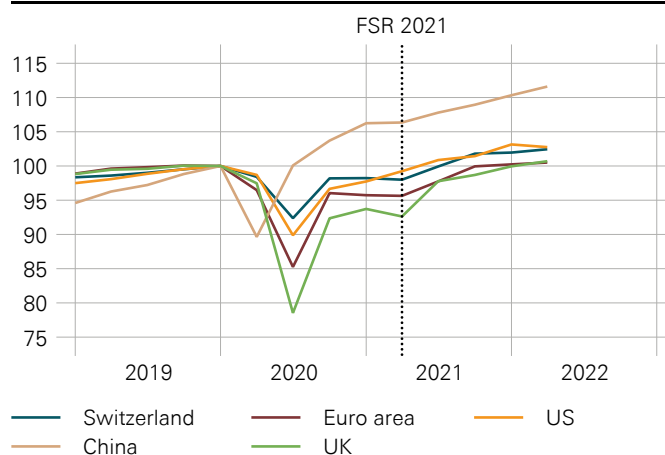
Upward pressure on interest rates as inflation rises more than anticipated: Since the end of 2021, inflation in the major economies has been consistently higher than previously expected, reaching historically high levels in the US and the euro area (cf. chart 2). This occurred as a result of the strong recovery from the pandemic, ongoing supply chain disruptions and rising energy and commodity prices. Russia's invasion of Ukraine pushed up energy and commodity prices further.

Higher-than-expected inflation led to rising interest rates and increased uncertainty about their future path. Since the end of 2021, long-term interest rates and their volatility have increased significantly in the major economies (cf. chart 3). Furthermore, some central banks – for example, in the US and UK – have begun raising their policy rates. Global interest rates remain low by historical comparison, however.

REAL GDP LEVEL

Indexed to Q4 2019 = 100

Chart 1



Source(s): Refinitiv, SNB calculations, State Secretariat for Economic Affairs (SECO)

Moderate deterioration in market assessment of global credit quality: Market-based indicators point to a moderate deterioration in expected global credit quality since Russia's invasion of Ukraine. Corporate credit risk premia were stable over the reporting period until the start of the war, but have since increased moderately (cf. chart 4). They remain well below levels observed during past periods of financial stress. Sovereign credit risk has increased sharply for Russia and Ukraine since the beginning of the war, and moderately for other emerging economies and southern euro area member states (cf. chart 5).

Overall, data on corporate credit ratings (cf. chart 6) and non-performing loans paint a favourable picture of global credit quality. The ratio of rating downgrades to total rating changes has fallen from the highs reached during the pandemic and lies below historical averages.

Furthermore, non-performing loan ratios have remained at low levels.

However, there are significant vulnerabilities that could amplify potential future shocks. In both the sovereign and the corporate segments, global debt relative to GDP increased sharply at the beginning of the pandemic and it has decreased only moderately since (cf. chart 7). The sharp increase in debt levels is partly a result of the public support measures provided during the pandemic. While these measures were successful in mitigating the economic impact of this shock, the resulting higher debt levels imply vulnerabilities in the longer term, particularly in the sectors most affected by the pandemic. A recent example of the vulnerabilities associated with high debt levels is the ongoing restructuring of the Evergrande Group, a large and highly leveraged Chinese real estate developer. Going forward, two opposing effects will influence debt

INFLATION

Consumer prices, year-on-year change

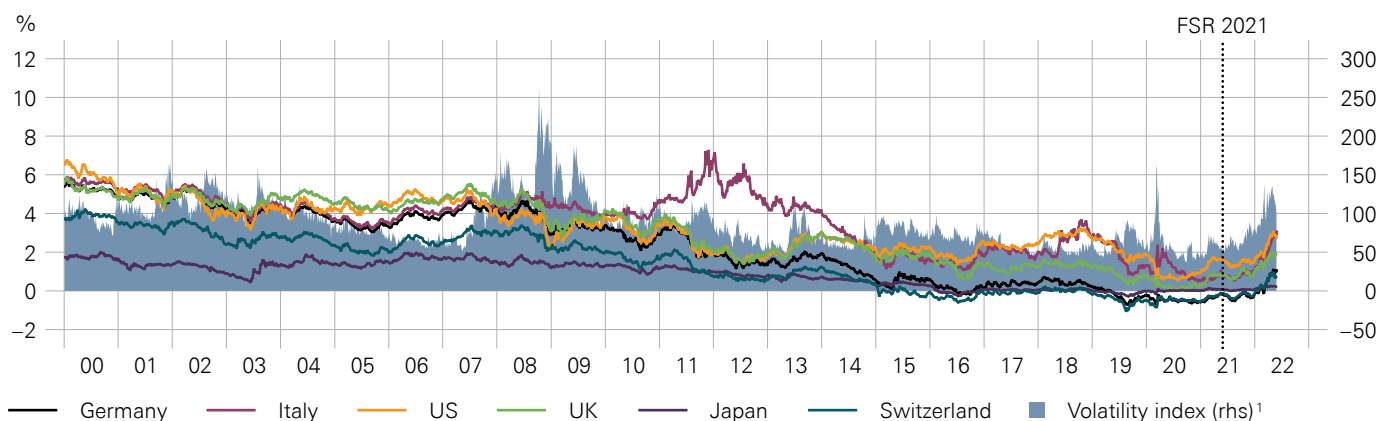
Chart 2



Source(s): Refinitiv, SFSO

LONG-TERM INTEREST RATES: TEN-YEAR GOVERNMENT BONDS

Chart 3



1 The index used is the MOVE Index, which measures the implied volatility of US Treasury options.

Source(s): Bloomberg, Refinitiv

sustainability: on the one hand, the globally high level of inflation will have a dampening effect on debt-to-GDP ratios. On the other, higher interest rates will increase the debt service burden for borrowers.

In Switzerland, too, market indicators such as corporate bond spreads are consistent with a moderate deterioration in expected corporate credit quality. In line with global developments, private debt relative to GDP is high. High household debt relative to GDP, and rising affordability risks as measured by the loan-to-income (LTI) ratio of new mortgage loans, constitute relevant vulnerabilities (cf. subchapters 2.2 and 5.2). As regards backward-looking indicators, non-performing loan ratios remain historically low and indicators for corporate insolvencies are still below pre-pandemic levels, despite recent increases.

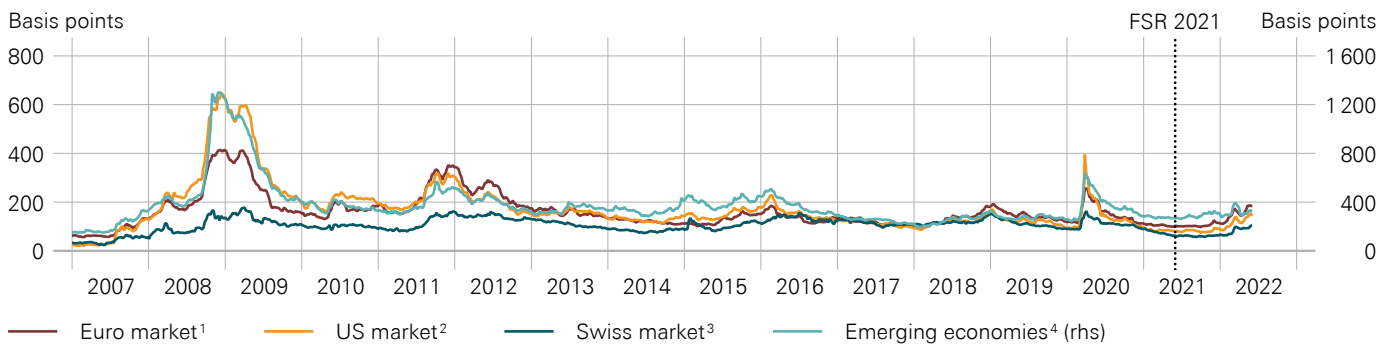
Corrections in global stock prices: The stock market rally underway since spring 2020 came to a halt towards the end of 2021 (cf. chart 8). In an environment where inflation was consistently higher than expected and global interest rates were moving upwards, stock prices started to fall and stock market volatility began to increase. Russia's invasion of Ukraine in February 2022 led to an additional increase in stock market volatility, especially in the euro area. Consequently, global stock prices are currently lower than twelve months ago.

As a result of these corrections, the cyclically adjusted price-to-earnings ratio, a measure of stock valuation, decreased in the major economies (cf. chart 9). However, it still lies significantly above its long-term average in some countries, including the US and Switzerland.

BOND SPREADS

Yield spread between corporate and government bonds

Chart 4



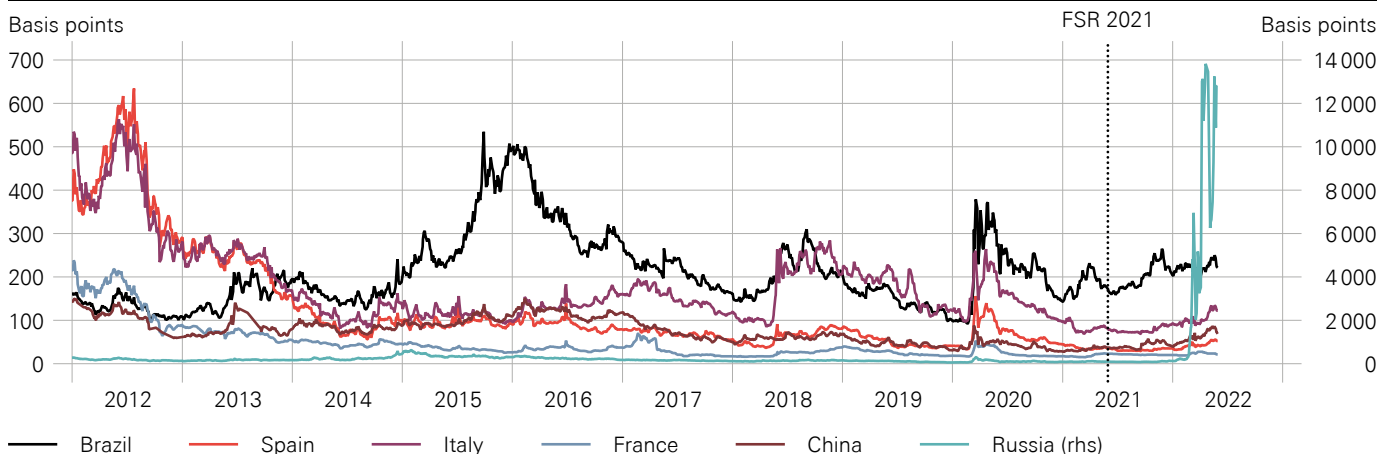
- 1 Euro-Aggregate Corporate (investment grade, 5–7-year maturity, EUR-denominated) and German Government (5–7-year maturity), Bank of America Merrill Lynch.
- 2 US Corporate (investment grade, 5–7-year maturity, USD-denominated) and US Treasury (5–7-year maturity), Bank of America Merrill Lynch.
- 3 Yields for Swiss investment-grade corporate bonds and for Swiss Confederation bonds (5-year maturity), calculated by SNB.
- 4 Emerging Economies Corporate (USD and EUR-denominated), option-adjusted spread, Bank of America Merrill Lynch.

Source(s): Refinitiv, SNB

SOVEREIGN CREDIT DEFAULT SWAP PREMIA

Premia for credit protection (five-year senior)

Chart 5



Source(s): Bloomberg, Refinitiv

Market assessment of global banking sector negatively affected by war in Ukraine: In February 2022, the price of bank stocks fell sharply and volatility increased significantly, reflecting heightened uncertainty about the macroeconomic outlook, elevated inflation and the war in Ukraine. The decline in prices due to the war was more pronounced for bank stocks than for the general stock market, with euro area banks particularly affected. Bank stocks in the euro area and the US are well below the levels observed 12 months ago.

Bank credit default swap (CDS) premia – market indicators of bank resilience – have increased since the end of 2021, reflecting the deterioration in economic and financial conditions, and, in particular, the perceived risks for financial institutions stemming from the war in Ukraine and the associated sanctions (cf. chart 10).

However, they have remained well below levels observed during past periods of financial stress.

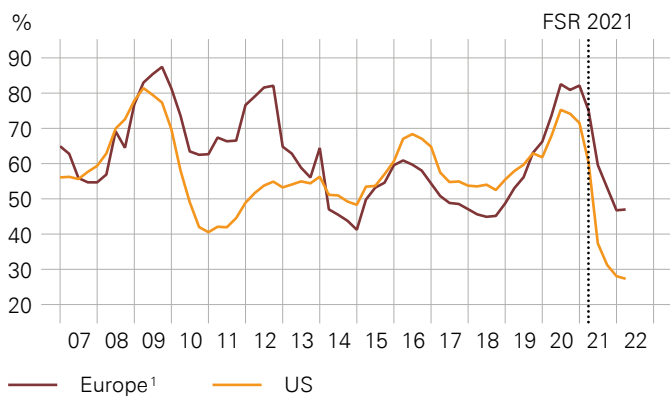
Vulnerable real estate markets: Global real estate prices have risen at a rapid pace over the past year.¹ Overall, the vulnerability of these markets to future shocks has increased.

In residential real estate markets, prices have mostly continued to rise – in many countries at an accelerated pace, outstripping consumer price inflation (cf. chart 11). Besides low interest rates, pandemic-induced higher demand for living space, increased demand from investors, and tight supply have contributed to the rise in residential

¹ Cf. ECB, Financial Stability Review, May 2022, pp. 11, 33–38; Board of Governors of the Federal Reserve System, Financial Stability Report, May 2022, pp. 19–20.

RATING DOWNGRADES RATIO

Number of downgrades relative to total rating changes in non-financial sector, moving average over four quarters Chart 6

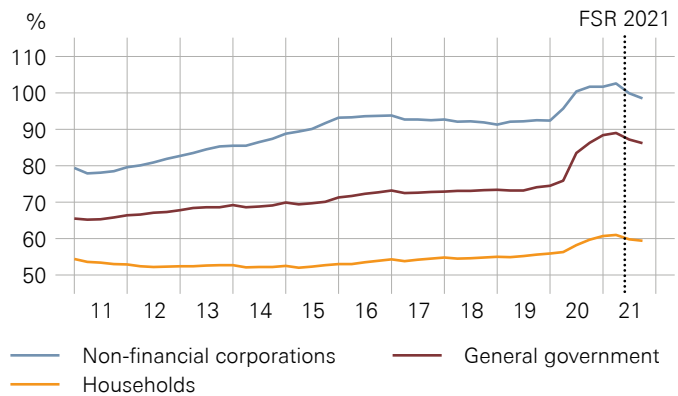


¹ EU-17 countries plus Switzerland, Norway and Iceland.

Source(s): Moody's

GLOBAL DEBT-TO-GDP RATIO¹

Chart 7

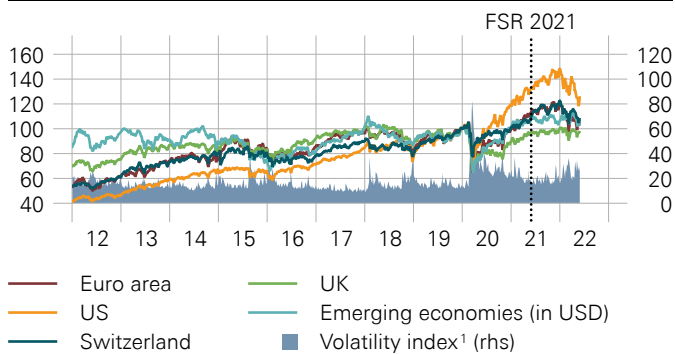


¹ All reporting countries. Aggregate based on conversion to USD at PPP exchange rates.

Source(s): BIS

STOCK MARKET INDICES

Datastream global indices (indexed to 31 Dec 2019 = 100) and volatility Chart 8

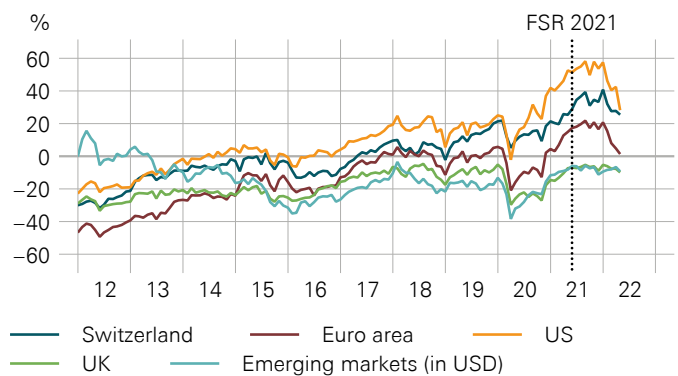


¹ The index used is the Chicago Board Options Exchange Market Volatility Index (VIX), which measures the implied volatility of index options on the S&P 500 (in %).

Source(s): Refinitiv

CYCLICALLY ADJUSTED PRICE-TO-EARNINGS RATIO

Deviation from average;¹ Datastream global indices Chart 9



¹ The average of earnings is calculated using a 10-year moving average. The average of the price-to-earnings ratio is calculated over the period 1985–2021 or for the period where data are available.

Source(s): IMF, Refinitiv

real estate prices.² In the context of these price developments, vulnerabilities in the residential real estate markets of several major economies have increased. The residential price-to-rent ratio, a general measure of real estate valuation, has increased markedly and lies above its long-term average in many countries, including Switzerland (cf. chart 12). More generally, a wide range of indicators, accounting for the impact of factors such as income and interest rates, point to vulnerabilities in many residential real estate markets.³

In the commercial investment segment, developments have varied between countries, locations and property types. In the euro area, commercial real estate markets declined during the pandemic but they have recovered slightly since the end of 2021. However, parts of the market remain vulnerable to further price corrections.⁴ In the US, aggregate commercial real estate prices have continued to rise strongly over the last year and point to high valuation pressure.⁵ Commercial real estate prices in Switzerland have continued to decline.

Overall, the outlook for real estate markets remains uncertain, as neither the impact of future interest rate developments nor the persistence of pandemic-related

2 Cf. BIS, BIS Bulletin, no. 50, Housing market risks in the wake of the pandemic, March 2022.

3 Cf. ECB, Financial Stability Review, May 2022, pp. 35–38; Board of Governors of the Federal Reserve System, Financial Stability Report, May 2022, pp. 19–20; Federal Reserve Bank of Dallas, Real-Time Market Monitoring Finds Signs of Brewing U.S. Housing Bubble, March 2022.

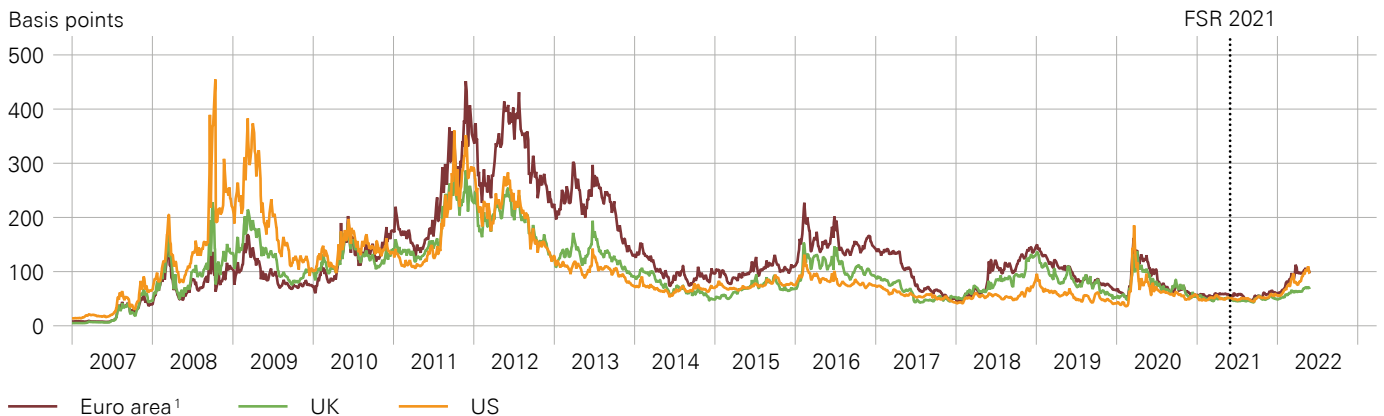
4 Cf. ECB, Financial Stability Review, May 2022, pp. 10, 34–35.

5 Cf. Board of Governors of the Federal Reserve System, Financial Stability Report, May 2022, pp. 9, 17–18.

BANK CREDIT DEFAULT SWAP PREMIA

Average of biggest banks (five-year senior)

Chart 10



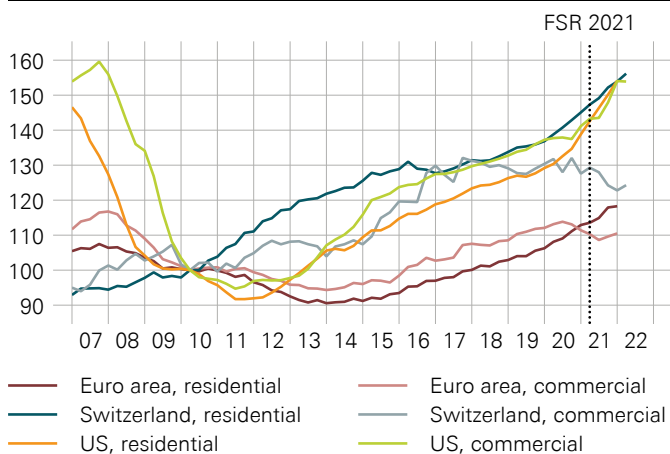
1 France, Germany, Italy, Netherlands and Spain.

Source(s): Bloomberg, Refinitiv, SNB calculations

REAL ESTATE PRICES

In real terms (deflated by total CPI), Q1 2010 = 100

Chart 11

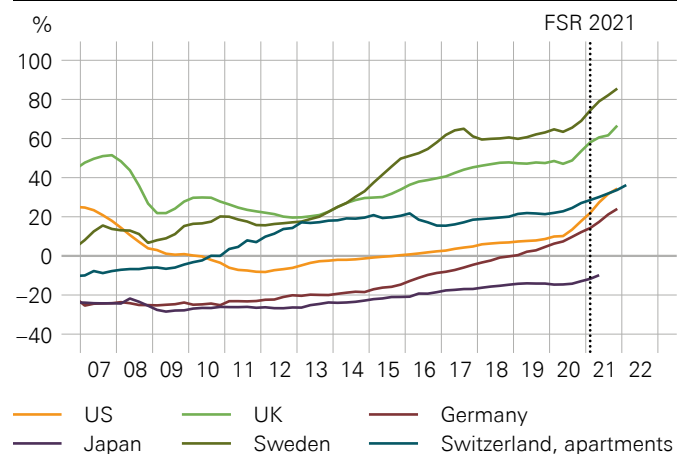


Source(s): BIS, Refinitiv, SFSO, Wüest Partner

RESIDENTIAL PRICE-TO-RENT RATIOS

Deviation from average since 1970

Chart 12



Source(s): OECD, SFSO, Wüest Partner

preference shifts are clear at this stage. Real estate markets are vulnerable to shocks, in particular in countries where price growth exceeds levels that can be explained by fundamental factors.

2.2 SWISS CREDIT AND REAL ESTATE MARKETS

Mortgage volume and residential real estate prices have continued to rise since the end of 2020, driven by strong demand for residential real estate against a backdrop of low interest rates as well as inelastic and tight supply. Pandemic-related shifts in household preferences, and thus in demand, for residential real estate are likely to have contributed to this rise, too.

Vulnerabilities on the mortgage market have declined since the end of 2020 as a result of the swift economic recovery, however they remain higher than before the pandemic overall. At the same time, vulnerabilities on the residential real estate market have continued to increase since the end of 2020, as price growth has exceeded levels that can be explained by fundamental factors such as income and rents.

With increasingly stretched valuations, a market correction becomes more likely. Rising interest rates could lead to a smooth correction in prices, with a corresponding reduction in vulnerabilities. However, the more and the faster interest rates rise, the greater the risk of a large and abrupt real estate market correction, which would expose banks to substantial loss potential. It is essential that banks maintain adequate resilience to cover this risk.

Moderate mortgage growth, strong residential real estate price growth

Year-on-year mortgage growth in the Swiss banking sector as a whole picked up during the first three quarters of 2021, and in Q4 it returned to a moderate level comparable with Q4 2020 (3.3% at end-2021 versus 3.1% at end-2020).⁶ Meanwhile, transaction price indices for single-family houses and apartments indicate that growth on the owner-occupied residential real estate market was strong in 2021; it surpassed the growth recorded in 2020, which had already been strong despite the pandemic. At the end of 2021, year-on-year transaction price growth was 8.3% for single-family houses (end-2020: 5.4%) and 6.7% for apartments (end-2020: 5.1%).⁷ In the residential investment property segment, year-on-year transaction price growth increased to 6.9% for apartment buildings

(end-2020: 3.2%).⁸ Overall, year-on-year growth in Q1 2022 was similar to year-on-year growth in Q4 2021 for both mortgage volume and residential real estate prices.

Vulnerabilities on mortgage and residential real estate markets persist

Vulnerabilities on the mortgage market have declined since the end of 2020, but overall they remain higher than before the pandemic. The decrease occurred despite the temporary pick-up in mortgage growth and can largely be attributed to strong GDP growth amid the ongoing economic recovery. As a result, the mortgage-to-GDP ratio declined compared to 2020, as did the difference, or ‘gap’, between this ratio and its long-term trend – a measure of vulnerability. While the ratio remains higher than before the pandemic, the gap has decreased compared with pre-pandemic levels. Finally, affordability risks, as measured by the LTI ratio of new mortgage loans, increased in all segments (cf. subchapter 5.2.1).

On the residential real estate market, vulnerabilities have increased further since the end of 2020 in all segments. Transaction prices for single-family houses, apartments and apartment buildings rose more strongly than can be explained by fundamental factors, implying increasing vulnerabilities both in the owner-occupied and investment property segments.

For the residential real estate segments, a broad set of indicators currently points to stretched valuations, implying an elevated risk of corrections. Uncertainty regarding the appropriate valuation level of real estate is high, however. For the apartment segment, for example, simple valuation metrics, such as price-to-rent and price-to-GDP⁹ ratios, have reached levels that are about 30–35% above their historical averages (cf. chart 13). According to model-based indicators taking into account a broader set of economic factors (e.g. income and interest rates in addition to GDP and rents), current prices are about 10–35% above their model-implied levels. The upper and lower ends of this range are given by the ‘user cost’ model.¹⁰ This forward-looking metric is sensitive to assumptions regarding the evolution of interest rates and rents over the very long term. For instance, according to this model, and assuming that the real mortgage rate returns to its average for the last 50 years (2.6%, ‘historical average’), market prices for apartments are about 35% above the level that can be explained by fundamental factors. Assuming an

6 The mortgage growth calculations account for corrections made at the bank level. Consequently, they may deviate from information published on the SNB’s data portal, data.snb.ch. Mortgage growth at insurers (excluding reinsurers) amounted to –2.6% in 2021. At pension funds, for which the latest available figures are for the year 2020, mortgage growth was 18%. The overall market share of non-banks, i.e. insurers and pension funds, in outstanding domestic mortgages remained small – at around 3.5% for insurers and around 2% for pension funds in 2020. While the market share of non-banks was somewhat larger when measured in terms of the increase in mortgage volume, banks dominated from this perspective, too.

7 Source: Wüest Partner. According to the Swiss Federal Statistical Office (SFSO) indices, year-on-year price growth at the end of 2021 had accelerated to 8.0% for single-family houses (end-2020: 3.2%) and to 6.7% for apartments (end-2020: 3.1%).

8 Source: Wüest Partner.

9 Given the lagged availability of broad income measures, the vulnerability indicators for the real estate markets presented in this section use GDP as a proxy for income. Available income data do not alter the assessment of vulnerabilities in 2020 and 2021 substantially. According to these data, vulnerability indicators would have increased less in 2020 if household income rather than GDP had been used as a fundamental factor, but they would have increased more in 2021.

10 For a description of the user cost model, cf., for example, Poterba, J. M. (1984), Tax Subsidies to Owner-Occupied Housing: An Asset-Market Approach, *The Quarterly Journal of Economics*, 99(4), pp. 729–752. In the ‘historical average’ version of the user cost model, long-term expectations for the real mortgage rate are set to the corresponding historical average of 2.6%; in the ‘low interest rate’ and ‘very low interest rate’ versions, the expected real mortgage rate is set to 1.5% and 1.0%, respectively.

environment of very low interest rates with a real mortgage rate of 1.0% ('very low interest rate'), the corresponding deviation is slightly over 10%. Moreover, current prices are about 15% higher than the level implied by an econometric model¹¹ that explains real estate prices based on their historical relationship with per capita GDP, the stock of residential buildings per capita and the real long-term interest rate. As can be seen in chart 13, this model's estimates are sensitive to fluctuations in income, such as those observed since the outbreak of the pandemic. Taking the various methods into consideration, current real estate prices are roughly 10–35% above the levels that can be explained by fundamental factors. This range has shifted upwards compared to the end of 2020 and the period before the pandemic.

When interpreting these figures, it is important to bear in mind that they do not capture all demand and supply factors that can impact short and medium-term equilibrium conditions on the residential real estate market. The significant price increases for single-family houses and apartments observed since the outbreak of the pandemic, for example, likely reflect demand shifts colliding with inelastic and tight supply, rather than speculative factors. First, pandemic-related changes in preferences for space or home ownership may have led to an increase in demand. Indications of a stronger preference for space can be seen in an above-average decline in vacancies of larger dwellings and a particularly pronounced increase in prices for second homes. Such changes may have reinforced the demand shift towards owning relative to renting induced

11 For a description of the econometric model, cf., for example, Cuestas, J. C., M. Kukk and N. Levenko (2021), Misalignments in house prices and economic growth in Europe, *Working Papers*, 2021/07, Economics Department, Universitat Jaume I, Castellón, or Muellbauer, J. (2018), Housing, debt and the economy: a tale of two countries, *National Institute Economic Review*, National Institute of Economic and Social Research, vol. 245(1), August, pp. 20–33. A similar model is also used by the ECB (cf. ECB, *Financial Stability Review*, May 2022, p. 34, and ECB, *Financial Stability Review*, November 2015, pp. 45–47).

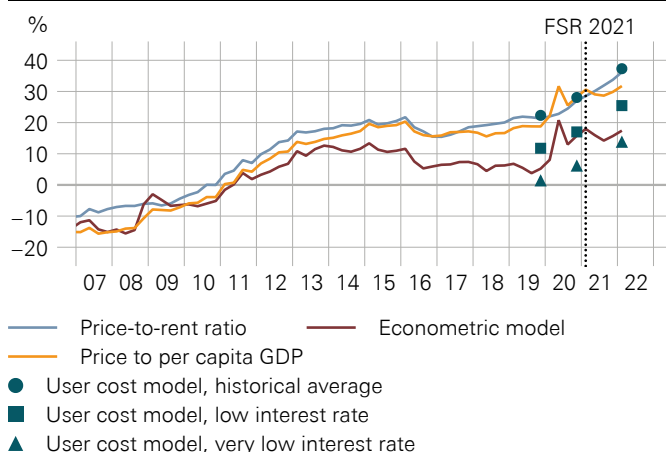
by the low running costs of owning in a low interest rate environment. Second, the search for yield amid low interest rates has shifted investor focus towards the construction of rental units over the last decade. This has further tightened the supply of single-family houses and apartments available for sale; supply had already been constrained in these segments due to the scarcity of construction land – a trend that has been driven by both physical and regulatory factors. If such shifts in demand or supply turn out to be permanent, some of the indicators depicted above may overestimate the vulnerability of the domestic residential real estate market.

However, uncertainty with regard to the persistence of these factors is high. In particular, factors such as demand for home ownership induced by low running costs are likely to reverse in a context of markedly rising interest rates. Overall, the SNB's assessment remains that the residential real estate market is vulnerable. Furthermore, from a risk assessment perspective, it is prudent to assume that the impact of some of the aforementioned factors will prove temporary.

Although vulnerabilities are visible across the residential segments, the residential investment property segment appears to present the greatest risk of price corrections. First, the deviation from levels which can be explained by fundamental factors seems to be highest in this segment. Second, this segment is likely to be particularly sensitive to changes in interest rates. If risk-free rates continue to rise, yields for residential property investments would have to increase from their current low levels in order to preserve a sufficient risk premium. This would require lower prices, higher rents, or a combination of both. Price corrections are likely to play an important role in this context as the decrease in yields observed over the last 20 years has been driven by price increases. Furthermore, scope for raising rents in response to higher interest rates

APARTMENTS: VALUATION INDICATORS

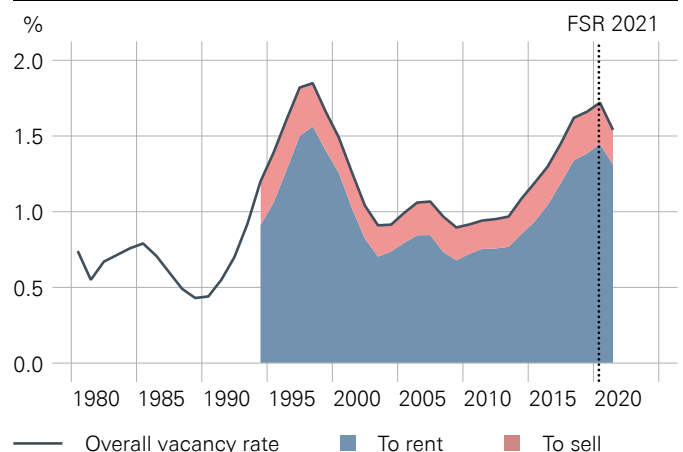
Deviation from indicator-implied price levels Chart 13



Source(s): SECO, SFSO, SNB, Wüest Partner

RESIDENTIAL VACANCY RATE

Vacant dwellings relative to total number of dwellings Chart 14



Source(s): SFSO, SNB calculations

is limited, due to both regulatory factors¹² and the current market situation. The latter is still characterised by above-average vacancy rates in peripheral urban areas, despite a decline in the overall vacancy rate in 2021 (cf. chart 14) and early signals of a gradual tightening of the rental market. Third, commercial investors with limited liability, such as real estate funds, are active in the residential investment property segment. Experience shows that in a downturn, such investors cause quicker and larger losses for banks than private households, where individuals are liable with all their assets.

In the commercial investment segment, developments have continued to be mixed since the end of 2020 and the outlook remains uncertain. While, overall, commercial real estate prices have declined, developments have varied depending primarily on location. For example, in the office segment, tenant demand has been higher in city centre locations than in peripheral urban areas.¹³ Going forward, structural changes, such as the growing importance of working from home or the changing status of brick-and-mortar retail relative to online shopping, will continue to present challenges for the commercial investment segment. In light of these trends, there is uncertainty regarding the preferences tenants will have in the future – for example, regarding the relative importance of location and property-specific features.

Given the vulnerabilities on the mortgage and residential real estate markets, the SNB submitted a proposal to the Federal Council at the end of 2021 requesting the reactivation of the sectoral countercyclical capital buffer (CCyB) at 2.5% of risk-weighted exposures secured by residential property in Switzerland. The CCyB had been deactivated in March 2020 against the backdrop of the coronavirus pandemic, as part of a package of measures by the federal government, the SNB and FINMA aimed at giving banks maximum latitude for lending to companies. Since then, pandemic-related uncertainty regarding companies' access to credit has decreased significantly. The Federal Council approved the proposal on 26 January 2022. As a consequence, capital requirements for domestic residential mortgages will increase as of 30 September 2022. This will help to ensure that banks' resilience is in line with the heightened risk situation.

2.3 CLIMATE RISK

The SNB actively monitors climate-related risks to financial stability. Climate change could affect banks' traditional core business – e.g. as a result of write-downs on loans to particularly exposed companies or trading

losses caused by valuation adjustments in stock and bond markets.¹⁴

There are essentially two key types of climate risk: transition risks and physical risks.

Transition risks are the risks associated with transitioning to a sustainable, low-carbon economy. New laws and regulations as well as technological innovations can lead to upheavals in the economy. For example, a sudden and strong increase in emission taxes or a ban on carbon-intensive production processes could threaten the existence of companies or entire industrial sectors.

Physical risks are risks associated with an increase in the frequency and severity of climate-related natural catastrophes. These natural catastrophes involve weather events (storms, floods, droughts, etc.) as well as longer-term environmental changes (rising sea levels, changes in precipitation, etc.). For example, storms can damage production facilities and infrastructure, leading to declines in economic output.

From a financial stability perspective, the SNB focuses on whether the banking system and systemically important financial market infrastructures are adequately prepared for potential climate-related shocks and whether climate risks are properly covered by existing regulations.

Pilot project in cooperation with FINMA

As part of this work, the SNB, in cooperation with FINMA and the University of Zurich, conducted a pilot project to measure climate-related transition risks at the two globally active banks, Credit Suisse and UBS. The objectives of FINMA and the SNB were twofold: first, to gain experience in climate-related scenario analysis and, second, to obtain an initial picture of the climate-related transition risks these two banks face.

After evaluating a range of methodologies, FINMA and the SNB opted for a scenario analysis approach developed at the University of Zurich. This approach was refined and applied to data supplied by Credit Suisse and UBS.¹⁵ The analysis required a specific data survey at these banks, in which information was collected about business loans, shares and corporate bonds (including derivatives) on their balance sheets.

The approach models sudden changes in the expectations of market participants regarding climate policy measures. The baseline scenario does not feature any new measures. This is compared with the market expectations for alternative scenarios based, for example, on greenhouse gas emissions of net zero by 2050 or a delayed transition

12 While, in principle, rent law establishes a close link between rents and interest rates, overall, lower interest rates have not resulted in decreasing rents since 2008. This will impede rent hikes as, according to rent law, earlier declines in interest rates must be taken into account.

13 Cf. Credit Suisse, Swiss Office Property Market 2022, p. 6.

14 For an overview of climate risks in the context of financial stability, cf. BIS, *The green swan*, January 2020.

15 The approach is based on Battiston, S., A. Mandel, I. Monasterolo, F. Schütze and G. Visentin (2017), A climate stress-test of the financial system, *Nature Climate Change*, vol. 7, pp. 283–288 (2017), and was refined in cooperation with Prof. Battiston.

starting in 2030. The changes in market expectations in these scenarios lead to the revaluation of the financial instruments on the banks' balance sheets. Financial instruments issued by companies that rely on fossil fuels are particularly impacted.

The transition scenarios deployed in the model were developed by the Network for Greening the Financial System (NGFS) and are widely used as benchmarks by supervisory authorities. For comparative purposes, in addition to the University of Zurich approach, an alternative stress test methodology developed by the central bank of the Netherlands, the DNB, was used.¹⁶

The analysis showed that, aggregated across both banks, about a quarter of the portfolios analysed were exposed to climate-policy-relevant sectors. These are classified as 'fossil-fuel', 'transportation', 'utility' and 'energy-intensive'.¹⁷ Compared to the market as a whole (market capitalisation based on data from a major global index provider), the banks' exposures to these sectors are similar or lower.

The analysis conducted in the pilot project provides an initial estimate of transition risk.¹⁸ Further work by FINMA and the SNB will be needed to obtain a more robust assessment of the materiality of climate risks. This relates in particular to how long time horizons should be handled and how the impact of transition scenarios on companies and banks should be measured. There is a wide range of methodologies, each of which produces different estimates.¹⁹ It is therefore important to compare the results of analysis based on these various methodologies. At the same time, analysis performed by other central banks indicates that the assessment of materiality is highly dependent on assumptions regarding the extent to which financial markets – and especially banks – price in climate risk.²⁰ Finally, the scope of the analysis needs to be broadened to cover other bank activities, such as mortgage lending, as well as physical risks. Further studies at international level will play an important role in resolving these issues. FINMA and the SNB will, in close cooperation with the banks, enhance and refine their current approach to measuring climate risk accordingly.

16 Vermeulen, R., E. Schets, M. Lohuis, B. Kölbl, D.-J. Jansen and W. Heeringa (2018), An energy transition risk stress test for the financial system of the Netherlands, *Occasional Studies*, vol. 16, no. 7, De Nederlandsche Bank.

17 The sectors are defined in accordance with the classification of 'Climate Policy Relevant Sectors' in Battiston et al. (2017).

18 In line with its practice for stress tests, and in light of the fact that only two banks were analysed, the SNB does not present in detail the specific results of the stress scenario analysis.

19 Cf. Bingle, J. and Cholesanti Senni, C., (2022), Taming the Green Swan: a criteria-based analysis to improve the understanding of climate-related financial risk assessment tools. *Climate Policy*, vol. 22, issue 3.

20 For example, in its Financial Stability Review 2021, the Deutsche Bundesbank shows that the choice of reference scenario leads to different climate-related transition shocks for German banks. A reference scenario that assumes no further climate transition policies (NGFS scenario 'Current Policies') results in larger shocks for German banks than a reference scenario that already prices in policies that limit the temperature rise to below 2°C by the end of the century (NGFS scenario 'Below 2°C'). Cf. Deutsche Bundesbank, Financial Stability Review 2021, pp.101–102.

Bank disclosures

Transparency on the part of banks regarding their climate-related financial risks is an important element in the assessment of these risks. Both Credit Suisse and UBS disclose various climate-related metrics in their sustainability reports.²¹ In particular, they report corporate loan exposures to climate-sensitive sectors. In absolute terms, Credit Suisse and UBS reported exposure of USD 79.6 billion and USD 37.5 billion, respectively, at the end of 2021.²² These exposures are similar in magnitude to those obtained in the analysis conducted by FINMA and the SNB. Due to the current lack of a common disclosure standard, the definitions of climate-sensitive sectors differ across banks.²³ In relative terms, the shares of these exposures to total loan exposure are 17.4% (Credit Suisse) and 8.2% (UBS). These shares are lower than those calculated in the analysis conducted by FINMA and the SNB, which, as mentioned in the previous section, are about a quarter across both banks. This is due to the fact that FINMA and the SNB relate the climate-sensitive corporate exposures to total corporate loans, while the banks relate them to the entire loan book, which includes, for example, household mortgages.

Activities at international level

At international level, the SNB contributes to the activities of the NGFS to define methodologies and best practices for central banks to assess climate-related risks. Moreover, as members of the Basel Committee on Banking Supervision (BCBS), the SNB and FINMA participate in its work regarding the integration of climate risks into banking supervision. In particular, the Committee is investigating the extent to which climate-related financial risks can be addressed within the existing Basel Framework, identifying potential gaps in the current framework and considering possible measures to address them.²⁴

2.4 MACROECONOMIC AND FINANCIAL SCENARIOS

To capture the different sources of risk to the Swiss banking sector, the SNB considers a baseline and four stress scenarios for developments in the economic environment and in financial market conditions. The baseline scenario reflects the current economic and financial environment and describes the most likely outcome given the information currently available. By contrast, the stress scenarios are designed for systematically analysing the vulnerabilities and resilience of the Swiss banking sector. The SNB periodically estimates the impact of the stress scenarios, irrespective of how likely a given scenario is considered

21 Cf. Credit Suisse, Sustainability Report 2021, p. 137, and UBS, Sustainability Report 2021, p. 57.

22 Both banks also published data at the end of 2020. Exposures were similar, with Credit Suisse reporting USD 83.0 billion and UBS USD 37.5 billion.

23 UBS's sector definition was developed in collaboration with the UN Environment Programme Finance Initiative (UNEP FI). Credit Suisse's sector definition is based on client industry codes used in internal credit risk management processes (NAIC/NOGA) and the sector selection is based on an internal assessment.

24 Cf. BIS consultation paper, Principles for the effective management and supervision of climate-related financial risks, 16 November 2021.

to be in the short term. Each stress scenario covers a subset of relevant risk factors for Swiss banks that are analysed within an internally consistent framework. The calibration of shocks is guided by historical experience.

All of the stress scenarios concentrate on macroeconomic and financial risk factors.²⁵ The impact of the different scenarios on the Swiss banking sector as regards banks' loss potential and resilience is examined in chapters 4 and 5.

Baseline scenario

The baseline scenario assumes no escalation of the war in Ukraine to other regions and no further significant and long-lasting disruptions to western imports of energy goods and other commodities. Under these assumptions, the impact of the war on global economic activity is moderate. As a result, the global economic expansion continues, albeit less dynamically than in previous quarters as the recovery from the pandemic is complete in many economies. Additional headwinds are generated by falling real incomes amid high inflation and by lockdowns in China. Inflation is high in the short term, but recedes thereafter. Global monetary policy normalisation continues. Economic conditions in Switzerland are in line with global developments.

Stress scenarios

Protracted euro area recession: This scenario involves a protracted recession for the euro area. Stock prices drop and corporate spreads widen globally. In many countries, including Switzerland, real estate prices fall significantly. In Switzerland there is also a protracted recession and interest rates remain very low for an extended period.

Interest rate shock: In this scenario, high inflation triggers a rapid rise in interest rates around the globe. Subsequently, economic growth stalls and real estate and stock prices fall sharply.

Global recession: A severe global recession unfolds. Global financial stress rises significantly, and both real estate and stock prices drop sharply. Global interest rates remain low.²⁶

Emerging markets crisis: Emerging economies experience a severe recession with an abrupt rise in domestic bond spreads and a sharp drop in stock prices. The advanced economies experience a mild recession, but major financial stress. Global interest rates remain low.

Benchmarks for risks related to war in Ukraine

The economic and financial effects of the war in Ukraine could be significantly worse than those described in the baseline scenario. A further escalation of the war or a widening of sanctions could lead to a renewed increase in energy and commodity prices and severe energy supply disruptions. For example, a more severe embargo on Russian energy imports, especially on gas, could cause sharp increases in energy prices and shortages in energy supply. Higher uncertainty could also weigh on consumption and investment. Overall, a further escalation would entail the risk of higher inflation and of an economic slowdown, or even a recession. This could trigger a significant tightening of financial and monetary conditions and a further correction on stock markets.²⁷

The protracted euro area recession scenario and the interest rate shock scenario offer a benchmark for substantially worse-than-expected economic and financial effects of the war in Ukraine.²⁸ An escalation of the conflict could trigger a recession in the euro area and delay monetary policy normalisation. An alternative path would be that upward pressure on energy prices, other commodity prices and inflation leads to a significant global tightening of monetary and financial market conditions, triggering a correction in real estate and financial asset prices and stalling economic growth.

²⁵ In addition to the risks covered by these scenarios, operational risks (including legal and cyber risks) can materialise, in most cases independently of the underlying economic scenario.

²⁶ This scenario definition is similar to the 'severely adverse scenario' in the US Federal Reserve's 2022 stress test.

²⁷ For an analysis of the economic consequences of an escalation of the war or a widening of sanctions, cf., for example, State Secretariat for Economic Affairs, Economic Forecasts and Scenarios, 14 March 2022; ECB (2022), ECB staff macroeconomic projections for the euro area, March 2022; IMF (2022), IMF World Economic Outlook, April 2022, pp. 25–26; Deutsche Bundesbank (2022), Potential macroeconomic consequences of the war in Ukraine – simulations based on a severe risk scenario, Monthly Report, April 2022, pp. 13–29.

²⁸ For a stress test analysis that focuses on worse-than-expected economic and financial effects of the war, cf. Bank of Spain (2022), Financial Stability Report, Spring 2022, pp. 62–65 and pp. 105–108.

3 Structure of the Swiss banking sector

The banking sector plays an important role in Switzerland’s economy, as banks are the main providers of essential financial services. These ‘systemically important functions’ include, in particular, the domestic deposit and lending business. Moreover, the banking sector accounts for around 5% of value added in Switzerland, and employs about 107,000 people.

The Swiss banking sector is distinguished by its size, the dominance of a small number of banks and its international integration. At the end of 2021, total banking sector assets stood at roughly CHF 3,900 billion. This is equivalent to about 520% of Swiss GDP – a high ratio by international comparison (cf. chart 15). A look back over the last 25 years shows that this ratio climbed steadily to over 800% until the beginning of the global financial crisis of 2007/08. Then it fell sharply before rebounding a little recently (cf. chart 16). While both the pre-crisis rise and the post-crisis decline are exclusively attributable to foreign assets – especially those held by the two largest Swiss banks, Credit Suisse and UBS – the recent rebound has been driven by an increase in domestic assets. Against this backdrop, domestic employment in the Swiss banking sector has remained relatively stable.¹

1 According to SNB data, between 2005 and 2021, domestic employment decreased slightly from approximately 110,000 to approximately 107,000 on a consolidated basis. Data are only available from 2005 onwards.

The Swiss banking sector can be broken down into three broad categories: (i) the two globally active banks, Credit Suisse and UBS, (ii) the domestically focused banks (DFBs),² primarily comprising regional, cantonal and Raiffeisen banks, and (iii) other banks, which include domestic banks as well as branches and subsidiaries of foreign banks. These three bank categories differ with regard to size, market share in domestic business, and business model.

Of the 228 banks in Switzerland, the SNB has designated five institutions as systemically important for the country.³ Systemically important banks are those whose failure could cause serious damage to the Swiss economy and the Swiss financial system on account of their size, interconnectedness with the economy and financial system, as well as their services which cannot be substituted at short notice.⁴ Due to their systemic importance, they are subject to special regulatory requirements under the Banking Act.⁵ The five systemically important banks are the two globally active banks, Credit Suisse and UBS, and three domestically focused banks, PostFinance, Raiffeisen Group and ZKB. The Financial Stability Board (FSB) has identified Credit Suisse and UBS as global systemically important banks (G-SIBs) ever since the classification was officially introduced in November 2011.

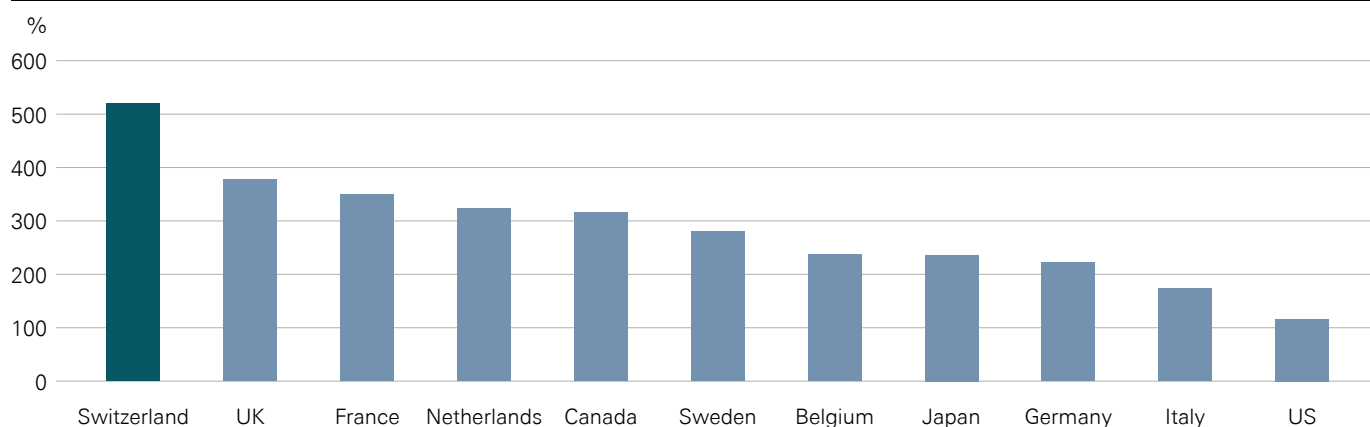
An international comparison shows that the five systemically important banks are large relative to the economy (cf. chart 17). This is particularly true of the two globally active banks, Credit Suisse and UBS. Their total

2 Banks with a share of domestic loans to total assets exceeding 50% or which play a prominent role in the domestic deposit and lending market.
3 At the group level, the highest level of consolidation, there are 228 banks in Switzerland. At the individual bank level, there are 239 banks.
4 Cf. arts. 7 and 8 Banking Act.
5 These special requirements include higher capital and liquidity requirements as well as specific requirements for resolvability in a crisis (cf. art. 9 Banking Act).

BANKING SECTOR SIZE RELATIVE TO GDP, BY JURISDICTION

Ratio of total assets to GDP¹

Chart 15



1 Total assets as at Q4 2020, GDP as at 2019

Source(s): Central bank websites, IMF

exposure,⁶ as a measure of bank size, is roughly 120 to 140% of Swiss GDP, respectively. The three domestically focused systemically important banks (DF-SIBs) are also large relative to the Swiss economy in an international comparison, with total exposure in each case of between 17% and 40% of GDP.⁷

The five systemically important banks play a prominent role in the Swiss banking sector. In terms of total assets, the two globally active banks – Credit Suisse and UBS – dominate, accounting for approximately one-fifth and one-quarter of total banking sector assets, respectively. In the

6 Total exposure is the sum of on and off-balance-sheet positions as defined in the Basel III leverage ratio framework.
7 A comparison of euro area banks to euro area GDP (cf. dark yellow dots in chart 17) serves as a useful alternative benchmark since these banks have access to centralised funding and recapitalisation schemes (cf. www.srb.europa.eu/en/content/srb-banking-union).

domestic deposit and lending business, the three DF-SIBs also play an important role. Together, the five systemically important banks account for more than half of this domestic business (cf. charts 18 and 19). The other domestically focused banks account for roughly one-third. The market share of the ‘other banks’ category is less than one-tenth.

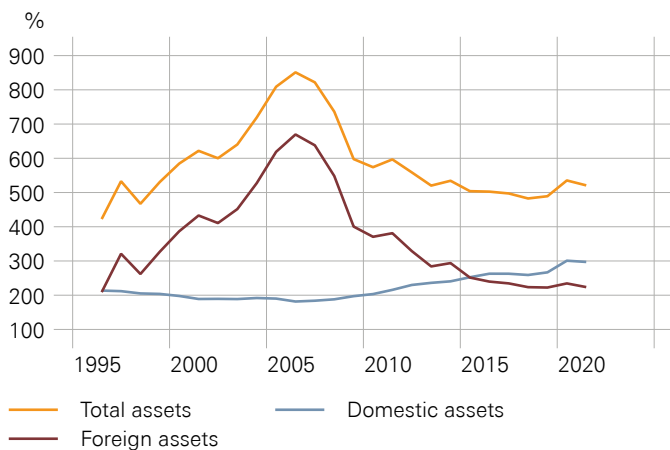
The business models of the three bank categories are very different. The two globally active banks, Credit Suisse and UBS, are universal banks with a large proportion of foreign business (roughly 70% of their respective balance sheets). Both institutions place special emphasis on international wealth management, but they also have substantial operations in domestic deposit and lending business as well as investment banking. While investment banking has been scaled back since the global financial crisis, it continues to make up about one-third of the globally active banks’ total exposure. The revenue structure of these two banks is relatively diversified, with the largest share coming from fee and commission income due to their focus on wealth management (cf. chart 20).

The domestically focused banks concentrate mainly on deposit and lending business, with a special focus on mortgage lending. Interest income is therefore the dominant component of their total revenue. Other sources of revenue play a smaller role (cf. chart 20). Their domestic assets account for about 90% of their total assets.

In the ‘other banks’ category, most institutions focus on wealth management. Accordingly, fee and commission income makes up about two-thirds of their total income. Foreign assets account for slightly more than half of the total assets held by these banks, reflecting their international clientele.

SIZE OF SWISS BANKING SECTOR RELATIVE TO GDP

Ratio of assets to GDP, consolidated Chart 16

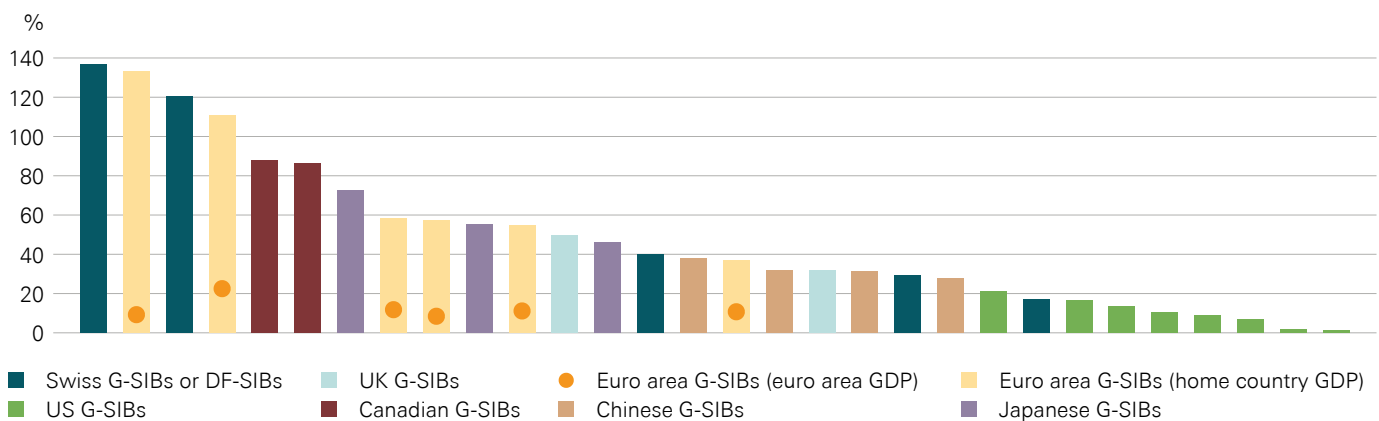


Source(s): SNB

SIZE OF INDIVIDUAL BANKS RELATIVE TO GDP, BY JURISDICTION¹

G-SIBs and Swiss DF-SIBs, ratio of total exposure to GDP

Chart 17

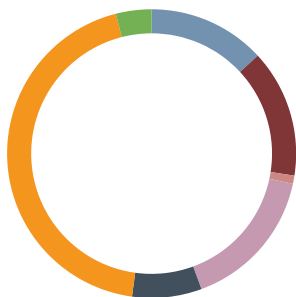


¹ Total exposure as at Q1 2022 except for Swiss DF-SIBs (Q4 2021); GDP averages for 2019, 2020 and 2021 except for Canada (2019 and 2020).

Source(s): Bank disclosures, IMF, SNB calculations

The Financial Stability Report focuses on those banks primarily responsible for providing systemically important functions for the Swiss economy. These are the globally active banks, Credit Suisse and UBS, and the domestically focused banks. These two groups of banks are discussed in separate chapters. The three DF-SIBs – PostFinance, Raiffeisen Group and ZKB – are analysed together with the other domestically focused banks. However, due to their particular importance for financial stability, they are also discussed separately where appropriate. The Financial Stability Report does not provide any further analysis of the ‘other banks’ category as they are less relevant for the domestic banking business and would thus pose fewer potential risks for the Swiss economy in the event of a crisis.

MARKET SHARE DOMESTIC LOANS
2021 Chart 18



— Credit Suisse **13%**
 — UBS **14%**
 — PostFinance **1%**
 — Raiffeisen **16%**
 — ZKB **8%**
 — Other DFBs **44%**
 — Other banks **4%**

Source(s): SNB

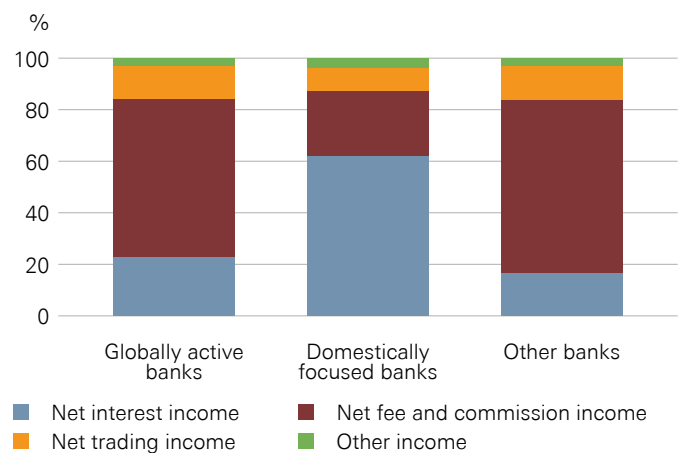
MARKET SHARE DOMESTIC DEPOSITS
2021 Chart 19



— Credit Suisse **14%**
 — UBS **16%**
 — PostFinance **7%**
 — Raiffeisen **15%**
 — ZKB **7%**
 — Other DFBs **35%**
 — Other banks **8%**

Source(s): SNB

REVENUE STRUCTURE
As a percentage of total revenue, 2021 Chart 20



Source(s): SNB

4 Globally active banks

4.1 RESILIENCE

The assessment of the two globally active Swiss banks' resilience comprises two elements: profitability and capitalisation. Sustainable profits are the first line of defence for absorbing losses in a stress event and they help to restore capital – the second line of defence – following such an event.

4.1.1 PROFITABILITY

UBS and Credit Suisse develop differently in terms of profitability

Against the backdrop of the economic recovery and the favourable conditions that prevailed on the financial markets until the end of 2021, the two globally active Swiss banks developed differently in terms of profitability. UBS's return on assets (ROA)^{1,2} in the past four quarters (Q2 2021 to Q1 2022) is among the highest it has achieved in the past two decades, and remains between that of its

European and US peers (cf. chart 21).^{3,4} UBS benefited from a strong increase in revenues compared to those generated in the previous four quarters (Q2 2020 to Q1 2021), in particular due to higher net fee and commission income. By contrast, Credit Suisse's ROA was negative. Its profitability was negatively affected by extraordinary items such as provisions for litigation and a major goodwill impairment.⁵ Moreover, its operating performance (excluding such items) was relatively low due to a significant decline in revenues, particularly in trading, while operating expenses remained stable. The decline partly reflects the reduction in risk and exposure of its investment banking unit, which Credit Suisse implemented following the losses associated with the default of the US hedge fund Archegos. Credit Suisse has stated that its profitability is likely to remain negative in Q2 2022.⁶ For both Credit Suisse and UBS, losses directly related to the war in Ukraine were small,⁷ reflecting their limited exposure to Russia and Ukraine. The sizeable provisions Credit Suisse and UBS had set aside in the previous period for pandemic-related credit risk were partly released.⁸

3 For the international comparison of profitability, the sample is limited to other global systemically important banks (G-SIBs) with a business model that resembles that of the globally active Swiss banks. Specifically, the sample includes, besides Credit Suisse and UBS, the following banks: JP Morgan Chase, Bank of America, Citigroup, Morgan Stanley, Goldman Sachs, Barclays, HSBC, Deutsche Bank, Société Générale and BNP Paribas.

4 The picture is similar when adjustments are made for the differing methods of calculating balance sheet size under the various accounting standards. Banks which calculate according to US GAAP tend to have smaller balance sheets and thus a higher ROA due to more generous netting options. This applies, for example, to the US banks and to Credit Suisse. Total exposure, which is employed for the internationally comparable leverage ratio, adjusts for these differences and yields a similar picture to the simple balance sheet totals used here.

5 In the period from Q2 2021 to Q1 2022, Credit Suisse booked a goodwill impairment mainly relating to the Donaldson, Lufkin & Jenrette acquisition in 2000 of CHF 1.6 billion and litigation provisions of CHF 1.9 billion. UBS's litigation provisions over the same period amounted to USD 1.0 billion.

6 Cf. Credit Suisse's press release 'Credit Suisse provides trading update', 8 June 2022.

7 Losses related to the war in Ukraine in Q1 2022 amounted to approximately USD 0.1 billion at UBS and CHF 0.2 billion at Credit Suisse.

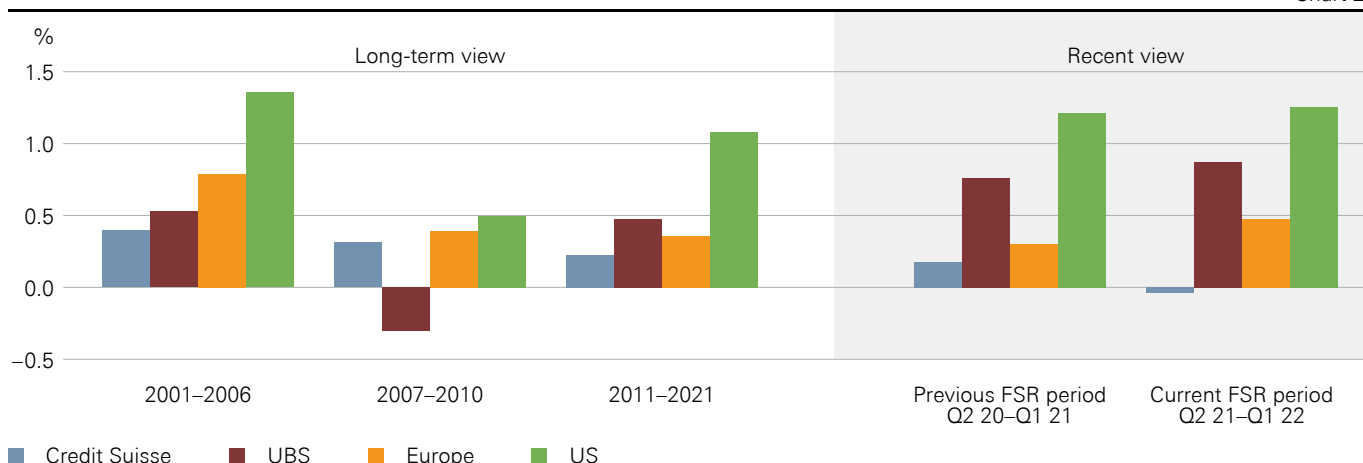
8 Provisions for credit losses comprises all credit loss expenses that are reflected in the profit and loss statement.

1 ROA is defined as pre-tax profit as a percentage of total assets.

2 From a financial stability perspective, profitability metrics that relate profits to the size of the balance sheet are particularly relevant. ROA is such a metric that is widely used and available for a long time period. Profits relative to equity (return on equity, ROE) is a popular metric among investors but has less relevance from a financial stability point of view.

RETURN ON ASSETS (REPORTED PRE-TAX PROFIT AS A PERCENTAGE OF ASSETS)

Chart 21



Source(s): Bloomberg, SNB calculations

The diversified revenue structure of the two globally active banks contributed to their resilience during the pandemic. By international comparison, both institutions exhibit a large share of non-interest income, particularly net fee and commission income (cf. chart 22). This reflects the importance of their wealth management activities. In the view of both banks, the more challenging environment since the end of 2021 may negatively affect client activity.⁹

4.1.2 CAPITALISATION

Regulatory capital ratios improve further

The two globally active Swiss banks have further improved their capital position. At the end of Q1 2022, Credit Suisse's look-through¹⁰ going-concern leverage ratio stood at 5.6% and its going-concern risk-weighted capital ratio at 17.9%. The former has increased by 0.6 percentage points since Q1 2021 and the latter by 1.8 percentage points. This is, on the one hand, due to the decrease of roughly 10% in both leverage ratio exposure and risk-weighted assets (RWA), and, on the other hand, to Credit Suisse issuing short-term mandatory convertible

notes¹¹ to strengthen its Common Equity Tier 1 (CET1) base after the Archegos losses.¹² At UBS, the going-concern regulatory capital ratios increased due to retained earnings and stood at 18.8% (risk-weighted) and 5.5% (leverage ratio) at the end of Q1 2022 (cf. table 1).

With these improvements, the two globally active banks' regulatory capital ratios are above pre-pandemic levels and exceed the look-through capital requirements of the Swiss 'too big to fail' (TBTF) regulations. For UBS, these requirements were raised back to their original level of 5% (leverage ratio) and 14.3% (risk-weighted) at the end of Q3 2021, reflecting an increase in its market share in the domestic deposit and lending business.¹³ This means both globally active Swiss banks are again subject to the same requirements.

In an international comparison, both banks' Basel III risk-weighted capital ratios continue to be well above the average for G-SIBs. Their Basel III leverage ratios are in line with (UBS) or above (Credit Suisse) the corresponding international average (cf. chart 23).

9 Cf. UBS's first quarter 2022 report, p. 11: "While the path of economic growth has become much more uncertain, we expect growth in economic activity to continue, although increased uncertainty may continue to affect client activity levels and asset prices." Cf. Credit Suisse's press release of 27 April 2022, p. 3: "We would expect these market conditions [of heightened volatility] to persist in the coming months. In our Wealth Management business, while revenues should benefit later in the year from the higher interest rate environment, client risk appetite may remain subdued."

10 The analysis in this report focuses on the look-through perspective. In this perspective, eligible going-concern instruments are defined according to the final capital quality requirements of the Swiss TBTF regulations, i.e. after expiry of all transitional provisions. Going-concern capital is made up of Common Equity Tier 1 (CET1) capital and high-trigger contingent capital instruments (HT CoCos) that qualify as additional Tier 1 (AT1) capital. By contrast, in their disclosures the two globally active banks use a grandfathering perspective. In the grandfathering perspective, eligible going-concern instruments are defined according to the regulations currently in force. These allow the temporary inclusion of instruments that are not eligible as going-concern capital under the final TBTF requirements. Specifically, the banks can use low-trigger contingent capital instruments (LT CoCos) with AT1 capital quality up to their first call date in order to comply with the going-concern requirements currently applicable. Credit Suisse and UBS can benefit from this grandfathering perspective until 2024 and 2025, respectively.

4.2 RISK

The two globally active Swiss banks are exposed to four main categories of risk: credit risk, market risk, operational risk and business risk. The first subchapter below describes these risk categories in qualitative terms and, where applicable, illustrates their relative importance using RWA and exposure data. The second subchapter describes the potential impact of stress scenarios on these risk exposures.

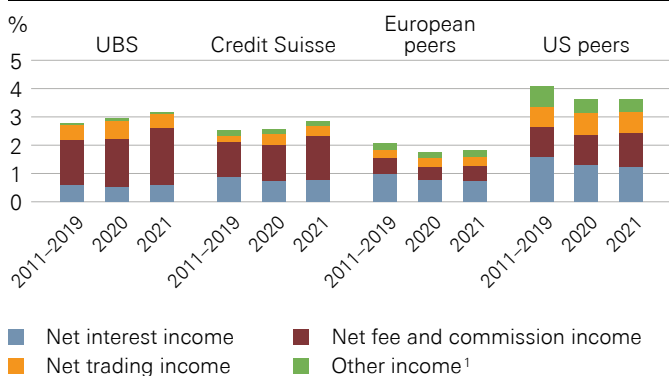
4.2.1 RISK CATEGORIES

Credit risk in various business activities

Credit risk is the risk of loss due to a client or counterparty failing to make contractually agreed payments. At 69%, credit risk makes up the largest share of the globally active Swiss banks' total RWA (cf. chart 24). The banks' credit exposures arise not only from loans on their balance sheets but also from off-balance-sheet positions and counterparty exposures from derivatives and securities financing transactions. All these exposure categories together represent 62% of the globally active banks' total exposure (cf. chart 25).

REVENUE BY TYPE (AS A PERCENTAGE OF ASSETS)

Chart 22



1 Other income includes, in particular, non-interest income from off-balance-sheet operations, such as trust income or income arising from securitisation transactions.

Source(s): Moody's, SNB calculations

11 The mandatory convertible notes were converted on 12 November 2021 (cf. Credit Suisse's Q4 2021 Earnings Release, p. 13).

12 For more details on the Archegos event, cf. Financial Stability Report 2021, p. 24 et seq.

13 The requirement for the TBTF going-concern leverage ratio (risk-weighted capital ratio) of 5% (14.3%) comprises a base requirement of 4.5% (12.9%) plus surcharges for market share and bank size as measured by total exposure. For UBS, these surcharges had declined by 0.125 percentage points (1.4 percentage points) as at 1 January 2020, reflecting a reduction of the bank's market share in the domestic deposit and lending business at that time.

GOING-CONCERN CAPITAL RATIOS AND REQUIREMENTS

Table 1

	Credit Suisse		UBS		Requirement ¹
	Q1 2021	Q1 2022	Q1 2021	Q1 2022	
TBTF CET1 ratios (in percent)					
TBTF CET1 capital ratio	12.2	13.8	14.0	14.3	10.0
TBTF CET1 leverage ratio	3.8	4.3	3.9	4.2	3.5
TBTF going-concern ratios (look-through, in percent)²					
TBTF going-concern capital ratio	16.1	17.9	18.7	18.8	14.3
TBTF going-concern leverage ratio	5.0	5.6	5.2	5.5	5.0
TBTF going-concern ratios (with grandfathering, in percent)³					
TBTF going-concern capital ratio	17.6	19.4	19.6	19.2	14.3
TBTF going-concern leverage ratio	5.5	6.1	5.4	5.6	5.0
Basel III ratios (in percent)⁴					
Basel III CET1 capital ratio	12.2	13.8	14.0	14.3	8.0
Basel III Tier 1 capital ratio	17.6	19.5	19.6	19.2	9.5
Basel III Tier 1 leverage ratio	5.5	6.1	5.4	5.6	3.5
Capital levels (in CHF billions)					
TBTF CET 1 capital	37.0	37.7	38.2	41.2	–
TBTF going-concern capital (look-through)	48.7	48.8	50.9	54.3	–
TBTF going-concern capital (with grandfathering)	53.4	53.2	53.2	55.5	–
Exposure levels (look-through, in CHF billions)					
TBTF RWA	303	274	272	288	–
Of which RWA for credit risk ⁵	218	186	191	203	–
Of which RWA for market risk	22	17	10	13	–
Of which RWA for operational risk	64	70	72	73	–
TBTF total exposure	968	878	982	991	–

1 The capital requirements do not include a countercyclical buffer requirement. The Swiss requirements do not take into account FINMA Pillar 2 capital add-ons.

2 The ratios are calculated based on the final requirements – i.e. the requirements after expiry of grandfathering and all other transitional provisions. As such, going-concern capital consists of CET1 capital and HT CoCos with AT1 capital quality.

3 The ratios are calculated taking into account the grandfathering clause applicable from January 2020: LT CoCos with AT1 capital quality and a first call date after 1 January 2020 are counted as going-concern capital.

4 The requirement for the Basel III CET1 capital ratio comprises the minimum of 4.5%, the capital conservation buffer of 2.5% and the surcharge for global systemically important banks of 1% for both banks. The requirement for the Basel III Tier 1 capital ratio comprises, in addition, a minimum of 1.5% to be met with capital of at least AT1 capital quality. And the leverage ratio requirement comprises the minimum of 3% and the surcharge for global systemically important banks of 0.5% for both banks.

5 Includes non-counterparty-related risks.

Source(s): Bank disclosures, SNB calculations

Table 2 gives an overview of the credit portfolios of the two globally active banks, broken down by counterparty type. The retail portfolio, consisting chiefly of domestic mortgages and Lombard loans,¹⁴ is the largest in terms of exposure. In a risk-weighted perspective, credit exposures to corporate clients, arising from global investment banking and Swiss corporate banking, are more material. The higher average risk weight of corporate credit exposures reflects, in particular, their lower degree of collateralisation.

Since Q1 2021, Credit Suisse has reduced its credit risk RWA by 15%, mainly through active exposure reductions at its investment banking unit. In particular, the bank has exited most of the prime services business in the wake of the Archegos losses. Over the same period, UBS's credit risk RWA increased by 6%, mainly due to higher lending in its global wealth management division (cf. table 1 above).

Market risk relevant despite low RWA contribution

Market risk is the risk of loss arising from movements in market prices. For the two globally active Swiss banks, market risk arises in the context of trading assets and derivatives. Although these positions in the trading book represent 19% of both banks' total exposure (cf. chart 25), their contribution to total RWA is rather limited. At 5%, market risk accounts for a much smaller share of RWA

14 Lombard loans are secured loans or credit lines mainly to private clients in the wealth management segment. They are typically collateralised by security portfolios.

than credit risk (cf. chart 24). The underlying reason for this is that positions in the trading book are often hedged, which reduces their RWA contribution.¹⁵ Market risk RWA exhibit relatively high volatility, driven by changing risk levels or model parameter updates.

Despite its small contribution to RWA, market risk is an important risk category for the globally active banks for two reasons. First, the applied hedging strategies in the trading book may not fully protect against very large market shocks and volatility.¹⁶ To better address market risks observed during stress periods, the Basel Committee on Banking Supervision (BCBS) has recalibrated the regulatory market risk framework for the trading book, which will be implemented as part of the final Basel III reform package. Second, not all market risks that banks are exposed to are subject to the regulatory market risk framework for RWA. Examples in this context include mark-to-market losses on financial instruments in the banking book from equity or credit spread risks.

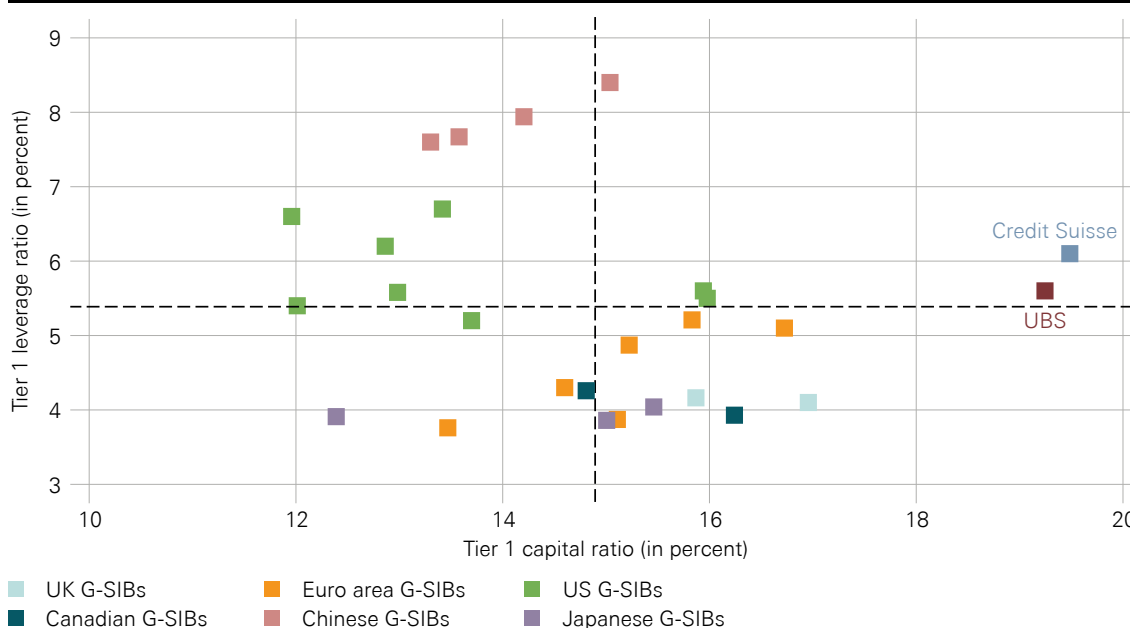
15 Value at risk (VaR), a statistical measure for the short-term loss potential in the trading book and one of the inputs for calculating market risk RWA, is relatively small at both banks due to the hedging of the different trading book positions. At the end of 2021, regulatory VaR (time horizon 10 days and confidence level 99%) was CHF 104 million at Credit Suisse and USD 21 million at UBS (cf. banks' Pillar 3 reports).

16 The mutual hedging of derivatives and trading positions may be impaired by very large market shocks. Previously strongly correlated risk factors may suddenly behave differently in a stress scenario (basis risk). Furthermore, the risk profile of non-linear derivatives may change substantially under such a scenario.

INTERNATIONAL COMPARISON OF TIER 1 CAPITAL¹

G-SIBs, Q1 2022

Chart 23



1 The dashed lines depict the (unweighted) averages.

Source(s): Bank disclosures

Operational risk high by international comparison

Operational risk is the risk of loss due to inadequate procedures, fraud, failed internal systems, or external events. It also includes legal risk and cyber risk.

Operational risk is material at the globally active Swiss banks and reflects, in particular, the complexity of their international business activities. It accounts for 25% of the two banks' total RWA (cf. chart 24). This is high by international comparison,¹⁷ as the operational loss history of both institutions includes several costly legal cases.

Since Q1 2021, operational risk RWA have increased moderately at both banks, mainly due to significant litigation provisions that entered the loss history of the

17 At the end of June 2021, operational risk as a share of G-SIBs' minimum required capital averaged around 14% (cf. Basel III Monitoring Report, February 2022).

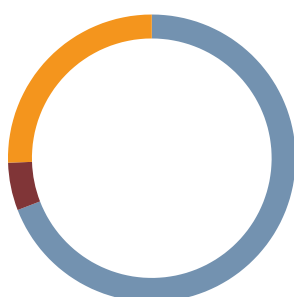
banks' RWA models (cf. table 1). While litigation risks have been most relevant in a historical perspective, cyber risks are a growing concern in a forward-looking perspective. The BCBS and FINMA consider cyber-related threats as one of the key emerging risks for financial institutions.¹⁸ Since the outbreak of the pandemic, the trend towards remote working arrangements and the provision of financial services through digital channels has accelerated, offering additional points of access to banks' systems. The banks' growing reliance on technology-based services provided by third parties is a further emerging operational risk.¹⁹ Since the beginning of the war in Ukraine, the risk of cyberattacks may also have increased.

18 Cf. BCBS's newsletter of 20 September 2021 and FINMA's 2021 annual report.
19 Cf. BCBS, Principles for Operational Resilience, March 2021.

BREAKDOWN OF RWA

Globally active banks as at Q1 2022

Chart 24



— Credit risk **69%**
— Market risk **5%**
— Operational risk **25%**

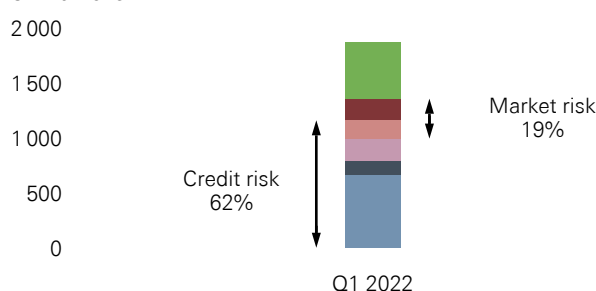
Source(s): Bank disclosures, SNB calculations (weighted average)

BREAKDOWN OF TOTAL EXPOSURE

Globally active banks as at Q1 2022

Chart 25

CHF billions



■ Loans on balance sheet ■ Off-balance-sheet positions
■ Securities financing transactions ■ Derivatives
■ Trading positions
■ Other assets (mainly cash and balances at central banks)

Source(s): Bank disclosures, SNB calculations

CREDIT PORTFOLIOS OF THE GLOBALLY ACTIVE BANKS¹

Q4 2021, in CHF billions

Table 2

	Credit Suisse			UBS		
	Exposure	RWA	Average risk weight	Exposure	RWA	Average risk weight
Sovereign exposures	163	2	1%	218	4	2%
Exposures to banks and institutions	32	9	28%	49	14	28%
Corporate exposures	155	82	53%	167	85	50%
Retail exposures	203	35	17%	376	57	15%
Of which residential mortgages ²	115	20	17%	155	33	21%
Other exposures	15	13	88%	12	12	95%
Total	569	141	25%	822	171	21%

1 Includes credit risk and counterparty credit risk but excludes exposures to central counterparties.

2 Excludes mortgages under the standardised approach.

Source(s): Bank disclosures (converted from USD to CHF for UBS), SNB calculations

During the last year, several reports and proceedings highlighted different types of operational risks to which the globally active banks are exposed. Credit Suisse published a report on an external investigation into the case of Archegos, finding several failures with regard to risk management and control processes,²⁰ and answered shareholders' questions relating to the Greensill matter.²¹ FINMA concluded its proceedings against Credit Suisse regarding loans to Mozambique, finding shortcomings in risk management and serious violations of anti-money laundering reporting obligations.²² UBS was found guilty by the French Court of Appeal of laundering the proceeds of tax fraud relating to its cross-border business between 2004 and 2012.²³ UBS AG has filed an appeal against this verdict.

Against this backdrop, it is important that the globally active Swiss banks remain subject to adequate capital requirements for operational risks, reflecting their risk profile. Under the new Basel III standardised approach, capital requirements for operational risks are proportional to an internal loss multiplier, which depends on a bank's loss history over the last ten years. This multiplier is essential for the risk sensitivity of the new approach and incentivises banks to reduce and properly manage operational risks. The SNB supports the implementation of this new standardised approach in Switzerland in its default form, i.e. without invoking the national discretion of setting the internal loss multiplier equal to one.

Business risk relevant due to large fee and commission income component

Business risk refers to the risk of reduced revenues due to a drop in business volume or client activity. While there is no specific RWA requirement for business risk, it plays an important role for the globally active Swiss banks due to their wealth management and investment banking activities. For instance, a severe financial market shock, followed by a slow recovery and ongoing uncertainty, could reduce both the value of assets under management and the demand for client transactions. As a result, fee and commission income would decrease. In the current environment, business risk could materialise if stock prices fell due to a global rise in interest rates or if market participants postponed transactions due to uncertainty regarding geopolitical conflicts.

War in Ukraine increases risks

The globally active banks' direct credit exposures to Russia and Ukraine are limited. At the end of Q1 2022, UBS and Credit Suisse each disclosed net credit exposures to Russia of approximately CHF 0.4 billion, mainly from loans, derivatives and trade finance. These exposures have been reduced since the beginning of the year and are small compared to exposures disclosed by other European

G-SIBs.²⁴ Losses related to the war in Ukraine in Q1 2022 amounted to approximately USD 0.1 billion at UBS and CHF 0.2 billion at Credit Suisse. Net assets in Russian subsidiaries were USD 51 million at UBS and approximately CHF 0.2 billion at Credit Suisse at the end of Q4 2021. Moreover, credit risk exposures to Ukraine are not material for the globally active Swiss banks.

While direct credit exposures to Russian counterparties are limited, the war in Ukraine and the related sanctions against Russia have affected the global commodity trading sector – a significant industry sector in Switzerland.²⁵ Prices and volatility in the global commodity markets have increased sharply since Russia's invasion of Ukraine, leading to higher margin requirements and higher liquidity needs for commodity trading firms. Moreover, the global sanctions against Russia have further increased the complexity and risks involved in the commodity trading business. The globally active Swiss banks, like other large banks, provide transaction financing and credit facilities to commodity trading firms. The gross credit exposures to these firms are sizeable but they are secured by collateral to a large extent.²⁶

Despite the limited impact the war in Ukraine has had on the globally active banks so far, further escalations and spillover effects of this conflict could expose them to complex and material risks.²⁷ The rapidly evolving sanctions imposed by numerous countries against Russian individuals or entities increase the complexity of the banks' operations and could also limit the banks' ability to settle outstanding transactions with Russian counterparties. Ultimately, the war in Ukraine could trigger severely adverse macroeconomic and financial scenarios beyond the conflict region; these are discussed in the following subchapter.

4.2.2 IMPACT OF STRESS SCENARIOS

Loss potential remains substantial under stress scenarios

The SNB focuses on the macroeconomic and financial stress scenarios described in subchapter 2.4 when assessing the magnitude of the globally active banks' risk exposure and loss potential. The loss potential under these stress scenarios continues to be substantial.

20 Cf. Credit Suisse's press release of 29 July 2021.

21 Cf. Credit Suisse's press release of 4 April 2022.

22 Cf. FINMA's press release of 19 October 2021.

23 Cf. UBS's press release of 13 December 2021.

24 Société Générale disclosed total exposure to Russia of EUR 19 billion at the end of 2021; the bank reduced this to EUR 3 billion in Q1 2022 by ceasing its banking and insurance activities in Russia. UniCredit disclosed total exposure to Russia of EUR 7 billion at the end of April 2022.

25 According to statistics published by the Swiss Federal Statistical Office (SFSO), some 900 firms in Switzerland are engaged in commodity trading, employing almost 10,000 staff. Cf. SFSO's press release of 8 March 2021.

26 The size of UBS's commodity trade finance portfolio was USD 9 billion as at 31 March 2022 (cf. UBS's first quarter 2022 report). The size of Credit Suisse's portfolio was USD 9 billion as at 31 December 2021 (cf. Credit Suisse's 2021 sustainability report).

27 Cf. also Urban Angehrn's speech at FINMA's annual press conference, 5 April 2022.

The loss potential is highest under the global recession scenario, which combines a deep recession in the advanced economies with severe stress on the global financial markets. The main contribution to the loss potential in this scenario is credit losses from corporate loan portfolios and counterparty exposures in investment banking, as well as from retail and corporate loan portfolios in Switzerland. Business risk also plays an important role in this scenario, as the severe market shocks reduce client assets and client activity, leading to lower fee and commission income. These market shocks also result in significant mark-to-market losses on fair-valued credit, securitisations, and equity positions.

The protracted euro area recession, interest rate shock, and emerging markets crisis scenarios have a smaller but still substantial impact on the globally active banks. The losses in these scenarios originate from the same risk categories

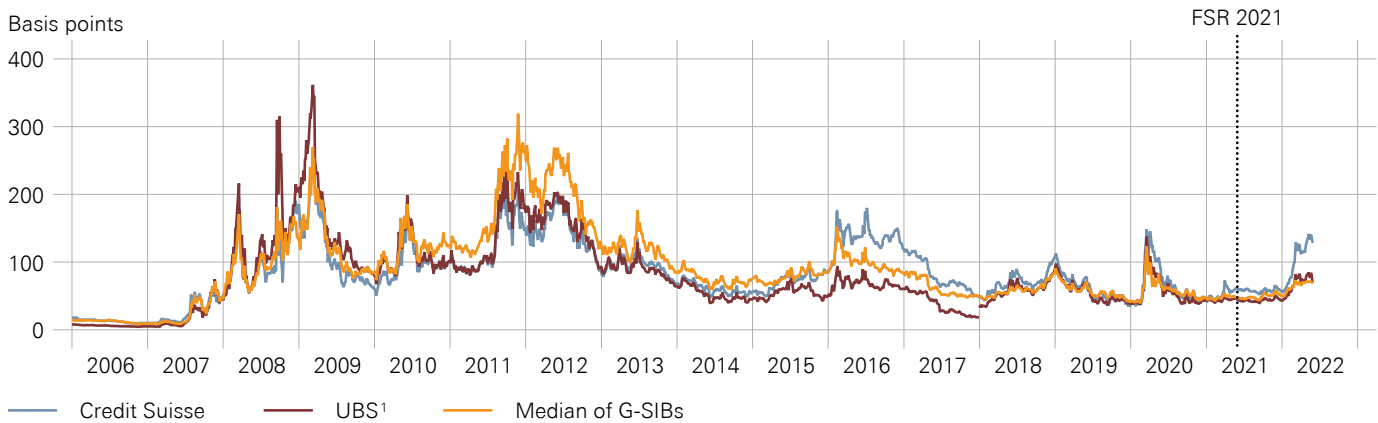
as described for the global recession scenario, but their relative contributions depend on the characteristics of the scenario concerned. In the emerging markets crisis scenario, for example, mark-to-market losses and business risk play a particularly important role due to the very severe financial market stress, whereas credit losses in advanced economies are less pronounced.

As discussed in subchapter 2.4, the protracted euro area recession and interest rate shock scenarios offer a benchmark for the economic and financial effects of the war in Ukraine being substantially worse than expected. In the protracted euro area recession scenario, credit losses from corporate exposures in Europe are particularly pronounced. This scenario also captures the impact of the hypothetical default of a major counterparty in the context of stressed financial markets. The interest rate shock scenario leads to substantial losses in Swiss mortgage and

INTERNATIONAL COMPARISON OF CDS PREMIA

Premia for credit protection (five-year senior)

Chart 26



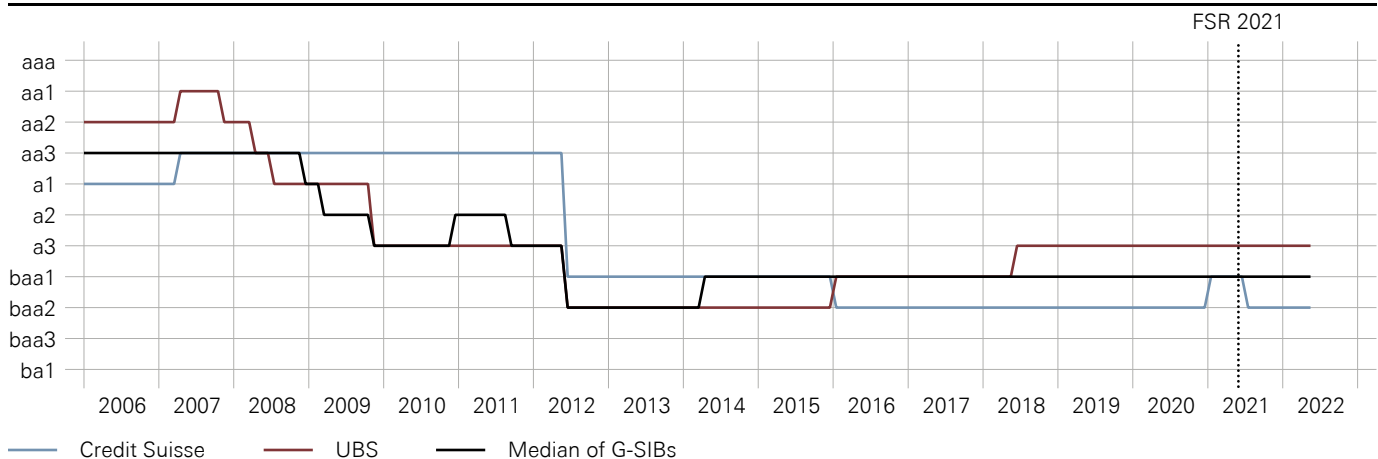
1 Up to end-2017, at operating company level (UBS AG); from 2018, at holding company level (UBS Group AG).

Source(s): Bloomberg, Refinitiv

INTERNATIONAL COMPARISON OF STAND-ALONE RATINGS

Moody's, baseline credit assessment

Chart 27



Source(s): Bloomberg, Moody's

corporate loan portfolios. Moreover, business risks materialise as the stock market correction puts fee and commission income under pressure.

The results of the stress scenario analysis indicate that, thanks to their capital buffers, the two globally active Swiss banks are well placed to cope with severely adverse developments in economic and financial conditions. Independently of macroeconomic or financial shocks, material losses can also result from operational risk, particularly legal risks. Overall, the analysis underlines that the TBTF capital requirements are necessary to ensure adequate resilience at these two banks.

4.3 MARKET ASSESSMENT

Gap between the two globally active Swiss banks widens

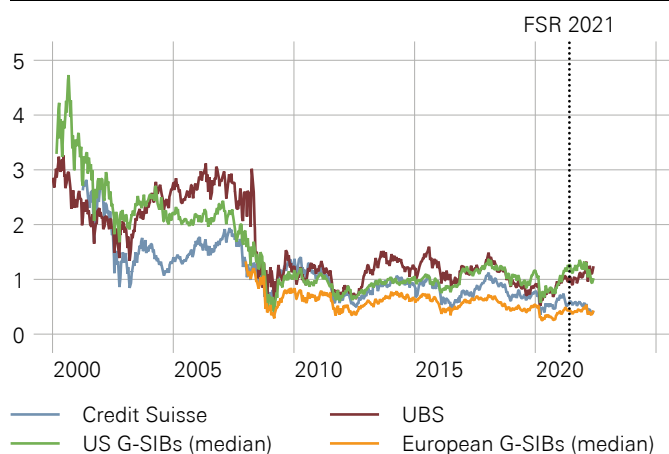
Market-based indicators provide a complementary assessment of the two globally active Swiss banks' resilience, in addition to regulatory capital ratios and profitability metrics. Since last year's Financial Stability Report, the gap between UBS and Credit Suisse has widened both regarding their credit default swap (CDS) premia and stock market valuations.

CDS premia reflect the market's assessment of a bank's creditworthiness. The greater the perceived credit risk, the higher the premium on a given CDS.²⁸ As has been the case for the other G-SIBs, the CDS premia of both globally active Swiss banks have increased since the end of 2021, reflecting the deterioration in economic and financial conditions, and, in particular, the perceived risks

²⁸ It is important to note, however, that market prices include market expectations of government support in a crisis (TBTF issue). CDS premia thus reflect the market's view of the likelihood that the underlying credit will be repaid. It is irrelevant whether the investment is repaid by the bank or by a third party such as the government.

MARKET CAPITALISATION OVER TOTAL EQUITY

G-SIBs Chart 28



Source(s): Bloomberg

for financial institutions stemming from the war in Ukraine and the associated sanctions. However, CDS premia have remained well below the levels reached in the global financial crisis and the euro area debt crisis. Based on CDS premia, the market considers that Credit Suisse presents a higher risk than UBS. In an international comparison, CDS premia for UBS are currently in line with the G-SIB median, whereas those of Credit Suisse are higher (cf. chart 26).

Banks' creditworthiness is also reflected in the stand-alone ratings of the three major rating agencies, Moody's, S&P and Fitch. These evaluate the intrinsic financial strength of the banks, assuming no extraordinary external support.²⁹ The stand-alone rating of UBS is unchanged, while that of Credit Suisse is lower compared to last year's Financial Stability Report.³⁰ The stand-alone rating of UBS is slightly above the G-SIB median, while that of Credit Suisse is slightly below (cf. chart 27 for an international comparison based on Moody's stand-alone ratings).

Stock market valuation can be measured using the ratio of market capitalisation over book value of total equity (cf. chart 28). The war in Ukraine led to a decline in the stock market valuation of the two globally active Swiss banks, comparable with that of the other G-SIBs. In the case of UBS, the decline was only temporary. UBS's stock market valuation continues to be higher than that of Credit Suisse. Since last year's Financial Stability Report, the gap between Credit Suisse and UBS in terms of the stock market valuation has widened. UBS's valuation is above the median for US G-SIBs, whereas Credit Suisse's is close to the median for European G-SIBs.

The observed differences in stock market valuation between the globally active Swiss banks and their international counterparts primarily reflect differences in expected profitability. Chart 29 plots the metric for stock market valuation (market capitalisation over book value of total equity, y-axis) against a metric for profitability (return on assets, x-axis).³¹ It shows that the stock market valuation is correlated with profitability. The stock market valuation of the globally active Swiss banks is broadly in line with this observation.

²⁹ In addition to stand-alone ratings, the agencies issue long-term credit ratings, which explicitly factor in the possibility of extraordinary government support ('government support uplift') in the event of a crisis. At holding company level, the three major rating agencies removed this government support uplift a few years ago. At the operating company level, S&P and Fitch have also removed the government support uplift, while Moody's continues to assume that the globally active Swiss banks – alongside most other G-SIBs in Europe and the US – benefit from a 'moderate probability of government support' resulting in a 1 notch rating uplift on their deposits and senior unsecured debt.

³⁰ UBS: Moody's, S&P and Fitch rate the creditworthiness of UBS as unchanged compared to last year's Financial Stability Report. Credit Suisse: Moody's, S&P and Fitch rate the creditworthiness of Credit Suisse as lower (-1 notch) compared to last year's Financial Stability Report.

³¹ A similar picture emerges if the ratio of market capitalisation to CET1 capital is used as a measure of stock market valuation and return on total exposure is used as a measure of profitability.

4.4 RESOLUTION

If a globally active Swiss bank gets into financial distress and recovery measures prove unsuccessful, an orderly resolution must be possible without exposing taxpayers to loss. FINMA is responsible for the planning and operational implementation of the globally active Swiss banks' resolution. To this end, it draws up a resolution plan for each of the globally active Swiss banks. FINMA's primary resolution strategy is to restructure these banks via a 'single point of entry' bail-in. This means that FINMA would intervene at the level of the group holding company and convert bail-in-able creditors' claims into equity, which would help to restore the bank's capital base. Such bail-in-able claims usually consist of specific debt instruments known as 'bail-in bonds'.³²

If FINMA's primary resolution strategy were to fail, the banks' Swiss emergency plans would serve as a fallback for safeguarding systemically important functions in Switzerland.³³ In their plans, the two globally active Swiss banks have to demonstrate how they would maintain systemically important functions for Switzerland if they were at risk of insolvency – independently of the rest of the group. FINMA continues to view the Swiss emergency plans of Credit Suisse and UBS as ready to implement.³⁴

32 Cf. FINMA Resolution Report 2020, p. 20.

33 The systemically important functions comprise, in particular, domestic deposit and lending business as well as domestic payment transactions.

34 Cf. FINMA Resolution Report 2022, www.finma.ch/en/enforcement/recovery-and-resolution/resolution-report/.

Important regulatory progress made regarding funding in resolution

There are two key prerequisites for an orderly resolution. First, a bank needs an appropriate level of gone-concern loss-absorbing capacity to allow for recapitalisation by means of a bail-in in the event of impending insolvency. Second, a bank needs sufficient liquidity to implement the resolution strategy ('funding in resolution'). Both prerequisites have to be fulfilled at group level as well as at the level of the individual group entities.

Regarding gone-concern loss-absorbing capacity, Credit Suisse and UBS meet the current requirements. Regarding funding in resolution, important regulatory progress has been made since last year's Financial Stability Report. First, amendments to the Liquidity Ordinance will enter into force on 1 July 2022.³⁵ The liquidity needs of systemically important banks in the event of a resolution were not appropriately covered by the existing liquidity requirements.³⁶ The amendments to the Liquidity Ordinance are intended to ensure that systemically important banks hold sufficient liquidity to cover their needs even in the event of a resolution. Second, the Federal Council has announced its intention to introduce a Public Liquidity Backstop (PLB) in Switzerland.³⁷ Such a PLB could act as an additional line

35 Cf. Federal Council's press release of 3 June 2022, www.admin.ch/gov/en/start/documentation/media-releases.msg-id-89132.html.

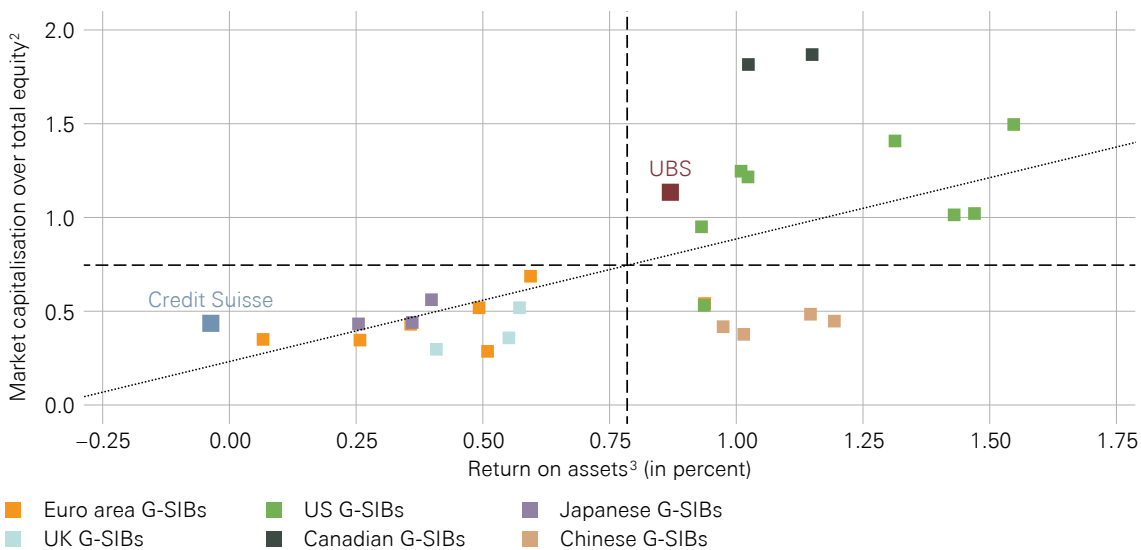
36 Cf. FDF's press release of 30 September 2021, www.admin.ch/gov/en/start/documentation/media-releases.msg-id-85304.html.

37 Cf. Federal Council's press release of 11 March 2022, www.admin.ch/gov/en/start/documentation/media-releases.msg-id-87574.html.

INTERNATIONAL COMPARISON OF MARKET CAPITALISATION OVER TOTAL EQUITY WITH RETURN ON ASSETS¹

G-SIBs, Q1 2022

Chart 29



1 The dashed lines depict the (unweighted) averages. The dotted line represents the regression of 'market capitalisation over total equity' on 'return on assets'. The correlation between the two series is 0.63.

2 Market capitalisation measured as at Q1 2022; total equity as at Q1 2022.

3 Return on assets defined as pre-tax profit of last four quarters as a percentage of total assets as at Q1 2022.

Source(s): Bloomberg

of defence in a severe crisis. The PLB would require the creation of a legal basis by the Swiss parliament. The Federal Council has instructed the Federal Department of Finance (FDF) to prepare a consultation draft by mid-2023. According to the key parameters for a PLB defined by the Federal Council, liquidity assistance for a systemically important bank would be provided by the SNB in the form of a state-guaranteed loan. Moreover, the PLB should have privileged creditor status in bankruptcy in order to avoid potential losses for the Confederation and should be predicated on a loss-recovery and sanctioning mechanism.

Banks have several lines of defence to absorb liquidity shocks. The liquid assets they hold constitute the first line of defence. Even with solid liquidity requirements, situations can arise in which the liquid assets of the banks are not sufficient to implement the resolution strategy. In its function as lender of last resort, the SNB can provide additional liquidity against sufficient collateral.³⁸ This emergency liquidity assistance by the SNB constitutes the second line of defence. If the first and second lines of defence still proved to be insufficient, the PLB could provide additional liquidity as a third line of defence.

³⁸ Cf. Guidelines of the Swiss National Bank on monetary policy instruments of 25 March 2004 (as at 1 July 2021), www.snb.ch/en/mmr/reference/snb_legal_geldpol_instr/source/snb_legal_geldpol_instr.en.pdf.

5 Domestically focused banks

5.1 RESILIENCE

The assessment of the domestically focused Swiss banks' resilience comprises two elements: profitability and capitalisation. Sustainable profits are the first line of defence for absorbing losses in a stress event and they help to restore capital – the second line of defence – following such an event.

5.1.1 PROFITABILITY

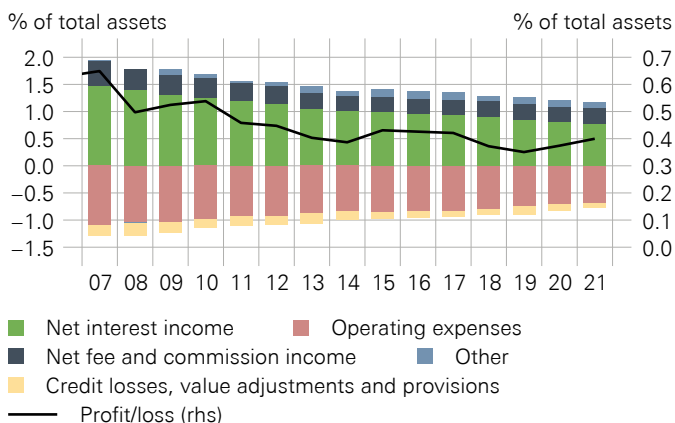
Bank profitability increases slightly but remains low by historical comparison

Against the backdrop of the economic recovery, ongoing pandemic-related support measures and favourable conditions on financial markets, the domestically focused banks' profitability – measured as the return on assets (ROA) – rose slightly in 2021 to 0.40% (from 0.37% in 2020; cf. chart 30).¹ ROA increased despite the negative contribution to overall ROA from net interest income (NII), i.e. from these banks' core business. This negative contribution was more than offset by improvements in the banks' cost efficiency (lower business expenses per unit of assets) and higher net fee and commission income. Furthermore, the positive contribution from lower credit losses, value adjustments and provisions indicates that the economic consequences of the coronavirus pandemic

1 ROA is defined as post-tax profit as a percentage of total assets.

RETURN ON ASSETS OF DOMESTICALLY FOCUSED BANKS

Chart 30



Source(s): FINMA, SNB

have had less of an impact on banks' credit portfolios than previously expected. Bank profitability remains low by historical comparison, having fallen significantly over the last decade and a half (by roughly 40% since 2007) as low interest rates have weighed on interest rate margins.

Profitability also improved in 2021 at the three domestically focused systemically important banks (DF-SIBs).

Raiffeisen Group's ROA increased from 0.33% (2020) to 0.38% (2021). ZKB's ROA increased from 0.46% (2020) to 0.49% (2021). PostFinance's ROA increased from 0.11% (2020) to 0.18% (2021). At these banks, too, the positive contributions from net fee and commission income as well as business expenses to overall ROA either complement the stable contribution of NII (in the case of ZKB) or more than offset the negative contribution of NII (in the case of Raiffeisen and PostFinance).

Interest rate margin declines further from already low level

For the domestically focused banks, NII is the dominant income component. The average interest rate margin on outstanding claims at the domestically focused banks has been on a downward trend since 2007, decreasing by 40% from 1.80% to 1.09% in 2021.² This amounts to an annual decline of about 5 basis points over that period. In 2021, the average interest rate margin declined by 2 basis points (cf. chart 31).

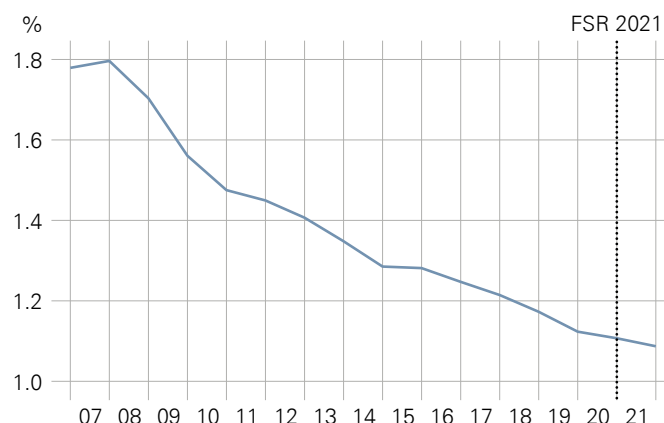
The development of interest rates continued to compress domestically focused banks' interest rate margins in 2021. In particular, the average interest rate on outstanding mortgage loans decreased further from 1.28% (end-2020) to 1.19% (end-2021) as maturing loans were renewed at lower rates. The average interest rate on new mortgages

2 Interest rate margins are approximated as NII divided by the sum of mortgage claims, claims against customers, and financial claims.

INTEREST RATE MARGIN OF DOMESTICALLY FOCUSED BANKS

Weighted average

Chart 31



Source(s): FINMA, SNB

across all maturities decreased from 0.97% in 2020 to 0.93% in 2021.

Margin pressure stemming from declining interest rates on mortgage portfolios was partly offset by the increased pass-through of low and negative interest to depositors, which further reduced the banks' funding costs in 2021. First, the overall share of domestic customer deposits subject to negative interest continued to increase. Second, within the overall share of domestic customer deposits not yet subject to negative interest, the fraction of deposits carrying near-zero or zero interest rates increased further. Meanwhile, total direct negative interest payments to the SNB remained stable compared to 2020 and resulted in a less than 1% reduction in total interest income.

Going forward, the banks' interest rate margins should gradually benefit from the recent rise in long-term interest rates. However, a large interest rate shock would be detrimental to the banks' margins and profitability as both interest rate risks and credit risks would materialise. In such an event, interest rate risks would materialise as the increase in funding costs would outpace the increase in interest income (cf. subchapter 5.2.2).

5.1.2 CAPITALISATION

Stable capital ratios ensure significant loss-absorbing and lending capacity

In 2021, the domestically focused banks' capitalisation remained broadly stable at a high level. Their capital base grew further, mainly due to earnings retention. While the capital base of these banks increased slightly faster than their risk-weighted assets (RWA), it grew roughly in line with the size of their balance sheets and leverage ratio exposures.

The going-concern risk-weighted capital ratios of the domestically focused banks increased slightly, in terms of both total eligible capital (2020: 18.6%; 2021: 19.1%) and Tier 1 capital (2020: 18.1%; 2021: 18.4%). Their risk-

weighted ratio is high by historical comparison and has been growing steadily over the past decade (cf. chart 32).³ The domestically focused banks' going-concern Tier 1 leverage ratio remained broadly stable at 6.7% at the end of 2021 (end-2020: 6.8%).⁴

Domestically focused banks' capital buffers are substantial. These buffers are reserves that banks can use to cover loss potential from their exposures and continue lending without breaching regulatory minimum requirements.⁵ At the end of 2021, buffers above minimum requirements typically represented 7.5–15% of the banks' RWA (cf. chart 33) and 3–6% of their total balance sheet (cf. chart 34). In aggregate, their capital buffers in excess of the regulatory minima amounted to approximately CHF 55 billion (2020: CHF 53 billion) or 3.8% of the banks' total balance sheet. About 60% of these buffers (CHF 33 billion) are held voluntarily by the domestically focused banks as surpluses above all regulatory minimum and buffer requirements.⁶

3 For the aggregate analysis in this section, a phase-in perspective is used for DF-SIBs' going-concern capital ratios. Furthermore, since January 2020, participants in the definitive small banks regime have been exempted from certain regulatory requirements (cf. www.finma.ch/en/supervision/banks-and-securities-firms/kleinbankenregime/). In this section, these banks are included only in aggregate leverage ratio figures and are excluded from risk-weighted ratios.

4 The domestically focused banks' going-concern Tier 1 leverage ratio stood at 8.4% at the end of 2020, taking into account FINMA's decision to extend the temporary exemption of central bank reserves for the calculation of the leverage ratio from 25 March 2020 to 1 January 2021. Excluding the impact of this temporary exemption for all domestically focused banks, the going-concern Tier 1 leverage ratio stood at 6.8% at the end of 2020. Cf. Financial Stability Report 2021 for more details.

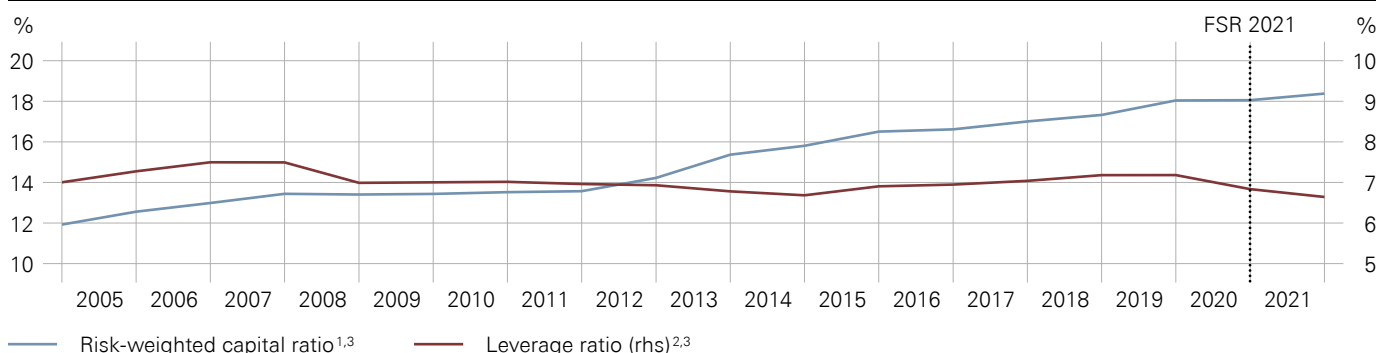
5 Cf. Capital Adequacy Ordinance, CAO.

6 These include the capital buffer target levels set according to supervisory category (cf. CAO), as well as the bank-specific capital buffer requirements applying to systemically important banks. These requirements go beyond the Basel III requirements for all banks, except those pertaining to supervisory category 5, which includes the smallest banks and the banks with the lowest risk exposure. Some banks have Pillar 2 capital surcharges for specific risks; these are not taken into account here.

CAPITAL RATIOS OF DOMESTICALLY FOCUSED BANKS

Risk-weighted Tier 1 capital ratio and Tier 1 leverage ratio

Chart 32



1 From 2020, excluding members of small banks regime.

2 Until 2013, Tier 1 divided by total assets. From 2014, Tier 1 divided by Basel III leverage ratio exposure. For 2020, the Basel III leverage ratio exposure includes central bank reserves.

3 A phase-in perspective is used for DF-SIBs' going-concern capital ratios.

Source(s): FINMA, SNB

GOING-CONCERN CAPITAL RATIOS AND REQUIREMENTS

Look-through and phase-in

Table 3

	PostFinance			Raiffeisen Group			ZKB		
	2020 ⁴	2021	Requirement 2021 ³	2020 ⁴	2021	Requirement 2021 ³	2020 ⁴	2021	Requirement 2021 ³
TBTF ratios (look-through, in percent)¹									
TBTF going-concern capital ratio	16.1%	17.8%	12.9%	16.9%	19.1%	13.2%	17.6%	17.5%	12.9%
TBTF going-concern leverage ratio	4.5%	4.5%	4.5%	6.0%	6.0%	4.6%	5.8%	5.9%	4.5%
TBTF ratios (phase-in, in percent)²									
TBTF going-concern capital ratio	18.1%	18.7%	12.9%	19.6%	21.7%	13.2%	18.9%	18.5%	12.9%
TBTF going-concern leverage ratio	5.0%	4.7%	4.5%	7.0%	6.8%	4.6%	6.2%	6.2%	4.5%
Levels (in CHF billions)									
Tier 1 capital TBTF (look-through)	5.3	5.5	–	15.8	17.4	–	12.1	12.5	–
Tier 1 capital TBTF (phase-in)	6.0	5.8	–	18.3	19.8	–	13.0	13.3	–
TBTF RWA	33.0	31.0	–	93.5	91.2	–	68.5	71.6	–
TBTF total exposure	118.3	122.8	–	263.3	289.4	–	208.3	212.4	–

1 The ratios are calculated based on the final requirements, i.e. no transitional provisions are taken into account.

2 The ratios and levels are calculated based on the phase-in requirements as at end-2020 (for 2020 figures) and as at end-2021 (for 2021 figures).

3 The Swiss sectoral countercyclical capital buffer (CCyB) for the risk-weighted requirements is zero in 2020 and 2021. Excluding bank-specific Pillar 2 surcharges for specific risks.

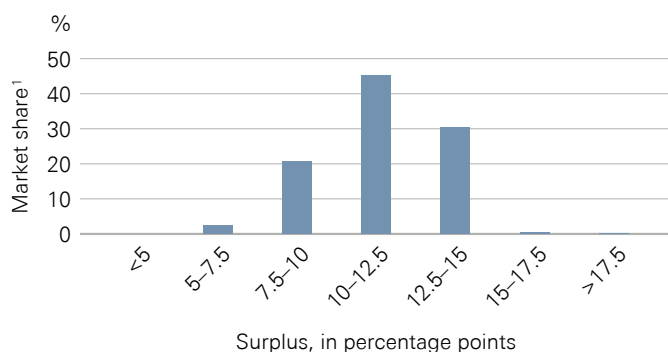
4 The phase-in TBTF going-concern leverage ratio as well as the TBTF total exposure for 2020 are calculated without exclusion of central bank reserves.

FINMA granted the temporary exclusion of central bank reserves from the leverage ratio calculation from 25 March 2020 to 1 January 2021. Cf. Financial Stability Report 2021 for further details.

Source(s): DF-SIBs' regulatory disclosures

RISK-WEIGHTED SURPLUS CAPITAL OF DOMESTICALLY FOCUSED BANKS

Capital surplus with respect to 8% minimum requirement for risk-weighted total capital ratios Chart 33

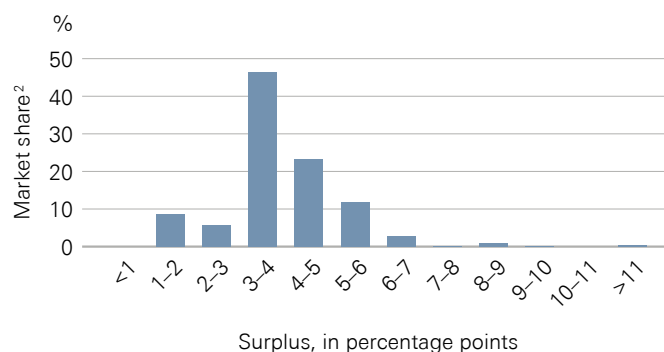


1 Share of domestically focused banks' total Basel III leverage ratio exposure. Excluding members of small banks regime.

Source(s): FINMA, SNB

LEVERAGE RATIO SURPLUS CAPITAL OF DOMESTICALLY FOCUSED BANKS

Capital surplus with respect to 3% minimum requirement for leverage ratios¹ Chart 34



1 Total Basel III leverage ratio exposure includes central bank reserves.

2 Share of domestically focused banks' total Basel III leverage ratio exposure.

Source(s): FINMA, SNB

On 26 January 2022, the Federal Council approved the SNB's proposal to reactivate the sectoral countercyclical capital buffer (CCyB) at 2.5% of risk-weighted exposures secured by residential property in Switzerland. This reactivation will lead to a rise in the capital requirements for mortgage loans on residential property in Switzerland. It will first and foremost maintain the banking sector's resilience, and strengthen it where necessary. The reactivation of the CCyB will commit an estimated CHF 5.6 billion in additional capital at the domestically focused banks – roughly 10% of the CHF 55 billion already held in excess of the minimum requirement. This will make it possible to limit the negative consequences of a strong correction on the Swiss mortgage and residential real estate markets for the banking sector. Indirectly, this will also mitigate the negative consequences for the Swiss economy.

DF-SIBs comply with TBTF going-concern requirements

DF-SIBs are subject to the additional going-concern and gone-concern requirements defined in the Swiss 'too big to fail' (TBTF) regulations. At the end of 2021, the three DF-SIBs were fully compliant with the look-through as well as the phase-in TBTF going-concern risk-weighted capital and leverage ratio requirements (cf. table 3).

In a look-through perspective, the TBTF risk-weighted capital ratio increased at Raiffeisen Group and PostFinance, and decreased slightly at ZKB. The increase at Raiffeisen and PostFinance mainly reflects lower RWA and higher capital. For Raiffeisen, the reduction in RWA is primarily due to the conversion to the foundation internal ratings-based approach (F-IRB), which began in 2019 and will continue with a progressive decrease of floor provisions until Q3 2022.⁷ Raiffeisen built up Tier 1

capital, while PostFinance, according to its regulatory disclosures, would use a smaller portion of its available Tier 1 capital to fulfil the look-through gone-concern requirements (cf. 'Gone-concern loss-absorbing capacity varies across DF-SIBs' in subchapter 5.3). To avoid double-counting, such capital has to be deducted from Tier 1 going-concern capital ratios. The slight decrease in the TBTF risk-weighted capital ratio at ZKB mainly reflects the growth in its RWA. TBTF leverage ratios increased slightly at ZKB, and remained stable at Raiffeisen Group as well as PostFinance.

In a phase-in perspective, the TBTF risk-weighted capital ratio decreased at ZKB and increased at Raiffeisen Group and PostFinance. While for ZKB the TBTF risk-weighted capital ratio decreased mainly due to the growth in its RWA, for the other two DF-SIBs the ratio increased mainly due to the decline in their RWA. The leverage ratio decreased at Raiffeisen Group and PostFinance mainly due to the growth in their leverage ratio exposure, and it stayed constant at ZKB.

5.2 RISK

Domestically focused banks are mainly exposed to domestic credit risk, interest rate risk, operational risk and business risk. This subchapter discusses credit risk and interest rate risk in detail and operational risk in qualitative terms. Furthermore, stress scenario analysis provides a complementary and broader assessment of these banks' risks, including business risk.

5.2.1 CREDIT RISK

Credit risk is the risk of loss due to a client or counterparty failing to make contractually agreed payments.

⁷ Under F-IRB, banks are allowed to develop their own empirical models to estimate certain risk components required for calculating the RWA, such as the probability of default, while relying on regulatory parameters for other risk components.

DOMESTIC BANK CREDIT BY TYPE OF BORROWER AND LOAN

Domestically focused banks, figures at end-2021¹

Table 4

	Households	Non-financial corporations	Financial corporations	Public corporations	All sectors
Domestic bank credit (in CHF billions)	588	244	37	24	892
Domestic bank credit (in percent)	65.8	27.3	4.1	2.7	100.0
Of which mortgages	64.2	22.7	2.2	0.2	89.3
Of which other loans: secured	0.9	2.0	0.7	0.5	4.1
Of which other loans: unsecured	0.8	2.7	1.2	2.1	6.8

¹ Reporting entity: Domestic bank offices; positions are vis-à-vis domestic non-banks (all currencies).

Source(s): Credit volume statistics, SNB

Large exposure to domestic credit market

At the end of 2021, domestic credit accounted, on average, for around two-thirds of the aggregate balance sheet of the domestically focused banks. By sector, credit to households made up two-thirds of total credit, and corporate loans to the real sector⁸ around one-quarter. Broken down by type of loan, around 90% of the credit volume was mortgage loans, while most of the remaining loans (approximately 60%) were unsecured (cf. table 4).

Due to the composition of their balance sheets, domestically focused banks are particularly exposed to developments affecting the financial soundness of corporations and households as well as to real estate prices in Switzerland. Having deteriorated markedly in 2020 with the onset of the coronavirus pandemic, the economic environment was favourable in 2021. Since the end of 2021, however, it has become more challenging.

The pandemic-induced deterioration in the macroeconomic environment in 2020 was barely reflected in credit quality indicators for domestically focused banks in either 2020 or 2021. Backward-looking indicators such as the level of specific provisions or the share of non-performing loans, as well as more forward-looking indicators such as the level of impaired claims, remain low by historical comparison.

As pandemic-related support measures are lifted, a lagged effect of the pandemic on credit quality remains possible, but it should be limited. Besides the large share of secured corporate loans at these banks, the support measures (plus the fact that they are being phased out only gradually) and the ongoing recovery of the Swiss economy should all help to mitigate the impact.

⁸ In the following, the term ‘corporations’ is used to denote corporations in the real sector, i.e. private non-financial corporations.

The war in Ukraine has so far had no significant effect on the domestically focused banks. However, while the direct exposure of these banks to Russia and Ukraine is not material, the war could have stronger and longer-lasting economic effects than are currently expected. This could lead to a deterioration in the quality of the domestically focused banks’ credit portfolios (cf. ‘Stress losses could be significant, but capital buffers should ensure adequate resilience’ in subchapter 5.2.4).

Strong growth in mortgage exposure

In 2021, domestically focused banks’ exposure to the Swiss mortgage and residential real estate markets increased further (cf. subchapter 2.2, ‘Swiss credit and real estate markets’ for developments in these markets). Mortgage growth at these banks was strong – by the end of 2021 it had accelerated to 4.2% (3.6% at end-2020).⁹ Mortgage volume has been growing significantly faster at the domestically focused banks than at the globally active banks since the onset of the global financial crisis in 2007. The difference in growth rates became more pronounced in 2021 (compared to 2020) as the globally active banks reduced their mortgage growth significantly.

Residential investment properties – share of new mortgage loans with high LTV ratios decreases further

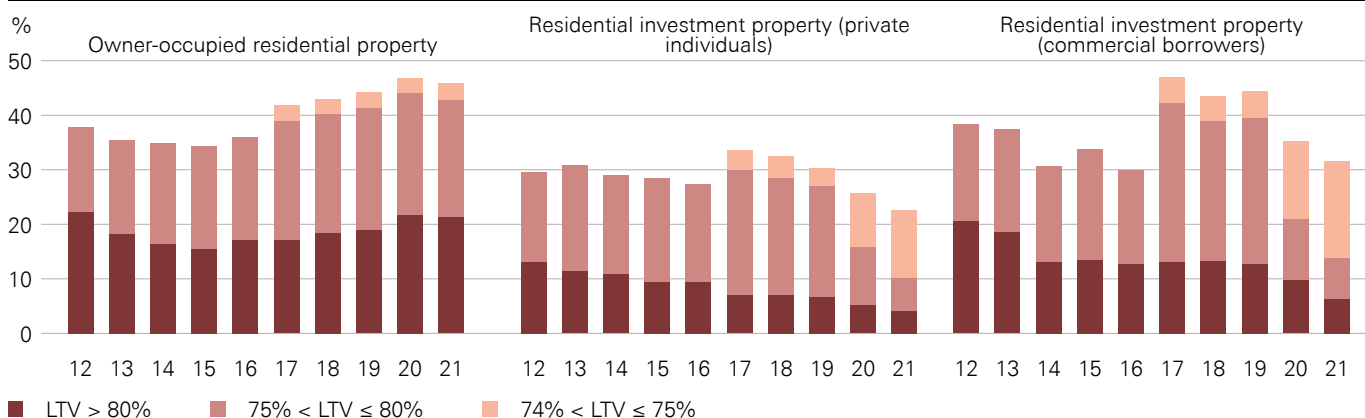
The revision of the self-regulation guidelines for banks in the area of investment properties led to a further substantial decrease in the share of new mortgage loans with high loan-to-value (LTV) ratios in 2021, according to the SNB’s survey on new mortgages. The revised guidelines became effective on 1 January 2020 and stipulate, among other things, a minimum down payment of 25% of the lending value (previously 10%). While the guidelines do not explicitly include the buy-to-let

⁹ The mortgage growth calculations account for corrections made at the bank level. Consequently, they may deviate from information published on the SNB’s data portal, data.snb.ch.

LOAN-TO-VALUE OF NEW MORTGAGE LOANS

Proportion of new loans with LTV over 74%, 75%, and 80%¹

Chart 35



¹ Measurement of the 74–75% share is only possible since 2017 (start of SNB’s revised survey on new mortgages).

Source(s): SNB

segment, FINMA recommends voluntary application to this segment, and many banks are following this recommendation.

The share of new mortgage loans with an LTV of more than 75% decreased, from 21% in 2020 to 14% in 2021 for residential investment properties held by commercial borrowers, and from 16% to 10% for residential investment properties held by private borrowers (cf. chart 35). As expected, this shift in banks' lending policy has led to an accumulation of new loans with an LTV of just below 75%. Two factors explain why the share of new mortgage loans with an LTV of more than 75% did not drop to zero in spite of the 25% down payment requirement. First, data in the mortgage survey include non-profit housing, which is not covered by the self-regulation guidelines. Second, a small number of banks originated loans with LTVs of more than 75%, in turn accepting the application of penalty risk weights and interventions by FINMA.

LTI ratios for new mortgage loans increase

According to the SNB's mortgage survey, affordability risks as measured by the loan-to-income¹⁰ (LTI) ratio of new mortgage loans increased further in 2021. In the owner-occupied residential property segment and the segment of residential investment property held by private individuals, the increase is visible regardless of the level of imputed interest rates used to measure this risk (5%, 4% or 3%), i.e. irrespective of the LTI thresholds considered (cf. chart 36). In the segment of residential investment property held by commercial borrowers, the increase is visible for imputed interest rates of 4% and 3%, i.e. for the upper part of the LTI distribution.

10 For the owner-occupied residential property segment, a standardised definition of income is used, which consists of the borrower's employment or pension income. For the residential investment property segment, income consists of net rents from the property.

Broader assessment of households' financial position indicates higher resilience than suggested by LTI analysis

The LTI and LTV ratios are key parameters for measuring banks' risk-taking – and borrowers' financial resilience – on the mortgage market. For the owner-occupied segment, the assumption behind the LTI ratio is that household income is the main determinant of loan affordability. For the investment segment, the assumption is that rents are the main source of revenue. The rationale behind the LTV is that the value of the real estate collateral is the primary factor limiting loss in the event of default.

In reality, borrowers may have substantial additional financial resources, which could have implications for financial resilience. Taking a broader set of financial resources into account when assessing affordability risks could therefore be useful. However, data availability is a major obstacle to such an analysis.

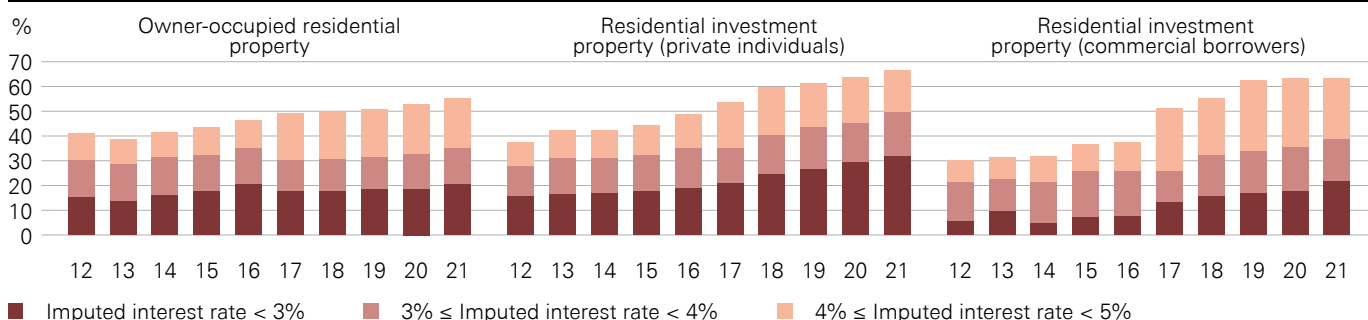
Granular tax data for households in the canton of Berne¹¹ were examined in order to gain insight into the materiality of these additional financial resources. Overall, analysis of these data confirms that affordability risks for new residential mortgages increased between 2012 and 2019. At the same time, it shows that households' financial resilience is higher and has deteriorated less than the LTI figures suggest. More recent cohorts of homebuyers are wealthier than previous cohorts, either because they are older and have therefore accumulated more wealth before acquiring real estate, or because they have benefited from increasingly significant intergenerational wealth transfers in the form of gifts and inheritances. Moreover, the data

11 The canton of Berne is a large canton offering a combination of urban and rural areas and is thus representative of Switzerland as a whole. However, property prices and household debt have been growing somewhat more slowly in this canton than in the more dynamic regions of Switzerland. The extent to which conclusions based on data for the canton of Berne also apply to such regions is unclear due to the lack of data.

LOAN-TO-INCOME OF NEW MORTGAGE LOANS¹

Proportion where imputed costs exceed rents (inv. prop) or one-third of income (owner-occ.) at an imputed interest rate of up to 5%²

Chart 36



1 From 2017 on, data from the SNB's revised survey on new mortgages are shown.

2 The dark red shaded area shows the proportion where imputed costs exceed rents or one-third of income at an imputed interest rate of up to 3%. The red shaded area shows the additional proportion for an imputed interest rate of between 3% and 4%. The pale red shaded area shows the additional proportion for an imputed interest rate of between 4% and 5%. Besides the imputed interest rate (5%, 4%, 3%), the imputed costs comprise maintenance and amortisation costs (1% each).

Source(s): SNB

show that for households acquiring an investment property, the sources of income over and above rental income from that property are material and thus contribute notably to the households' resilience. Overall, in the canton of Berne, higher risk-taking in terms of LTI appears to have been largely compensated for by higher financial resilience among borrowing households.

It is important to note that the above observations pertain only to mortgage loans to households. No comparable data are available for commercial investors in the residential property segment. For these investors, LTI figures point to a strong increase in affordability risks over the last decade. Experience shows that in a downturn, such investors cause quicker and larger losses at banks than households. One reason for this is that for the same LTI or LTV, commercial borrowers tend to pose a greater risk because of their limited liability, whereas individuals are liable with all their assets. Another possible reason is that for commercial borrowers, a broader perspective may not reveal higher financial resilience: affordability risks in this segment will depend on firms' additional assets, with their concomitant risks, but also on their additional liabilities – as well as on the income streams associated with these assets and liabilities. The higher capital requirement imposed on this mortgage segment under Basel III is an acknowledgement of the greater risk it presents.

The data situation in Switzerland for assessing mortgage risks faced by the Swiss banking sector has improved significantly over the last decade, in particular thanks to the introduction in 2011 of the SNB's survey on new mortgages. The above analysis suggests that a broader perspective on borrowers' financial resilience offers significant additional insights for risk analysis. Going forward, the SNB will, in close cooperation with banks and FINMA, examine how the assessment of risks in the mortgage market could be further improved.

5.2.2 INTEREST RATE RISK

Interest rate risk can result from a mismatch between the repricing maturities of a bank's assets and liabilities. Banks typically use short-term liabilities (i.e. deposits with potentially short, but contractually undefined, repricing maturities) to refinance long-term assets (i.e. loans with relatively long, but contractually defined, repricing maturities). The result of such maturity transformation is that interest rates on assets are locked in for longer than interest rates on liabilities. This exposes banks to upward shocks in interest rates – a sudden and large increase in interest rates would reduce the present value of assets more substantially than the present value of liabilities.

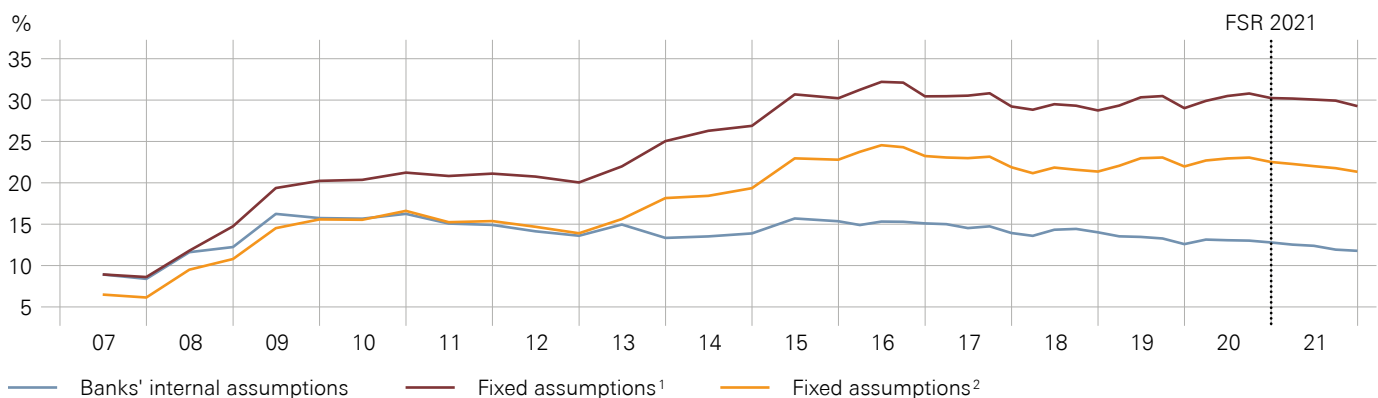
Persistently high interest rate risk exposes banks to sudden and large upward interest rate shocks

In 2021, interest rate risk from maturity transformation – as measured by the impact of an upward interest rate shock on the banks' net present value (NPV) relative to Tier 1 capital – remained broadly unchanged at a high level. Based on repricing assumptions for non-maturity positions that are fixed over time and that are the same for all banks, domestically focused banks' NPV would have declined, on average, by 29.3% of Tier 1 capital (assuming a 15-day repricing maturity for sight deposits) or 21.3% (based on a 10-month repricing maturity) if interest rates had suddenly risen by 200 basis points (cf. chart 37). Based on banks' internal repricing assumptions, which banks can – and do – adjust over time, this value would currently be significantly lower (11.8%). The difference is explained by assumptions regarding the repricing behaviour of sight and savings deposits (i.e. positions without contractual maturity) – which, in turn, is dependent on depositor

INTEREST RATE RISK OF DOMESTICALLY FOCUSED BANKS

Losses in NPV with 200 bp interest rate rise as percentage of Tier 1 capital, under different repricing assumptions

Chart 37



1 Assumed repricing maturities of 1.5 years for savings deposits and variable rate mortgage claims, and of 15 days for sight deposits.

2 Assumed repricing maturity of 10 months for sight deposits instead of 15 days.

Source: FINMA, SNB

behaviour – in the event of an interest rate rise.^{12,13} The uncertainty surrounding these assumptions is considerable. Accordingly, it is important that banks adopt a conservative stance when choosing the internal repricing assumptions used for setting their interest rate risk appetite.

The NPV analysis shown in chart 37 highlights banks' substantial exposure to large upward interest rate shocks. However, it tends to overestimate banks' exposure to small or medium upward interest rate shocks. In the current environment, banks will benefit from moderate interest rate increases, as they would lead to a restoration of the currently negative liability margins, a fact that is not fully accounted for in the NPV analysis (cf. Financial Stability Report 2016, pp. 26–30).¹⁴ Accordingly, the market interest rate increases recently observed in Switzerland will lead to a (partial) restoration of the banks' liability margins. For large interest rate shocks, the positive impact on NII from the restoration of the liability margin would be small relative to the negative impact resulting from the deterioration in the structural margin, as liabilities would reprice faster than assets. For instance, according to the SNB's stress scenario analysis, in the interest rate shock scenario, banks would suffer a decline in NII due to their high level of maturity transformation, despite the restoration of their liability margins.

5.2.3 OPERATIONAL RISK

Operational risk is the risk of loss due to inadequate procedures, fraud, failed internal systems, or external events. It also includes legal risk and cyber risk. Operational risk can materialise independently of the underlying economic scenario and is not covered by the SNB's stress scenario analysis for domestically focused banks.

As in the case of the globally active banks (cf. 'Operational risk high by international comparison' in subchapter 4.2.1), cyber risk has become a growing concern for the domestically focused banks as well. A cyberattack that severely impairs the operational capability of a systemically important bank or group of banks could spill over to other financial institutions, including as a result of a loss of confidence in the financial system. In addition, a cyberattack on a technology company that provides services to many financial institutions simultaneously – or on their

downstream service providers – could spread to the financial system.¹⁵

5.2.4 IMPACT OF STRESS SCENARIOS

Stress losses could be significant, but capital buffers should ensure adequate resilience

Two of the scenarios discussed in subchapter 2.4 are of particular relevance for domestically focused banks: the protracted euro area recession scenario and the interest rate shock scenario. As discussed in subchapter 2.4, the protracted euro area recession and interest rate shock scenarios offer a benchmark for the economic and financial effects of the war in Ukraine being substantially worse than expected.

Most of the domestically focused banks are projected to incur losses under the protracted euro area recession scenario. Under this scenario, the Swiss economy would enter a deep recession, unemployment rates would rise sharply and interest rates would stay low. Furthermore, the domestic real estate market would face a significant price correction and global financial markets would experience stress. Consequently, losses on corporate loans and mortgages would increase markedly and NII would continuously decline as maturing loans would be renewed at lower rates. Moreover, banks' net fee and commission income would decrease due to the stress on financial markets.

Overall, the impact of losses under the protracted euro area recession scenario on banks' capital would be moderate. The capital buffers of the domestically focused banks would remain substantial after the shock. Nonetheless, in the absence of counteracting measures, a small number of banks could approach, or fall below, the specific capital buffer target levels set by the CAO – or even fall below regulatory minima.

Under the interest rate shock scenario, almost all domestically focused banks would experience substantial losses. The losses would mainly be driven by an increase in mortgage interest rates, leading to a materialisation of affordability risks and a pronounced drop in real estate prices, exposing a proportion of the banks' mortgage portfolios to under-collateralisation. Consequently, write-downs on domestic mortgages would surge. Moreover, due to their high level of maturity transformation, banks would suffer a decline in NII under this scenario, despite the restoration of their liability margins.

Overall, the impact of the interest rate shock scenario on banks' capital would be significant. Domestically focused banks' aggregate losses would be substantially larger under this scenario than under the protracted euro area recession scenario and would deplete a significant proportion of these banks' capital buffers. Many banks would fall below the specific capital buffer target levels set

¹² The analysis accounts for linear interest rate risk hedging. The two sets of fixed repricing assumptions underlying the upper set of curves depicted in chart 37 aim to illustrate how sensitive the interest rate risk metric is to changes in the assumed repricing maturities related to customer deposits (15 days vs. 10 months). Cf. Financial Stability Report 2013, pp. 18–19 for a discussion of fixed and banks' own internal repricing assumptions.

¹³ If interest rates rise, a substantial portion of funds could quickly migrate into longer-term liabilities with typically higher rates, or other forms of investment. As a result, banks may need to reprice customer deposits faster than currently anticipated to retain the customer deposits as a source of funding.

¹⁴ The interest rate margin has three components: the asset margin, the liability margin, and the structural margin. The asset margin is the difference between the interest on the asset and that on the alternative asset with the same maturity on the capital market. The liability margin is the difference between alternative funding costs for the same maturity on the capital market and the interest paid on the liability. The structural margin is the margin from maturity transformation, i.e. the difference between the capital market interest rates on the corresponding asset and liability margins.

¹⁵ Cf. FSB, Annual Report 2021, p. 8.

by the CAO. Moreover, in the absence of counteracting measures, a number of banks with a sizeable cumulative market share would approach, or fall below, regulatory minima. Overall, though, thanks to the substantial capital buffers currently available, most domestically focused banks should be able to absorb the losses under such a stress scenario while continuing to lend.

The results suggest that the domestically focused banks' capital buffers should ensure adequate resilience. These banks should be able to continue to fulfil their role as credit providers to households and firms under a wide spectrum of stress scenarios. It is important to note that, in addition to the losses that the stress scenarios could cause, material losses for domestically focused banks can also occur due to operational risks (including legal and cyber risks).

5.3 RESOLUTION

If a DF-SIB gets into financial distress and recovery measures prove unsuccessful, an orderly resolution must be possible without exposing taxpayers to loss. In order to alleviate the TBTF issue, systemically important banks must meet additional gone-concern loss-absorbing requirements and emergency planning requirements. Moreover, these banks need sufficient liquidity to implement their resolution strategy (cf. 'Important regulatory progress made regarding funding in resolution' in subchapter 4.4). The current status of gone-concern loss-absorbing requirements and emergency planning requirements at the DF-SIBs is discussed below.

Gone-concern loss-absorbing capacity varies across DF-SIBs

Gone-concern requirements for DF-SIBs entered into force in 2019 and are being phased in by 2026.¹⁶ Eligible instruments for covering gone-concern requirements include contingent capital and bail-in instruments, excess Tier 1 capital, cantonal/state guarantees and similar mechanisms.¹⁷ The extent of additional loss-absorbing capacity build-up resulting from these requirements will vary across banks and depends on the type of instruments used.

At the end of 2021, there was a shortfall with respect to the gone-concern requirements for PostFinance in a look-through perspective, meaning that the bank will have to build up gone-concern instruments or adapt its total exposure to meet these requirements by 2026. Assuming that some of the going-concern Tier 1 capital,

which is accounted for in a phase-in perspective and is held in excess of requirements, is used to fulfil gone-concern requirements, ZKB and Raiffeisen Group would already comply with look-through gone-concern requirements. However, assuming that these banks' current phase-in Tier 1 capital continues to be reserved for going-concern loss absorption in the future, both banks would have to build up gone-concern instruments by 2026 to meet their look-through requirements. In a phase-in perspective, all three banks met the TBTF gone concern risk-weighted capital and leverage ratio requirements at the end of 2021.

DF-SIBs' emergency plans not yet accepted by FINMA

As part of the TBTF requirements, the three DF-SIBs must demonstrate to FINMA that they have effective emergency plans. In conjunction with gone-concern requirements, such emergency plans ensure the safeguarding of systemically important functions in Switzerland in a crisis. By the end of 2021, the three DF-SIBs' emergency plans exhibited different degrees of implementability, but none of them had been approved by FINMA.¹⁸

¹⁶ Cf. CAO.

¹⁷ Excess Tier 1 capital not used to cover going-concern requirements may be used with preferential treatment for gone-concern purposes. As a result, depending on the amount of excess Tier 1 capital, the gone-concern risk-weighted requirement is reduced by up to one-third of the requirement. To avoid double-counting, such capital has to be deducted from Tier 1 going-concern capital ratios. Explicit cantonal/state guarantees or similar mechanisms are eligible for covering up to half of gone-concern requirements – or even all of them, subject to additional conditions.

¹⁸ Cf. FINMA's press release 'FINMA considers recovery and resolution planning by the 'too big to fail' institutions to be well on track – but there are still gaps', 24 March 2022.

Abbreviations

AT1	Additional Tier 1
Basel III	International regulatory framework for banks developed by the BCBS
BCBS	Basel Committee on Banking Supervision
BIS	Bank for International Settlements
CAO	Capital Adequacy Ordinance
CCyB	Countercyclical capital buffer
CDS	Credit default swap
CET1	Common Equity Tier 1
CoCos	Contingent capital
DFB	Domestically focused bank
DF-SIB	Domestically focused systemically important bank
FDf	Federal Department of Finance
FINMA	Swiss Financial Market Supervisory Authority
F-IRB	Foundation internal ratings-based approach
FSB	Financial Stability Board
GDP	Gross domestic product
G-SIB	Global systemically important bank
HT CoCos	High-trigger contingent capital
IMF	International Monetary Fund
LT CoCos	Low-trigger contingent capital
LTl	Loan-to-income
LTV	Loan-to-value
NBA	National Bank Act
NGFS	Network for Greening the Financial System
NII	Net interest income
NPV	Net present value
PLB	Public Liquidity Backstop
ROA	Return on assets
ROE	Return on equity
RWA	Risk-weighted assets
SECO	State Secretariat for Economic Affairs
SFSO	Swiss Federal Statistical Office
TBTF	Too big to fail
ZKB	Zürcher Kantonalbank

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**Data and data sources**

The banking statistics used in this report are based on official data submitted and on data published by individual banks. The analysis covers globally active banks and domestically focused commercial banks. The latter comprise banks (currently around 100) with a share of domestic loans to total assets exceeding 50% or with a prominent role in the domestic deposit market. Data on the globally active banks and the DF-SIBs are analysed at a consolidated level. This document is based on data as at 31 May 2022.

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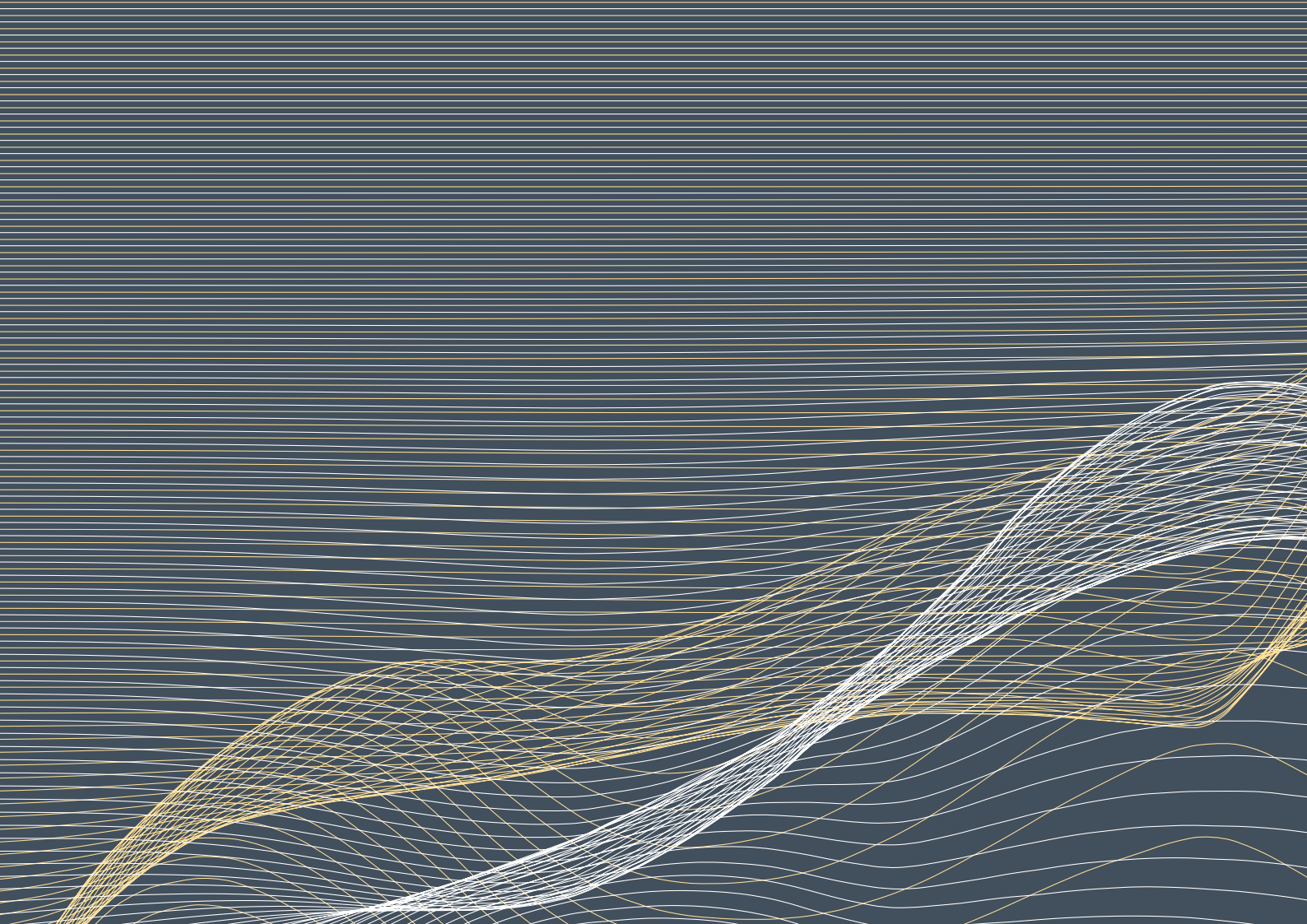
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