FINANCIAL STABILITY REPORT 2018

FMA

Financial Market Authority
Liechtenstein

PREFACE

In this report, the Liechtenstein Financial Market Authority (FMA) presents its financial stability risk assessment for the financial sector in Liechtenstein. Since Liechtenstein does not have a national central bank, the FMA is legally responsible to contribute to the stability of the financial system in accordance with the Financial Market Supervision Act (FMA Act, Art. 4).

Financial stability can be defined in many ways. Most importantly, financial stability is a necessary condition for the efficient allocation of resources in an economy, the management of risks and the absorption of shocks. The stability of the financial system also ensures access to finance and credit for households and businesses both during booms and recessions and even in the case of severe macroeconomic shocks. While this report covers Liechtenstein's whole financial sector, it particularly focuses on the banking sector. The banking sector is not only by far the most important financial sector in Liechtenstein, but empirical evidence from previous crises also suggests that financial stability goes hand in hand with a stable banking sector.

As explained in the following report, Liechtenstein's financial sector is in good shape, with overall risks remaining low. While the financial sector, and particularly the banking sector, is large relative to GDP, relatively risk-averse business models, stable shareholder structures as well as high capitalization and strong liquidity and profitability indicators contribute to a mitigation of risks and a positive outlook for the financial services sector. The non-bank financial sector, i.e. insurances, asset managers and investment funds, play a relatively small role relative to the banking sector, but show a promising growth outlook and constitute an important complement contributing to the reputation of Liechtenstein as a financial center.

At the same time, systemic risks in the financial sector have to be defined more broadly than in other countries. Against the backdrop of the large role of the financial sector and its significance for the economy as a whole, a regular and careful analysis of the various risk factors is indispensable to appropriately calibrate and apply the various available macroprudential instruments, which crucially contribute to the stability of the financial sector.

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EXECUTIVE SUMMARY

After the upswing in economic activity in 2017, global growth has weakened since the beginning of the year. Despite the somewhat weaker growth momentum, unemployment rates have continued to decrease on the back of continuing positive growth rates, and inflation pressures have started to increase in major economies. Furthermore, signs are increasing that the US business cycle may be turning, as the on-going monetary policy normalization has led to a flattening of the US yield curve. Following some years of low volatility and high risk appetite in financial markets, a repricing of risk premia is underway, which could have substantial implications for vulnerable households and non-financial corporations in advanced economies (AEs) and for both private and public sectors in emerging market economies (EMEs).

While the outlook for the global economy remains relatively favourable, downside risks to the global outlook have clearly risen in the past year. Notwithstanding the decline in business confidence since the start of the year, indicators still point to stable and positive global growth. The influence of recent volatility events – such as the stock market correction in February and recent tensions in EMEs – has been limited so far. Downside risks to global growth have however clearly increased in recent months amidst rising protectionism, growing concerns in emerging markets and an increase in global political and policy uncertainty. Furthermore, incentivized by the long low-interest rate environment, indebtedness has increased in many countries both in private and public sectors. Our analysis suggests that under current conditions, an increase in uncertainty and financial market turbulence could have particular adverse effects on the real economy, also because the monetary policy space is still severely limited in most large economies.

While data availability is limited, indicators point to a continued recovery of Liechtenstein's economy following the exchange rate shock in 2015. Typical for a small economy, GDP growth is highly volatile in Liechtenstein, as single transactions of large firms can have a noticeable impact on macroeconomic data. Following negative GDP growth in 2015, the economy has returned to a growth course in 2016, and the quarterly business survey indicates a strong recovery since 2017. Total employment increased by 3.6% in 2017, with the unemployment rate dropping to 1.8%.

The strong manufacturing sector distinguishes Liechtenstein from other financial centers, and the highly specialized economy benefits from its full access to main European markets. Since Liechtenstein is in a customs union with Switzerland and also a member of the European Economic Area (EEA), the country is fully integrated in major European markets. While Liechtenstein is part of the Swiss Franc currency area based on an intergovernmental state treaty, the EEA membership implies that the financial sector is fully regulated according to EU standards. Besides the large share of industry and manufacturing in Liechtenstein's GDP, the country's economic diversification is also strengthened by the high share of small and medium enterprises, further contributing to the strong specialization of the economy. The high private sector expenditures for research and development (R&D) highlight the innovative strength of the economy, with total employment exceeding the number of inhabitants in Liechtenstein.

While Liechtenstein is characterized by relatively low overall indebtedness of the non-financial sector, debt is strongly concentrated in the household sector. As the relatively high stock of household debt is one of the main risks in the banking sector, the

FMA has already introduced various policies to address this issue. At the same time, however, available data on household indebtedness is likely to overestimate risks arising from household encumbrance, as data is not available in its usual consolidated form. In addition, high job security and continuously low unemployment rates over the past decades lead to high planning certainty for the household sector in Liechtenstein in terms of household income, and relatively low taxation on household income leads to higher disposable incomes, thus further improving the sustainability of household debt relative to countries with higher tax rates. Also, as a large part of mortgages is denoted by fixed interest rates, an abrupt increase of interest rates is unlikely to affect Liechtenstein's households immediately, but rather slowly over time, which is a crucial risk-mitigating factor. Moreover, household debt is well collateralized and mortgage growth has weakened recently. Additionally, the total stock of non-financial corporate sector debt is very low, and the public sector has virtually zero debt, resulting in a low overall debt-to-GDP ratio.

The large banking sector does not only require an efficient microprudential banking supervision, but also calls for a strong macroprudential framework. The banking sector is highly concentrated and plays an important role in Liechtenstein's economy. Liechtenstein banks have traditionally focused on the rather conservative business model of private banking and international wealth management, but have avoided the more risky field of investment banking. Throughout the past three years, the banking sector particularly benefited from strong growth abroad, with foreign subsidiaries significantly contributing to the banks' profitability. At the same time, profitability indicators of Liechtenstein banks do not stand out among their European peers, also because of the high capitalization of the sector. Efficiency indicators – such as the cost-income ratio – partly reflect the staff-intensive business model, but also point to further room for improvement in terms of productivity. The high capitalization of Liechtenstein's banking sector, sound liquidity indicators and a very low non-performing loan (NPL) ratio furthermore underline the stability of Liechtenstein's banking sector. Liechtenstein is part of the Swiss franc currency area, with banks having access to SNB funding on the same terms as Swiss banks.

The non-bank financial sector is smaller than the banking sector, and overall risks seem quite limited. Insurance undertakings in Liechtenstein benefit from the direct market access to the EEA and to Switzerland, with premium income of the non-life insurance sector exceeding the premium income of life insurances for the first time in 2017. Risks in the insurance sector are limited in Liechtenstein considering both current risk indicators as well as prevalent business models. The pension system in Liechtenstein is built on three pillars, and both the public pension as well as the occupational pension system is based on a stable footing. While the investment fund sector plays a relatively minor role in Liechtenstein's overall economy, it substantially contributes to the country's reputation as a financial center and is also a non-negligible factor in terms of employment. The investment fund sector is also closely linked to the banking sector and plays an important role as a complement to the three large banks in Liechtenstein's financial center. In the fiduciary sector, the FMA is responsible for the AML/CFT supervision, but has limited legal authority to supervise the corresponding companies economically and prudentially, with data availability thus being limited. While available numbers point to a declining importance of the fiduciary sector, recent cases of fraud have raised questions about the efficiency of the current supervisory framework of Liechtenstein's fiduciary sector.

As an innovative-friendly country, Liechtenstein is in demand as a FinTech location. To facilitate the development of innovative business models, the FMA has established a group called "regulatory laboratory/financial innovation" acting as single entry point for all questions regarding FinTech. Liechtenstein was among the first countries to approve cryptocurrency investment funds in 2017, albeit only for professional investors. Furthermore, the government has reacted to the increased interest in blockchain based business models with a new legislation for the regulation of Trusted Technologies (such as distributed ledger technology, DLT) services currently under consideration.

Liechtenstein's financial sector is of particular national economic importance. In absence of a national central bank, the FMA and the government have jointly taken macroprudential measures to ensure financial stability in Liechtenstein. The national macroprudential authority (Financial Stability Council) will be established in 2019 to further strengthen macroprudential policy collaboration and to promote financial stability. To this end, the Council has a large set of available macroprudential instruments at its disposal (e.g. capital-based and real estate instruments), and the appropriate calibration of these instruments will be one of the crucial tasks of the new Financial Stability Council. A mix of risk-mitigating policy instruments has already been launched in the past few years, and additional measures to further improve financial stability are currently underway.

While the financial sector in Liechtenstein is assessed to be sound, the following recommendations aim at ensuring financial stability in a sustainable manner. Some country-specific factors related to the small size of the country, the large banking sector and some specific legal features have to be considered when evaluating risk-mitigating policies. Due to the large financial sector, systemic risks have to be defined more broadly than in other countries. Against this backdrop, the FMA recommends the following measures, which are explained in detail in the following Financial Stability Report.

– As a small open economy, the implementation of and the compliance with all relevant international and European financial market regulations is key for Liechtenstein's international integration.
– Banks' international growth strategies should not be at the expense of lower financial stability. Banks should avoid excessive risk-taking and maintain their high capital levels.
– Although private sector indebtedness is overall limited, it is strongly concentrated in the household sector, which calls for a close monitoring of corresponding risks in the banking sector.
– Given the large financial sector and the relatively high volatility of GDP growth, the sound fiscal policy approach should be continued.
– It is also crucial to gradually improve data availability to enable in-depth economic and financial stability analyses. This also ensures an appropriate calibration of the various macroprudential instruments at hand.
– The FMA will further focus on crises prevention and the preparation of a policy tool box for the unlikely case of a crisis. To decrease both the probability and the associated costs of a crisis, it is important to further strengthen macroprudential supervision and the bank resolution framework. Additionally, the FMA will continue to closely monitor the development of risks in the banking sector and will regularly reassess the need for adjustment of available macroprudential instruments.

MACROECONOMIC ENVIRONMENT AND FINANCIAL MARKET DEVELOPMENTS

Macroeconomic environment

Following a broad-based recovery in 2017, global growth has weakened somewhat since the start of the year. Growth in the euro area decreased from 0.7% (quarter-on-quarter, q-o-q) in the final quarters of 2017 to 0.2% (q-o-q) in the third quarter of 2018 (see Figure 1). The United States recorded some weakening of growth in the third quarter, albeit from relatively high levels. While global growth prospects have overall stabilized at a somewhat lower level, the recent uptick in US growth is also a result of the US tax reform that took effect at the start of the year. Switzerland has finally overcome the cyclical trough starting with the exchange rate shock in 2015 and reported strong growth rates at the turn of the year. Growth has also weakened in the second quarter, however, and Switzerland as a small and open economy remains vulnerable to global developments.

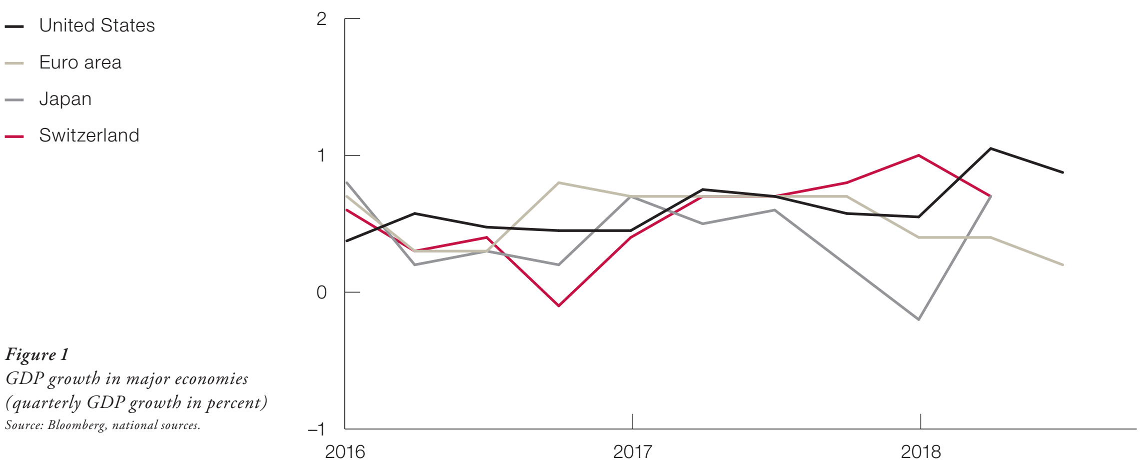

Figure 1
GDP growth in major economies (quarterly GDP growth in percent)
Source: Bloomberg, national sources.

The cyclical downturn is also observable in global trade activities, with global merchandise trade growth turning negative in mid-2018. Global import growth, as reported by the CPB Netherlands, has turned negative in April amidst negative growth contributions from advanced economies. In spite of the recent recovery in July and August, the latest developments mark the end of a two-year period of strong trade growth based on a synchronized cyclical upturn in both advanced and emerging economies. If the trade weakness continues in the next few months, the probability of a global recession may substantially increase. At the same time, one has to keep in mind that merchandise trade data is remarkably volatile (see Figure 2) and short-term movements should thus not be overinterpreted.

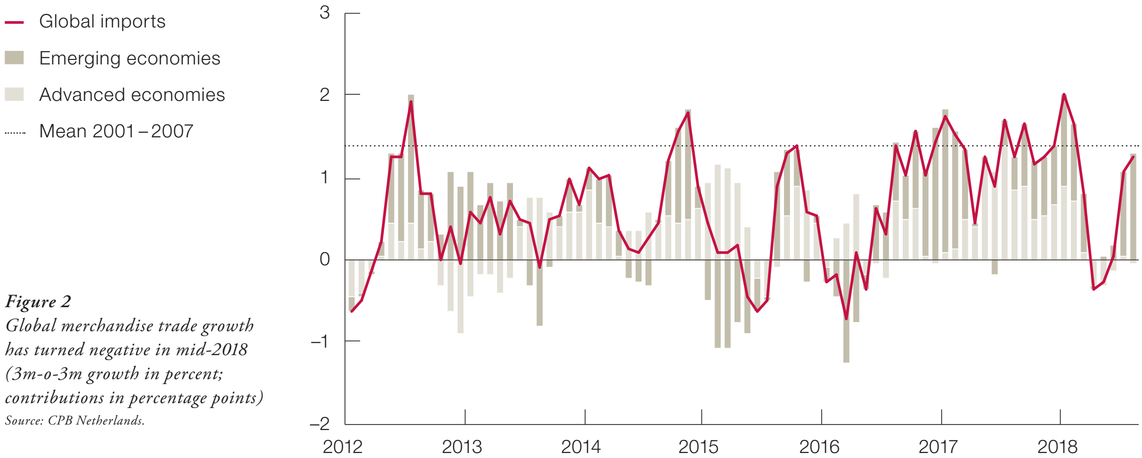

Figure 2
Global merchandise trade growth has turned negative in mid-2018 (3m-o-3m growth in percent; contributions in percentage points)
Source: CPB Netherlands.

Leading indicators point to continued, but weakening growth in major economies. The global composite Purchasing Manager Index (PMI) decreased from its peak of 54.8 in February to 53.0 in October, with a decline in both manufacturing and services sectors. The slowdown in the euro area is also clearly observable in the PMI data (see Figure 3), although current composite output PMIs still signal positive growth in the coming quarters. While growth rates in the euro area have disappointed in the first half of the year, business sentiment has remained relatively positive in the US, also because of the expansionary tax reform that came into force at the start of the year.

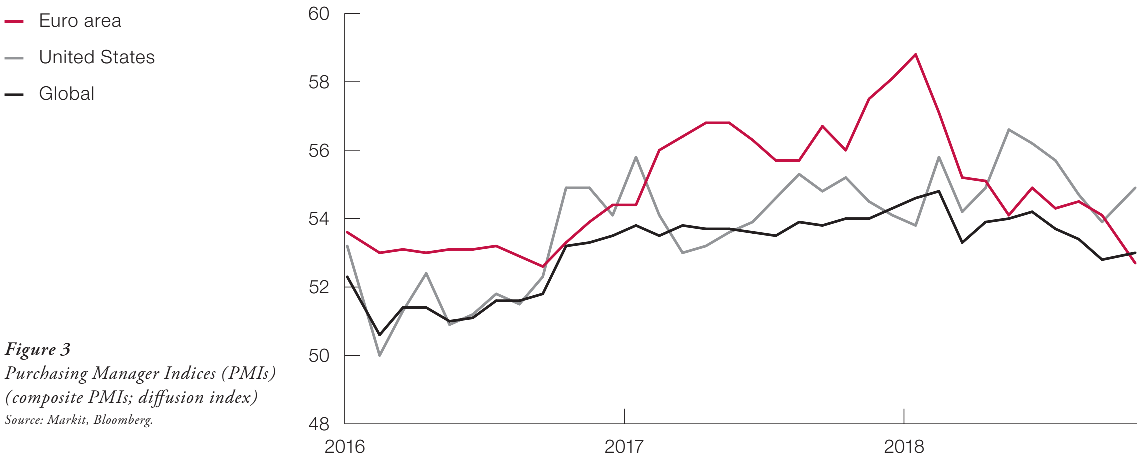

Figure 3
Purchasing Manager Indices (PMIs) (composite PMIs; diffusion index)
Source: Markit, Bloomberg.

The expansionary fiscal policy measure however coincides with a cyclical upturn (associated with a positive output gap) in the US, and growth effects of the tax reform are thus severely limited by the increasingly scarce labor supply. In this context, the expansionary fiscal policy may induce unwanted side-effects, including intensifying inflation pressure and a deteriorating trade balance.

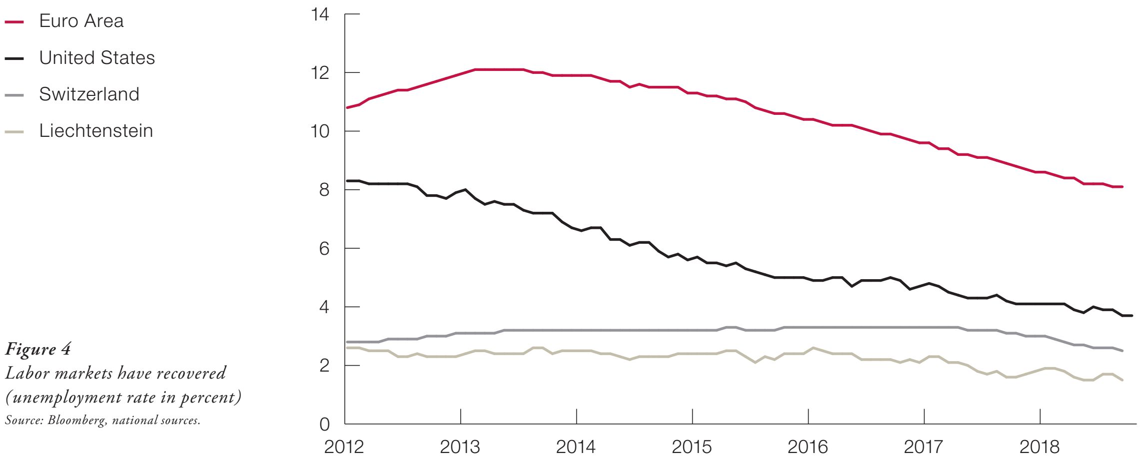

Figure 4
Labor markets have recovered (unemployment rate in percent)
Source: Bloomberg, national sources.

Against the background of solid growth, the recovery of labor markets has continued in the past year. Unemployment rates decreased to 3.7% in the US and 8.1% in the euro area. In Switzerland and Liechtenstein, the unemployment rate also decreased slightly from already low levels, to 2.5% and 1.5%, respectively.

Inflation and financial markets

Along with the labor market recovery, inflation pressures have slightly increased in major economies. With the unemployment rate below its natural rate, wage growth in the US has increased markedly in recent months. Although the rise in inflation was partly due to a recovery in energy prices, core inflation has also risen. In the euro area, inflation stood at 2.2% (y-o-y) in October and the US reported even higher inflation rates at 2.3% (September). Finally, after a long period of below-target inflation, labor supply is running short, and price pressures seem to build up accordingly, as suggested by the Phillips curve.

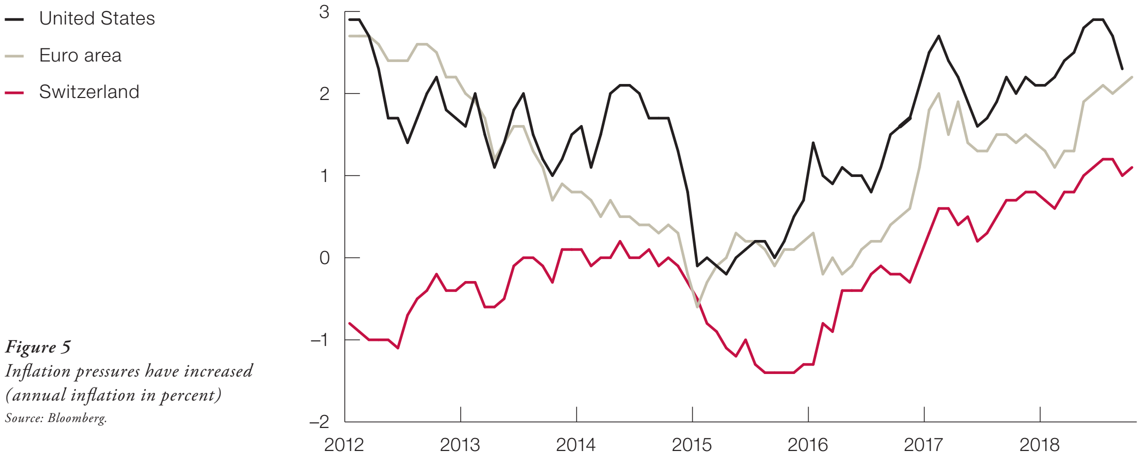

Figure 5
Inflation pressures have increased (annual inflation in percent)
Source: Bloomberg.

In Switzerland, the deflationary phase following the exchange rate shock in early 2015 could also be overcome, with the inflation rate increasing to 1.1% in October, well in line with the SNB's target.

BOX 1

The economy of Liechtenstein[1]

The strong manufacturing base differentiates Liechtenstein from other regional financial centers. The contribution of the industrial and manufacturing sector to Liechtenstein's GDP amounts to 39%, thus substantially exceeding the share of the financial services sector (see Figure B1.1). The economy's strong economic diversification is additionally based on the high share of small and medium enterprises, including highly successful niche players in global markets.

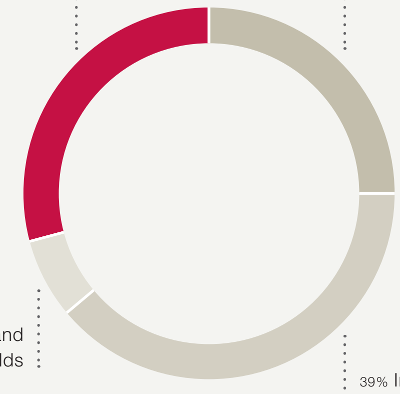

Figure B1.1
Contributions to gross value added (2015, shares in percent)
Source: Office of Statistics.

High private sector expenditures for R&D are expressed in an outstanding innovative strength of the economy. In 2016, research and development (R&D) spending by industrial member companies of the Liechtenstein Chamber of Commerce and Industry (LCCI) amounted to CHF 485 million, about 7.9% of GDP.[2] While data is not directly comparable to internationally available numbers, it can plausibly be concluded that Liechtenstein is ahead of the three OECD countries with the highest share of R&D spending. As a result, the economy is extraordinarily innovative, with 1.6 new patent applications per 1,000 inhabitants per year, way ahead of other innovative countries like Switzerland and Sweden.[3]

In Liechtenstein's economy, total employment exceeds the number of inhabitants. Total population stood at 38,114 in 2017, exceeded by the total number of employed people (38,661), with the majority being commuters living in Switzerland and Austria. Liechtenstein's industrial companies rely on

1 *The government and the Liechtenstein Institute have recently published a comprehensive overview on "Economic and financial data on Liechtenstein", see Brunhart and Frommelt (2018).*

2 *It can be assumed that more than half of this amount is attributable to Liechtenstein, since almost 60% of the LCCI's R&D employees work in Liechtenstein.*

3 *Data is based on Brunhart and Frommelt (2018).*

BOX 1

their strong export base and also have large subsidiaries and branches abroad, with 83% of all employees of LCCI companies working outside Liechtenstein (Figure B1.2). Liechtenstein banks and banking groups employ about half of their employees in Liechtenstein.

The highly specialized economy benefits from its full access to main European markets, including Switzerland and the European Economic Area (EEA). Liechtenstein has a very distinct legal arrangement, including a customs union with Switzerland since 1923 and the membership in the EEA since 1995. Liechtenstein has introduced the Swiss Franc as the local currency already back in 1924. While the country does not have a vote in monetary policy decisions by the Swiss National Bank (SNB), the use of the Swiss Franc has been institutionalized and legally secured in an intergovernmental currency treaty between Liechtenstein and Switzerland in 1980. While the SNB is responsible for monetary policy decisions, financial stability issues and macroprudential policy are joint responsibilities of Liechtenstein's government and the FMA. The EEA membership implies that the financial sector is fully regulated according to EU standards. While the accession to the EEA was a controversial decision in the early 1990s, the membership is nowadays seen as indispensable for Liechtenstein's international integration efforts, both for the industrial as well as the financial sector.

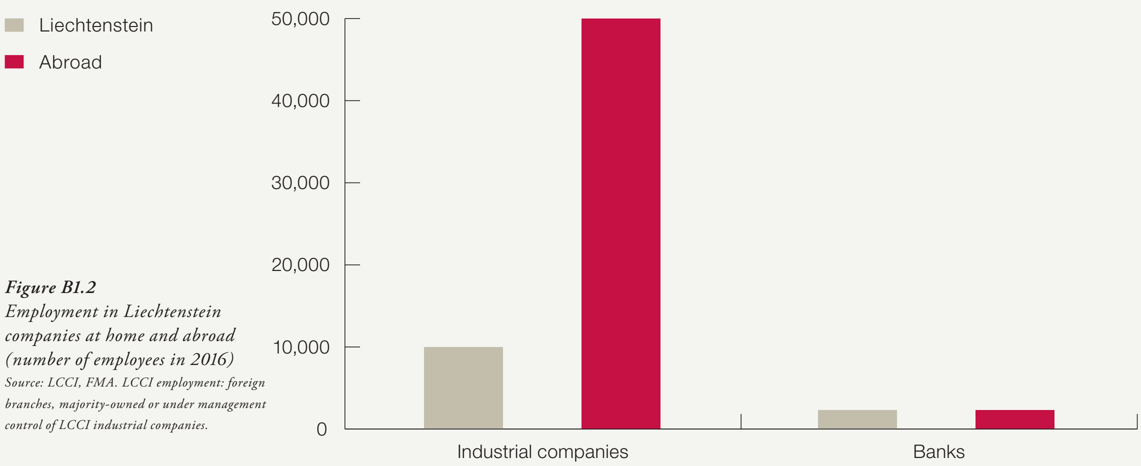

Figure B1.2
Employment in Liechtenstein companies at home and abroad (number of employees in 2016)
Source: LCCI, FMA. LCCI employment: foreign branches, majority-owned or under management control of LCCI industrial companies.

Limited data availability due to the small country size complicates the economic and financial analysis for Liechtenstein. Against the backdrop of the small size of the economy (total GDP amounted to CHF 6.1 billion in 2016) data availability is an issue, with many economic and financial indicators not being available or being published with a long delay. The country size also raises questions about the meaningfulness of collecting and publishing high-frequency indicators, as single transactions of large firms can substantially affect macroeconomic indicators. Nevertheless, taking into account the small size of the country, a number of statistical indicators is readily available, enabling policy-makers to follow

BOX 1

the main developments in the economy, and to react accordingly if necessary.

Following the slowdown after the exchange rate shock in 2015, Liechtenstein's economy is on a recovery course, with survey data pointing to a strong cyclical upturn in the past year. Typical for a small economy, GDP growth is highly volatile in Liechtenstein, as single transactions of large firms can have a noticeable impact on macroeconomic data (see Figure B1.3). Following negative GDP growth in 2015, the economy has returned to a growth course in 2016, and the quarterly business survey indicates a strong recovery since 2017. Total employment increased by 3.6% in 2017, with the unemployment rate dropping to 1.8%, down from 2.1% in the previous year.

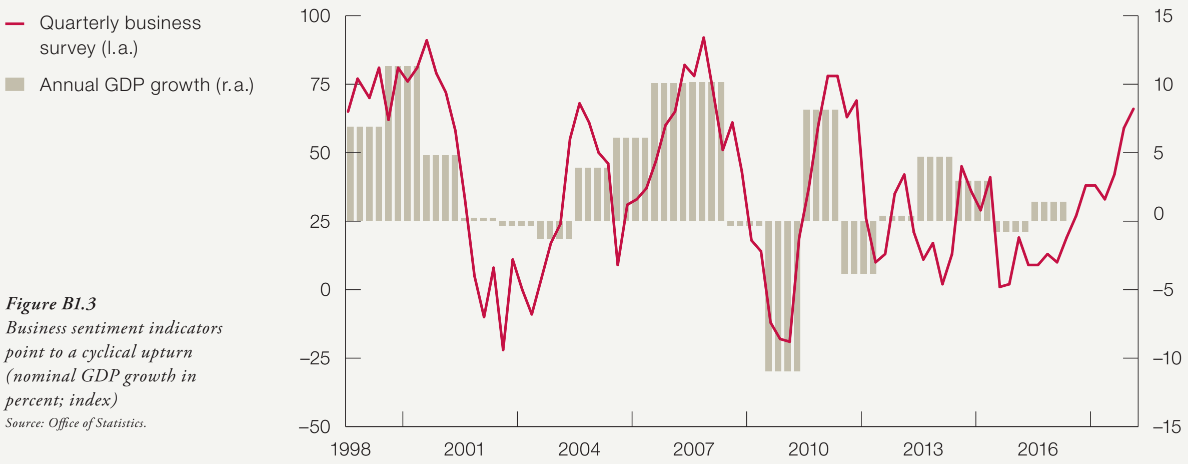

Figure B1.3
Business sentiment indicators point to a cyclical upturn (nominal GDP growth in percent; index)
Source: Office of Statistics.

To account for the high volatility in GDP, all indicators relative to GDP presented in this report are calculated based on potential output. Based on the business survey, GDP can be backcasted for the years 2017 and 2018. Subsequently, potential GDP is estimated by using standard methods (HP filter). Potential output in 2017 is estimated at CHF 6.4 billion.

Reference

Brunhart, A. and Frommelt, C. (2018). "Economic and financial data on Liechtenstein", Liechtenstein Institute, available at https://liechtenstein-institut.li/contortionist/0/contortionistUniverses/397/rsc/Publikation_downloadLink/Economic-and-financial-data-LI-2018.pdf.

Despite the still low volatility, stock markets outside the US have performed rather poorly since the start of the year. Along with the cyclical upturn in the real economy and still accommodative monetary policy conditions, global stock markets reported strong growth in 2017. The stock market correction in early February – triggered by strong wage growth and higher inflation expectations in the US – has highlighted vulnerabilities of equity markets towards seemingly minor market developments (Figure 6). In particular, markets have been reminded that an increase of inflation associated with the economic recovery may lead to faster monetary tightening than previously expected. Interestingly, despite its already high valuations, US stock markets have recovered most strongly, as the US economy is still on a strong growth course. Valuations are however unusually high, thus increasing the probability of renewed stock market turbulence.

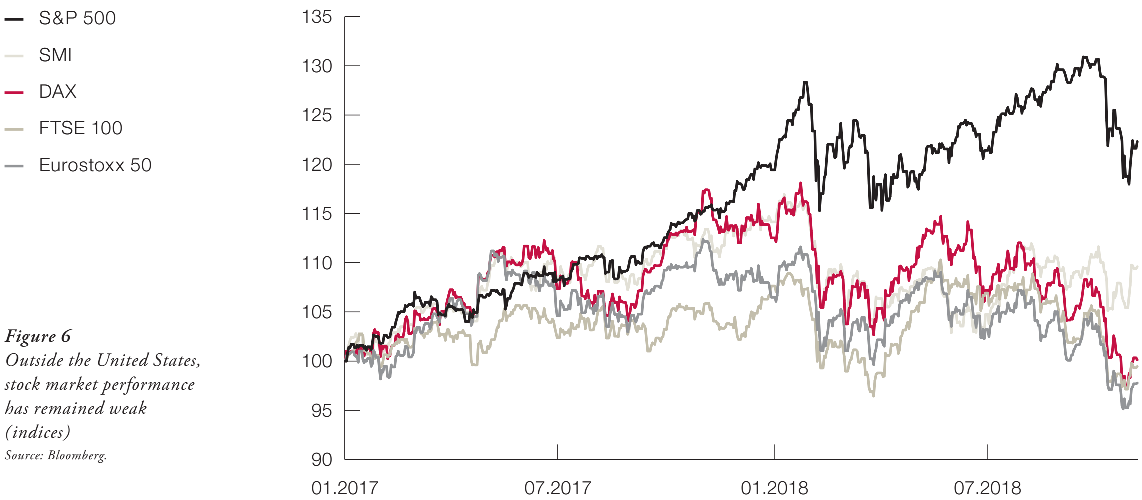

Figure 6
Outside the United States, stock market performance has remained weak (indices)
Source: Bloomberg.

Monetary policy normalization is underway, with the US Fed hiking its federal funds rate and the ECB ending its asset purchase program at the end of the year. The US Federal Reserve has reacted to the cyclical upturn with three interest rate hikes in 2018, with one additional increase of the target band currently expected by financial markets. In the euro area, the ECB has announced an end of its asset purchase program by the end of 2018, thereby starting its exit from the non-conventional monetary policy measures. At the same time, the ECB extended its forward guidance, i.e. that current interest rates will remain at current levels "at least through the summer 2019". Long-term sovereign bond yields in the US have remained mostly stable over the past few months, with bond markets in the euro area differing strongly across countries (Figure 7). While yields of 10-year German government bonds decreased in light of lower growth, political developments in Italy triggered a strong increase in Italian government bonds, which rose to above 3%. Swiss 10-year government bonds have fluctuated around the zero line since the start of the year.

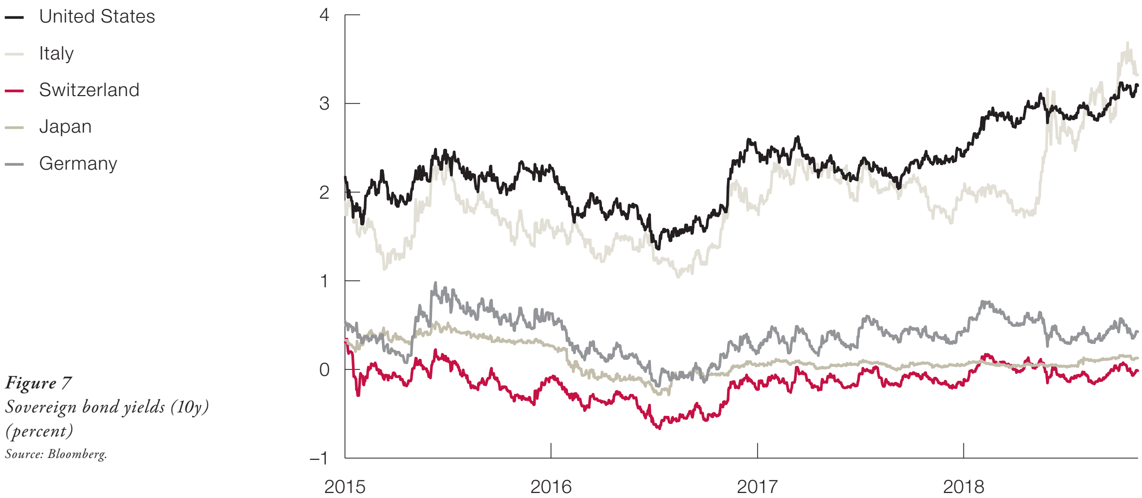

Figure 7
Sovereign bond yields (10y)
(percent)
Source: Bloomberg.

Meanwhile, signs are mounting that the US business cycle may be nearing its end. Since the first interest rate hike of the US Fed at the end of 2015, short-term interest rates have increased more strongly than long-term rates, resulting in a substantial flattening of the US yield curve. In recent months, the spread between 10-year and 2-year treasuries have fallen to the lowest level since 2007 (Figure 8). A reversal of the yield curve – in particular, if the spread becomes negative – is considered being a harbinger of a nearing recession, since markets price in future interest rate cuts by the Federal Reserve. From a historical perspective, each US recession since the 1970s was indeed preceded by a reversed yield curve. With the envisaged interest rate hikes in 2018 and 2019, the corresponding spread could become negative for the first time since the global financial crisis.

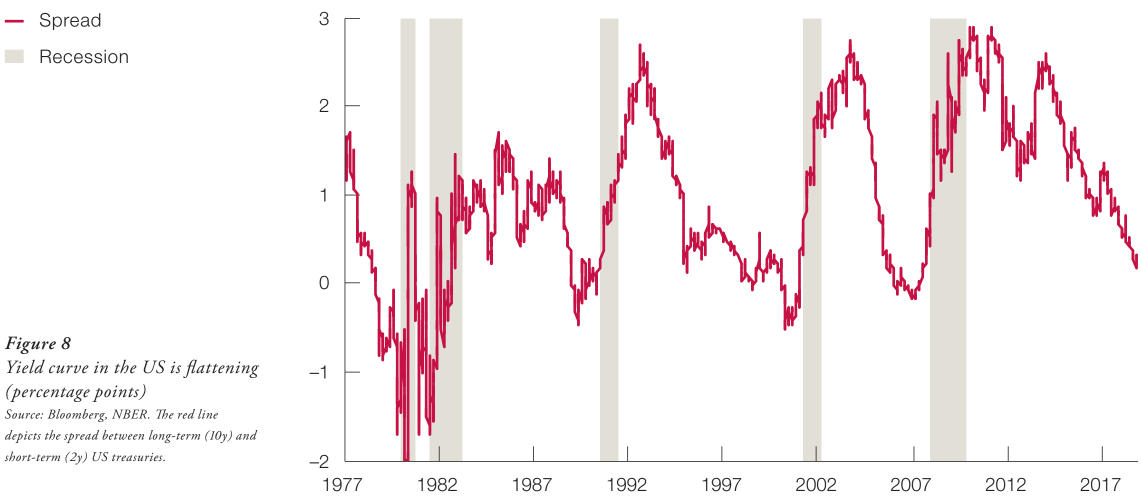

Figure 8
Yield curve in the US is flattening
(percentage points)
Source: Bloomberg, NBER. The red line depicts the spread between long-term (10y) and short-term (2y) US treasuries.

After a period characterized by extremely low volatility and high risk appetite, a repricing of risk premia may be well underway. Risk premia in bond markets are still relatively benign, implying potential for a substantial repricing across market segments. For instance, countries with different credit ratings are in many cases priced relatively similarly, and risk premia could adjust quickly in an environment of increasing financial turbulence. Since the start of the year, first signs of a repricing have already emerged, with both low-rated US corporate bonds spreads and emerging market spreads increasing (Figure 9). Lower rated bonds benefited from the very benign macroeconomic environment in 2017 which was characterized by historically low (implied) volatility at global stock markets. While volatility has remained relatively low despite of the spikes in February and October, the period of extremely low volatility may be nearing its end, as monetary tightening cycles are typically associated with a marked increase of stock market volatility.

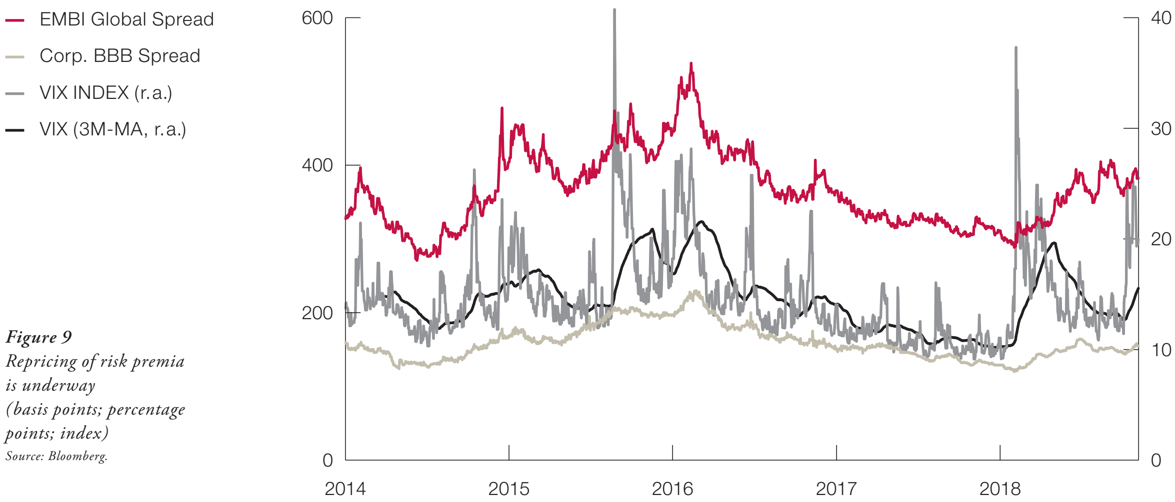

Figure 9
Repricing of risk premia is underway
(basis points; percentage points; index)
Source: Bloomberg.

In light of the developments in Turkey and Argentina, emerging markets have come under renewed scrutiny in recent months. Against the backdrop of increasing interest rates in the United States, the real effective exchange rate of the USD has started to appreciate since the beginning of 2018. Tightening monetary policy make financial investments in the US more attractive relative to other countries, and monetary tightening in the US is thus often associated with capital outflows from emerging market economies (EMEs). While EME fundamentals generally point to a higher resilience of the respective countries compared to the situation before the global financial crisis, some countries are nevertheless specifically vulnerable to capital outflows. In particular, countries which run large current account deficits are dependent on continuous capital inflows, and hence increasingly run into troubles when capital flows to EMEs go into reverse.

BOX 2

Financial turbulence indices: US, euro area and Switzerland

Financial turbulence indices are an important instrument to track global risks and the structural health of financial markets. Taking into account various variables of interest, such indices can summarize all relevant events into a single indicator. Included variables can be related to the stock and bond market performance, but also to the level and spread of interest rates or the effective exchange rate of the local currency. Subsequently, the task of such a risk index is to depict deviations from the status quo of such variables in a timely and accurate manner. In this report, we use the modified turbulence measure suggested by Stöckl, Hanke and Angerer (2017) based on Kritzman and Li (2010). We develop four risk indices taking into account variables that are of interest to policy makers. Other authors have used this measure to e.g. forecast real economic activity based on the health of the 20 largest banks in the United States (Giglio, Kelly and Pruitt, 2016).

While data availability issues and the non-existence of both a stock market and government bonds make the calculation of a Liechtenstein-specific index impossible, we calculate global and regional indices that are directly relevant for Liechtenstein's financial market. For the three regional (US, euro area and Switzerland) risk indices we use the respective major stock indices (S&P 500, EuroStoxx 50, SMI), their implied volatility indices (e.g. VIX), the inflation rate (CPI), the 2 and 10-year government bond yields and the real effective exchange rate calculated by the BIS.[4] For the global index, we combine all regional variables, weighing them by the corresponding regional GDP. In each panel of the figure below, we depict the respective risk index (black line) and the contributions of its individual variables, where the sum of the contributions amounts to the respective risk index.

The index does not only take into account level-deviations from historical means, but also changes in historical correlation patterns across variables. This is one of the main advantages of the applied methodology. For instance, in the case of inflation and long-term interest rates being strongly positively correlated based on historical data, the risk index spikes in the case of the two variables moving into different directions at a single point in time. This is very important, as the index detects untypical correlation patterns in financial markets, which are often a leading indicator for financial market turbulence in the near future.

The index indeed captures the main adverse events in global financial markets in the past few decades and thus offers a quantitative measure to the narrative of past financial crises. Taking a closer look at Figure B2.1, we first discuss the three regional indices before we elaborate on the global index that combines information from the regional indices. Overall, the indices reflect all major events that are commonly associated with periods of financial distress.

For the United States, the most prominent spikes in the index are caused by the Asian, Russian and global financial crisis, as well as the burst of the dot-com bubble and the 9/11 terror attacks. Movements in the stock index (S&P500) and its implied volatility index (VIX) are often driving the financial turbulence indicator, but in some cases (e.g. the 2007 US bear market) other variables play a major role for spikes in the index, such as an inflation

4 *Calculated as trade-weighted average of real exchange rates relative to the respective main trading partners.*

BOX 2

shock or a drastic change in the short-term government bond yield.

For the euro area index, the European sovereign debt crisis has caused more financial stress than the global financial crisis. In the third panel, we find some crises (like the Asian, Russian and the global financial crisis) to drive the European index to similar levels as its US counterpart. The largest spike in the European risk index can however be observed during the European sovereign debt crisis when the sharp rise in short-term interest rates after the final decision on the 2nd Greek bailout drives the European index to its maximum level.

Unsurprisingly, the risk index for Switzerland shows major spikes at the time of strong exchange rate movements. Most interestingly, the Swiss risk index reaches its highest levels during the Russian financial crisis, closely followed by the recession in the early 1990s (which was associated with a downturn in the Swiss housing market) and the global financial crisis. All of these events are primarily driven by the stock market (partly also due to missing information in the first part of the sample). Since the global financial crisis, only two very specific "Swiss" events have driven the risk index, both caused by the real effective exchange rate (REER): The 2012 setting of the exchange rate cap by the SNB and the subsequent removal of the cap in January 2015.

At the global level, the index clearly identifies the global financial crisis as the event with the largest impact on the risk structure of global financial markets. Remarkably, the second major risk event is the Russian financial crisis that has affected all three markets simultaneously. Other important large impact events are the European sovereign debt crisis and the 2015 stock market selloff, i.e. when the Dow Jones Index fell by 588 points during a two-day period, thus strongly affecting all three implied volatility indices. From a Swiss perspective, we find that the setting and removal of the Swiss Franc exchange rate cap had the largest individual influence on the global index, even when taking into account Switzerland's relatively small GDP in relation to the euro area and the United States.[5]

While risk indices have remained at relatively low levels in the past few years, they indicate an increase in global risk since the turn of the year. In recent months, we observe an increase in all indices from a historical low at the end of 2017 towards a level that can still be regarded as low. Although the index remains below its 25th percentile in historical comparison, recent developments associated with increasing political uncertainty (e.g. protectionism, Brexit) and increasing stress in emerging market economies (Turkey, Argentina) clearly led to a rise in financial market risk at the global level. For the United States and Switzerland, the most recent increase in their indices is also driven by real effective exchange rates. In line with historical patterns, decreasing risk appetite in global financial markets has led to an appreciation of safe haven currencies, such as the US dollar, the Swiss Franc or the Japanese Yen.

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5 GDP data is based on the OECD database and refers to Q1 2018.

BOX 2

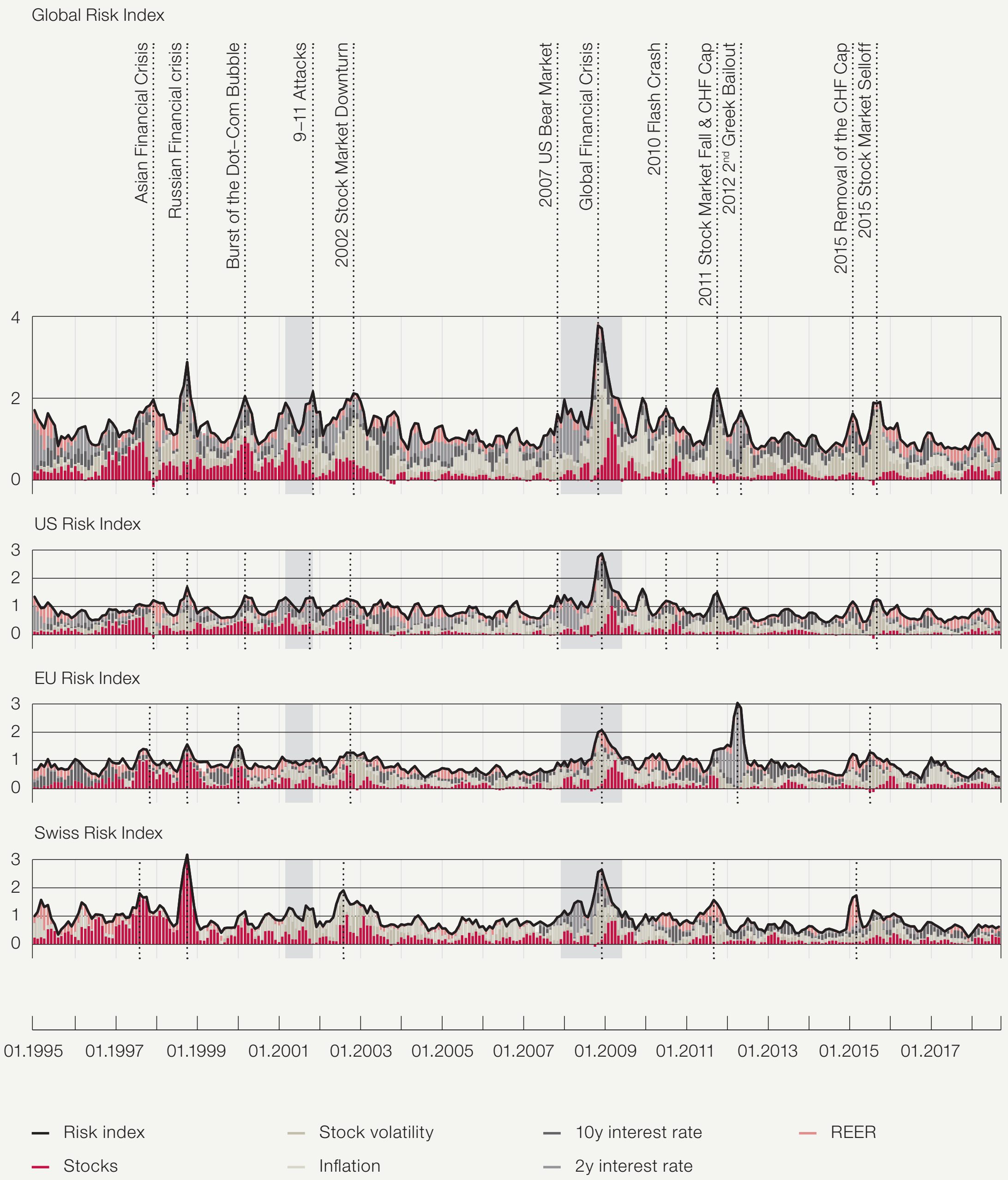

Figure B2.1
Global and regional (US, euro area, Switzerland) risk indices
(indices)
Notes: Data was retrieved from Bloomberg. The sample period is 1990:01–2018:09, the plotting period is 1995:01–2018:09.

Two countries catch one's eye in this respect – Argentina and Turkey. In both cases, continuous twin deficits (current account deficits accompanied by public budget deficits) have led to relatively high levels of foreign debt, to a large part denominated in foreign currency. In addition, strongly rising inflation rates have undermined the confidence of international investors. In such a situation, capital outflows cause a depreciation of the local currency and thus lead to further increasing inflation rates, potentially setting in motion a downward spiral. The impact on the global economy mainly depends on whether developments in the two countries are spilling over to other EMEs, as some large emerging countries also exhibit twin deficits (e.g. Brazil, South Africa) and other country-specific vulnerabilities.

Following a relatively strong depreciation, also due to the recovery in the euro area, the Swiss Franc has recently gained strength again in light of increasing tensions in financial markets. After following a pronounced depreciation trend since mid-2017, the Swiss Franc has reached CHF 1.20 per EUR in April, i.e. the level before the exchange rate cap was abandoned by the SNB, which is also broadly in line with a fair valuation according to purchasing power parity (Figure 10).

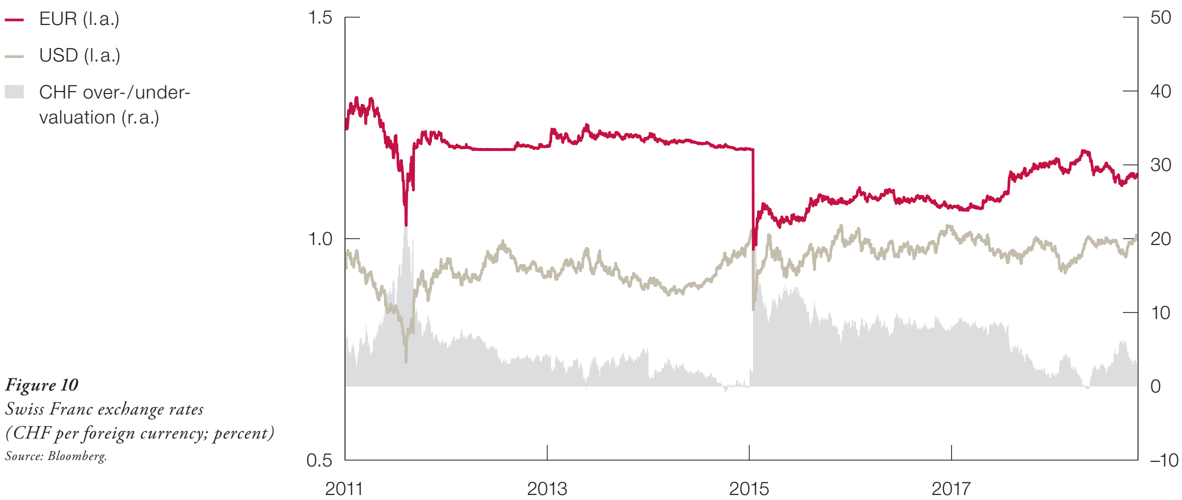

Figure 10
Swiss Franc exchange rates
(CHF per foreign currency; percent)
Source: Bloomberg.

Since then, however, political developments in Italy and rising global tensions have led to a re-appreciation of the Swiss Franc against the EUR and other currencies, once again confirming its role as a safe haven currency.

While financial markets have remained relatively calm overall, financial turbulence has nevertheless increased substantially since the start of the year. Box 2 introduces a composite financial turbulence index for three regions (United States, Euro area, Switzerland) taking into account a large set of variables, such as interest rates, inflation, exchange rates and stock market volatility. The methodology of the index does not only take into account deviations of the corresponding variables from their historical means, but also changes in correlation patterns across the included variables, therefore capturing uncommon market developments often preceding financial crises. Against the backdrop of increasing uncertainty related to trade tensions, the starting monetary tightening cycle, a slowdown in China and increasing concerns in emerging economies, global risk has increased somewhat since the start of the year, although from a relatively low level.

Risk assessment

Despite of weakening growth prospects, the outlook for the global economy remains relatively benign. While business sentiment has deteriorated somewhat since the start of the year, indicators still point to stable and positive global growth. Furthermore, contagion from volatility events – such as the stock market correction in February and recent tensions in emerging economies – has been limited so far. In addition, in this benign macroeconomic environment, banks have become more resilient amidst rising profitability and higher capitalization ratios.

At the same time, downside risks to growth have clearly increased since the start of the year. Despite of the still positive growth outlook, risks for the global economy have increased amidst rising protectionism, growing concerns in emerging markets, an expected inversion of the yield curve in the United States and an increase in global political and policy uncertainty. Particularly in the US, the potential for a further cyclical upturn are limited by a tightening labor market and growing inflation pressures signaling that the US economy is in a late stage of the business cycle. The most serious risk probably stems from rising trade tensions and growing protectionism, particularly from the US. A pronounced slowdown in global trade activity would likely lead to a recession of the global economy, with severe consequences for financial markets and financial sectors around the world.

The increase in policy uncertainty is reflected in rising turbulence at financial markets since the start of the year, albeit from relatively low levels. As explained in Box 2, signs of financial stress are on the rise. Uncertainties surrounding trade policies have reached historically high levels, and the perceived probability of a "hard" (no-deal) Brexit has also increased lately. At the same time, financial markets are characterized by continued intense risk taking, leading to stretched valuations particularly in the United States. Furthermore, periods of monetary tightening are often associated with higher volatility and rising turbulence in financial markets.

A repricing of global risk premia could have serious consequences in both advanced and emerging economies. In a maturing cyclical upturn, rising inflation could lead to stronger interest rate increases than anticipated by financial markets. In addition, risk premia have already started to rise in recent months, even though remaining at relatively low levels from a historical perspective. Incentivized by the long low-interest rate environment, indebtedness has increased in many countries, with public and private sector debt levels often above the thresholds associated with debt overhangs. In this context, public debt sustainability concerns have resurfaced, triggered by the events in Italy. While the liquidity of euro area sovereign bond markets deteriorated during the Italian sell-off in May, the market has largely recovered subsequently. In contrast, however, the liquidity of euro area high-yield non-financial corporate (NFC) bonds has remained at a lower level since May and yet has to recover from the developments in Italy, pointing to tightening financial conditions. Large outflows from bond funds investing in EMEs since April also signal a declining risk appetite in financial markets. While high debt levels of households and NFCs make them vulnerable to an abrupt increase in interest rates, a market repricing could also affect funding conditions of banks, in particular institutions that are dependent on market-based unsecured funding.

Under current conditions, a further increase in uncertainty, followed by an increase in volatility and financial turbulence, could have particular adverse effects on the real economy. Although most major central banks have started or outlined the exit from unconventional monetary policy, interest rates and global funding conditions have remained quite accommodative. While favorable funding conditions are positive for the growth outlook, it also implies that the monetary policy space in the case of an emerging recession is very limited, and that central banks could hardly counteract a severe slowdown. In this context, the economic literature finds that financial turbulence has particularly adverse consequences when monetary policy space is limited (see Box 3). In addition, our empirical analysis in Box 4 suggests that in the current environment of high economic policy uncertainty, rising financial turbulence is likely to have more adverse effects, implying currently elevated risks for the real economy in the case of a financial market correction.

BOX 3

Monetary policy space and the effects of financial sector distress

Following the Great Recession, the global economy has entered a period of historically low interest rates. Low interest rates are a consequence of cyclical factors associated with comparatively low growth and inflation rates in advanced economies. At the same time, however, structural factors also appear to play a role. Many observers point out that structural changes such as demographic and productivity developments in developed economies make a sustained low interest rate environment more likely.[6] This scenario is often referred to as "low-for-long" (BIS, 2018). While low interest rates, per se, can have adverse effects on financial stability,[7] they additionally constrain the room of maneuver of central banks.

In a severe recession, monetary policy is effectively limited by the zero lower bound on nominal interest rates. With interest rates at or close to zero, central banks can no longer mitigate adverse macroeconomic shocks by conventional monetary easing. Amano and Shukayev (2012) argue that this limited monetary policy space may be particularly relevant in the context of financial crises as the increase in the risk premium cannot be counteracted by lowering interest rates.

Empirical evidence suggests that financial stress has particularly adverse consequences in a low-interest rate environment. A recent study by Romer and Romer (2018) evaluates the role of monetary policy space in the propagation of financial crises. They identify times when credit provision becomes more costly resulting in a reduction in credit supply for a given level of borrower risk. To this end, they exploit narrative accounts on financial disruption elicited from the OECD Economic Outlook (see also Romer and Romer, 2017). The financial distress measure covers 24 OECD countries.[8] While the study reports a general decline in GDP following a surge in financial disruption, they uncover considerable variation in the output response associated with monetary policy space. More precisely, the decline in GDP is approximately 40 to 60 percent smaller when a country exhibits sufficient monetary policy space.[9]

Financial stress could therefore have particularly adverse effects in the current macroeconomic environment. Even though we observe cautious increases in interest rates in several economies, policy rates of central banks around the world generally remain low. This leaves the monetary policy space limited, which in turn, increases potential adverse effects of financial disruption. According to the economic literature, stress in financial markets would thus have particularly severe consequences in the current environment of severely limited monetary policy space.

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6 *See also the FMA publication Economics Focus 01/2017, "Why are interest rates so low?", http://www.fma-li.li/files/fma/fma-blickpunkt-volkswirtschaft-1-2017.pdf.*

7 *E.g., low interest rates impair the profitability of the financial sector and fuel excessive risk taking, see Borio and Zhu (2012).*

8 *The 24 OECD countries considered are the OECD members as of 1973.*

9 *Sufficient monetary policy space is defined by the policy rate being larger than 1.25%.*

BOX 4

Financial distress and the macroeconomic effects of uncertainty

On the back of intensifying protectionism and trade disputes, global economic uncertainty has surged in recent months. Economic policy uncertainty has increased substantially since the start of the year (Figure B4.1). In particular, rising protectionism tendencies in the United States, but also in other parts of the world, have led to a drop in business sentiment and uncertainties about the global growth outlook. Apart from the stock market correction in early February, policy uncertainty is not yet reflected in common financial distress indices or in stock market volatility.

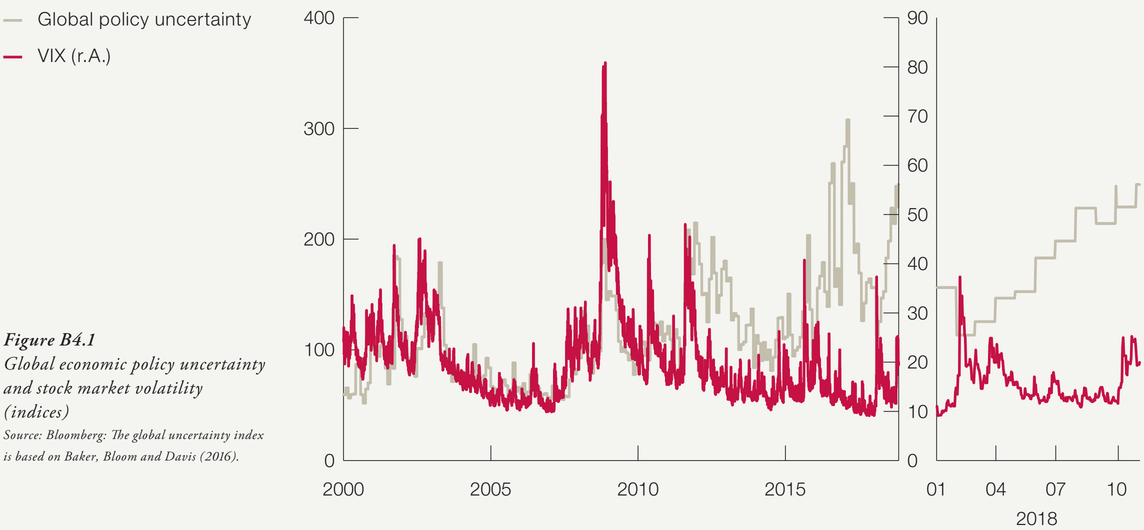

Figure B4.1
Global economic policy uncertainty and stock market volatility (indices)
Source: Bloomberg: The global uncertainty index is based on Baker, Bloom and Davis (2016).

Changes in perceived global risk do not only affect financial markets but also exert adverse real effects on the economy. One way global risk influences the real economy is through economic uncertainty. When global risk surges, economic agents become uncertain about future economic outcomes. This uncertainty affects economic decision making, i.e. people are reluctant to engage in irreversible investments or hiring. In addition, higher uncertainty increases the premium on external finance as banks and investors price the corresponding risk. The latter mechanism may be particularly strong in situations when financial intermediation is already distressed (Alessandri and Mumtaz, 2018).

BOX 4

The effect of an increase in perceived global risks may depend on the macroeconomic and financial environment. To evaluate this link between uncertainty and financial intermediation, we study the reaction of real economic activity in a scenario in which financial intermediation is well functioning and in a scenario in which financial intermediation is distressed. To select these states of the functionality of financial intermediation, we consider the financial distress measure by Romer and Romer (2017) introduced in Box 3. For every period where the OECD Economic Outlook addresses disturbances in financial intermediation, we assign the respective country to a state of distressed financial intermediation, while a country is regarded as being in a state of well-functioning financial intermediation if this is not the case. We estimate the average effects of a rise in uncertainty on growth rates of GDP of 24 OECD countries.[10] As a measure for uncertainty, we use the global risk index introduced in Box 2. Figure B4.2 shows the average dynamic response of the GDP growth rate to a surge in global risk for three scenarios using data from 24 OECD countries. In the first scenario, we leave financial distress out of consideration and only look at the average effects of global risk. In the second scenario, we consider the effects of a risk increase when a country is in a state of no financial distress, while in the third scenario countries are exposed to some degree of financial distress. Each subfigure shows the effects of a surge in global risk (by one standard deviation)[11] in the period it takes place and the dynamic response in the subsequent six quarters.

An increase in global risk has particularly severe effects on GDP in the case of already distressed financial markets. Considering the first panel in Figure B4.2, we see that surges in global risk generally affect GDP growth rates adversely, leading to a decline in growth rates of approximately 0.5 percentage points for one year. In the second and third column, we disentangle the effects of global risk depending on the current state of financial intermediation. Comparing the two scenarios “no financial distress” and “financial distress”, it is evident that surges in global risk are particularly harmful when they coincide with already distressed financial intermediation. This is not only true for the aggregate of the 24 OECD countries we consider, but also strongly suggested by country-by-country estimations. While we observe only a moderate decline in GDP growth associated with surges in global risk in the “no financial distress” scenario, in the “financial distress” scenario GDP growth decreases by approximately one percentage point over a time period of one year.

10 *The GDP is measured in purchasing power parities to facilitate comparability.*

11 *The size of one standard deviation of the global risk measure captures a typical global risk shock.*

BOX 4

Empirical evidence thus suggests that economic policy uncertainty has more adverse effects on the real economy in an environment of high financial distress. Current conditions are characterized by relatively stable financial markets, which contribute to a mitigation of the adverse effects of uncertainty. However, this may change rapidly in case of emerging financial market stress, which is important to keep in mind as we observe high political uncertainty, and, at the same time, limited monetary policy space (see Box 3). In a nutshell, a repricing of global risk premia and/or a severe stock market correction is more likely to spill-over to the real economy in an environment of already distressed financial intermediation.

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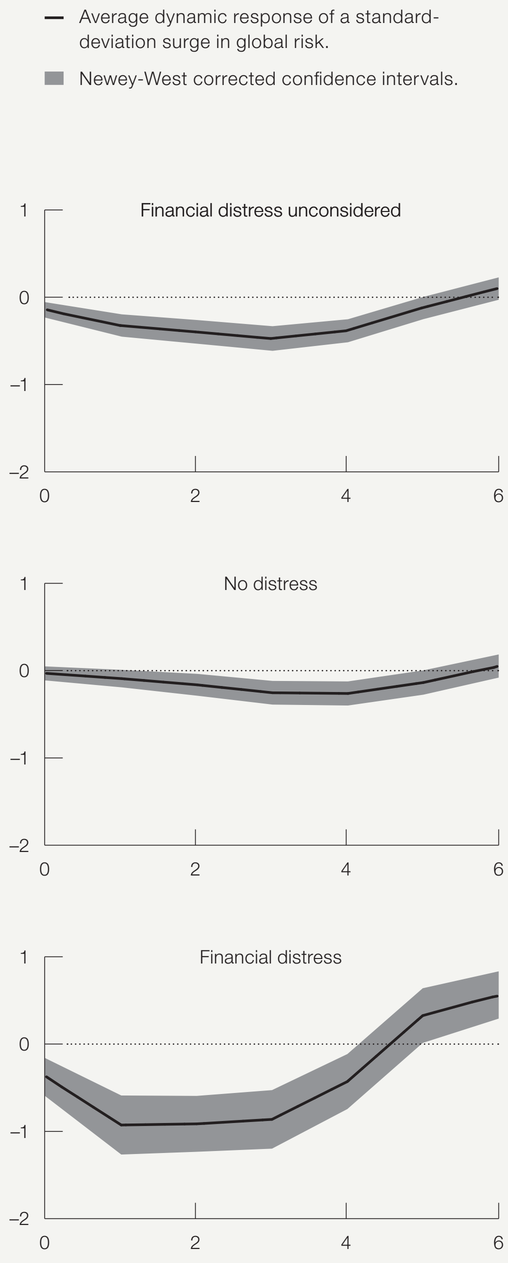

Figure B4.2
The impact of an increase in global risk on GDP growth (deviation of GDP growth from baseline scenario in percentage points; quarters)

LIECHTENSTEIN'S NON-FINANCIAL SECTOR

Overview and international comparison

While data availability is limited, available information points to relatively low overall indebtedness of the non-financial sector in Liechtenstein. In contrast to the very detailed public sector accounts, data on private indebtedness – both for non-financial corporations (NFCs) and households – do not exist in its usual consolidated form for Liechtenstein. The following analysis is thus based on various data sources, including tax statistics and the FMA's internal supervisory statistics. Data from the tax authority show a relatively high indebtedness of private households amounting to approximately 127% of GDP. The lion's share of private households' debt consists of mortgages. The high headline number is however not fully comparable to other countries. As explained in detail below, within-household sector debt is also considered in this statistics, which is not the case in other countries' debt statistics. Furthermore, on the back of moderate tax rates, high disposable income increases debt sustainability relative to other countries, and the relatively high debt ratios are also accompanied by high (net) household wealth. Still, the high stock of household debt is one of the main risks in the banking sector, and various policies targeting this issue have been introduced in recent years (see the following section and Box 5 on Liechtenstein's real estate sector). On the other hand, the NFC sector has a very low debt ratio, also due to corresponding tax incentives (see below). In total, the NFC debt-to-GDP ratio is estimated at approximately 25% of GDP by end-2017.

A very healthy public sector contributes to the overall stability of the financial sector. Following a remarkable fiscal consolidation package after the global financial crisis, the public sector recorded considerable budget surpluses over the last few years. Furthermore, the public sector has virtually no debt, but relatively large liquid financial reserves, which is an important factor of stability for the financial sector and the economy as a whole.

From an international perspective, Liechtenstein exhibits a low debt-to-GDP ratio. The relatively high indebtedness of the household sector is accompanied by low debt of NFCs and zero debt of the general government, resulting in a low overall debt-to-GDP ratio (see Figure 11).

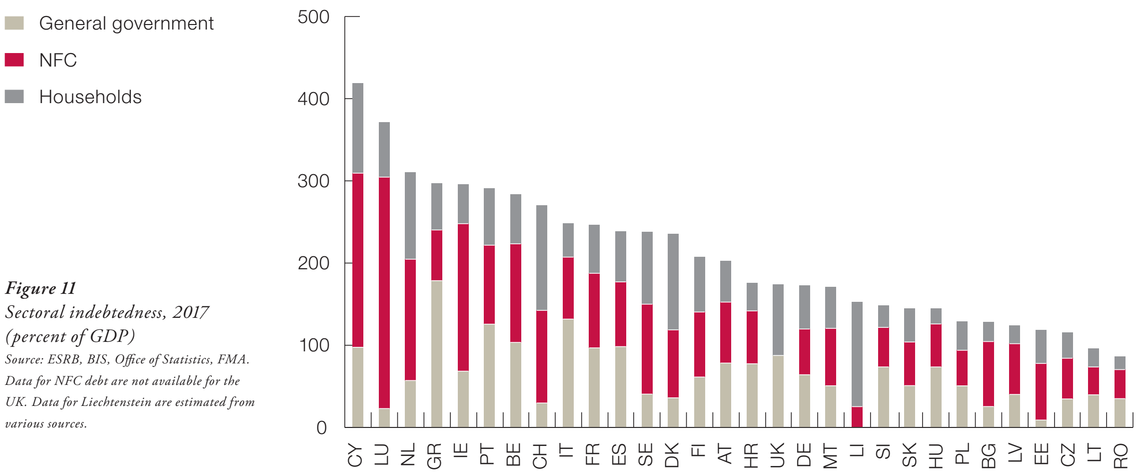

Figure 11
Sectoral indebtedness, 2017
(percent of GDP)
Source: ESRB, BIS, Office of Statistics, FMA. Data for NFC debt are not available for the UK. Data for Liechtenstein are estimated from various sources.

The private sector has benefited from the low-interest environment in recent years. While the low-interest rate environment implied some windfall gains particularly for the household sector in the last couple of years, the large majority of credits (and mortgages) exhibit fixed interest rates, leading to a gradual pass-through of interest rate changes over time (see Figure 12). The large share of fixed interest rate mortgages thus also implies that an abrupt interest rate increase – e.g. due to a repricing of global risk premia or a faster monetary tightening than currently envisaged by financial markets – would not affect Liechtenstein's households immediately, but only gradually over time. Such additional time for adjustment, both for the household sector and the banks facing the corresponding credit risk, is an important risk mitigating factor in the case of Liechtenstein.

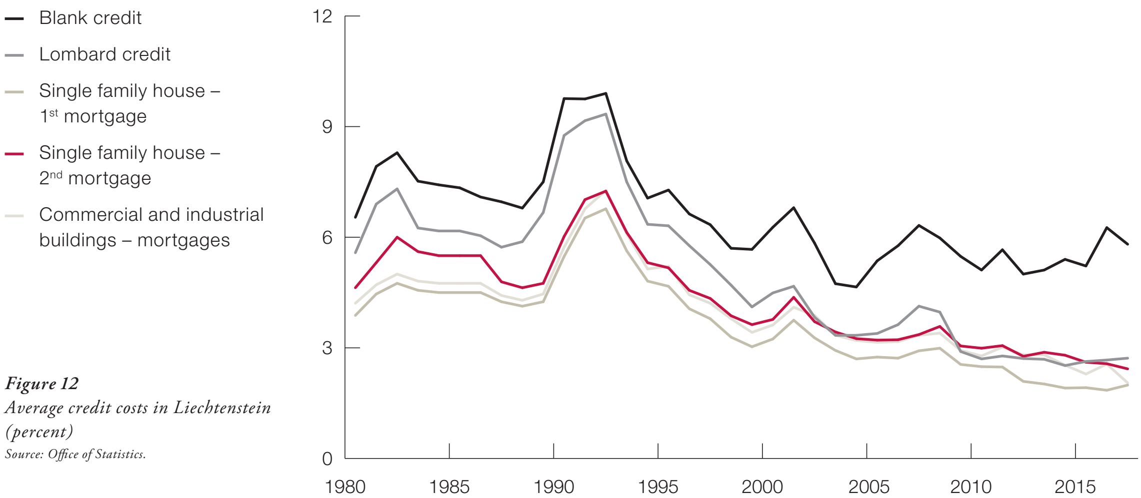

Figure 12
Average credit costs in Liechtenstein (percent)
Source: Office of Statistics.

Households

While data points to a relatively high household indebtedness in Liechtenstein, available numbers are likely to overestimate the debt burden relative to other countries. Based on tax statistics, household indebtedness is estimated at around CHF 8.2 billion (127% of GDP)[12] in 2017, with the lion's share of household debt consisting of mortgages. Headline numbers are however not only likely to overestimate risks in the household sector (see below), but are also not directly comparable to other countries. The household debt statistics are based on tax statements by households (supplemented by data from the banks' reporting system for the past two years), with

12 *Since neither debt statistics nor GDP numbers are available for 2017, this headline figure is based on internal estimations. Household debt is available until 2016 and is extrapolated based on proxies from banks' reported data. GDP numbers are available until 2016 (flash estimate). We use our internal backcasting model (based on the conjunctural survey) to estimate GDP in 2017. For calculating debt-to-GDP ratios, we consequently use potential GDP estimates to take into account the relatively high volatility of GDP in a small economy like Liechtenstein.*

a significantly broader definition than standard definitions of household debt, e.g. from Eurostat. More precisely, household debt statistics are typically calculated on a consolidated basis (i.e. credit within the household sector is not considered). On the contrary, debt statistics in Liechtenstein are based on tax statements, and credit within the household sector (even within a single household or a family) is recognized as a liability, since the taxable unit is the corresponding person and not the household. Alternative data sources point to a lower household debt-to-GDP ratio, but may in turn underestimate household debt. Banks' loans to private households amounted to 5.9 billion (or around 93% of GDP) by end-2017. While this figure does not take into account credit within the household sector (thus increasing comparability with international data), it also excludes cross-border credits by households and is thus likely to underestimate the debt ratio. Since only debt statistics based on tax statements are available as a time series, we proceed with the former definition of household debt. It is nevertheless important to keep in mind that the figure overestimates household debt systematically relative to other countries.

Besides definitional issues in measuring household debt, some structural characteristics and legal restrictions on real estate purchases imply that risks may be lower than suggested by the reported headline numbers. First, high job security and continuously low unemployment rates over the past decades lead to high planning certainty for the household sector in Liechtenstein in terms of household income, implying that the sustainable level of household debt is higher than in other countries. Second, relatively low taxation on household income leads to higher disposable income, thus further improving the sustainability of household debt relative to countries with higher tax rates. Third, banks follow prudent lending standards (see Box 5 below) and asset quality has continued to be favorable, with non-performing loan (NPL) ratios remaining at very low levels. Fourth, high household debt is accompanied by high household wealth, and data from tax authorities suggest that the household deciles with highest debts also show the highest (net) wealth. From the three largest banks (providing approximately 96% of credits to the household sector), a further distinction of the purpose of the credit is available. While residential mortgages indeed compose the lion's share of debt (around 75%), consumer loans play a negligible role. It thus seems likely that the remaining share is (at least partly) also a result of lombard credits, which are usually well collateralized with financial securities.

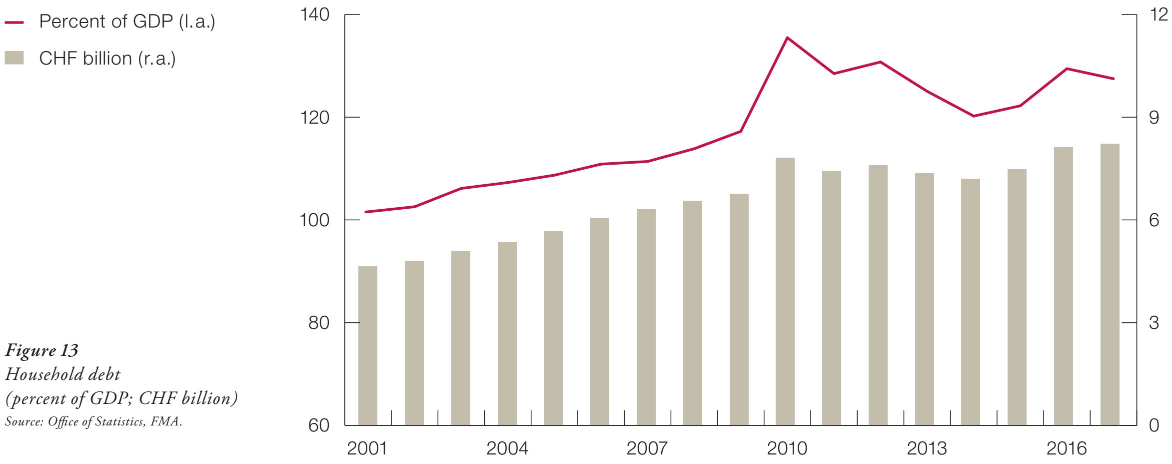

Figure 13
Household debt
(percent of GDP; CHF billion)
Source: Office of Statistics, FMA.

On the back of various policy measures, credit and mortgage growth has significantly weakened in the past few years, with the household debt-to-GDP ratio following a downward trend. After peaking at 135% of GDP in 2010, household debt has followed a declining trend relative to GDP in recent years, despite some volatility-induced uptick in 2016 (see Figure 13). The decline of the household debt-to-GDP ratio (estimated at 127% of GDP in 2017) also results in a negative credit gap, estimated at –4% at the end of 2017. The countercyclical capital buffer has therefore not yet been activated and is currently set at 0% (see Box 6 on the countercyclical capital buffer). Notwithstanding the high household indebtedness, overall risks are thus assessed to be limited in light of a slowdown of the financial cycle (see Box 5 on Liechtenstein's real estate sector), prudent lending standards of banks and low mortgage growth over recent years.

While an abrupt interest rate increase could imply risks for Liechtenstein's indebted household sector, the direct impact on the economy is likely to be limited. A repricing of global risk premia or any other abrupt increase of interest rates could hit the household sector due to the existing large stock of household debt to some extent. Even in such a scenario, however, the impact on the broader economy would be limited, as domestic demand plays a relatively minor role in Liechtenstein's small and open economy, dampening any procyclical effects of a downturn in the financial cycle. Thus, even a marked increase of the households' saving rate would have negligible demand effects. In addition, the bigger part of mortgages features fixed interest rates, i.e. the effect would take full effect only gradually with the renewal of expiring mortgages. Overall risks are hence limited, also because household balance sheets are assessed to be sound. The very low debt ratio of NFCs and the non-existence of public debt (but large public reserves) further contribute to the overall stability of the financial sector.

BOX 5

Liechtenstein's residential real estate sector

Liechtenstein's real estate sector is characterized by relatively high prices and low market activity. While there are no house price indices available, neither for house purchases nor for rents, alternative information from various sources nevertheless makes a comprehensive risk assessment of the residential real estate (RRE) sector in Liechtenstein possible. Earlier studies by the FMA (2013, 2015) show some very distinct features of the real estate sector in Liechtenstein. First, real estate prices are relatively high and have increased substantially since 2008, thus dampening the yields on real estate investments, since the increase in rents has been less dynamic in the same time period. Anecdotal evidence however suggests that price growth has substantially diminished in recent years, and mortgage growth has also weakened accordingly. Second, legal restrictions on the purchase of real estate – in case of already existing property within the family – lead to quite limited market activity. By contrast, transfer of property within the family is not subject to approval. As a result, the vast majority of real estate transactions are not purchases, but transfers by barter, donation or heritage. In the past four years (2014–2017), a total of 4,517 changes of ownership of real estate were recorded in Liechtenstein. Only in 1,282 cases (28%), the change in ownership took place by purchasing. Against this background, it becomes obvious that a price index based on approximately 300 annual transactions would be quite volatile, depending on the nature of transactions in the corresponding year. An analysis on the basis of other, already existing indicators – e.g. building activity, vacancy rates, mortgage growth, loan-to-value ratios (LTVs) etc. – is thus more reliable.

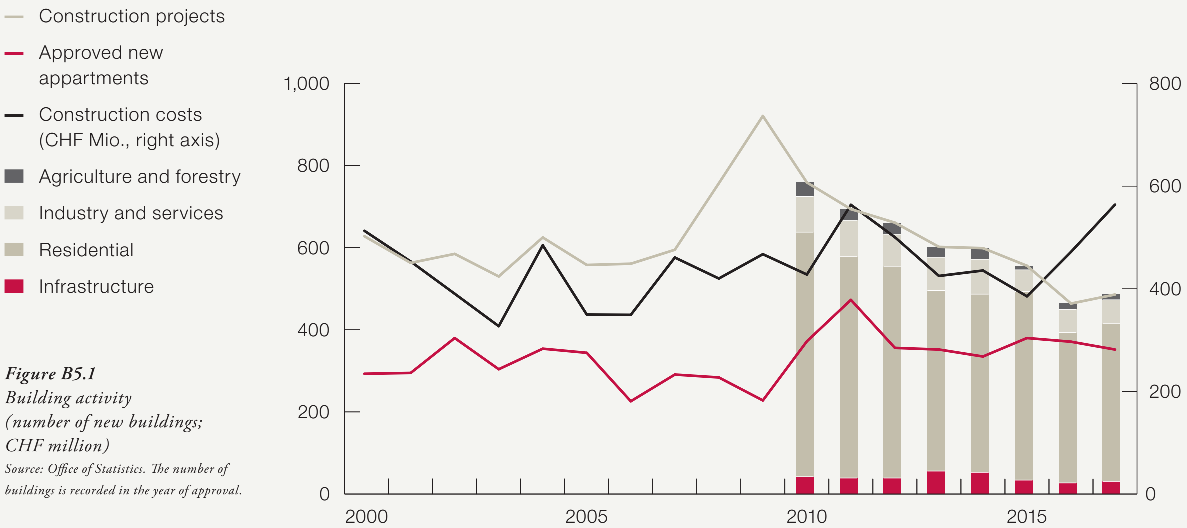

Figure B5.1
Building activity (number of new buildings; CHF million)
Source: Office of Statistics. The number of buildings is recorded in the year of approval.

BOX 5

Following a short boom before the global financial crisis, building activity has slowed down somewhat in recent years. The total number of construction projects has peaked at 921 in 2009, and has followed a downward trend in recent years, with 486 new projects in 2017 (Figure B5.1). The decline is mainly caused by RRE, although the declining number may partly reflect an increase in multi-family homes and a declining number of single-family houses. Annual construction expenditures have remained fairly stable in recent years, notwithstanding some volatility related to the small size of the country. Latest data for the first half of 2018 confirms this downward trend, with both the number of new construction projects as well as total construction costs being considerably lower than in the same period in the previous year.

While the number of residential units has increased in light of substantial building activity, the vacancy rate has subsided slightly in the past few years. The total number of apartments increased from 18,509 in 2010 to 20,514 in 2017. Since 2014, both the number of not permanently occupied residential units (including old houses and holiday homes) as well as vacant residential units (i.e. apartments available for sale/rent) has remained broadly stable. The vacancy rate even decreased slightly below 4% in 2017 (Figure B5.2).

Total mortgage growth has also declined markedly in recent years, contributing substantially to the downward trend in the household debt-to-GDP ratio. Historical time series of mortgage debt include cross-border credit to Switzerland (i.e. including the Swiss Franc currency area). Headline numbers show that mortgage growth has declined markedly from 8.8% in 2010 to 3.0% in 2017 in the past few years (Figure B5.3).

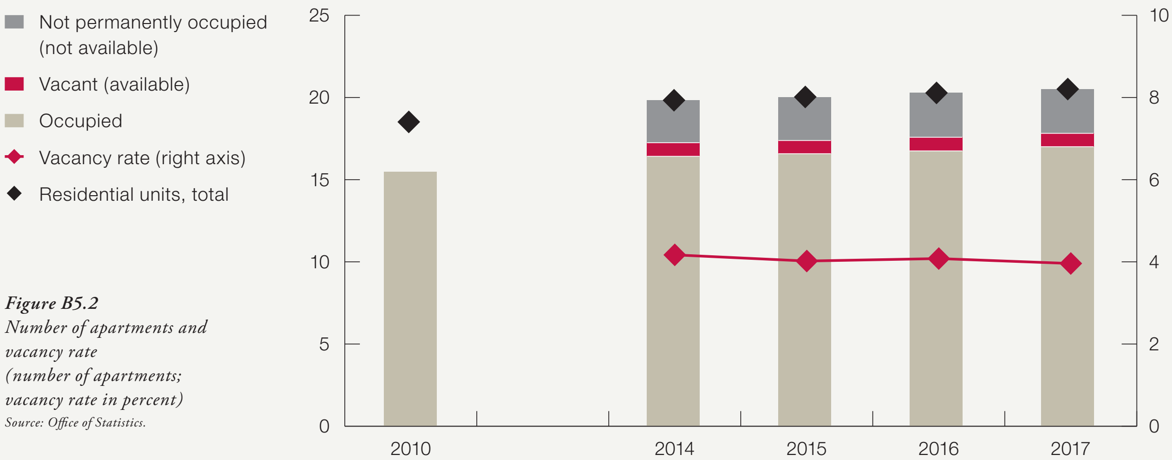

Figure B5.2
Number of apartments and vacancy rate
(number of apartments; vacancy rate in percent)
Source: Office of Statistics.

BOX 5

Data for the past few years – where Liechtenstein and Switzerland can be distinguished – suggest that mortgage growth has mainly been driven by lending activities to Switzerland. Annual growth of mortgages in Liechtenstein (including RRE and other real estate) amounted to 1.7% in 2017.

Mortgage growth in RRE has also remained low in recent years, and loan-to-value ratios (LTVs) suggest that banks follow prudent lending standards. Total growth of mortgages in RRE in Liechtenstein amounted to less than 2% on average in the past three years. Even more importantly, following the measures introduced in 2015 (see below), LTV ratios continued to improve in the past few years. The share of loans exhibiting an LTV ratio below 66% increased from 70.6% in 2014 to 74.7% in 2017 (in terms of loan volume, see Figure B5.4). Accordingly, the share of loans with an LTV larger than 80% continued to decrease from 2.1% to 1.5%, and the share of loans with an LTV between 66% and 80% also receded from 27.3% to 23.8%.

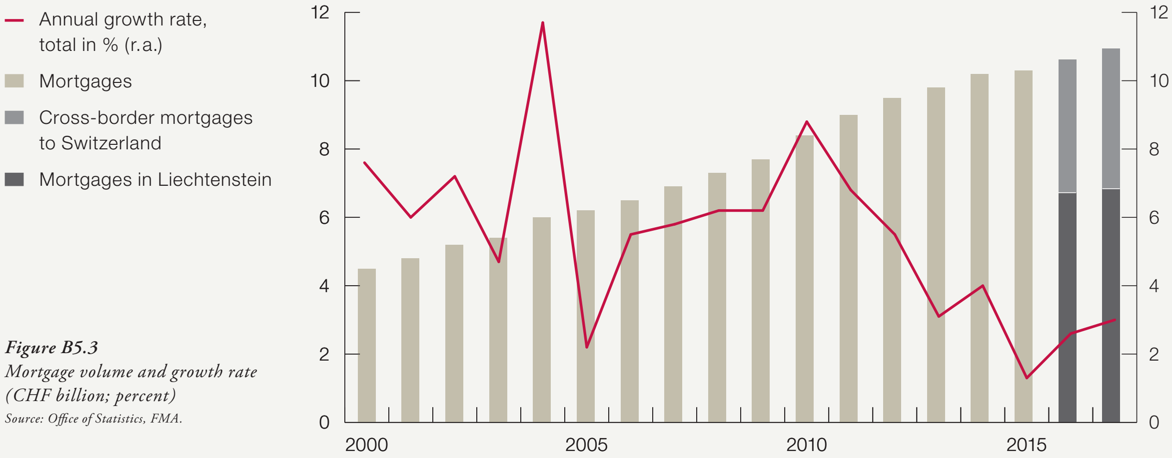

Figure B5.3
Mortgage volume and growth rate (CHF billion; percent)
Source: Office of Statistics, FMA.

Since the first analysis of the mortgage market in Liechtenstein, the FMA and the government have jointly introduced various policy measures to mitigate risks in the RRE sector. Following the policy objective of mitigating risks in the residential real estate market and preventing excessive credit growth and leverage in the household sector, the legal framework regarding owner's equity, affordability and amortization was adjusted, broadly following the current legal system in Switzerland. In general, the LTV ratio for mortgages for residential real estate and income property must not exceed 80%. In exceptional cases ("exceptions-to-policy"), where the LTV-ratio exceeds 80%, banks have substantially higher reporting requirements on the corresponding loans. Additionally, at loan origination, a long-term imputed interest rate (usually amounting to between 4.5% and 5%) aims at ensuring affordability of new loans, and new mortgages have to be amortized to a maximum LTV ratio of 66% within 20 years. Furthermore, the risk weights for RRE loans are slightly more restrictive than in the

BOX 5

"standard" CRR[13] framework. For mortgages with an LTV between 66% and 80%, risk weights amount to 50% (instead of 35%), while mortgages with an LTV larger than 80% lead to risk weights of 100% (in line with the CRR).

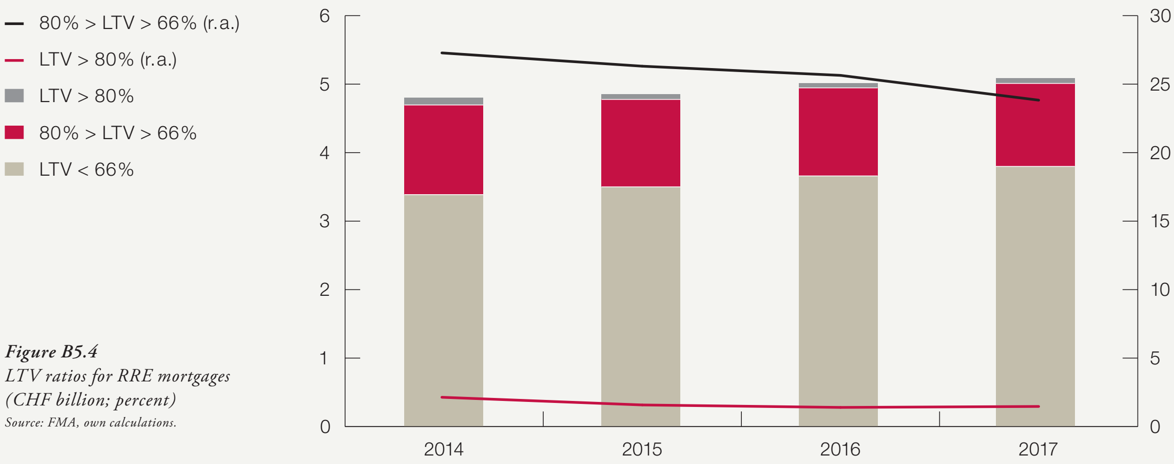

Figure B5.4
LTV ratios for RRE mortgages
(CHF billion; percent)
Source: FMA, own calculations.

The real estate sector in Liechtenstein is characterized by some structural specifics that contribute to a mitigation of risks. First, data from tax authorities suggest that debt is largely concentrated among the households with large wealth. Second, legal restrictions on the purchase of real estate – in case of already existing property within the family – lead to quite limited market activity. Since the space that is available in Liechtenstein is naturally very limited, demand for real estate that is available for sale has remained continuously high. Third, the number of persons/families that are allowed to establish their main residence in Liechtenstein is severely restricted. Demand for residency would be substantial due to the relatively moderate taxation in Liechtenstein. Both the legal restrictions on the purchase of real estate as well as immigration restrictions imply that any materialization of risks in the housing market could be targeted with specific relaxation of the corresponding limitations. This implies additional room of maneuver in the case of a crisis relative to other countries.

While risks in Liechtenstein's mortgage market seem quite limited, the tiny size of the country raises questions about the meaningfulness of collecting more and additional indicators. The very limited number of purchasing transactions would lead to a very volatile price index, complicating any interpretation of price-based indicators. Nevertheless, it is important to emphasize that risks related to RRE are closely monitored by the FMA, and that risk mitigating measures have already been adopted in the past few years.

13 *Capital Requirements Regulation, Regulation (EU) No 575/2013.*

Non-financial corporations

For corporations, tax incentives lead to a low debt-to-GDP ratio of the non-financial corporate (NFC) sector in Liechtenstein. In the corporate sector, equity costs (currently) up to 4% are tax-deductible, i.e. high equity reduces the corporate tax on profits. As a result, balance sheets of the corporate sector feature high equity shares and relatively low debt. While data availability is limited, as no consolidated debt statistics are available (similar to the household sector), leverage in the corporate sector can be estimated based on supervisory statistics (i.e. exposures of Liechtenstein banks to the domestic corporate sector), complemented by the volume of issued bonds by NFCs. Total exposures of Liechtenstein banks to the domestic NFC sector amounted to CHF 1.2 billion at end-2017, approximately 19% of GDP. Additionally, debt securities have to be considered as NFC debt. According to the debt securities statistics by the BIS[14], the total outstanding securities by NFCs in Liechtenstein amount to USD 0.4 billion (i.e. approximately CHF 400 million). Total NFC debt is thus estimated at around CHF 1.6 billion, approximately 25% of GDP. Since cross-border credits from foreign banks are not included in this estimate, the figure is likely to (slightly) underestimate the overall indebtedness of the NFC sector in Liechtenstein, although it seems likely that cross-border credits play only a minor role in Liechtenstein's NFC sector. Unfortunately, the exposure to the NFC sector in Liechtenstein is not available as a time series, because the supervisory reporting only includes this key figure as of late.

Besides the low indebtedness of NFCs, the strong contribution of the manufacturing and industrial sector to GDP differentiates Liechtenstein from other financial centers. The economy is well diversified, with the manufacturing and industrial sector's share in GDP being considerably higher (around 39%) than the share of the financial sector (around 25%). The high share of small and midsize enterprises further contributes to the strong economic diversification of Liechtenstein's economy. Combined with its high capitalization, the well diversified NFC sector thus is an important stabilizing factor both for the small economy and its relatively large financial sector.

Public sector

Public finances are characterized by budget surpluses, virtually zero debt and large financial reserves. Liechtenstein's public finances continue to be remarkably sound. After an ambitious structural reform package following the global financial crisis, public budget balances have returned to positive values in recent years. The public sector has virtually zero debt (in 2016, total gross debt amounted to CHF 27 million or 0.4% of GDP), and large financial reserves. At end-2016, net financial reserves increased to CHF 5.63 billion (92% of GDP) at the general government level, of which CHF 1.92 billion were at the state level, CHF 0.64 billion at the community level, and CHF 3.06 billion in social insurances.

Following the global financial crisis, budget deficits were countered by a severe fiscal consolidation program and structural reforms. The low global growth environment and structural changes in Liechtenstein's economy led to decreasing public revenues

14 *Bank for International Settlements, see https://www.bis.org/statistics/secstats.htm?m=6%7C33%7C615.*

following the global financial crisis. The government showed a strong reaction to these developments and implemented a series of structural reforms. While the increase in public expenditures in 2012 (see Figure 14) is mainly due to one-off effects related to the stabilization of the occupational pension of the state sector, the austerity package led to a significant decrease in public expenditures relative to GDP. Measures mainly focused on the expenditure side, including strong efficiency gains in public administration, cuts in the redistribution of revenues to the community level and a reform of the state pension system. As a result, Liechtenstein's public sector has returned to budget surpluses since 2014. In 2016, the budget surplus amounted to 3.2% of GDP, and preliminary data for 2017 at the state-level point to even stronger numbers. After the implementation of the structural reforms, the level of public expenditures amounted to 20.8% of GDP in 2016, the lowest level among European countries.

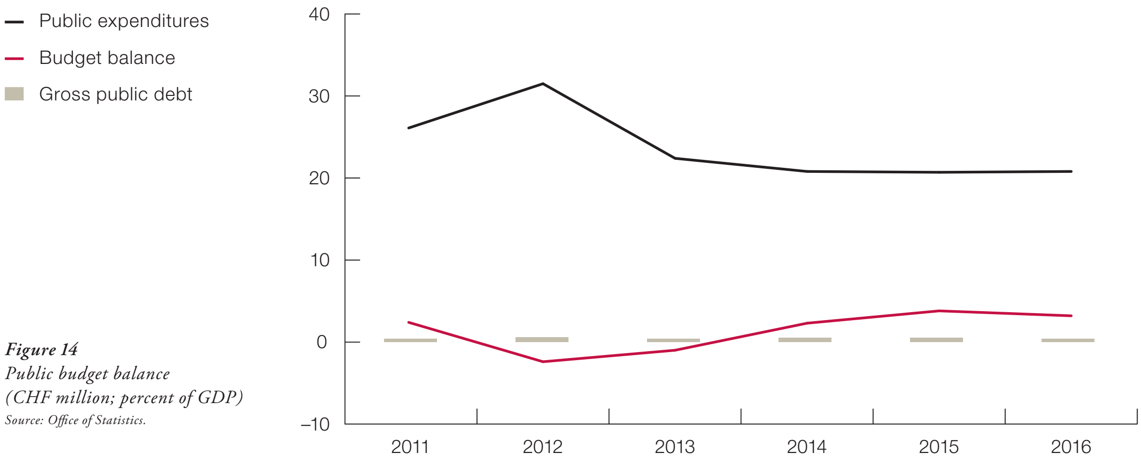

Figure 14
Public budget balance
(CHF million; percent of GDP)
Source: Office of Statistics.

Contrary to household and non-financial corporate sectors, data on public finances are widely available and very detailed. Public expenditures in Liechtenstein are very transparent, both at the state and the community level. The comprehensive reporting[15] combined with strong elements of direct democracy in the political system lead to a close surveillance of public finances by the public. In light of the comprehensive data sources and the very sound fiscal policy approach in the past few years, an in-depth analysis of the public sector seems unnecessary in the context of this report.

Fiscal policy mainly focuses on sound public finances and structural issues, as countercyclical policy would be mostly ineffective in light of the extremely small and open economy. While the soundness of public finances is largely beyond dispute in light of the presented statistics, the special focus of fiscal policy in Liechtenstein should be

15 *Reports are available in German, see "Finanzstatistik" by the Office of Statistics (https://www.llv.li/#/11405/-offentliche-finanzen) and the "Landesrechnung" published by the government (https://www.llv.li/#/11863/landesrechnung).*

emphasized in this context. While fiscal policy in other countries typically focuses on countercyclical policy measures and thus acts hand-in-hand with monetary policy to stabilize the business cycle, the role of fiscal policy in Liechtenstein is somewhat different. Since domestic demand plays only a minor role in the extremely small and open economy, any growth-enhancing fiscal policies – both at the revenue or expenditure side – have very limited effects on the demand side, i.e. the multiplier effect would be extremely small. Fiscal policy in Liechtenstein thus focuses on very sound public finances on the one hand, also to remain independent from global debt markets, and on structural reforms on the other hand, to create the best possible conditions facilitating growth in the private corporate sector. In this regard, the very sound public finances are a stability anchor for the whole economy.

LIECHTENSTEIN'S BANKING SECTOR

Structural features

The large banking sector relative to Liechtenstein's economy does not only require an efficient banking supervision at the individual bank level, but also calls for a strong focus on macroprudential supervision. Total assets of Liechtenstein's 15 banks amounted to CHF 82.4 billion at end-2017 at the consolidated level, corresponding to roughly 13 times the country's GDP. While the banking sector in Luxembourg is even larger relative to GDP (see Figure 15 below), the lion's share of Liechtenstein's banking sector is under domestic ownership. This implies that the FMA needs to address the related "too-big-to-fail" (TBTF) problem at the national level in order to mitigate risks for Liechtenstein's economy. The banking sector is highly concentrated, with three national ("other") systemically relevant institutions representing 91% of total assets of the banking sector. Consequently, the dominating role of these three institutions has to be taken into account when designing and applying macroprudential instruments.

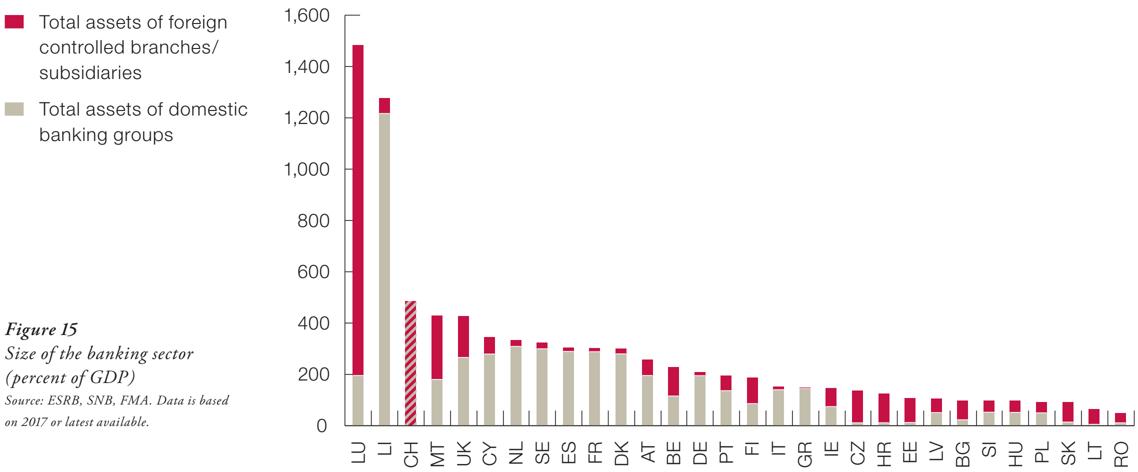

Figure 15
Size of the banking sector (percent of GDP)
Source: ESRB, SNB, FMA. Data is based on 2017 or latest available.

Liechtenstein banks focus their activities primarily on private banking and international wealth management. Thanks to Liechtenstein's membership in the European Economic Area (EEA), banks enjoy full access to the European single market. Some banks are also active outside the EEA with subsidiaries and branches, particularly in Switzerland and Asia. After some difficult years after the global financial crisis, with a substantial decline in assets under management (AuM) due to the market downturn and increasing regulatory pressure, the banking sector has recovered strongly in recent years. The positive development of AuM is due to net money inflows, positive market developments and acquisitions abroad (Figure 16).

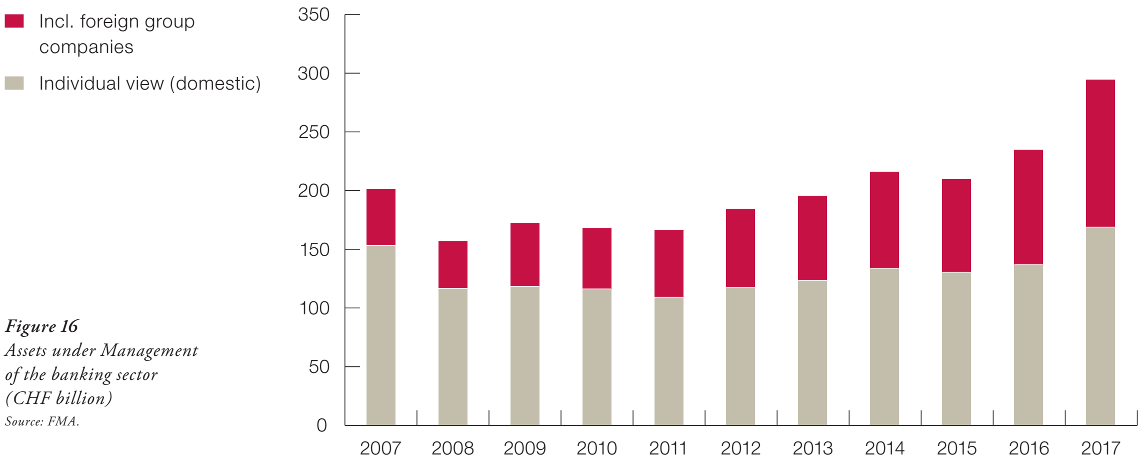

Figure 16
Assets under Management of the banking sector (CHF billion)
Source: FMA.

The banking sector plays an important role in Liechtenstein's economy and has followed a growth course in recent years. At the individual bank level, total employment amounts to approximately 2,500 employees, around 80% of them are working in Liechtenstein.[16] While this number underlines the importance of the banking sector, the share of about 5% in total employment once again underlines the well-diversified economy in Liechtenstein.

Profitability and income sources

While bank profits declined substantially after the global financial crisis, profitability has improved in the last few years, also in light of strongly growing activities in foreign markets. The banking sector was severely hit by the global developments of 2008, with plummeting profits in light of a steep decline of assets under management (see Figure 17). Profitability remained subdued for some years in light of a sluggish global recovery on the one hand and increasing international regulatory pressure on the other which was associated with significant additional expenses. While profitability of domestic banks has recovered substantially in the past three years, the contribution of foreign group companies has also become an important income source for the banking sector.

16 *The remaining 20% is employed in foreign branches, while employment in foreign group companies is not included in this number.*

Figure 17
Banking sector profits (CHF million; percent)
Source: FMA.

The business model of Liechtenstein banks primarily focuses on private banking and international wealth management. Based on self-reported income sources (weighted by total assets), private banking and wealth management services are the most important source of earnings for Liechtenstein's banking sector (see Figure 18), contributing to roughly half of total income (49%) when weighted by the size of the balance sheet. Traditional retail banking services contribute another quarter to total income, including bank lending (20%), payment transactions (4%) and trade finance (1%). While private banking activities are increasingly conducted at an international scale, with large local banks also expanding into Asian markets, the largest part – almost three quarters – of bank lending is regional business within the Swiss Franc currency area. "Other" sources of income also contribute roughly a quarter to banks' income, confirming that banks follow specialized business models besides the conventional banking activities, including the launch and management of investment funds or trading activities. Liechtenstein banks have traditionally focused on the rather conservative business model of private banking and wealth management, but have avoided the more risky field of investment banking. At the same time, a certain degree of diversification with regard to banks' income sources is welcome from a regulatory point of view.

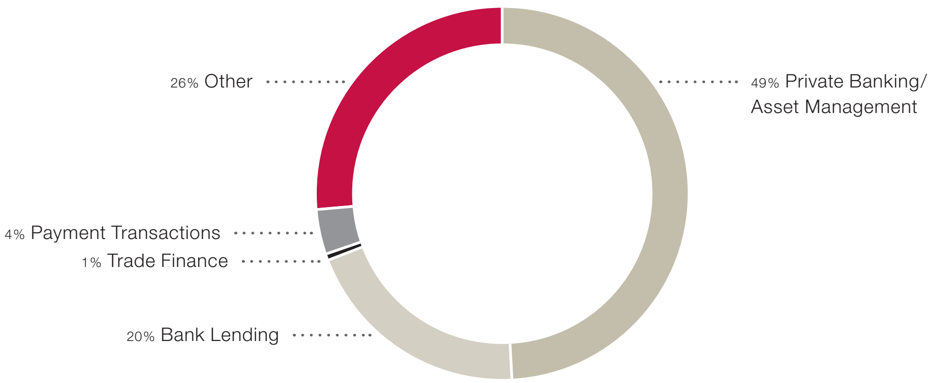

Figure 18
Sources of income of Liechtenstein banks
Source: FMA.

On the back of high capitalization, not least due to corresponding tax incentives, profitability indicators of Liechtenstein banks do not stand out among their European peers. Despite having specialized business models, Liechtenstein banks are not the most profitable ones in comparison to other European countries (see Figure 19). The tax system incentivizes high equity rates, which is an important factor for the high capitalization of the banking sector, but it dampens key profitability figures such as return on equity (RoE). In this context, RoE amounted to 7% on a consolidated basis in 2017, with the return on assets (RoA) at 0.7%.

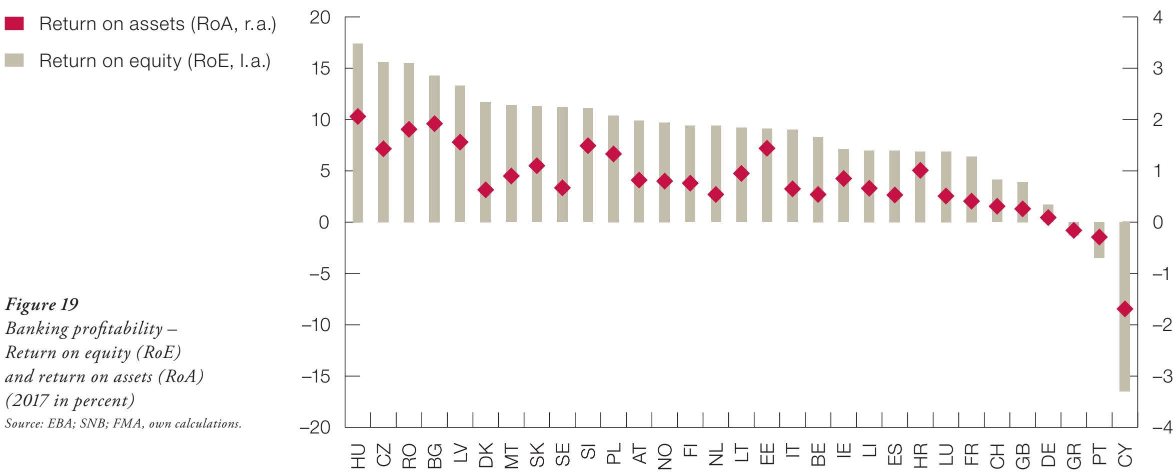

Figure 19
Banking profitability – Return on equity (RoE) and return on assets (RoA) (2017 in percent)
Source: EBA; SNB; FMA, own calculations.

Efficiency indicators do not only reflect the high regulatory pressure, but also point to further room for improvement. The relatively high cost-income ratio (CIR, see Figure 20) must be put into perspective, as private banking and wealth management are very staff-intensive businesses and thus associated with relatively high labor costs. Interestingly, Liechtenstein banks perform slightly better than their Swiss peers in terms of RoE and CIR. Nevertheless, the high regulatory pressure has been extremely challenging for small banks and related expenses – e.g. for compliance – have pushed the CIR upwards. The global competition will remain challenging, and a below-average value in this specific efficiency indicator suggests further room for improvement in certain key efficiency indicators in the banking sector. Overall, despite some differences across individual banks, Liechtenstein's banking sector is fairly profitable and the outlook remains stable.

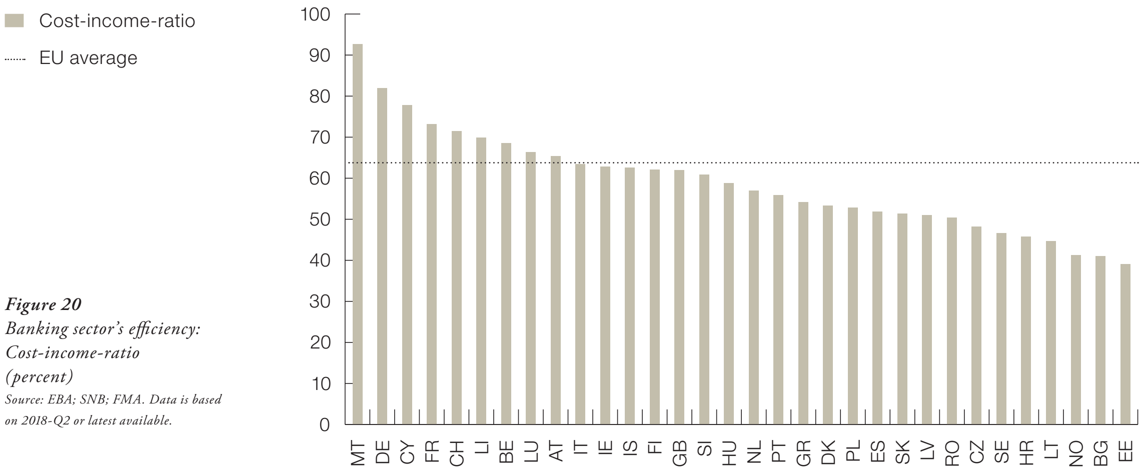

Figure 20
Banking sector's efficiency: Cost-income-ratio (percent)
Source: EBA; SNB; FMA. Data is based on 2018-Q2 or latest available.

Capitalization and asset quality

Liechtenstein's banking sector is well capitalized, implying substantial loss-absorption capacity in the case of an adverse event. On a consolidated basis, the weighted Tier 1 capital ratio amounted to 20.7% at the end of 2017 (previous year: 21.6%), solely consisting of Common Equity Tier 1 (CET1) capital. The capitalization is substantially higher than the EU average (see Figure 21). The high equity is incentivized by the corporate tax structure (allowing an equity cost deduction of currently 4%) and contributes to a stable banking sector. Even during the severe downturn following the global financial crisis, bank profits have always remained positive on an annual basis, and the Liechtenstein banking sector handled the crisis without any need for public financial support.

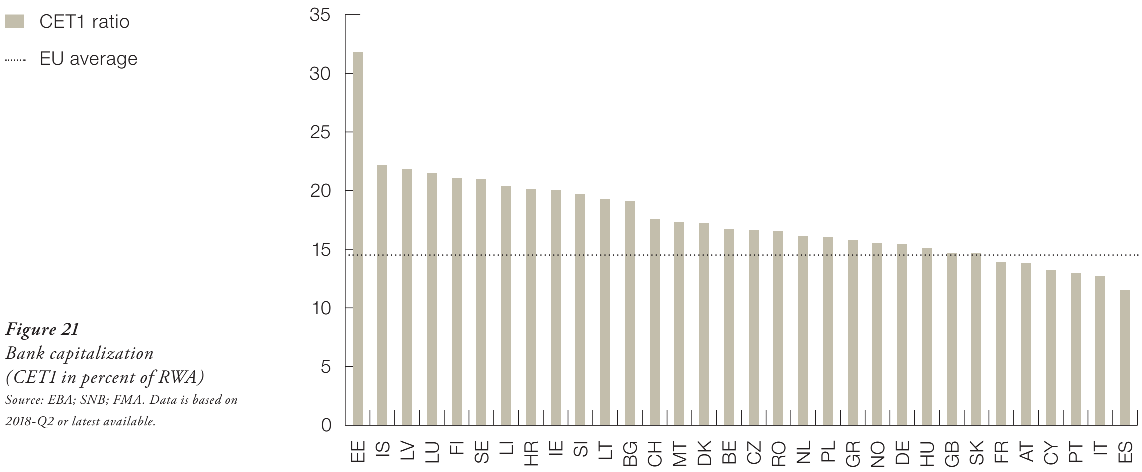

Figure 21
Bank capitalization
(CET1 in percent of RWA)
Source: EBA; SNB; FMA. Data is based on 2018-Q2 or latest available.

The high capitalization of the banking sector is also confirmed by the leverage ratio, and the largest banks in Liechtenstein also perform well in a comparison with globally systemically relevant institutions. In 2017, the FMA has officially identified the other systemically import institutions (O-SII) in Liechtenstein, including the LGT Group Foundation (LGT Group), the Liechtensteinische Landesbank AG (LLB Group) and the VP Bank AG (VPB Group). As mentioned above, the banking sector in Liechtenstein is highly concentrated, with the balance sheets of the three O-SIIs contributing more than 90% of the total size of the banking sector. While the three O-SIIs are rather small on a global scale, it is nevertheless interesting to compare the capitalization of Liechtenstein's systemically relevant institutions to the Global Systemically Important Institutions (G-SIIs).[17] As shown in Figure 22, Liechtenstein's O-SIIs stand out with their CET1 ratios of close to or exceeding the 20% threshold. Since the banks apply the standardized approach to measure credit risks, the ratio of risk-weighted assets (RWA) to total assets is relatively high, amounting to 39% at end-2017. Thus, the difference to EU and Swiss banks is even more pronounced when comparing the corresponding leverage ratios. In Liechtenstein, all three O-SIIs exceed a leverage ratio of 7%, which is significantly higher than the minimum ratio of 3% envisaged by Basel III.

17 *Total assets of the largest bank in Liechtenstein (LGT Group) amounted to roughly CHF 42 billion at end-2017, less than a tenth of total assets of the two largest banks in Switzerland (Credit Suisse AG, UBS AG). The comparison in Figure 22 should thus be interpreted cautiously.*

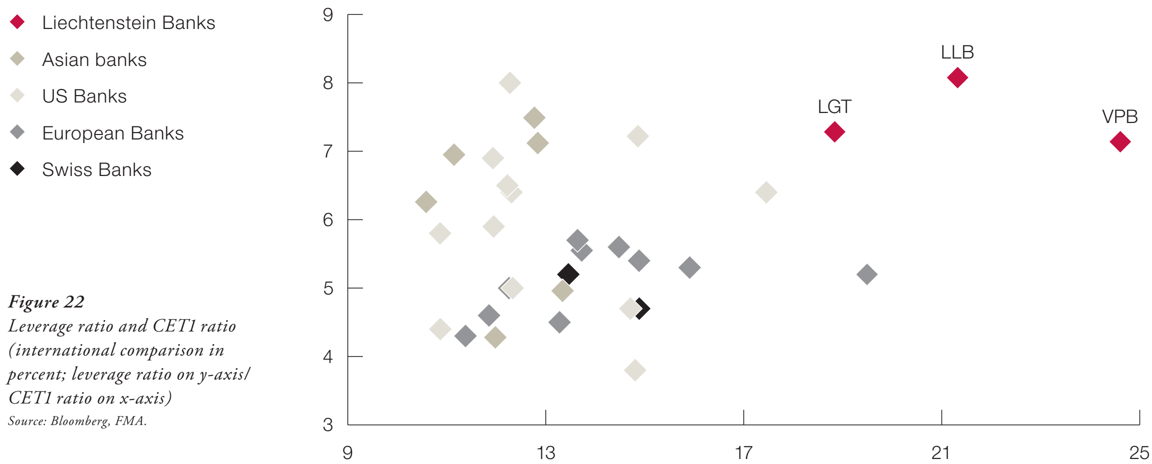

Figure 22
Leverage ratio and CET1 ratio (international comparison in percent; leverage ratio on y-axis/ CET1 ratio on x-axis)
Source: Bloomberg, FMA.

Asset quality has also remained favourable, with non-performing loans (NPLs) at very low levels. At end-2017, the NPL ratio of the banking sector amounted to a mere 0.8%, one of the lowest levels across European countries (Figure 23). The low level has to be seen in light of the stable development of Liechtenstein's economy in the past few decades. While Liechtenstein's GDP features significant volatility in light of the small size of the economy, Liechtenstein never experienced a severe economic crisis, with the housing market even remaining stable during the housing crisis in Switzerland at the beginning of the 1990s. In recent years, both the banking sector and policy-makers have reacted to the increasing indebtedness of the household sector, and key indicators suggest that risks have further diminished in recent years. Generally, the continuously low level of NPLs also confirms the prudent lending standards of banks in Liechtenstein, which have further tightened in recent years.

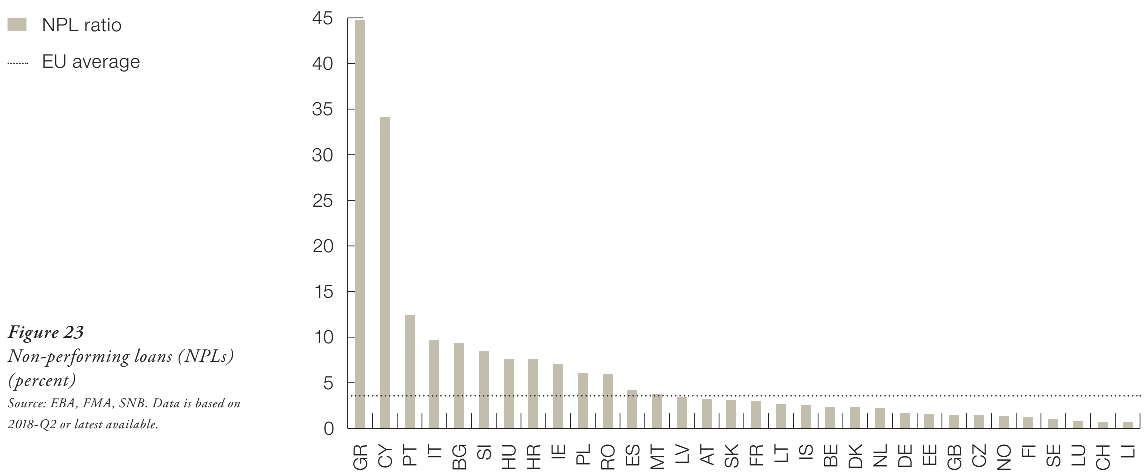

Figure 23
Non-performing loans (NPLs) (percent)
Source: EBA, FMA, SNB. Data is based on 2018-Q2 or latest available.

Liquidity and funding

The liability side of the balance sheet of Liechtenstein banks primarily relies on deposits. Because of banks' focus on private banking activities, the country's banking sector is relatively abundant with deposits. Total deposits of the banking sector amounted to more than CHF 65 billion at end-2017 on a consolidated basis (i.e. 79% of total assets). On the other hand, market-based funding plays only a minor role in Liechtenstein, representing only 4% of total liabilities. As a result, the loan-to-deposit ratio amounted to approximately 68% at end-2017, which is very low compared to other European countries.

Standard liquidity indicators also point to a stable banking sector, and Liechtenstein banks enjoy access to SNB funding on the same terms as their Swiss counterparts. Liquidity indicators also reflect the strong funding base of Liechtenstein banks, with the average (weighted) Liquidity Coverage Ratio (LCR) amounting to 177% at end-2017 (see Figure 24), while the Net Stable Funding Ratio (NSFR) exceeded the 300% threshold. Furthermore, the currency treaty between Liechtenstein and Switzerland ensures equivalence of Liechtenstein and Swiss banks in terms of central bank funding from the Swiss National Bank (SNB), which is also an important stability factor for Liechtenstein's banking sector.

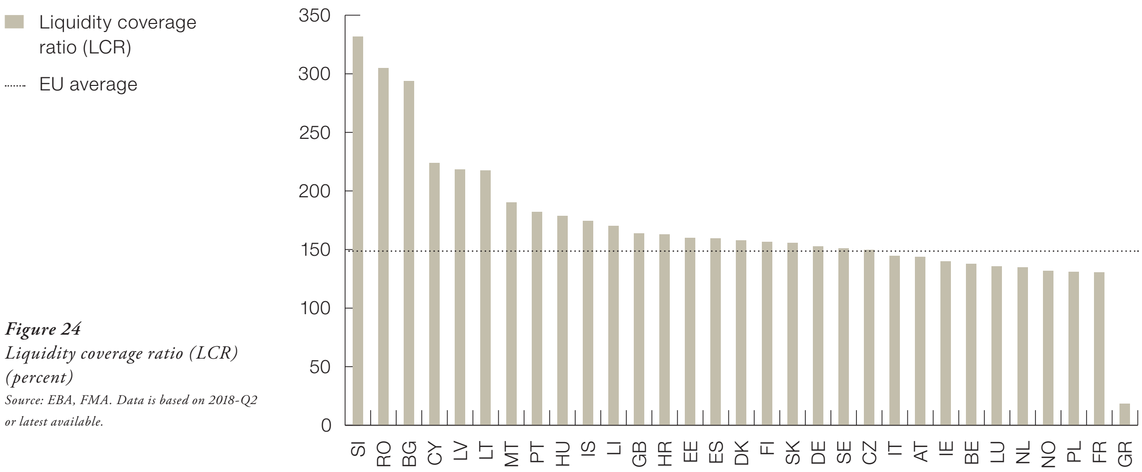

Figure 24
Liquidity coverage ratio (LCR) (percent)
Source: EBA, FMA. Data is based on 2018-Q2 or latest available.

Notwithstanding the comfortable liquidity position of Liechtenstein banks, it is important to ensure access to liquidity even in the unlikely case of a crisis. Since Liechtenstein is part of the Swiss Franc currency area based on an intergovernmental state treaty, monetary policy is conducted by the SNB. The SNB has defined five Swiss banking groups as systemically important by decree, and Liechtenstein's institutions are too small to qualify when considering the Swiss currency area as a whole. Furthermore, the SNB guidelines on monetary policy instruments state explicitly that the emergency liquidity assistance by the SNB requires certain conditions, including that the bank or banking group seeking credit must be of importance for the stability of the financial system. While Liechtenstein banks have access to SNB funding on the same terms as their Swiss counterparts, including the liquidity-shortage financing facility, the SNB guidelines imply that access to emergency liquidity assistance could be limited to some extent for Liechtenstein institutions, at least in comparison to the biggest banks or banking groups in Switzerland. The availability of highly rated securities in banks' balance sheets that can be used as collateral in monetary policy transactions is therefore essential for ensuring banks' liquidity in the unlikely case of a crisis. At the same time, along with their Swiss peers, Liechtenstein banks could make use of the SNB's liquidity-shortage facility and the emergency deposit depot in the case of a crisis, which ensures access to liquidity even in periods of severe liquidity shortage. The banking sector therefore benefits from being part of one of the most stable currency areas in the world, with access to central bank funding guaranteed by a corresponding intergovernmental state treaty.

LIECHTENSTEIN'S NON-BANK FINANCIAL SECTOR

Insurance sector

Insurance undertakings in Liechtenstein have direct market access to the countries of the European Economic Area (EEA) and to Switzerland. At the end of 2017, 20 life, 15 non-life and 3 reinsurers operated from Liechtenstein. Besides Liechtenstein's EEA membership that ensures market access to the Single Market, the Direct Insurance Agreement with Switzerland permits Liechtenstein insurers to offer their services also in Switzerland (and vice-versa).

Premium income of the non-life insurance sector exceeded the premium income of life insurances for the first time in 2017. Total premium income of insurance undertakings in Liechtenstein amounted to CHF 5.17 billion in 2017, with almost equal contributions from non-life (54%) and life insurance (46%). Due to the relocation of a large non-life insurance undertaking to Liechtenstein, premiums from non-life insurance exceeded premiums of life insurance for the first time in 2017 (see Figure 25).

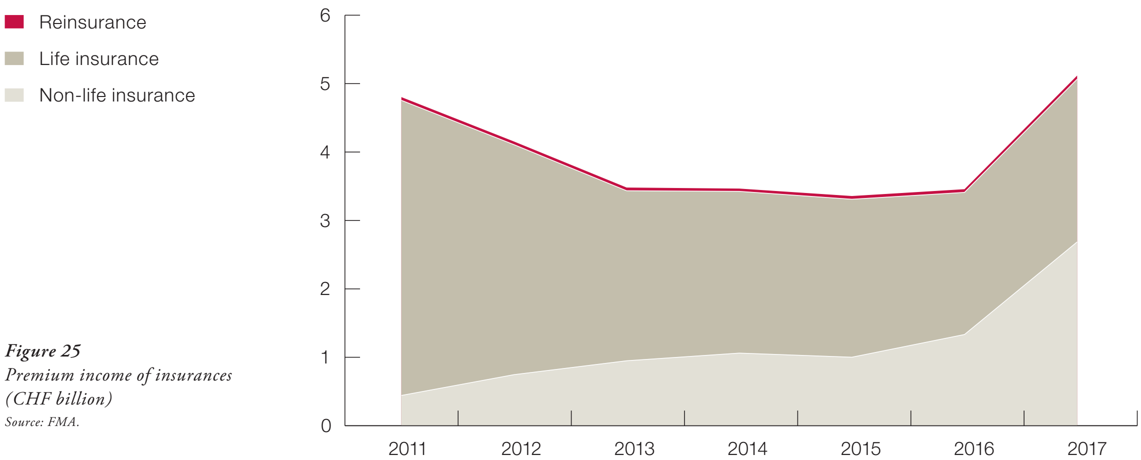

Figure 25
Premium income of insurances (CHF billion)
Source: FMA.

Cross-border provision of services represents the lion's share of insurance revenues. The main markets for Liechtenstein insurance undertakings in 2017 were Italy (15.4%), Switzerland (13.0%), Germany (13.0%) and Ireland (12.6%, see Figure 26). The international activities underline the attractiveness of Liechtenstein as a location for insurance undertakings seeking access to both the EEA and Switzerland.

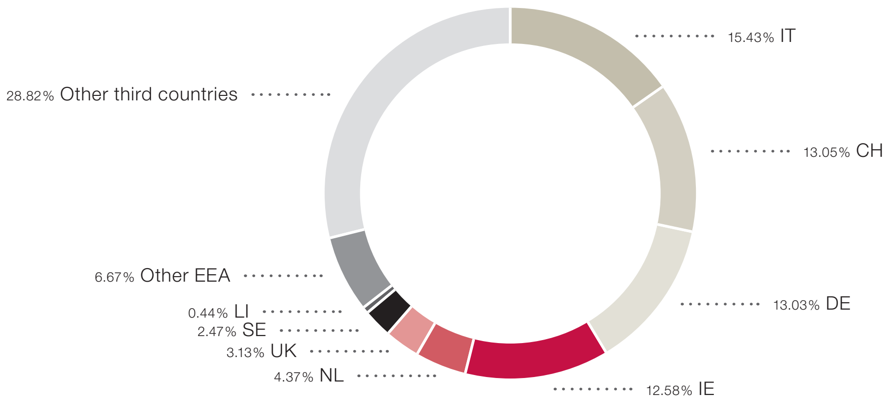

Figure 26
Premium income by country (2017 in percent)
Source: FMA.

Risks in the insurance sector are limited both in light of reported risk indicators and prevalent business models. Under the risk-based Solvency II supervisory system, insurance undertakings in the EEA must meet capital adequacy requirements so that the company can meet its obligations vis-à-vis policy holders even in extraordinary situations. At the end of 2017, all Liechtenstein insurance undertakings complied with solvency capital requirements under Solvency II, with the average solvency ratio amounting to 213%. The assets over liabilities ratio amounted to 112% at year end-2017, unchanged from the previous year. Additionally, in contrast to other countries, life insurance undertakings in Liechtenstein hardly suffered from the low interest environment, as guaranteed products are rare in Liechtenstein and the bulk of capital investments (around 84%) is attributable to investments managed for the account and risk of policy holders as part of unit-linked (fund-linked) life insurance.

The insurance sector is significantly smaller than the banking sector. At the end of 2017, a total of 867 people were employed by insurance undertakings in Liechtenstein (both domestically and abroad). While this number underlines the economic significance of the insurance business for Liechtenstein's economy, the sector is relatively small compared to the banking sector, which employed more than 4,600 people by year end-2016, about half of them working in Liechtenstein.

Pension schemes

The pension system in Liechtenstein is built on three pillars. Pillar one includes old age, disability and survivors' insurance and is administered by the state (AHV/IV). This public scheme is complemented by a mandatory occupational pension provision (pillar two), and private pension provision on a supplementary basis (pillar three). While the first pillar aims to secure the subsistence level of the insured person and family members in the event of old age, disability, and death, the second pillar aims at maintaining the accustomed standard of living after retirement. The third pillar, i.e. individual pension provision, serves to close provision gaps that cannot be covered by the first and second pillars.

Against the backdrop of recent structural reforms, the public pension system (AHV/IV) is based on stable footing. A revision of the legislation in context of the fiscal consolidation package decreased the state contribution to the public pension system, increased the retirement age by one year to 65 and raised the contributions from employers and employees. Although it is expected that the expenditures of the public pension system will exceed revenues in the next years, the large financial reserves accumulated in the past guarantee a stable public pension system. Financial reserves stood at CHF 3.17 billion at end-2017, i.e. financial reserves could cover pension payments for approximately 11 years. A more detailed analysis is available in the annual report published by the public pension's administration office (AHV).[18]

Occupational pension provision is administered by 22 different pension schemes. The autonomous legal entities in the form of foundations are subject to the Occupational Pensions Act (BPVG) and are supervised by the FMA. Occupation pension provision is funded by employer and employee contributions.

The large pension capital of the second pillar relative to the country's GDP underscores the great overall economic importance of the occupational pension scheme. Total assets of the pension scheme amounted to CHF 6.66 billion at end-2017, corresponding to 109% of Liechtenstein's GDP. This figure does not only show the overall well-positioned retirement system in Liechtenstein, but it also emphasizes the significance of Pillar two for the provision of pensions.

Notwithstanding some variance across the 22 different pension schemes, indicators point to an overall stable occupational pension system. At the end of 2017, the average cover ratio – i.e. the ratio of available assets to liabilities – stood at 107.8%, with a range between 98% and 122% across the 22 pension schemes. The return on assets increased from 4% in 2016 to 7% in 2017, further contributing to the increase in cover ratios. Since a detailed risk assessment report on the occupational pension system is published annually by the FMA[19], a more detailed analysis of pension schemes is omitted at this point.

Investment funds sector

While the fund sector plays a subordinate role in Liechtenstein's overall economy, it is an important component contributing to the country's reputation as a financial center. In Liechtenstein, 15 management companies (ManCos) are authorized to manage UCITS ("Undertakings for Collective Investments in Transferable Securities"), AIF ("Alternative Investment Funds") and IU ("Investmentunternehmen"), a domestic fund regime. By the end of 2017, 52% of investment funds had been set up as UCITS, 27% as AIF, and 21% as IU. Following the implementation of the revised IU fund regime in early 2018, a major shift from IU to AIF was observed. As of 30 June 2018, the market comprised of 47% UCITS, 45% AIF, and a small 8% portion of IU-funds.

While Liechtenstein's fund sector is relatively small by international standards, total assets held by investments funds have steadily grown over the last

18 *Available on the AHV website, see https://www.ahv.li/ueber-uns/jahresberichte.*

19 *Available on the FMA website, see https://www.fma-li.li/de/fma/publikationen/betriebliche-personalvorsorge-in-liechtenstein.html.*

ten years. For the year 2017, total assets under management (AuM) amounted to CHF 53.8 billion, which is 834% of the country's GDP. In comparison, Luxembourg and Ireland as major European fund hubs reported ratios of 7.679% and 757%, respectively. Two major increases in AuM occurred in 2013 and 2017 due to the redomiciliation of offshore assets to Liechtenstein. Without taking into account the latest redomiciliation, growth amounted to approximately 5% in 2017.

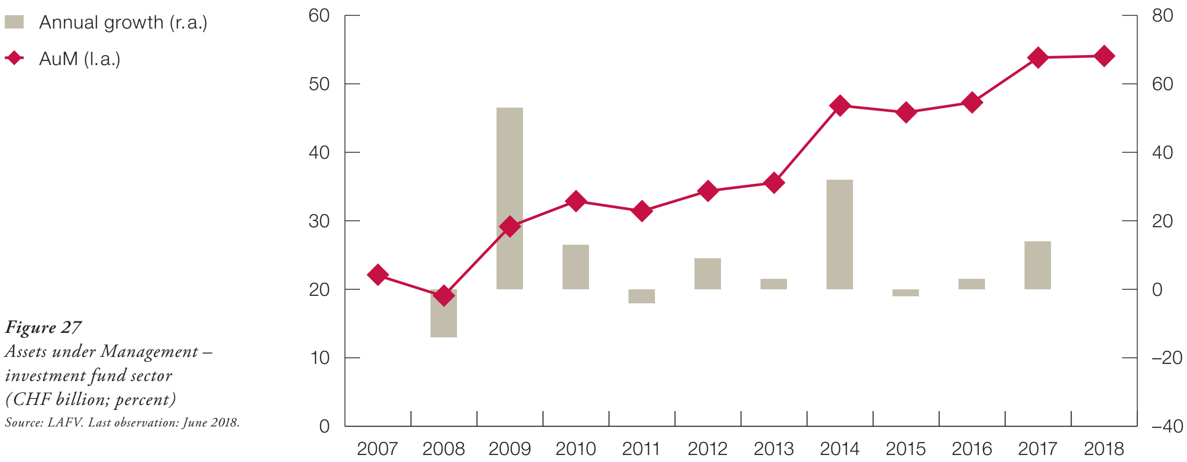

Figure 27
Assets under Management – investment fund sector (CHF billion; percent)
Source: LAFV. Last observation: June 2018.

Despite its relatively small size, the investment fund sector plays an important role for the financial sector, also as a complement to the banking sector. Liechtenstein ManCos earned net revenues of CHF 65 million in 2016 and CHF 69 million in 2017. Net revenues amounted to 1.1% of GDP in 2016. As per year-end 2017, ManCos employed 200 people, while asset management companies, i.e. MiFID investment firms, employed 642 people. This distribution illustrates the significance of asset management within the financial sector. In summary, ManCos and asset management companies contributed approximately 2.3% to total employment in Liechtenstein's economy.

Liechtenstein's investment fund sector is partially dependent on foreign fund promoters. The country has developed a large private label fund industry, since 65% of investment funds fall into that category. Liechtenstein is particular interesting to Swiss fund promoters. Due to Liechtenstein's close link to Switzerland and a variety of legal agreements implemented, Swiss promoters use Liechtenstein vehicles to gain access to the EEA market. Moreover, 27% of asset managers managing Liechtenstein investment funds are domiciled in Switzerland and supervised by the Swiss Financial Market Supervisory Authority (FINMA). This number is only marginally exceeded by domestic asset managers (33%). The oversight of delegated asset management activities is thus a focus area of ManCos.

Additionally, the sector shows concentration risks in terms of fund size. Fund size varies largely, with the average fund amounting to CHF 123 million in 2017, while the median size was considerably smaller at CHF 19 million. Five subfunds held net assets of CHF 1 billion and above. The ten largest subfunds bundled 39%, and the largest subfund alone accounts for 20% of total net assets. Nine out of the ten largest subfunds were managed by ManCos tied to Liechtenstein's three biggest banking groups. In general, private label funds are significantly smaller with an average (median) size of CHF 115 (21) million in net assets.

The investment fund sector is closely linked to the banking sector. ManCos that are part of a banking group play a significant role in Liechtenstein. More precisely, ManCos of the three largest banks, i.e. LGT Group, LLB Group, and VPB Group, jointly manage approximately 80% of the assets under management (AuM). The two ManCos of LGT administer approximately 54% of AuM, followed by LLB with 15% and VPB with 11%. The remaining independent management companies are significantly smaller.

Fiduciary sector

The FMA is responsible for the AML/CFT[20] supervision of the fiduciary sector, but has limited legal authority to supervise the corresponding companies economically and prudentially. By end-2017, 396 fiduciaries and fiduciary companies were active in Liechtenstein. The total revision of the Professional Trustees Act, in force since 2014, considerably strengthened the authority and competence of the FMA. The FMA is in particular responsible for granting, withdrawing and revoking licences, for verifying the compliance with the licensing conditions, for conducting inspections, for maintaining the register of licence-holders, and for responding to inquiries. In order to prevent abuse the FMA is entitled to issue public notifications identifying persons or legal entities that hold no licence according to the Professional Trustees Act. Moreover, the FMA works together with domestic and foreign authorities and protects clients by combating abuse, and levies fees and supervision tax. While the supervision by the FMA thus includes the ongoing examination of permit requirements, the fiduciary sector is largely self-regulated, with the Liechtenstein Institute of Professional Trustees and Fiduciaries (THK) incumbent to safeguard the honour, the reputation and the rights of trustees and also to supervise their duties.

While data availability is limited because of restricted supervision authority, available numbers point to a declining importance of the fiduciary sector. The well-developed financial center in Liechtenstein, including banks, insurances, investment firms, asset management companies and the fiduciary sector, is likely to have a competitive advantage compared to other countries due to its "one-stop shop" approach. The total number of foundations and trusts in Liechtenstein has decreased by more than 70% since 2009, from almost 49,000 to less than 14,000 entities by end-2017. Apart from these numbers, the far-reaching self-regulation of the sector implies that – in contrast to other sectors of the financial system – no extensive regulatory reporting is available, and more detailed information on the sector is thus not publicly available.

The FMA has recently introduced risk-based elements to increase the accuracy and efficiency of the AML/CFT supervision framework. Based on the Due Diligence Act, the FMA has the supervisory

20 *AML/CFT stands for anti-money laundering and combating the financing of terrorism.*

authority to examine fiduciaries regarding the adherence to the applicable AML/CFT standards. Since the beginning of 2018, fiduciary companies have the obligation to submit risk data to the FMA in this context, including the number of business relationships with politically exposed persons, with beneficial owners from third countries with strategic deficiencies or with simplified due diligence. Consequently, the themes for inspections are determined based on the risk data transmitted to the FMA. For instance, if a financial institution administrates a large number of business relationships with beneficial owners domiciled in high risk countries, these business relationships might be subject to a thematic inspection. Furthermore, the sample size to be inspected by mandated audit firms also depends on the internal risk-profile generated from the submitted data, and the scope of ordinary inspections is also determined by the risk assessment.

While cases of fraud can never be completely prevented by authorities, recent cases nevertheless suggest potential room for improvement regarding the supervision of the fiduciary sector. The Liechtenstein fiduciary sector was confronted with two severe cases of fraud in the past years, also attracting the interest of both local and international media. The strict prosecution and conviction of the defendants shows that the judicial system is working well in Liechtenstein. At the same time, however, the developments also raise questions whether such cases of severe fraud could have been discovered at an earlier stage. A revision of the supervision framework in the fiduciary sector addressing the revealed weaknesses should therefore be taken into consideration.

FinTech and digitalization

New technologies have the potential to revolutionize the financial sector. FinTech includes any technological innovation in the financial sector which will change the way financial services are delivered and designed. Probably most prominently, the blockchain technology can certainly be seen as such an innovation. It promises a decentralized approach to classic financial market services such as payment services.

Liechtenstein is an innovation-friendly country and is also in demand as a FinTech location. In 2017, the FMA processed about 100 enquiries with a FinTech connection. By end-August 2018, the mark of 170 inquires was already exceeded. A lot of FinTech companies intend using the Blockchain technology solely for the purpose of issuing tokens through an Initial Coin Offering (ICO). As a result, those tokens or coins rarely fall under financial market regulation. In general, the Blockchain technology is currently mainly used to gather funds to finance a promising start-up business model. While the FMA has reviewed over 50 planned ICO's in 2018 alone, only a few of them have actually been carried out. The current share of FinTechs in the financial sector is negligible, and blockchain as an underlying financial market technology is hardly used so far to provide classic financial market services in Liechtenstein.

Liechtenstein was among the first countries in Europe to approve cryptocurrency investment funds, and one bank in Liechtenstein is following a specialized business model focusing on FinTech services. The FMA has approved the first crypto fund already back in 2017, albeit the corresponding investment funds are only avail-

BOX 6

able to professional investors. Currently, six crypto funds (i.e. with crypto assets as underlying) are operating in Liechtenstein, with a total volume of CHF 3.3 million. One Liechtenstein bank acts as custodian of those funds. The bank also offers a wide range of services in the FinTech realm, including advisory services for ICOs and management of the generated funds.

To facilitate upcoming innovative business models, the FMA has established a group called "regulatory laboratory/financial innovation". This group serves as a single entry point for all questions regarding FinTech and the financial market. It is also involved in assessing FinTech business models with regard to possible licensing requirements based on the financial market regulation as well as application of the Due Diligence Act or the Securities Prospectus Act.

Furthermore, the interest in blockchain based business models that fall under financial market regulation is clearly rising. The FMA has observed an increase in inquiries regarding the issuance of security tokens as well as offering platforms for trading such tokenised securities. While such trading platforms have yet to be licensed, the FMA has recently approved a prospectus for issuing a security token.

The government has also reacted accordingly, with a new legislation for the regulation of Trusted Technologies (such as distributed ledger technology, DLT) services currently being under consideration. By initiating this act, the government attempts to establish a higher level of legal security for customers and providers. In order to achieve more sustainability and durability, the draft is created as technologically neutral as possible. Hence, a number of service providers using Trusted Technologies become subject to regulation, but not the technology itself.

In spite of the opportunities, regulators are also required to assess the underlying risks associated with new business models. The FMA aims at assessing FinTech and traditional business models consistently, i.e. as technology-neutral as possible. Besides the large chances, there are also considerable risks that have to be examined on a case-by-case basis, in particular to ensure a high level of investor protection in line with the FMA's mandate.

MACROPRUDENTIAL POLICY IN LIECHTENSTEIN

Macroprudential policy framework

In absence of a central bank, the Financial Market Authority (FMA) and the government are jointly responsible for financial stability issues and the conduct of macroprudential policy. One insight from the global financial crisis is the need to supplement microprudential supervision, which aims at the stability of individual financial institutions, with a macroprudential perspective. Macroprudential supervision should contribute to the stability of the financial system, in particular, by reducing the accumulation of systemic risks and strengthening the resilience of the financial system. It aims to reduce the probability and impact of financial crises, given that such crises have led to high costs in the past – also for the real economy. Financial stability is thus an important prerequisite for securing lending in an economy and, as a consequence, for enabling sustainable growth of the real economy. In addition, the financial sector in Liechtenstein is of disproportionate national economic importance, given the financial sector's high share of gross domestic product compared with other countries, hence further broadening the definition of systemic importance. In absence of a national central bank, ensuring financial stability is defined by law as part of the FMA's mandate. While the FMA honors this commitment with regular analyses on financial stability issues, the conduct of macroprudential policy is a joint responsibility of the FMA and the government.

In recent years, Liechtenstein has established a balanced system to ensure financial stability. With the implementation of the CRD IV package[21] in February 2015, European standard instruments for macroprudential policy-making have become available in Liechtenstein. In particular, the possibility to apply additional capital requirements has increased the room of maneuver for policy-makers and contributes strongly to the resilience of the banking sector. With the Recovery and Resolution Act, a uniform mechanism for efficient and effective crisis management at banks and investment firms entered into force at the beginning of 2017. Part of this legal framework is the resolution authority, which is integrated into the FMA's organization and has taken up its work. The FMA is now also represented on the European Systemic Risk Board (ESRB), along with representatives of Liechtenstein's government. This has further strengthened Liechtenstein's international integration and enhanced macroprudential supervision. Besides reports on international economic and financial market developments published on a regular basis, macroprudential supervision also calls attention to emerging systemic risks in Liechtenstein, discusses these risks with both the Executive Board and the supervisory divisions, and proposes the activation or recalibration of instruments if deemed necessary.

For the conduct of macroprudential policy, a whole range of instruments is available in Liechtenstein. In line with the CRD IV/CRR regulation, additional capital buffer requirements can be imposed, including a countercyclical capital buffer, a systemic risk buffer and additional capital requirements for other (i.e. national) systemically relevant institutions. Furthermore, the European regulations allow tighter liquidity provisions, either based on Pillar II or Art. 458 CRR. Higher risk weights for real estate can incentivize banks to tighten credit standards. Other instruments, such as restrictions on the leverage ratio or borrower-based measures (loan-to-value ratio –

21 The CRD IV package refers to both the EU Directive 2013/36/EU ("CRD IV") and the EU Regulation 575/2013 ("CRR").

LTV, loan-to-income ratio – LTI, debt-service-to-income ratio – DSTI, debt-to-income ratio – DTI etc.) are in principle available outside the framework of the CRD IV/CRR. Overall, the comprehensive set of instruments allows policy-makers to react to the build-up of systemic risks and introduce corresponding risk-mitigating policy measures.

To recognize the joint responsibility of the FMA and the government, a national macroprudential authority in the form of a Financial Stability Council will be established in 2019. With the full membership in the European Systemic Risk Board (ESRB), Liechtenstein is also expected to implement the ESRB's recommendations. These recommendations include the formal creation of a national macroprudential authority, which will take responsibility for the application of macroprudential instruments in the future. Depending on the instrument, either the government or the FMA can decide on the calibration of the corresponding macroprudential instrument. The coordination between the FMA and the government in the framework of the Financial Stability Council however ensures close collaboration between the two players, and an effective policy-mix.

Capital-based instruments

In line with European regulations, capital requirements for banks can be adjusted depending on the corresponding risk level.[22] The CRD IV regulation requires banks to have set aside enough capital to cover unexpected losses and remain solvent in a crisis. Capital requirements for banks in Liechtenstein include:

- **Pillar I requirement** (8% of risk-weighted assets, RWA): In line with the Basel framework, the minimum Pillar I capital requirements consist of common equity Tier-1 (CET1) capital (4.5%), plus additional Tier-1 (AT-1) capital (1.5%) and supplementary Tier-2 capital (2%). The 8% Pillar I capital requirement is applicable to all banks in Liechtenstein.

- **Pillar II requirement:** The aim of the Pillar II processes is to enhance the link between an institution's risk profile, its risk management and risk mitigation systems, and its capital planning. Pillar II consists of two major components: (1) effective and complete strategies and processes to assess and maintain the amounts, types and distribution of internal capital and liquidity in line with their risk profiles (ICAAP, ILAAP), as well as robust governance and internal control arrangements, and (2) supervisory review and evaluation process (SREP). The key purpose of the SREP is to ensure that institutions have adequate arrangements, strategies, processes and mechanisms as well as capital and liquidity to ensure a sound management and coverage of their risks, to which they are or might be exposed. Pillar II requirements are bank-specific and can be used to fine-tune capital and liquidity requirements at the individual bank level.

- **Capital conservation buffer** (2.5% of RWA): All banks have to hold a capital conservation buffer

22 *The following explanations are partly based on the EBA (https://www.eba.europa.eu/regulation-and-policy/supervisory-review-and-evaluation-srep-and-pillar-2) and the European Council's website (http://www.consilium.europa.eu/de/policies/banking-union/single-rulebook/capital-requirements).*

of the highest quality of its capital (CET1) equal to 2.5% of RWA. The purpose of the buffer is to conserve a bank's capital. If a bank does not comply with this buffer, it will have to limit or stop payments of dividends or bonuses. Liechtenstein has exercised the option to introduce the capital conservation buffer without any transitional period. The measure applies to all banks and investment firms in Liechtenstein and has been in force since February 2015.

– **Countercyclical capital buffer** (CCyB, currently set at 0% of RWA, see Box 7): The countercyclical capital buffer is a prudential tool to counteract the effects of the economic cycle on banks' lending activity. It requires a bank to have an additional amount of capital (CET1) in good times, when credit growth is strong, so that when the economic cycle turns, and economic activity slows down, this buffer can be released such that banks can maintain lending to the real economy. If a bank breaches this requirement, the same rules as in the case of the capital conservation buffer apply. While the CCyB is a powerful tool to tame the financial cycle, it has not yet been activated in Liechtenstein, as cyclical risks are increasingly diminishing in recent years (see Box 7 below).

– **Systemic risk buffer** (SyRB, 2.5% of RWA for the three largest banks): Member states have the right to require banks to hold a systemic risk buffer of CET1 capital. The requirement may be applied to the entire financial sector or its individual parts. The aim is to prevent and mitigate long-term non-cyclical systemic or macroprudential risks which may have serious negative consequences for the real economy. In Liechtenstein, systemically relevant institutions have a minimum SyRB of 2.5% according to national law which is applied to all exposures (i.e. total RWA). The long-term non-cyclical systemic risks stem from the structural vulnerabilities of Liechtenstein's small and open economy, with negative shocks being amplified rapidly also in light of the large banking sector relative to the country's GDP.

– **Global systemically important institutions buffer:** This buffer is mandatory for banks that are identified as "global systemically important institutions" (G-SIIs) to compensate for the higher risk they pose to the global financial system and for the potential impact of their failure. Due to the small size of domestic banks on a global scale, this capital buffer is not applicable to Liechtenstein.

– **Other systemically important institutions buffer** (currently set at 0% of RWA): The CRD IV provides for a buffer to include domestically important institutions as well as institutions of EU importance. The directive provides guidelines for identifying "other systemically important institutions" (O-SIIs) as well as an upper limit to the size of the buffer (2% CET1 of RWA). The FMA has identified three O-SIIs in Liechtenstein, the LGT Group Foundation, the Liechtensteinische Landesbank AG and the VP Bank AG. Since the SyRB and the O-SII buffer do not take effect cumulatively (i.e. only the higher of the two buffers applies), a positive value of the O-SII buffer would be mostly ineffective, and the buffer is therefore currently set at 0% of RWA.

Real estate instruments

The FMA has published two reports on vulnerabilities in the real estate sector in 2013 and 2015. The analysis identified several vulnerabilities in Liechtenstein's real estate and mortgage market in light of the substantial exposure of domestic banks towards the household sector, high household indebtedness, increasing house prices and substantial mortgage growth.

Following the analysis of the real estate market, additional data reporting on mortgages and a risk-mitigating policy mix have been implemented. In the context of the real estate sector and mortgages, the policy objectives particularly focus on the mitigation of risks in the residential real estate market and the prevention of excessive credit growth and leverage in the household sector. To make the policy instruments as effective as possible, the policy mix is based on both borrower-based and lender-based measures:

– **Loan-to-value (LTV) ratio:** At mortgage origination or if a mortgage is expanded, the loan-to-value ratio (LTV) must not exceed 80%. A higher LTV ratio is possible in exceptional cases, but such a loan has to be qualified as "exception to policy", implying stricter reporting requirements.

– **Amortization:** The mortgage has to be amortized so that the LTV ratio falls below two thirds within 20 years.

– **Risk weights:** Liechtenstein has exercised the option to apply slightly higher risk weights instead of the risk weights indicated in Art. 125(2) of the CRR, i.e. for residential properties with an LTV between 66 ⅔ percent and 80 percent, the risk weights are set at 50%.

The measures are intended to make vulnerable households more resilient and will likely have some dampening effect on total borrowing and house prices. The mentioned measures are applicable since February 2015 and are in principal cyclically-adjustable. Available data already points to observable effects, including a substantial decline in mortgage growth and easing building activity since 2015 (see Box 5).

The policy mix targeting the residential real estate sector is closely related to other policy areas. Liechtenstein is part of the Swiss Franc currency area, and monetary policy decisions by the SNB are thus directly relevant for Liechtenstein. In light of the low-interest rate environment since the global financial crisis, households were increasingly incentivized to increase their leverage. Related vulnerabilities had to be addressed by other instruments, and the mentioned macroprudential policy-mix targets the relevant risk areas directly and effectively. In combination with strong microprudential bank supervision the measures contribute substantially to the stability of Liechtenstein's financial sector.

BOX 7

Setting the countercyclical capital buffer in Liechtenstein

The countercyclical capital buffer (CCyB) is available since the implementation of the CRD IV package in February 2015. Currently, the national banking law prescribes that the CCyB must be published by the FMA (following the decision by the government) only in the case of a positive buffer rate. The CCyB has never been officially published, i.e. it has been kept at 0% since 1 February 2015. In the future, the national macroprudential authority (i.e. the Financial Stability Council) will recommend the activation and the level of the CCyB if deemed necessary, and the government subsequently has to decide about the activation or the recalibration of the CCyB, respectively.

Data availability for the calculation of the credit gap is limited in the case of Liechtenstein. Both the Basel Committee on Banking Supervision (BCBS) and the European Systemic Risk Board (ESRB) propose the calculation of the credit gap as the joint starting point for the calibration of the CCyB. The credit gap is calculated as the deviation of the private sector indebtedness relative to GDP from its long-run trend. Subsequently, this rule-based approach is then complemented by a set of additional indicators ("guided discretion"). In Liechtenstein, however, neither the private sector indebtedness nor the GDP is available in a timely manner. For this reason, private sector indebtedness has to be approximated based on two variables:

- **The mortgage volume** is available in the bank statistics back until 1972. However, it captures mortgages provided by Liechtenstein banks for the whole Swiss Franc currency area, i.e. it includes cross-border credits to Switzerland.

- **Private household indebtedness** is available from tax statistics since 2001. The figure is however not comparable to other countries, because it is not based on consolidated debt volumes (i.e. credit within the household sector is also captured).

Both indebtedness variables are only available on an annual basis, and the time series have to be extended with corresponding proxies from supervisory banking data.

GDP numbers are also published with a long delay, because they are based on tax statements by households and corporations. The flash estimate for annual GDP numbers is published with a delay of 15 months, with final numbers published 23 months after the year has ended. Since the calculation of the credit gap requires timely data on debt and GDP, the FMA uses an internal model to backcast GDP based on the quarterly business survey. Based on these estimations, potential output is estimated using standard methods, and all debt-to-GDP ratios are then calculated based on the potential output estimate.

BOX 7

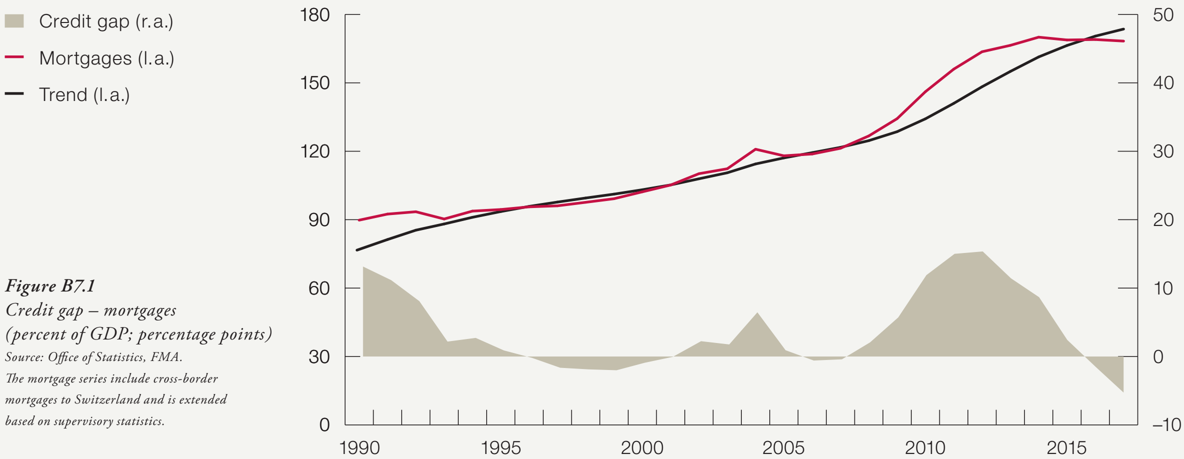

Figure B7.1
Credit gap – mortgages
(percent of GDP; percentage points)
Source: Office of Statistics, FMA.
The mortgage series include cross-border mortgages to Switzerland and is extended based on supervisory statistics.

While the two credit aggregates show somewhat different patterns over time, both variables point to a negative credit gap at the end of 2017. While the mortgage series (including cross-border mortgages to Switzerland, Figure B7.1) shows increasing debt levels in the past few years, household debt has followed a downward trend since 2011 (Figure B7.2). At the end of 2017, debt-to-GDP ratios are estimated at 168% (mortgages incl. Switzerland) and 127% (household debt), respectively. The corresponding credit gaps are estimated at –5.3% (mortgages) and –4.1% (household debt), i.e. both debt ratios point to a significantly negative credit gap. While the two time series are only proxies for private sector debt (as explained above), they nevertheless point to a consistent pattern. Accordingly, the financial cycle has turned, and cyclical vulnerabilities are gradually declining in Liechtenstein.

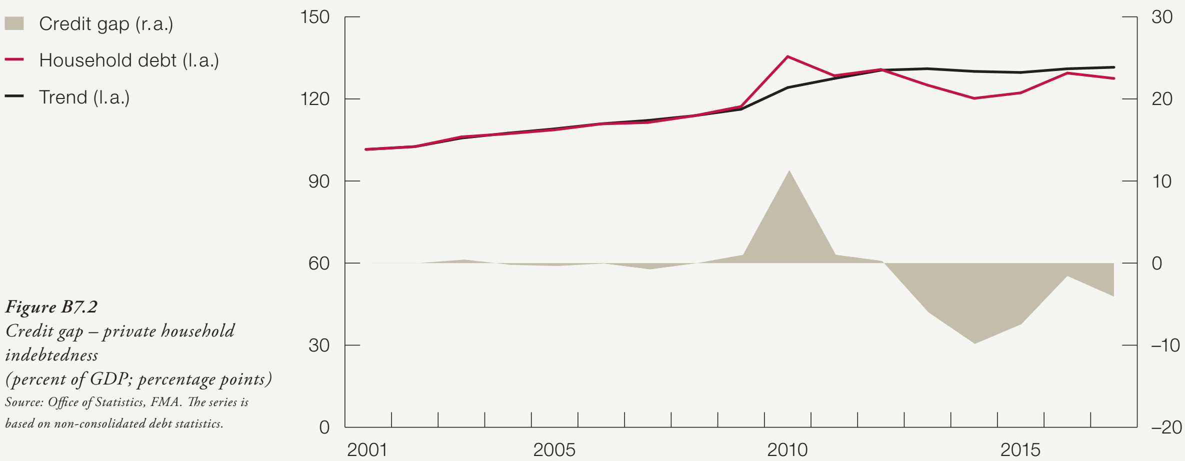

Figure B7.2
Credit gap – private household indebtedness
(percent of GDP; percentage points)
Source: Office of Statistics, FMA. The series is based on non-consolidated debt statistics.

BOX 7

Historical analysis shows that the CCyB should have been activated for a short time period following the financial crisis. While both time series currently signal negative credit gaps and therefore a CCyB of 0%, the analysis also shows that the credit gaps were significantly positive around 2010, and that both credit aggregates would have signaled a positive CCyB in light of increasing credit volumes due to the decrease in interest rates, hence incentivizing households to increase their leverage.

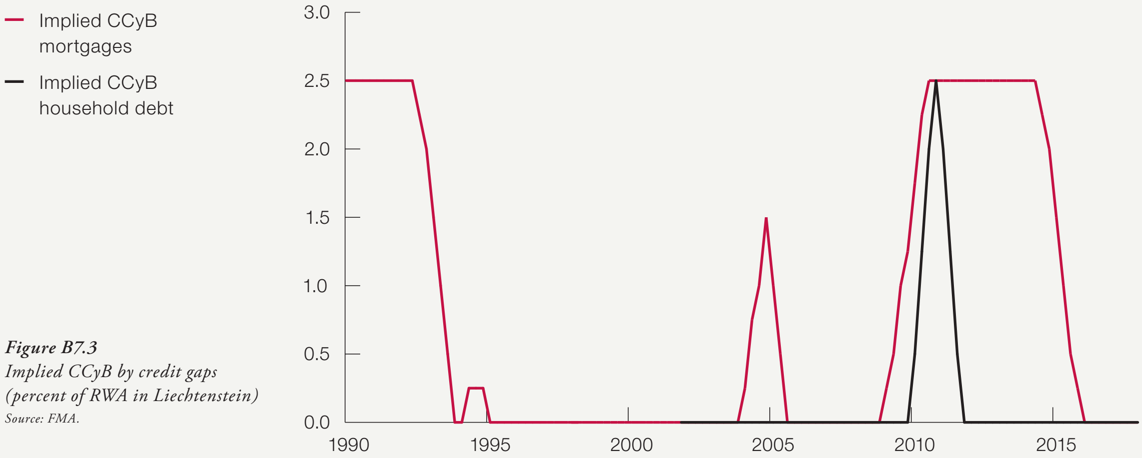

Figure B7.3
Implied CCyB by credit gaps (percent of RWA in Liechtenstein)
Source: FMA.

Along with the ESRB's recommendation, the FMA takes into account a whole range of additional indicators to calibrate the CCyB. The rule-based approach (i.e. the calculation of the credit gap) is complemented by a whole set of indicators. Although data availability is limited, the indicators cover developments of real estate prices (e.g. vacancy rates), credit developments, balance of payments imbalances, the soundness of bank balance sheets, debt burden of the private sector and possible mispricing of risks in global markets.

Based on the FMA's internal analysis, there are currently no intentions to change the CCyB for the time being. While Liechtenstein has experienced strong credit growth following the global financial crisis, credit expansion has weakened in recent years, resulting in a negative credit gap. Furthermore, additional indicators considered in the analysis currently do not signal any need to deviate from the benchmark buffer guide. Accordingly, the CCyB rate is currently set at 0%.

Recovery and resolution

The Liechtenstein Resolution Authority took on its work in January 2017 as a separate unit within the organizational structure of the FMA. Due to Liechtenstein's membership in the European Economic Area (EEA), the resolution framework is based on the EU's Banking Recovery and Resolution Directive (BRRD) and the entailing technical and regulatory standards as well as guidelines and recommendations. The year 2017 was characterized by finalizing the organizational setup of the resolution authority within the FMA, essential policy work and further preparatory work for resolution planning. The focus of 2018 is establishing the framework for resolution funding as well as the implementation of the new EU standard on the ranking of unsecured debt instruments in insolvency hierarchy.

In the second half of 2018 and the beginning of 2019, the Resolution Authority aims to discuss the pillars of its MREL-policy (Minimum Requirements of Own Funds and Eligible Liabilities) with the Liechtenstein institutions. Furthermore, work on the resolution plans for Liechtenstein institutions will continue, with an emphasis on the analysis of financial stability implications, critical functions and core business lines as well as the assessment of resolvability, critical interdependencies (amongst systemically relevant institutions in Liechtenstein as well as within each respective banking group) and the preliminary identification of potential resolution strategies. In this context, the Resolution Authority also seeks to strengthen the cooperation with its international counterparts (resolution colleges) and to continue participation within the resolution policy framework of the European Banking Authority (EBA). Finally, the Resolution Authority's cooperation with Liechtenstein's competent authority (banking supervision) with regard to recovery planning and the identification of impediments to resolution will be intensified.

Current reforms of EU regulations may imply imminent regulatory reforms of the resolution framework in Liechtenstein. Depending on the progress of the EU's reforms of the banking and resolution regulatory architecture ("CRD V", "BRRD 2" etc.) as well as the initiatives for resolution frameworks for central counterparties (CCPs) and systemically important insurance undertakings, 2019 might be the starting point for significant amendments and expansions to the existing regulatory framework for resolution in Liechtenstein.

Risks and recommendations

Liechtenstein's financial sector is in good shape. Overall, the financial sector is assessed to be sound, with risks remaining low. While the financial sector, and particularly the banking sector, is large relative to GDP, high capitalization and strong liquidity and profitability indicators contribute to a mitigation of risks and a positive outlook for the financial services sector. The non-bank financial sector, i.e. insurances, asset managers and investment funds, plays a relatively small role relative to the banking sector, but shows a promising growth outlook and constitutes an important complement contributing to the reputation of Liechtenstein as a financial center.

At the same time, systemic risks in the financial sector have to be defined more broadly than in other countries. Against the backdrop of the large role of the financial sector and its significance – also in terms of employment – for the economy as a whole, systemic importance has to be defined more broadly in Liechtenstein when compared with other countries. Thus, an assessment cannot only be based on the role of a systemically relevant bank for financial intermediation as a provider of critical functions to the real economy (i.e. payments services, lending and deposit business etc.), but must be seen in context of the whole economy, since the financial sector per se is an important part of it. At the same time, however, the strong manufacturing base differentiates Liechtenstein from other small financial centers, consequently reducing its dependence on the financial sector and, as a result, the vulnerabilities of the economy.

Some important specifics associated with the small size of the country and the special legal arrangements have to be taken into account when discussing risk-mitigating policies. Historically, there are strong ties between Liechtenstein and Switzerland. Already in the 1920s, a customs union was implemented, and the Swiss Franc was introduced as the local currency, with an intergovernmental currency treaty in 1980 ensuring legal certainty. Therefore, Liechtenstein does not have its own central bank, and the SNB is in charge for the conduct of monetary policy. The FMA complements the SNB's role by having the legal obligation to contribute to financial stability, with the conduct of macroprudential policy being a joint responsibility of the FMA and the government. Contrary to Switzerland, Liechtenstein has become a member of the EEA in 1995, implying that the financial sector is now fully regulated according to EU standards. While the EEA accession was a controversial decision at the beginning of the 1990s, particularly because it marked a divergence from Switzerland in this context, the membership is now seen as indispensable in terms of Liechtenstein's international integration efforts.

While private sector indebtedness is overall quite limited, it is strongly concentrated in the household sector. Although debt ratios are only partially comparable to other countries, data shows that private households have a relatively high indebtedness. Nevertheless, the associated risks are assessed to be limited, because the high debt level is partly due to structural specifics and mostly concentrated among households with high net wealth. Furthermore, the low debt ratio of the non-financial corporate sector and sound public finances lead to a low overall debt level in the Liechtenstein economy. Nonetheless, the concentration of indebtedness in the household sector requires a continuous monitoring of associated risks in the banking sector and the real estate market, as the lion's share of household debt consists of mortgages.

In light of the large financial sector and the relatively high volatility in GDP growth, the sound fiscal policy approach should be continued. Fiscal policy in Liechtenstein mainly focuses on sound public finances and on structural reforms, while countercyclical policies play a minor role on the back of the small and open economy implying a very small fiscal multiplier. The elevated volatility of GDP growth – which is normal for an economy of this small size – requires corresponding flexibility in policy-making and the public budget. The government has hence put a focus on extremely sound public finances, including budget surpluses and a continuous increase in financial reserves. This solid and predictable fiscal policy approach should be continued, as healthy public finances are also essential as a stability anchor for the financial sector.

As a small country, the implementation of all relevant international and European financial market regulations is key for Liechtenstein's international integration. For a continuously successful development of the financial market, the commitment to comply with European and international standards is essential. While the high financial regulatory pressure is challenging both for financial intermediaries and national regulators and authorities, the implementation of international standards is even more important in the case of small economies and financial centers. As pointed out by the Financial Stability Board, for instance, correspondent banking relationships are on a decreasing trend globally in light of increased regulatory pressure. Small jurisdictions are characterized by relatively low revenues for correspondent banks, raising questions whether the associated fixed costs (monitoring of legal framework, etc.) are justified from a business perspective. In this context, it is essential to be part of a transparent international regulatory framework such as the EEA agreement, ensuring legal certainty, international integration and market access for Liechtenstein's financial intermediaries.

In the context of the banks' international growth strategies, the international expansion should not be at the expense of lower stability. Liechtenstein banks have followed an expansionary strategy in recent years, with mergers and acquisitions in Switzerland, Austria and Asia. While this development is in principle welcome to open up new income sources, it is nonetheless important that these growth strategies do not lead to significantly higher risks for the financial sector and Liechtenstein's economy. In order to be resilient toward unexpected shocks, banks should avoid increased risk-taking and also keep their high level of capitalization.

To ensure financial stability, it is also important to improve the availability of data enabling the necessary economic analysis. In Liechtenstein, also due to the small country size, the availability of macroeconomic and financial data is limited. While a number of useful indicators is readily available despite severely limited resources, it is nevertheless important that data availability is gradually increased, including additional and timelier indicators for economic developments (e.g. GDP forecasts, timely cyclical indicators, tax statistics etc.) as well as financial sector data (e.g. interlinkages within the financial sector).

Finally, crisis prevention and the preparation of a policy tool box for the unlikely case of a crisis should also be a policy focus. While the currency treaty ensures access of Liechtenstein banks to SNB funding, monetary flexibility and the access to emergency liquidity would be limited in the case of a crisis. To ensure financial stability also in the case of a crisis, the close collaboration with international bodies is essential. In this context, a membership in the International Monetary Fund (IMF) should be taken into consideration. Financial stability analysis and macroprudential supervision should be strengthened, and further progress in bank resolution is necessary to ensure financial stability.

APPENDIX

List of abbreviations

AIF	Alternative investment fund
AML/CFT	Anti-money laundering/Combating the financing of terrorism
AT-1	Additional Tier-1 capital
AuM	Assets under management
BCBS	Basel Committee on Banking Supervision
BRRD	Banking recovery and resolution directive
CCPs	Central counterparties
CCyB	Countercyclical capital buffer
CET1	Common equity Tier 1
CHF	Swiss franc
CIR	Cost-income ratio
CPI	Consumer price index
CRD IV	Capital Requirements Directives
CRR	Capital Requirements Regulation
DLT	Distributed ledger technology
EBA	European Banking Authority
EEA	European Economic Area
EME	Emerging market economy
ESRB	European Systemic Risk Board
FINMA	Swiss financial market supervisory authority
FMA	Financial market authority
GDP	Gross domestic product
G-SII	Global systemically important institution
HP filter	Hodrick-Prescott filter
ICAAP	Internal capital adequacy assessment process
ICO	Initial coin offering
ILAAP	Internal liquidity adequacy assessment process
IU	"Investmentunternehmen"
LCCI	Liechtenstein Chamber of Commerce and Industry
LCR	Liquidity coverage ratio
LTV	Loan-to-value
ManCos	Management companies
MiFID	Markets in Financial Instruments Directive
m-o-m	Month-on-month
MREL	Minimum requirements of own funds and eligible liabilities
NFC	Non-financial corporate
NSFR	Net stable funding ratio
OECD	Organisation for Economic Co-operation and Development
O-SII	Other systemically important institution
PEPs	Politically exposed persons
PMIs	Purchasing manager indices
q-o-q	Quarter-on-quarter
R&D	Research and development
REER	Real effective exchange rate
RoA	Return on assets
RoE	Return on equity
RRE	Residential real estate
RWA	Risk-weighted assets
S&P 500	Standard & Poor's 500
SMI	Swiss Market Index
SNB	Swiss National Bank
SREP	Supervisory review and evaluation process
SyRB	Systemic risk buffer
THK	Liechtenstein Institute of Professional Trustees and Fiduciaries
UCITS	Undertakings for collective investments in transferable securities

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