INTERNATIONAL MONETARY FUND

IMF Country Report No. 23/176

LUXEMBOURG

May 2023

2023 ARTICLE IV CONSULTATION—PRESS RELEASE; STAFF REPORT; AND STATEMENT BY THE EXECUTIVE DIRECTOR FOR LUXEMBOURG

Under Article IV of the IMF's Articles of Agreement, the IMF holds bilateral discussions with members, usually every year. In the context of the 2023 Article IV consultation with Luxembourg, the following documents have been released and are included in this package:

- A **Press Release** summarizing the views of the Executive Board as expressed during its May 17, 2023 consideration of the staff report that concluded the Article IV consultation with Luxembourg.
- The **Staff Report** prepared by a staff team of the IMF for the Executive Board's consideration on May 17, 2023, following discussions that ended on March 10, 2023, with the officials of Luxembourg on economic developments and policies. Based on information available at the time of these discussions, the staff report was completed on May 2, 2023.
- An **Informational Annex** prepared by the IMF staff.
- A **Statement by the Executive Director** for Luxembourg.

The documents listed below have been or will be separately released.

Selected Issues

The IMF's transparency policy allows for the deletion of market-sensitive information and premature disclosure of the authorities' policy intentions in published staff reports and other documents.

Copies of this report are available to the public from

International Monetary Fund • Publication Services
PO Box 92780 • Washington, D.C. 20090
Telephone: (202) 623-7430 • Fax: (202) 623-7201
E-mail: publications@imf.org Web: http://www.imf.org
Price: $18.00 per printed copy

International Monetary Fund
Washington, D.C.

© 2023 International Monetary Fund

PRESS RELEASE

PR23/172

IMF Executive Board Concludes 2023 Article IV Consultation with Luxembourg

FOR IMMEDIATE RELEASE

WASHINGTON, DC – May 24, 2023:

On May 17, 2023, the Executive Board of the International Monetary Fund (IMF) concluded the Article IV consultation with Luxembourg.[11]

Luxembourg has shown resilience in the aftermath of the war in Ukraine and accelerated tightening of global financial conditions, partly helped by fiscal support. That said, despite robust labor market, GDP growth slowed. Soaring energy prices sent inflation to a multi-decade high, prompting the Government to support households and firms by introducing price controls and tax cuts. Although costly, the measures have helped temporarily keeping inflation below the levels in most euro area peers and limiting the number of wage indexations. Tighter financial conditions have started to impact the financial sector, with heterogeneity across segments. The financial sector, overall, remains resilient, though there are some pockets of vulnerabilities, especially in the real estate sector and non-bank financial institutions.

Growth is expected to slow to about 1 percent in 2023, before gradually recovering to its potential percent over the medium term. Headline inflation is likely to moderate further but core inflation is expected to remain persistent. The near-term outlook is highly uncertain. Risks are tilted to the downside and stem from a deeper global slowdown, a de anchoring of inflation expectations, and systemic financial instability at the global level.

Executive Board Assessment[2]

Executive Directors agreed with the thrust of the staff appraisal. They noted that the Luxembourg economy has remained resilient in the face of successive shocks, supported by solid fundamentals and a strong policy response. However, uncertainties and risks have risen, including from Russia's war in Ukraine and global financial tightening, as well as high domestic real estate prices and household indebtedness. In this context, Directors encouraged the authorities to continue pursuing policies targeted at addressing inflationary

---

[1] Under Article IV of the IMF's Articles of Agreement, the IMF holds bilateral discussions with members, usually every year. A staff team visits the country, collects economic and financial information, and discusses with officials the country's economic developments and policies. On return to headquarters, the staff prepares a report, which forms the basis for discussion by the Executive Board.

[2] The Executive Board takes decisions under its lapse-of-time procedure when the Board agrees that a proposal can be considered without convening formal discussions.

700 19th Street NW
Washington, DC 20431
USA

pressures and maintaining macro-financial stability, while implementing structural policies to promote economic resilience.

Directors urged the authorities to maintain a broadly neutral fiscal stance to help contain persistent inflation. They stressed the need for better targeted and less price distortionary energy support measures, while continuing efforts to promote energy security. Given the increased uncertainty over the near term, Directors saw scope for a flexible fiscal policy, including by allowing automatic stabilizers to operate fully. They also emphasized the need for prudent spending to preserve buffers, including by expediting pension reforms. Directors welcomed the recent adjustment of the tax brackets and called for more frequent, budget-neutral adjustments in response to inflation, alongside a comprehensive review of the tax-benefit system.

Directors noted that while financial risks have risen, banks' strong capital and liquidity buffers should help absorb potential shocks. They encouraged continued close monitoring of financial sector risks and pockets of vulnerabilities, especially in real estate. They saw merit in introducing income-based limits and considering targeted capital measures to strengthen banks' resilience. Directors welcomed the strengthening of the supervision and stress-testing capacities for investment funds, while calling for continued monitoring of liquidity and leverage and further proactive participation in international fora to strengthen investment fund regulation. While welcoming the authorities' plans, they encouraged further enhancements to the AML/CFT framework.

Directors stressed that structural reforms should primarily focus on real estate and labor markets. Improving housing affordability should remain a top priority, with further actions necessary on the supply side, including through front-loaded public investment, while avoiding demand support. Directors encouraged consideration of enhancing the automatic wage indexation framework, including by indexing wages to a measure of core inflation, while striking a balance between distributional and competitiveness concerns. Directors commended the authorities' progress in reducing gender gaps and encouraged additional measures to further reduce them. Seniors' labor market participation should also be improved.

It is expected that the next Article IV consultation with Luxembourg will be held on the standard 12-month cycle.

Table 1. Luxembourg: Selected Economic Indicators, 2021-24

		Est.	Proj.	
	2021	2022	2023	2024
Real economy (percent change)				
GDP	5.1	1.5	1.1	1.7
Domestic demand	8.2	2.0	2.5	2.3
Foreign balance 1/	-0.3	0.3	-0.7	0.1
Labor market (thousands, unless noted otherwise)				
Unemployed	17.1	14.6	15.7	17.1
(Percent of labor force)	5.7	4.8	5.1	5.4
Resident employment	281.7	289.2	293.6	298.4
Cross border workers (net)	203.9	213.3	216.8	220.4
Total employment	485.6	502.6	510.3	518.8
(Percent change)	3.0	3.5	1.5	1.7
Prices and costs (percent change)				
GDP deflator	6.2	6.4	3.6	3.1
CPI (harmonized)	3.5	8.1	2.6	3.1
CPI core (harmonized)	1.5	4.2	3.8	3.6
CPI (national definition)	2.5	6.3	3.2	2.9
Public finances (percent of GDP)				
General government revenues	43.6	43.5	43.4	44.2
General government expenditures	42.9	43.3	46.1	46.0
General government balance	0.7	0.2	-2.8	-1.8
General government structural balance	1.4	1.4	-0.3	-1.1
General government gross debt	24.5	24.6	27.5	29.2
Balance of payments (percent of GDP)				
Current account	4.6	5.0	4.5	4.4
Balance on goods	1.3	0.2	1.1	1.1
Balance on services	33.4	28.2	26.1	25.9
Net factor income	-31.0	-24.2	-23.5	-23.4
Balance on current transfers	0.9	0.8	0.8	0.8
Exchange rates, period averages				
U.S. dollars per euro	1.18	1.05	...	...
Nominal effective rate (2010=100)	104.04	102.68	...	...
Real effective rate (CPI based; 2010=100)	101.17	98.19	...	...
Credit growth and interest rates				
Credit to nonfinancial private sector (percent change) 2/	5.3	4.4	3.1	4.5
Potential output and output gap				
Output gap (percent deviation from potential)	1.0	0.5	-0.2	-0.5
Potential output growth (percent)	2.2	2.0	1.9	2.0

Sources: Luxembourg authorities and IMF staff estimates.

1/ Percentage point contribution to GDP growth.

2/ Including a reclassification of investment companies from financial to non-financial institutions

INTERNATIONAL MONETARY FUND

LUXEMBOURG

STAFF REPORT FOR THE 2023 ARTICLE IV CONSULTATION

May 2, 2023

KEY ISSUES

Context. Growth and employment have slowed somewhat, reflecting mostly weaker external demand, tighter financial conditions, and confidence effects. A large fiscal support package in the run up to the election has alleviated the impact of the energy shock on consumers and firms, with energy price controls limiting the pass-through to inflation and hence wage increases in a context of automatic wage indexation.

Outlook and risks. GDP growth is set to slow further in 2023 before rebounding next year, while employment and consumption are expected to remain robust. Inflation is likely to moderate, but its core component is projected to persist at high levels until 2025. Risks are mainly external and are tilted to the downside, notably after the recent stress in the global banking.

Policy Recommendations

Fiscal Policy

In the short term, significantly reduce the fiscal stimulus to contain aggregate demand and inflation pressure by keeping the cyclically adjusted balance broadly unchanged. Shift to more targeted and less price-distortionary energy support measures and continue investing in energy efficiency and renewables. In case of severe demand shocks, allow automatic stabilizers to fully operate and consider targeted support, complementing them with a suspension of wage indexation in case of supply shocks.

In the medium term, preserve buffers though prudent spending and an early pension reform. Better anchor fiscal policy and reduce procyclicality of fiscal policy by adopting a medium-term objective based on the overall balance and a ceiling on expenditure growth. Increase the frequency of the tax brackets adjustments for inflation in a budget-neutral way, within a comprehensive review of the tax and social benefits system to enhance its efficiency and distributional impact.

Financial Sector Policies

Banks have strong capital and liquidity buffers that would help cope with large adverse shocks. While bank-fund interlinkages are significant, especially on custodian banks' liability side, systemic risk appears manageable. Continue monitoring potential pockets

of vulnerabilities, especially in real estate, as well as liquidity and interest rate risks. On the macroprudential side, maintain the countercyclical capital buffer (CCyB) unchanged for now. Consider introducing income-based limits to avoid further buildup of vulnerabilities. Increase resilience to a severe downturn in the real estate market through targeted capital measures (apply sectoral systemic risk buffer, increase minimum risk weights and link them to LTV). Should the credit cycle deteriorate considerably, could consider relaxing the CCyB, while keeping the LTV limit unchanged.

Bolster resilience of *investment funds* by enhancing the effectiveness of swing pricing through better calibration to stress episodes and tailoring redemption terms to asset liquidity and investment strategy. Continue to coordinate actively with other supervisors, including on cross-border spillovers, and contribute to international efforts to strengthen oversight and regulatory and macroprudential requirements, especially concerning liquidity and leverage.

Structural Policies

To enhance *housing affordability*, focus on boosting supply by frontloading public construction projects, reducing bottlenecks, and increasing density. Avoid measures that boost housing demand and impede the adjustment of housing prices to more affordable levels. For *wage indexation*, consider indexing to core inflation (complemented as needed with targeted support for the poorest). Consider introducing progressive wage indexation and switching to a rule-based suspension of the system (e.g., based on competitiveness indicators that would encourage greater decentralization of wage bargaining).

Approved By
Ms. Papi (EUR)
Ms. Tamirisa (SPR)

Discussions were held during February 27–March 10, 2023. The team comprised E. Stavrev (head), T. Jardak, T. Iyer, and M. Fornino, and was assisted by K. Cerrato and P. Castillo. Mr. M. Scholer (OED) joined the discussions. The mission met with Minister of Finance Backes, Governor Reinesch, other officials, and representatives from the private sector and civil society.

CONTENTS

CONTEXT 5

RECENT DEVELOPMENTS 6

OUTLOOK AND RISKS 13

POLICY DISCUSSIONS: MANAGING RISKS AND INCREASING SOCIO-ECONOMIC RESILIENCE 14

A. Fiscal Policy: Navigating the Growth-Inflation Trade-off, Promoting Energy Security, and Preserving Buffers 14

B. Financial Sector Policies: Safeguarding Financial Stability and Increasing Resilience in a More Volatile Environment 19

C. Structural Policies: Bolstering Socio-economic Resilience 27

STAFF APPRAISAL 30

FIGURE

1. Labor Market and Wages 7

TABLES

1. Selected Economic Indicators, 2019–28 33
2. Balance of Payments, 2019–28 34
3. General Government Operations, 2019–28 35
4. International Investment Position, 2016–22 36
5. Financial Soundness Indicators, 2016–22 37

ANNEXES

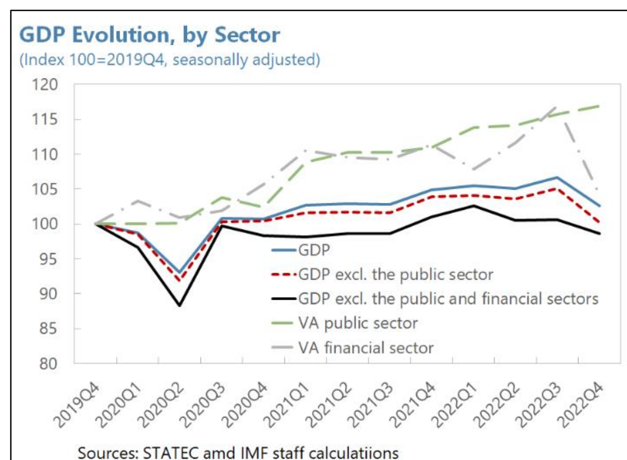
I. External Sector Assessment 38

II. The Impact of Financial Tightening in Luxembourg 41

III. Risk Assessment Matrix ____ 44
IV. Sovereign Risk and Debt Sustainability Analysis ____ 46
V. Implementation Status—FSAP Update 2017 Recommendations ____ 52
VI. Gender Gap In Luxembourg: Recent Developments and Room for Further Progress ____ 64

CONTEXT

1. Luxembourg has been more resilient than its peers and emerged from the pandemic in a strong position, although with some imbalances. GDP dropped by only 0.8 percent in 2020, given that the large service sector adapted quickly to remote working. Growth rebounded strongly in 2021, mainly reflecting an exceptional performance of exports of financial and nonfinancial services (e.g., air freight business to firms) as well as rapidly expanding public services. The labor market tightened, supporting wages and disposable income even as fiscal support was gradually withdrawn. Large excess savings, together with very low interest rates and supply bottlenecks in the construction sector, have put further pressure on an already hot housing market and raised concerns about affordability and attractiveness of the country for workers. This has also exposed the challenges of sustaining the extensive growth model (reliant on foreign labor force) that Luxembourg has been following in the last decades.



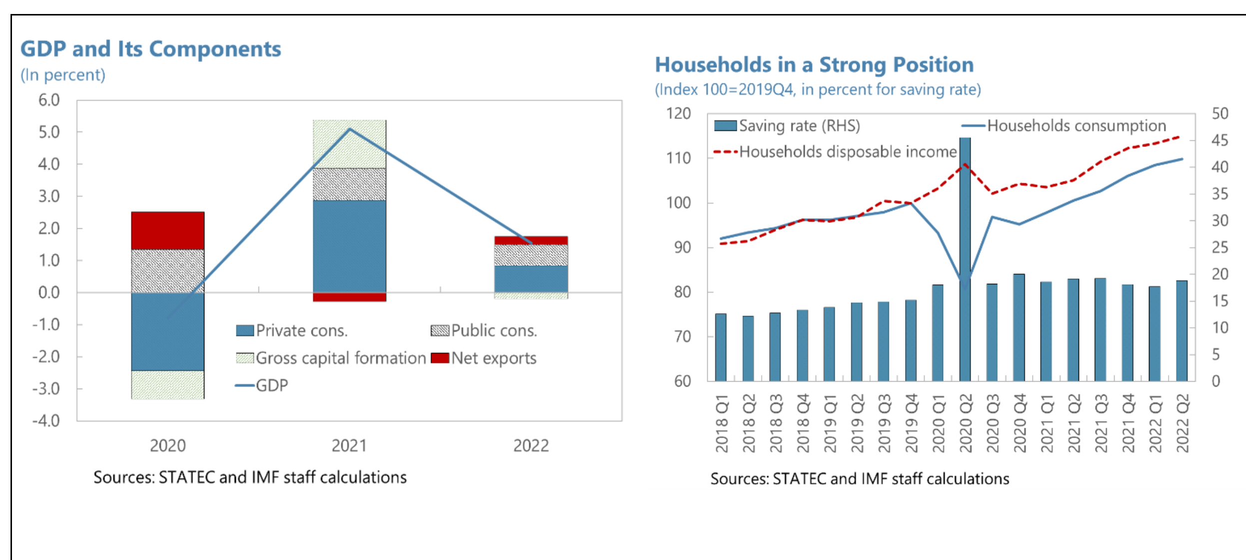
2. The war in Ukraine poses new headwinds to Luxembourg's economy, mainly through indirect spillovers. About 25 percent of Luxembourg gas imports were sourced from Russia in 2020. Yet, the direct impact of lower gas supply from Russia has been rather small. Higher imports from other producers and lower gas consumption, partly due to a milder winter, have limited disruptions. That said, the economy has been affected mainly through external demand channels. Soaring energy prices have put pressure on domestic energy prices and increased imported inflation. The acceleration of the monetary policy tightening by major central banks and heightened volatility of global financial conditions has affected the financial sector performance in Luxembourg. At the same time, it has dented confidence in European trading partners and Luxembourg. While commodity prices have recently declined, the global outlook is highly uncertain, and despite some moderation recently, inflation remains high by historical standards.

3. In a pre-election context, the impetus for large public intervention has been strong, with implications for inflation and fiscal buffers. In addition to generous fiscal support in response to the energy shock, a public wage increase (on top of the wage indexation) has been agreed for 2023-24 (50 and 80 million euros, respectively—total of 0.2 percent of GDP), which will further increase the public wage bill. Also, trade unions negotiated a tax relief and an adjustment of the personal income tax brackets for inflation (last adjusted in 2017). Finally, the government committed to compensate firms until January 2024 for the cost of a third indexation should it happen in 2023 and increased support to housing demand.

RECENT DEVELOPMENTS

The pace of the economic recovery is moderating from a strong cyclical position amidst external headwinds. Soaring energy prices, among other factors, sent inflation to a multi-decade high. This prompted a government response to support households and firms, with price controls and tax cuts temporarily keeping inflation below the levels in most euro area peers and limiting the number of wage indexations. Tighter financial conditions have started to impact the financial sector, with heterogeneity across segments. The impact of the recent stress in the global banking has been manageable so far. The financial sector, overall, remains resilient, though there are some pockets of vulnerabilities. House prices have grown at a more moderate pace as demand fell but are estimated to be still overvalued.

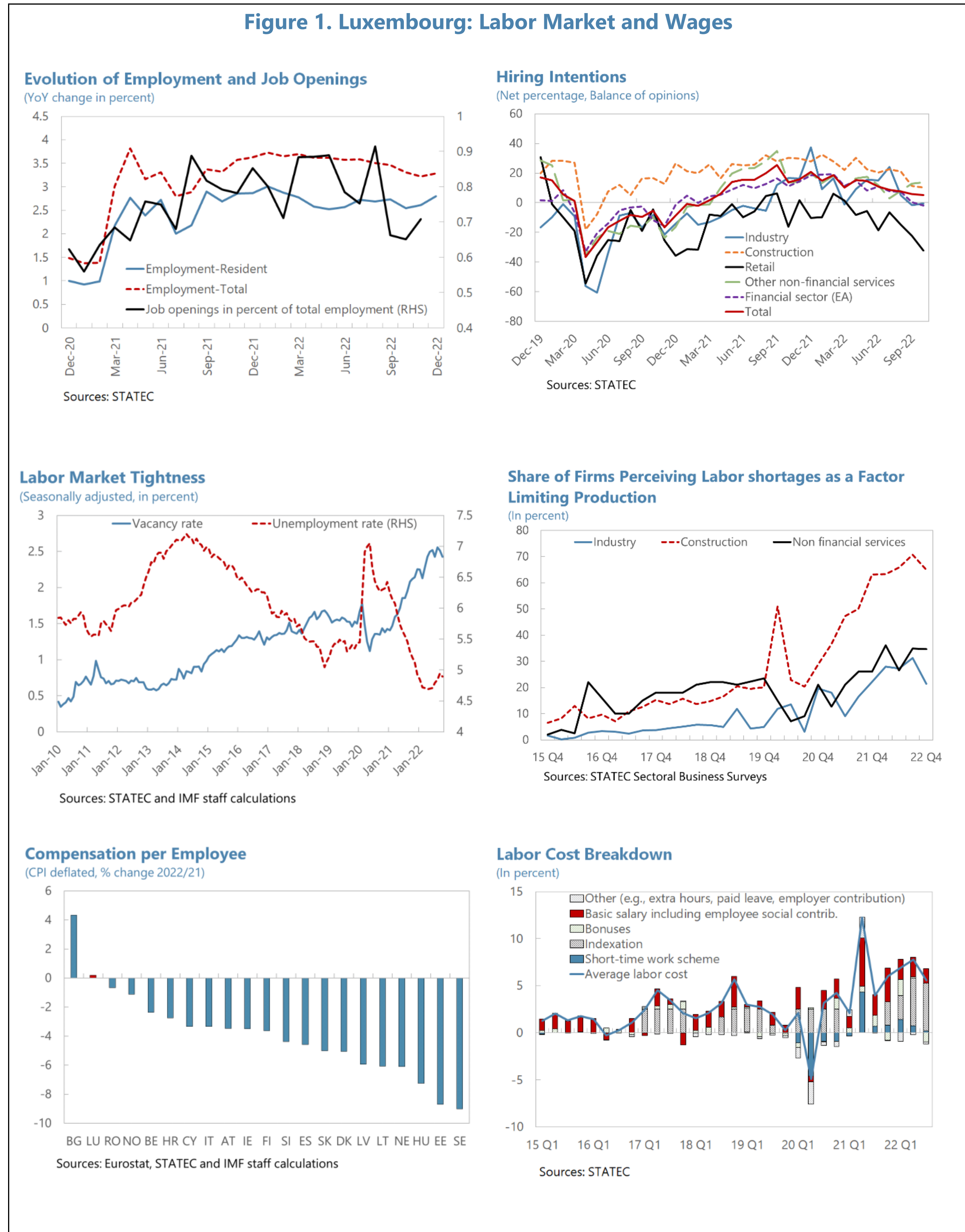
4. **While slowing mainly because of external headwinds, growth has remained relatively resilient, underpinned by robust consumption.** Growth moderated to 1.5 percent in 2022, from 5.1 percent in 2021. The slowdown reflects: i) falling investment due to increased uncertainty and lower real estate demand, and ii) base effects with a subdued performance of the external sector (mainly financial services) following an exceptional performance in 2021. This was partly offset by resilient public and private consumption growth, supported by the reopening of the economy, strong labor market, and expansionary fiscal policy. In 2023 Q1, high frequency indicators show mixed signals with some improvement in consumer and nonfinancial services confidence counterbalanced with worse confidence in manufacturing and construction (Table 1).



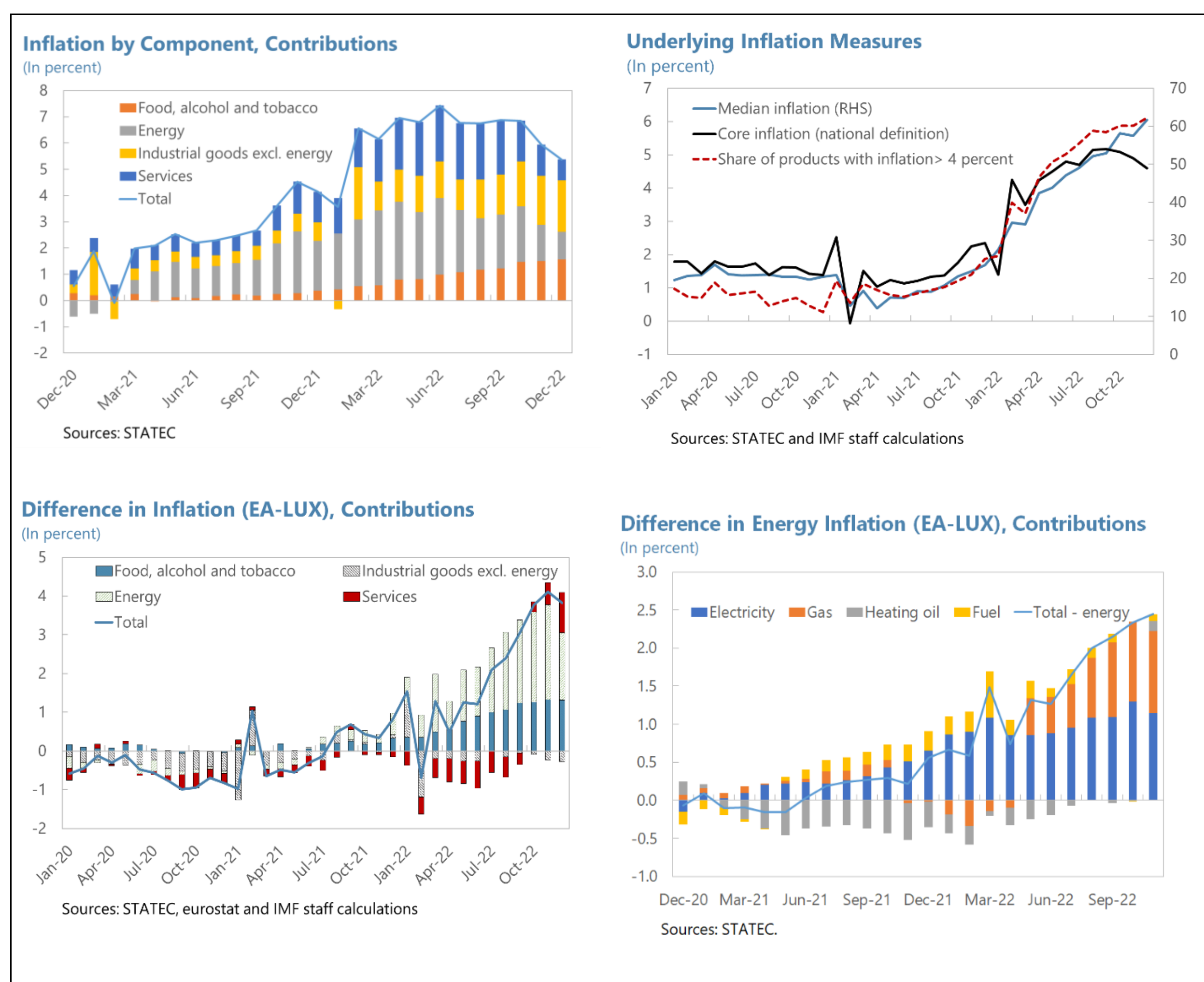
5. **The labor market has started to cool off but remains robust.** Unemployment continued to decline during 2022H1, falling below pre-crisis levels, amid robust employment growth. However, in Q3, new job openings started to moderate, mainly in construction and hotels and restaurants. Unemployment increased slightly to reach 4.8 percent in December 2022 (stable in February 2023), in part reflecting higher demand for jobs by Ukrainian refugees. Hiring intentions by firms have also eased. However, the vacancy rate remains elevated, and a large share of firms continue to report labor shortages as one the main factors limiting production. The two wage indexations (in October

2021 and April 2022) and tight labor market conditions have limited the erosion of real wages compared to other euro area countries (Figure 1).

Figure 1. Luxembourg: Labor Market and Wages



6. After increasing to multi-decade high by mid-2022, inflation has moderated, but has become broad-based. National headline inflation peaked at 7.4 (5.1) percent year on year (yoy) in June 2022 before easing in February 2023 (to 4.3 percent, on the back of lower energy prices, travel and free afterschool care and school meals. However, this decline in inflation masks a broadening of inflationary pressures, with core inflation persistently high at 4.8 percent and the share of items with inflation exceeding 4 percent growing to 63 percent over the same period. That said, with an annual average of 6.3 percent in 2022, inflation remains one of the lowest in the euro area, mostly because in Luxembourg, energy price controls and other subsidies limited the pass-through from wholesale to retail prices as well as second round effects due to the automatic wage indexation.



7. The government generously supported households and firms, including through price controls and tax cuts, limiting temporarily the impact of the energy shock on inflation. A tripartite agreement was reached in March 2022 to postpone the second indexation due in mid-2022 to April 2023. To compensate potential real income losses, the government provided initially a relatively targeted support, granting progressive income tax credits and one-off cash transfers for low-income households. The "Energiedësch" and "Solidaritéitspak 1.0" also included a stabilization of electricity prices, a subsidy to network gas costs, an excise tax reduction on fuel, a financial aid to

energy-intensive firms, as well as incentives and loan guarantees for green investments to both firms and households. In September 2022, as inflation and energy prices were higher than initially expected and pressure to restore the wage indexation mechanism increased, a second, less targeted, package ("Solidaritéitspak 2.0"), designed to reduce the number of indexation tranches, was announced. It encompassed price caps on gas, an electricity price freeze, subsidies on heating oil and pellets, and a temporary VAT rate cut of 1 ppt. It also extended support to firms adversely affected by the energy shock. In parallel, the wage indexation mechanism was restored, and the government committed to compensate firms until the end of the year for the cost of the third wage indexation should it occur in 2023. The March 2023 tripartite agreement extended the commitment to reimburse firms for the third wage indexation to January 2024, and the energy price measures to end-2024. It also granted a temporary tax relief to households. Finally, the authorities decided to raise minimum wages by 3.2 percent (on top of the wage indexations) in January 2023.

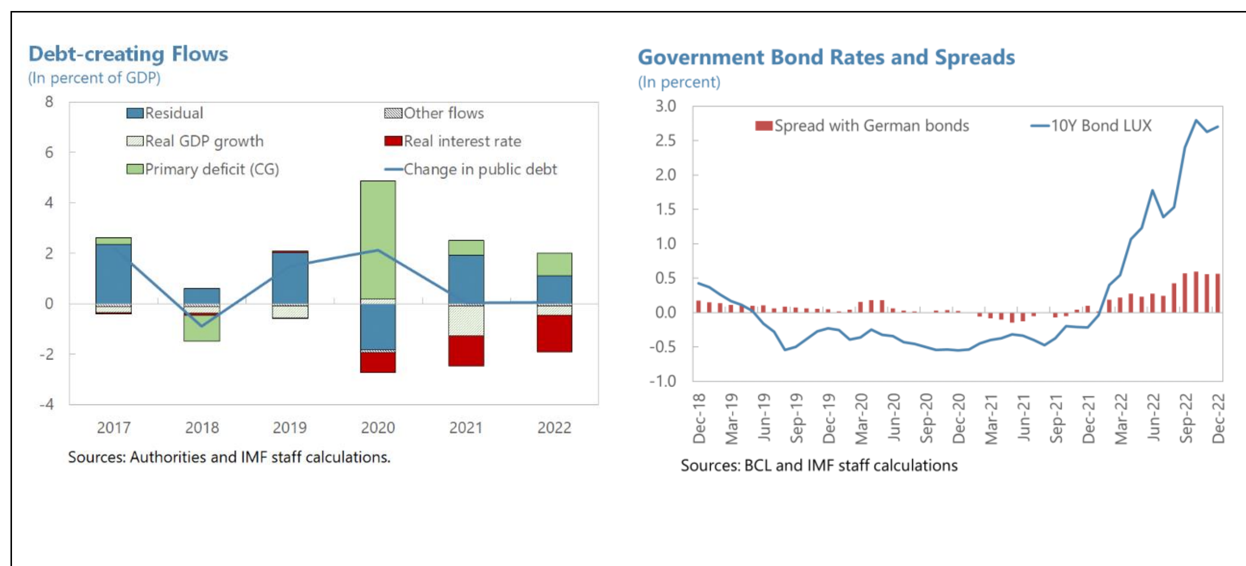
Discretionary Measures In reponse to COVID and Energy Shocks
(In percent of GDP)

	2020	2021	2022	2023	2024
COVID	**4.0**	**1.1**	**0.2**		
Revenue	0.8	0.0			
Expenditure	3.2	1.1	0.2		
Energy shock			**1.3**	**2.2**	**0.4**
Revenue			1.0	1.4	
Expenditure			0.3	0.7	0.4
Total measures	**4.0**	**1.1**	**1.5**	**2.2**	**0.4**

Sources: Authorities and IMF staff calculations

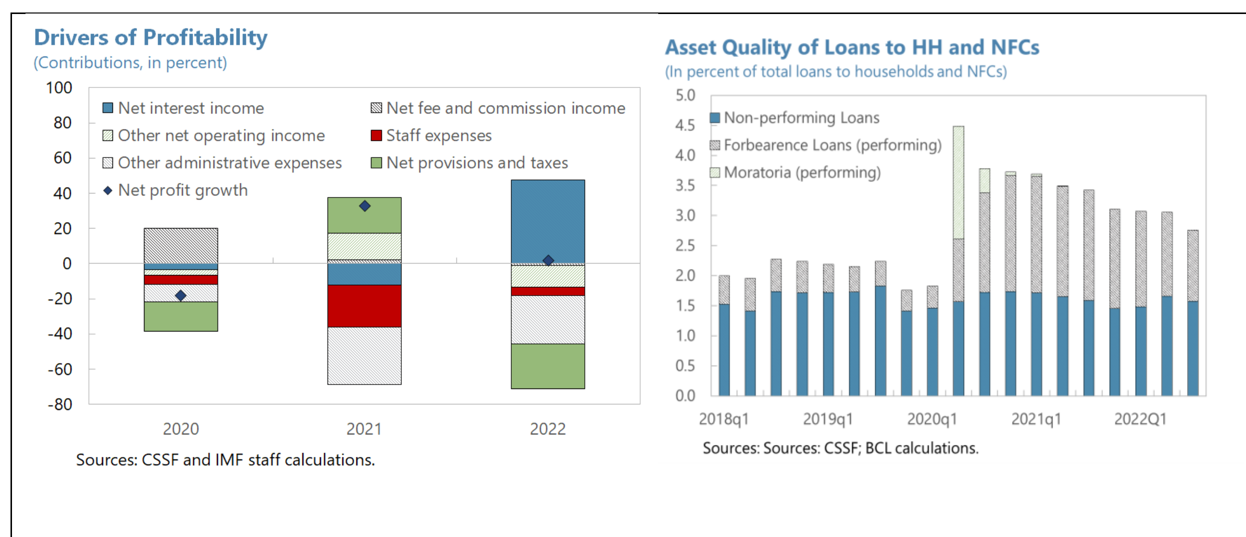
8. **The fiscal stance is estimated to have been expansionary in 2022.** High inflation and strong labor markets continued to support revenues. This together with the expiration of most COVID-19 fiscal measures and the under-execution of capital spending (including a slow uptake on some support measures) helped contain the growth in outlays and reduced the impact on the fiscal position so far. However, revenue weakened somewhat in the second half of 2022 due to slower economic performance (corporate income, subscription tax for investment funds, and excise taxes on fuel) and implementation of fiscal support measures (personal income tax).[1] The central government deficit is estimated to have widened to about 1 percent of GDP, and the cyclically-adjusted fiscal balance to have deteriorated by about 0.4 percent of GDP in 2022. However, a favorable interest rate-growth differential is estimated to have kept public debt broadly stable at 24½ percent of GDP at end-2022 (Table 3).

[1] Lower excise taxes on fuel are due to a 7.5 c/l cut over March-August 2022 as well as an unfavorable evolution of the price differential with France and Belgium.



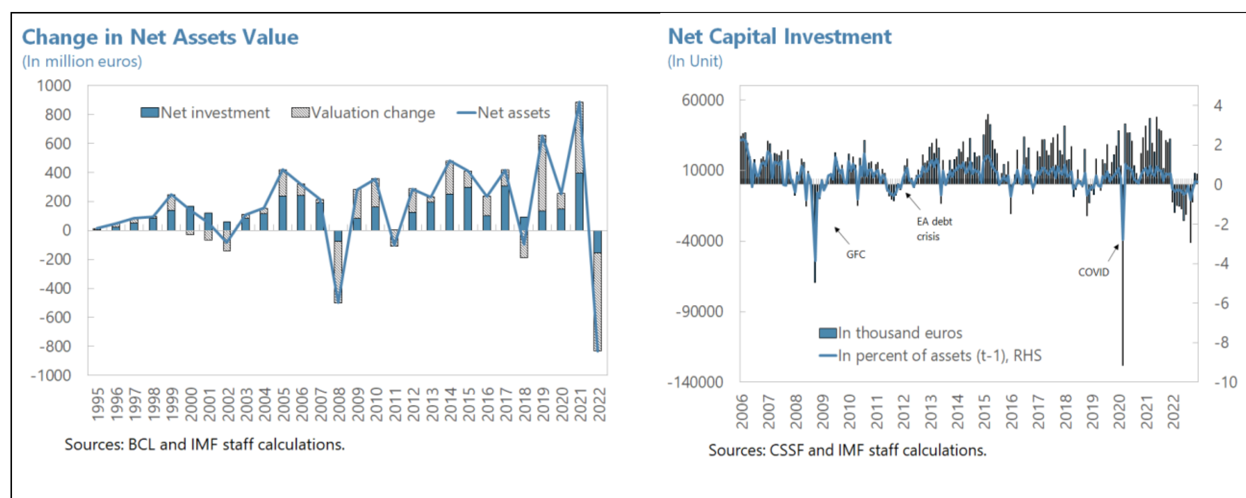
9. The financial sector is facing a more challenging environment.

- *Banks*. In 2022, net interest income benefited from higher interest rates. Profitability has improved slightly for most business models, despite lower non-interest revenue and higher operating costs and provisioning.[2] NPLs remain low but stage 2 loans have increased, especially for the nonfinancial corporate sector (likely related to the war in Ukraine and for performing exposures) and remain above pre-pandemic levels. While declining slightly, on aggregate, banks' capital and liquidity remain at comfortable levels (Table 5). The impact of the recent global banking stress on Luxembourg has been manageable so far. With an average LCR (NFSR) at 154 percent (130 percent) at end-2022, the current general liquidity situation of Luxembourg banks is assessed by the authorities as adequate and stable.



[2] Provisioning is mostly concentrated in corporate banking and clearing, treasury and/or payment services.

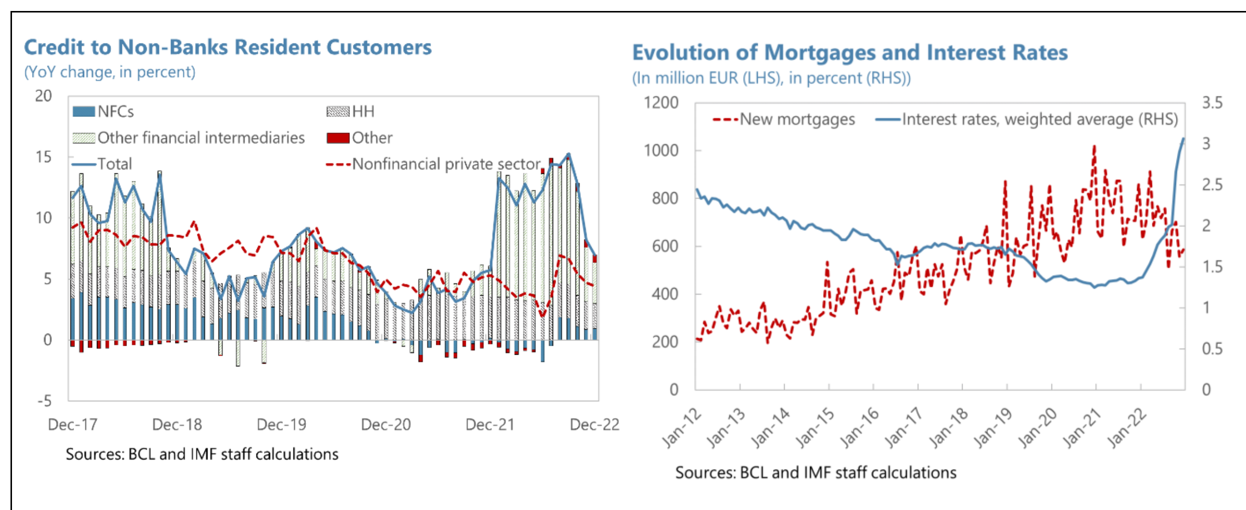
- *Investment funds*. Net assets steadily declined by 14 percent yoy in December 2022), reflecting mostly the correction in financial markets. However, investment funds also recorded net outflows (about 2½ percent of total assets), mostly in corporate, high yield and emerging market bond funds. Unlike during the COVID crisis, daily outflows were manageable and did not trigger liquidity stress and asset fire sales. The impact of the U.K. liability-driven investment turmoil has been isolated to a few investment funds with no broad-based spillovers to the rest of the industry.[3] The direct impact of the stress surrounding Credit Suisse appears contained, with no large redemptions recorded. Aggregate exposures of Luxembourg investment funds to securities issued by Credit Suisse are small (0.1 percent of the sector's total assets).



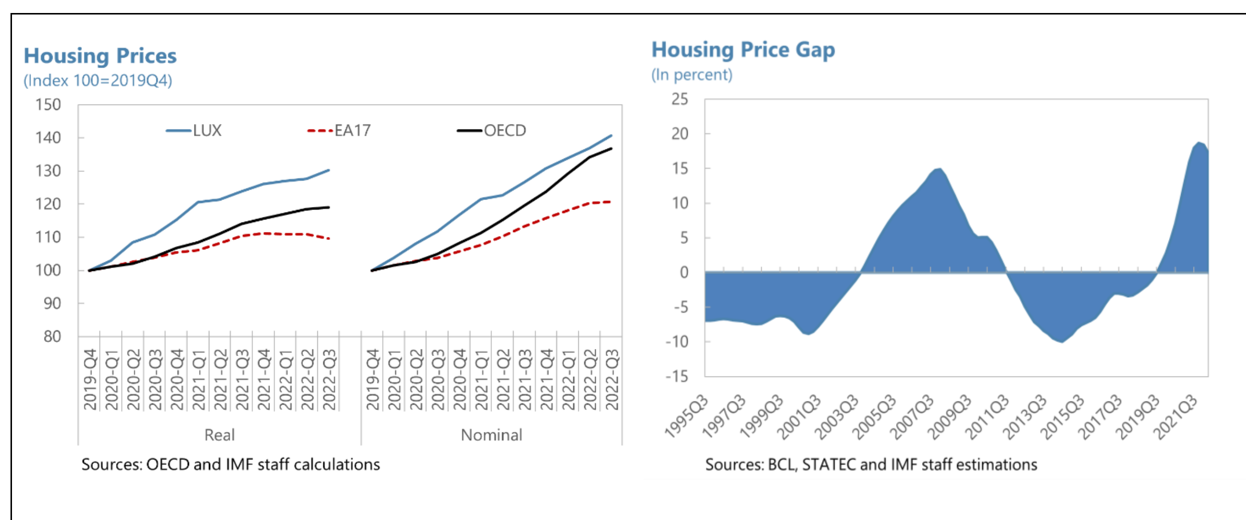
10. Credit to non-banks resident customers has increased, mostly reflecting loans to other financial intermediaries. Credit to the nonfinancial private customers has been less dynamic, growing at 4.4 percent in December 2022, slightly lower than a year ago. While still positive, households' borrowing contribution has been declining as demand for mortgages fell and credit standards tightened. On the corporate side, an increase in working capital needs have temporarily boosted credit in Q3.[4] Accordingly, estimates suggest that the credit gap has narrowed significantly.

[3] There are 3 investment fund managers active in GBP LDI funds in Luxembourg, representing 86 GBP LDI sub-funds with total net assets of about 19bn EUR before the mini-budget (<0.4 percent of net assets). In addition, 2 other IFMs managing LDI funds, but not in GBP, are active in Luxembourg.

[4] Credit to the corporate sector were much more dynamic for domestically oriented banks.



11. Pressures in the housing market are gradually abating amid falling demand, but prices remain overvalued and concerns about lower supply are rising. Reflecting mostly affordability issues, reduced yields on investment, and more recently higher mortgage rates, demand for housing has fallen significantly, especially for new dwellings and in Luxembourg City. Housing price growth averaged 9½ percent in 2022, 5 percentage points lower than its 2021 level, but by staff estimates, housing prices remain overvalued (around 17 percent in 2022Q2).[5] Higher input prices are increasing construction costs and some construction projects are reportedly being postponed. In addition, as higher input price volatility is deterring demand, to support revenues, many real estate developers have replaced the clause indexing prices on delivery based on the STATEC construction price index with fixed but higher prices at the time of the transaction.



[5] The assessment of the price misalignment is subject to large uncertainty. It draws on the model estimated in the 2018 Article IV Selected Issues "Housing market: Assessment and Policy Recommendations". Changes compared to the last Article IV reflect revisions in historical data and adaptation of the model specification.

12. The external position is assessed to be broadly in line with medium-term fundamentals (Annex I). The current account surplus is estimated to have widened to 5 percent of GDP in 2022. The impact of the energy shock on the trade balance and lower export performance of financial services has been more than compensated by the decline in investment income outflows. The net international position dropped by about 12 percent of GDP as positive valuation effects (euro depreciation) in net FDI and other investments were more than offset by net portfolio investment outflows. The authorities have reiterated their intention to channel 20 percent of the SDR1.3 billion allocation to countries in need.

OUTLOOK AND RISKS

13. Staff's baseline projections are underpinned by the following assumptions and policy settings. Global supply bottlenecks are expected to continue easing and lower international energy prices, notably for gas, should help disinflation globally and in Europe. Price pressures are anticipated to remain elevated in the near term, and natural gas prices are expected to remain above historical levels. In line with WEO assumptions, the major central banks are expected to continue with policy rate hikes, and following the recent stress in global banking, financial conditions are expected to tighten further. The authorities are expected to lift energy price controls in 2025, which are projected to remain binding during that period.

14. The near-term outlook is for continued, albeit lower, growth and persistent, though moderating, inflation. GDP growth is projected to slow to about 1.1 percent in 2023. Lower global growth and heightened financial volatility are expected to mute the net export contribution and weigh on fiscal revenues. Uncertainty and tighter financial conditions are likely to dampen private investment, including in real estate, with house price growth expected to moderate further. Nevertheless, with three indexations projected in 2023 and large stimulus, real disposable income will likely increase, supporting private consumption. Despite expected layoffs in construction, employment growth is expected to slow only moderately, given a large contribution from the public sector and possibly some labor hoarding in expectation that the slowdown is short-lived. Headline inflation is projected to halve to 3¼ percent in 2023, aided mainly by the energy price caps/controls, while core inflation would remain elevated above 3¾ percent. Credit growth is expected to slow, especially for mortgages, but remain positive, supported by robust labor market and wage increases. In 2024, growth is expected to rebound to 1¾ percent but the output gap is projected to remain slightly negative, with growth expected to converge to its potential of 2¼ percent in the medium term. Inflation is likely to be around 3 percent until 2025, as the authorities lift the VAT rate cut in 2024 and the energy price controls in 2025.

15. There is significant uncertainty around the outlook, with downside risks to growth and broadly balanced risks to inflation. In the short term, external risks include: an abrupt global slowdown or recession, miscalibration of monetary policy in major economies that would lead to a de anchoring of inflation expectations, systemic financial instability (Annex II); and an intensification of the war in Ukraine and associated disruptions to energy supply. These risks would further dampen Luxembourg's economic prospects, lowering growth and fiscal revenue. If some of these shocks

materialize, the growth-inflation tradeoff is exacerbated, and the wage-price spiral in a context of automatic wage indexation could hinder external competitiveness (Annex III).

16. High inflation, tighter financial conditions, and recessionary risks pose challenges for the financial sector. While banks will benefit from higher interest rates in the short term, a steeper and more persistent increase in borrowing costs together with higher input costs for firms could adversely affect asset quality and collateral valuation. It could also further dampen credit growth, including for mortgages, with potentially a larger-than-expected adjustment of house prices. Higher inflation will translate into higher operating costs (including wages) for financial entities. More volatility in financial markets will further dampen asset growth in investment funds, custodian banks, and private banking. It could also increase the probability of disorderly adjustment, market dysfunction and black swan events, exacerbating liquidity risks as highlighted by the recent global banking events. Overall, however, strong fundamentals, robust frameworks and institutions, as well as the diversity of the Luxembourgish financial system constitute mitigating factors in the face of these shocks.

17. Additional risks could also limit potential growth in the medium to long term. Like other countries, Luxembourg's economy will need to deal with climate risks, geopolitical fragmentation, and ageing population. Structural skills mismatches and weakening attractiveness could make labor shortages more persistent and hinder productivity growth.

Authorities' Views

18. There was a broad agreement on the outlook and risks. The authorities stressed that the economy has shown resilience in the face of consecutive adverse shocks, with robust labor market and tax revenues. They are more sanguine than staff about the near-term GDP growth, projecting 2.2 percent and 3.2 percent, respectively, in 2023 and 2024. Nonetheless, they acknowledged high uncertainty and agreed that risks have increased recently, especially after the banking sector events in the US and Switzerland. On the domestic front, they agreed that the real estate sector may face challenges in the near term. Nonetheless, the authorities were confident of the country's resilience, including due to a diversified and sound financial sector as well as ample fiscal space.

POLICY DISCUSSIONS: MANAGING RISKS AND INCREASING SOCIO-ECONOMIC RESILIENCE

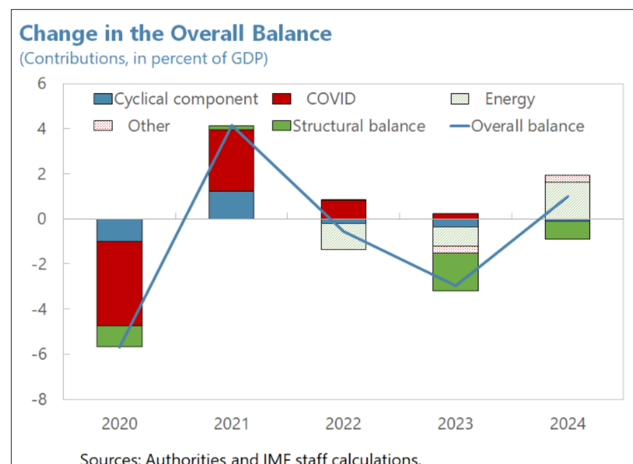
A. Fiscal Policy: Navigating the Growth-Inflation Trade-off, Promoting Energy Security, and Preserving Buffers

To facilitate the disinflationary process, fiscal policy should help contain demand, while supporting the most vulnerable. In a context of automatic wage indexation, policies have helped households and firms deal with surging energy prices, while mitigating wage-price spirals. However, while energy prices have declined in recent months, switching to better targeted and less distorted price signals is needed going forward to minimize fiscal costs and lock-in energy savings. At the same time, the authorities should

strengthen their fiscal framework and reform their tax-benefits to preserve their fiscal space and capacity to deal with future shocks, fiscal risks, and growing needs.

Near-term Fiscal Stance and Response to the Inflation Shock

19. Fiscal policy is expected to be expansionary in 2023. The deficit is forecast to be about 2¾ percent of GDP, driven partly by the support packages and lower tax revenues from the corporate sector.[6] The structural balance excluding one-off measures (energy and COVID-related ones) is also worsening by a 1¾ percent of GDP, mostly reflecting permanently higher current spending, including a sharp increase in the public wage bill and social measures. The authorities have also restored the indexation of family benefits and made after school care and school meals free for all. They introduced some tax credits to single parent households—a welcome development—as well as tax measures to increase the attractiveness for talent workers.



Sources: Authorities and IMF staff calculations.

20. The fiscal position is subject to pressures. Revenue could fall more than expected if economic performance, in particular in the export sector, is weaker. On the expenditure side, the fiscal cost of the solidarity packages is uncertain and will depend on wholesale energy prices and inflation persistence.

21. Given persistent inflationary pressures, staff recommends a broadly neutral fiscal stance in 2023-24. Although the cyclical downturn in the context of a small output gap and ample fiscal space call for some fiscal stimulus, the planned fiscal stance appears overly loose given still-elevated inflation and the strong households' financial position. Accordingly, staff recommend significantly reducing the fiscal impulse by keeping the cyclically adjusted balance (excluding the one-off quota transfer to the EU) broadly unchanged. This could be achieved for example, by postponing hiring in the public sector, further rationalizing intermediate consumption spending (e.g., energy), while preserving capital spending, and better targeting of the energy support measures (see below). Moreover, the authorities should refrain from any additional stimulus, especially with permanent fiscal effect, that will only fuel demand and make inflation pressures more persistent, with adverse effects on competitiveness. Also, fiscal overperformance due to higher than-expected revenue or lower spending (e.g., due to lower energy prices or low uptake) should be saved or redirected to accelerate the energy transition and support housing supply.

22. Fiscal policy should remain nimble in the face of heightened uncertainty. In case of additional supply shocks, the authorities could consider suspending the automatic wage indexation,

[6] The cost of the policy package will highly depend on wholesale prices of electricity and gas.

as in the past, or reforming it in consultation with the trade unions (see below). By contrast, in case of a deep demand shock, which would also relieve inflation pressures, the authorities could consider targeted stimulus in addition to allowing automatic stabilizers to fully operate.

23. Even if reducing headline inflation in the short term, the authorities' energy measures are costly, lead to more persistent core inflation, and limit incentives to energy savings. In the context of automatic indexation, price caps have reduced headline inflation in the short term through direct and second round effects. Yet, this could come at the expense of higher aggregate demand and higher core inflation. In addition, while some measures have been well targeted, others have been universal, regressive and hence costly despite the recent drop in wholesale energy prices. For example, the VAT rate cut is regressive, may not be fully passed through to prices, especially given the temporary change and limited size, and could be used to support firms' profit margins. At the same time, once removed, the pass-through could be relatively high, contributing to higher inflation in 2024. Second, limiting the pass-through to retail energy price distorts the price signal and impedes needed adjustment of energy consumption, given that part of the energy shock could be permanent.

24. Better-targeted, less distortionary measures, and more effective support to the green transition are needed. Block pricing, where only a basic amount of consumption is subsidized, could be envisaged instead of current price caps, which would smooth the inflationary impact, encourage demand reduction, and lower the cost. Technical difficulties to distinguish the bills of multi-family residences would favor linking the support to the unit's share in past energy use. Another alternative is social tariffs that would apply to the vulnerable only.

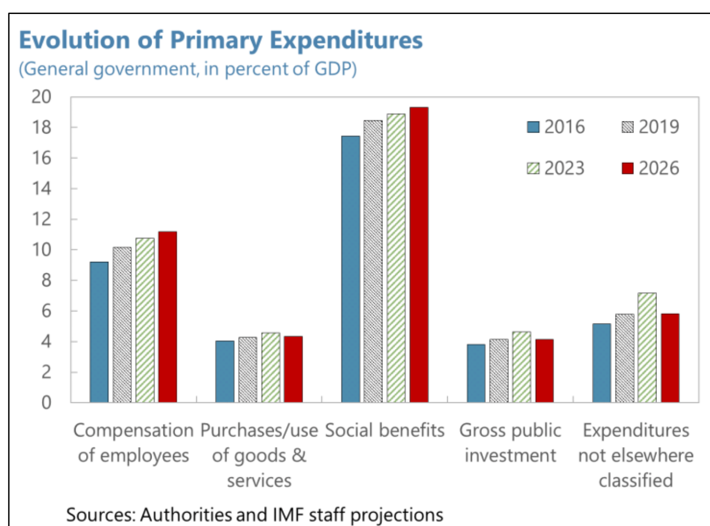
25. Also, more could be done to support the green transition and improve energy security. Between August 2022 and January 2023, gas consumption dropped by 19 percent relative to the 2017-21 average. Milder weather contributed to one third of the reduction, with the rest due to lower demand by energy-intensive firms (equally split between the closure of one old manufacturer and lower activity and transition to alternative energy). To lock-in these gains while limiting the impact on the economy, accelerated investment in renewable energy and measures to support energy efficiency are welcome and will reduce dependence on energy imports.

Medium-term Fiscal Stance and Fiscal Reforms

26. Over the medium term, fiscal accommodation is foreseen to be gradually withdrawn. Under the baseline, barring any additional shocks, the fiscal deficit is projected to gradually narrow towards ½ percent of GDP. Expenditures will remain nonetheless about 2¾ percent of GDP higher than pre-COVID levels, driven by higher wage-related spending and interest payments. This will be financed by higher revenue, mostly from personal income taxation, which could be temporary, given the pressure to index the tax brackets (see para 28) and the ending of the VAT rate cut in 2024. While the projected deficit is expected to stabilize the debt to GDP close to 30 percent, the latest MTO estimate by the European Commission, which accounts for ageing-related costs, is for a balanced budget. Luxembourg's large financial sector, ageing-related costs, as well as fiscal risks, together with rising borrowing costs, may put further pressure on public debt. Accordingly, staff sees merit in

having a somewhat more prudent recurrent spending—about ¼ percent of GDP lower spending over the medium term. While the pension system has built-in triggers intended to ensure its sustainability, it is currently estimated to increase the general government deficit by 8 percentage points of GDP by 2070, and reserves would be depleted by around 2047, if no action is taken. An early reform of the pension system would avoid a large adjustment of parameters needed to ensure sustainability, create space for greater capital and targeted social spending and enhance intergenerational equity. In this context, priority should be given to increasing the effective retirement age (currently around 60 years) towards the statutory retirement age of 65 years. This would require, among others, disincentivizing early retirement and a less generous pension system.[7]

27. There is a need to better anchor fiscal policy and strengthen the medium-term fiscal framework. Albeit still low compared to peer countries, public debt tripled relative to the pre-GFC level. It is expected to increase further and potentially test the 30 percent self-imposed debt limit in the medium term. Primary expenditures have been growing rapidly since mid-2010s and their rigidity has also increased. While revenue growth has been also sustained, this has been mostly due to a higher tax wedge for individuals (the PIT brackets have not been adjusted to inflation since 2017), one-off revenue collection from the introduction of e-filing, and buoyant asset prices. With the European Commission's reform orientation of the economic governance framework (EGF) not binding for Luxembourg, there is a need to better anchor fiscal policy. The authorities could envisage:



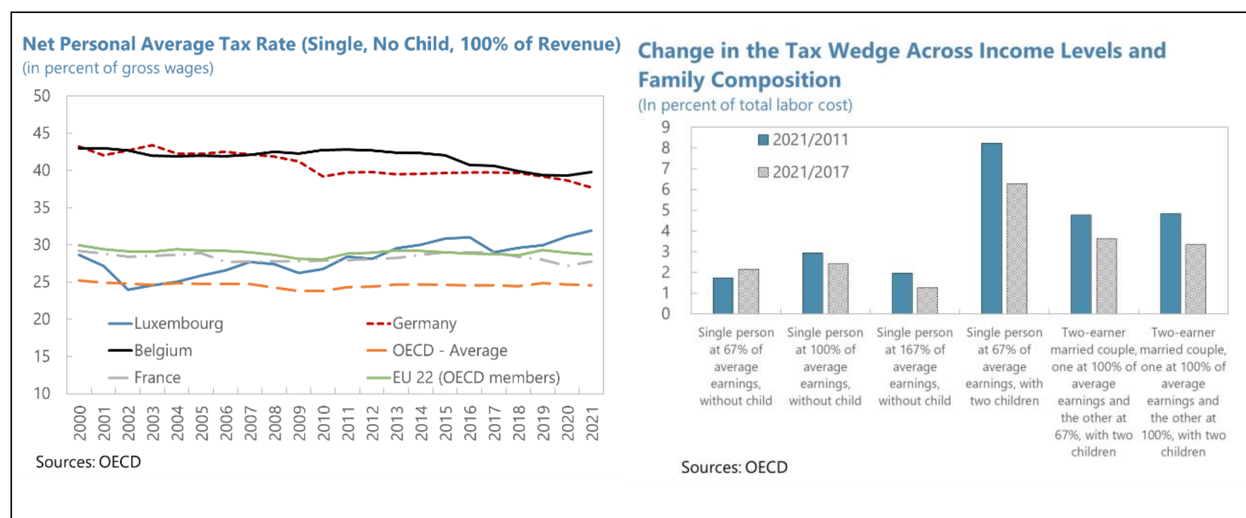
- *Implementing a medium-term objective* (MTO) based on the general government fiscal balance, adjusted every 3-5 years. The MTO should be ambitious to take into account fiscal risks.
- *Adopting an expenditure ceiling rule as operational target* to reduce procyclicality of spending. This will provide steadiness on expenditure implementation in the face of volatile revenue and improve effectiveness. To the extent the Social Security system spending is relatively predictable, the focus will be on determining the central and local government outlays.[8]
- *Keeping the debt to GDP as a long-term debt anchor*, being prudent, considering the country vulnerabilities, but not too restrictive given rising ageing costs.

[7] For further details, see IMF Country Report No. 19/131.

[8] The rule could include a carefully crafted escape clause, activated in response to severe idiosyncratic shocks such as large growth falls, major natural disasters, or national emergencies.

- *Enhancing medium-term budgeting* and strengthening the fiscal risks framework, in line with previous Article IV consultations.

28. A comprehensive review of the tax and benefits system is needed to enhance the distributional role of fiscal policy. The interaction between the low frequency of tax bracket adjustment for inflation and the automatic wage indexation has been suboptimal, causing, for example, unintended distributional effects. Historically, the authorities used to adjust the tax brackets for inflation on an ad-hoc basis. In general, the revenue windfall has been used to finance additional spending. The impact on low and middle-income households was compensated through tax credits and different benefits (not always well-targeted). At the time of the adjustment, a large stimulus was injected in the economy which has sometimes contributed to procyclical fiscal policy. Empirical evidence shows that, irrespective of the level of inflation, more frequent income tax brackets adjustments make the relationship between inflation and income inequality more transitory. It also finds that a longer duration between two successive adjustments of the tax brackets reduces employment, savings, and output.[9] Hence, staff recommends more frequent adjustment of the tax brackets.[10] The additional cost to the budget should be compensated by better targeting other tax expenditures/benefit measures (e.g., a gradual phasing out of interest payment deductibility, means-testing of family benefits and housing support, etc.). More generally, a comprehensive review and a simplification of the tax-benefit system is needed to enhance the distributional impact of fiscal policy and avoid overlapping support.



Authorities' Views

29. The authorities highlighted the effectiveness of the adopted packages in containing inflation in a context of automatic wage indexation and remain committed to fiscal discipline. They emphasized that the support packages, in particular the time-bound direct price controls, were

[9] See Tax bracket creep and its effects on income distribution - ScienceDirect.

[10] Germany adjusts every 2 years while keeping the flexibility for more. The new Austrian system introduces a 2/3 automatic adjustment for all brackets except the highest, and the remaining 1/3 will is adjusted with some discretion.

successful in taming headline inflation and avoiding several tranches of wage indexation that would have hindered competitiveness. They noted limited effects of wage indexation on inflation, which in a small open economy is mostly driven by external factors. The authorities agreed that stronger price signals would help lock-in energy savings and indicated that block pricing could be envisaged. Regarding the ongoing discussion on the Economic Governance Review at the European level, authorities highlighted that changes to the existing fiscal framework should continue to promote prudent and forward-looking decision-making in all EU member states. The authorities also agreed on the need for early pension reform without giving any timeline. Also, they broadly agreed with staff's proposal for a more frequent inflation adjustment of the tax brackets, while stressing that it should be done in a budget neutral way and within a comprehensive review of the tax-benefit system.

B. Financial Sector Policies: Safeguarding Financial Stability and Increasing Resilience in a More Volatile Environment

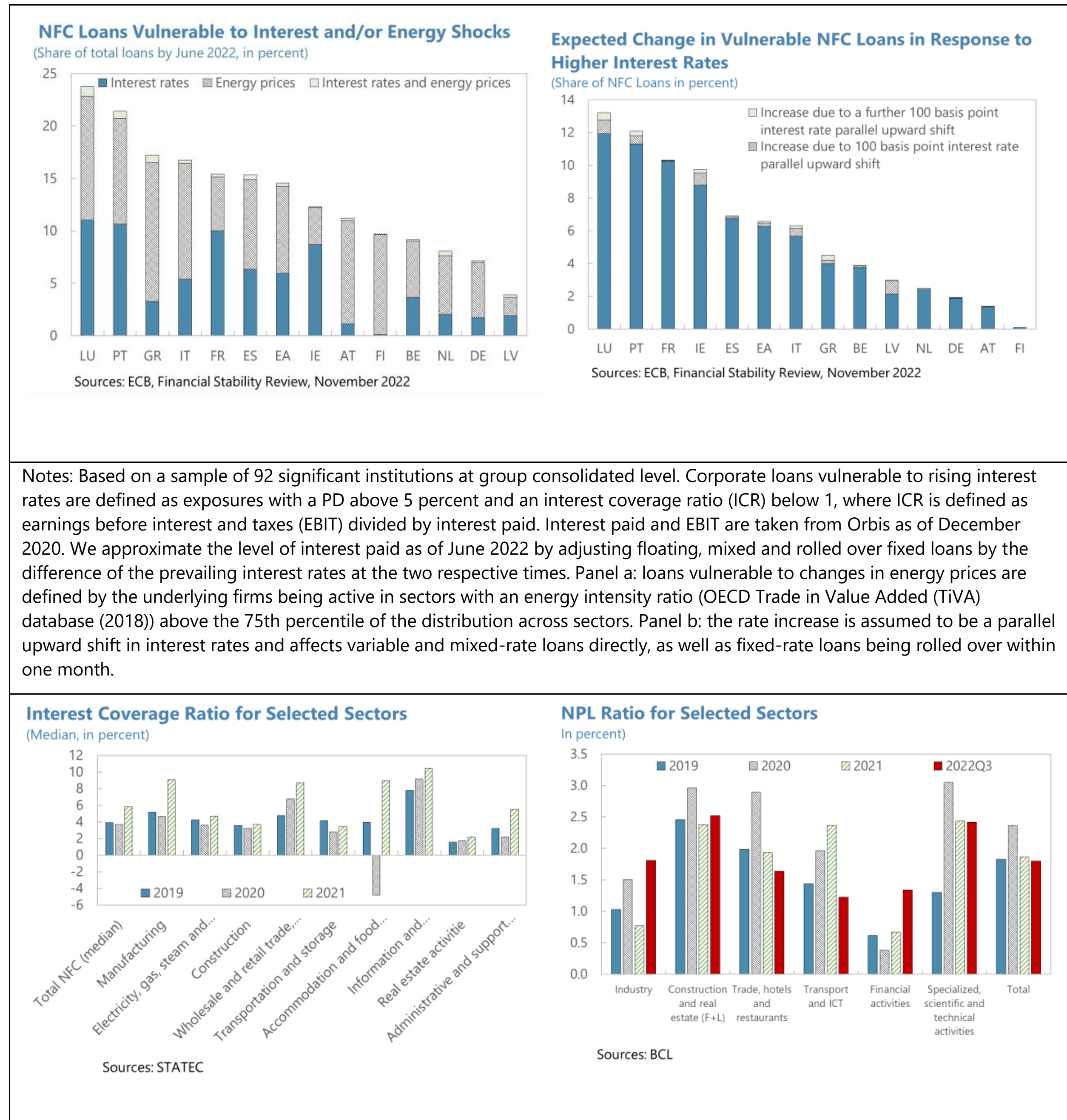
Financial risks have increased, especially following the recent global banking stress, with areas of vulnerabilities in the real estate sector and non-bank financial institutions. Given banks' strong capital and liquidity buffers, these risks appear manageable. Yet, close monitoring of credit, liquidity, and interest risks should continue. Given high households' indebtedness and concentration of mortgages, fine-tuning macroprudential policy is encouraged to avoid further build-up of vulnerabilities and to increase resilience. Some investment funds are vulnerable to disorderly market corrections and could amplify shocks. Risks from liquidity and leverage should be carefully monitored and liquidity management tools better calibrated to deal with stress episodes.

Banks

30. Higher inflation and borrowing costs, and lower activity are likely to increase credit risk, but several factors will mitigate the impact.

- *Nonfinancial corporate sector*. Overall, the strong liquidity position and fiscal support will moderate the impact of recent shocks on firms. Yet, leveraged firms with weak pricing power could be at risk and real wage rigidity reduces the capacity of some domestic firms to adjust. Simulation analysis by the ECB shows that corporate sector loans from Luxembourgish banks are sensitive to higher energy and financing costs. Particular attention should be given to sectoral (concentration) risk, for example in the construction sector and manufacturing, where the NPL ratio has already started to increase.[11] Cross-border exposures also require greater scrutiny and the review of the waivers to large exposure limits for intra-group transactions, in line with the 2017 FSAP, should continue (Annex V).

[11] Bankruptcies have also increased significantly in Q4, although from low levels.

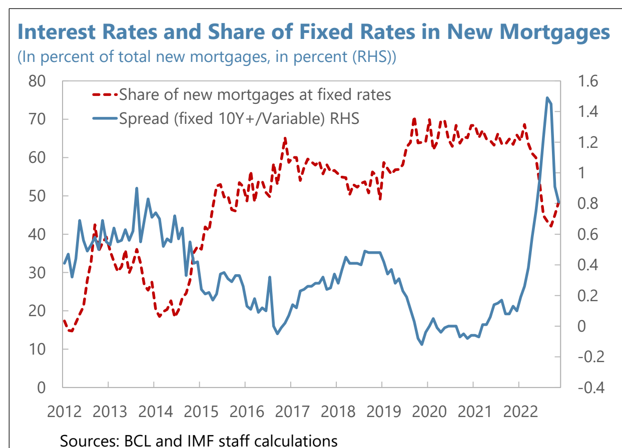


Notes: Based on a sample of 92 significant institutions at group consolidated level. Corporate loans vulnerable to rising interest rates are defined as exposures with a PD above 5 percent and an interest coverage ratio (ICR) below 1, where ICR is defined as earnings before interest and taxes (EBIT) divided by interest paid. Interest paid and EBIT are taken from Orbis as of December 2020. We approximate the level of interest paid as of June 2022 by adjusting floating, mixed and rolled over fixed loans by the difference of the prevailing interest rates at the two respective times. Panel a: loans vulnerable to changes in energy prices are defined by the underlying firms being active in sectors with an energy intensity ratio (OECD Trade in Value Added (TiVA) database (2018)) above the 75th percentile of the distribution across sectors. Panel b: the rate increase is assumed to be a parallel upward shift in interest rates and affects variable and mixed-rate loans directly, as well as fixed-rate loans being rolled over within one month.

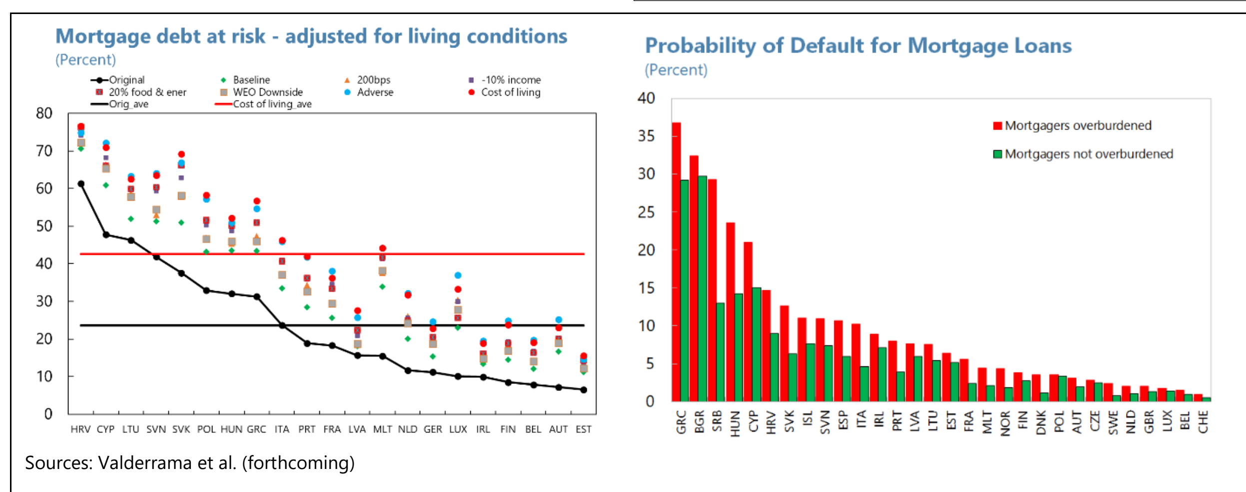
- *Households*. Higher for longer interest rates could erode low-income households' and overburdened low-middle income households' capacity to service their debt.[12] The relatively high (42.5 percent) and increasing share of variable rate mortgages, together with high household indebtedness could also pose challenges in the future, especially if combined with recessionary pressures and surging unemployment. For example, a 200 basis point increase

[12] The share of households with variable mortgages is lower for bottom 20 percent (17 percent).

in interest rates could triple the mortgage debt at risk (to 30 percent). That said, high net worth, excess saving, low unemployment, wage indexation and increases in minimum wages, as well as large fiscal support, boost households' resilience to shocks in the short term, with relatively low probability of default on aggregate.



Sources: BCL and IMF staff calculations



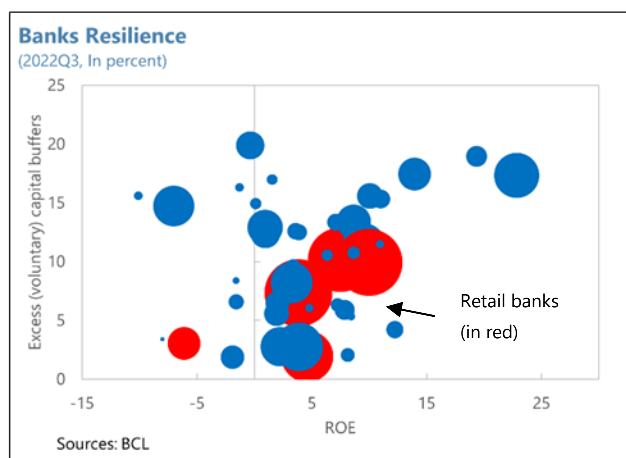
Sources: Valderrama et al. (forthcoming)

31. The impact of the tightening of global financial conditions on banks' profitability is uncertain. Net interest margins are likely to increase. Yet, historically, this was associated with lower net fees and commissions. Funding costs are likely to rise following the TLTRO repayment and recent pressures in the global banking system. Custodian and private banks have been highly dependent on capital market developments and can be vulnerable to market corrections. Deteriorating asset quality and collateral revaluation due to repricing of real and financial assets will increase provisioning needs. Finally, high inflation and related increases in operating costs, including wages, could also weigh on profitability. Overall, staff expect any potential gains from higher interest rates to be short-lived. Accordingly, structurally weak profitability will need to be addressed by incentivizing diversification of activity and mutualization of compliance costs.

32. While further moderation is expected, a sharp correction in real estate prices is unlikely in the short term, but the authorities should remain vigilant. Historically, housing prices in Luxembourg have been resilient to downturns and interest rate shocks, mostly because of a structural supply deficit. Yet, tighter financial conditions and changes in real estate taxation, could lead to selling at a time when demand is subdued, and lead to a larger than expected correction. By contrast, hoarding behavior and delays in construction projects and financial difficulties of builders and real estate developers could depress supply and sustain high prices. For commercial real estate,

activity has remained resilient and vacancy rates have fallen. However, transaction volumes are lower than pre-crisis levels. The longer-term trends in retail and office market should continue to be carefully monitored, including by filling remaining data gaps (notably prices).

33. With strong capital and liquidity buffers, overall, the banking sector appears resilient, but continued close monitoring of credit, liquidity, and interest rate risks is paramount. CSSF's top-down stress tests (based on 2021 data and preliminary 2022 information) show that, under the adverse scenario, CET1 buffers would decline by 4 percentage points by end-2024 (mostly due to credit losses) to 19½ percent, well above required levels. Corporate, private, and universal banks would be more affected than other business models. The immediate impact of the recent stress in the global banking on Luxembourg bank's liquidity has been so far limited. The authorities are monitoring daily liquidity and banks are required to report any breaches (including possible future LCR breaches). Stress tests conducted by the authorities to assess hidden losses on held-to-maturity securities following an interest rate shock show that on aggregate, banks are in good position to absorb these losses should they materialize.



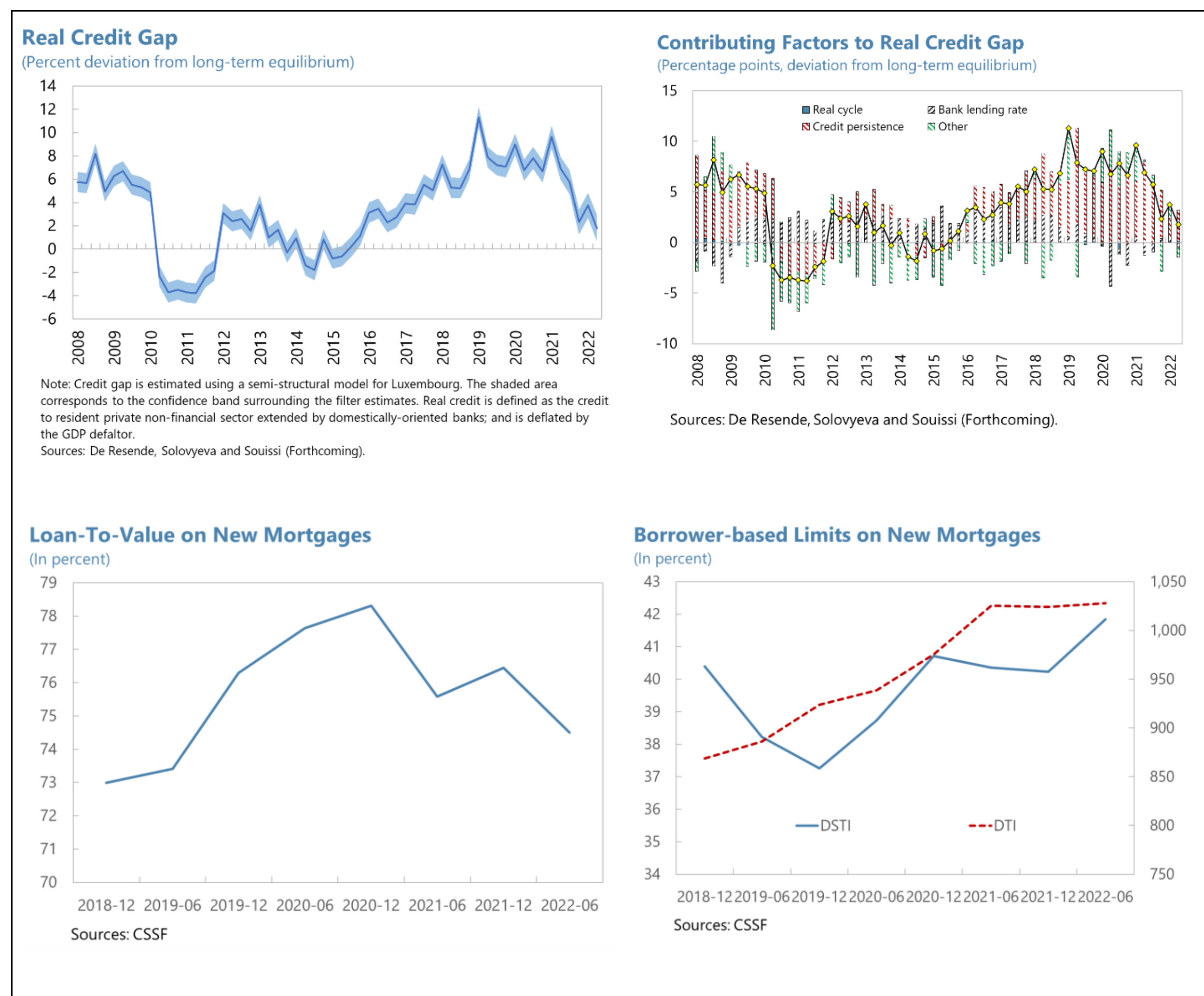
Luxembourg: Stress-test Results by Business Model

	Starting CET1	Total depletion	Δ New impairments and RE credit losses	Δ Market losses	Δ NII	Δ operational risk losses	Δ FX hedging costs	Δ NFCI	Δ NFCI asset under management	Δ Net operating income	Δ Administrative costs	Δ taxes	Δ RWA increase (SA, IRB, RE)	Δ RWA from impairments	Δ quality assurance (impact P/L)	End CET1
Total	**22.0**	**-4.1**	**-2.4**	**-4.4**	**-0.8**	**8.8**	**-0.3**	**6.2**	**-0.6**	**0.9**	**-11.7**	**-0.7**	**-1.7**	**0.3**	**2.2**	**17.9**
Custodian banking and IF activities	**27.7**	11.6	-0.3	-1.4	-1.8	30.3	-1.5	23.1	-3.5	1.6	-28.6	-5.0	-1.9	0.0	0.5	**39.4**
Corporate finance	**19.3**	-5.6	-3.4	-4.9	-0.3	2.4	-0.1	2.2	-0.1	0.7	-4.0	0.0	-1.3	0.5	2.6	**13.7**
Clearing, treasury and payment systems	**29.6**	2.1	-2.2	-4.3	-2.3	18.4	-0.6	29.0	-3.8	1.1	-33.4	-1.6	-0.9	0.2	2.4	**31.7**
Covered bonds banking	**42.7**	-14.6	-0.4	-7.0	0.2	6.6	-0.3	-2.6	0.0	-6.2	-4.7	0.0	-4.3	0.0	4.6	**28.1**
Private banking	**26.2**	-6.1	-1.0	-7.3	-1.3	10.9	-0.6	14.0	-0.9	2.0	-24.6	-0.8	-1.7	0.1	5.2	**20.0**
Retail and commercial banking	**14.0**	-0.9	-5.4	-0.8	-0.9	14.3	0.0	1.9	0.0	0.0	-9.9	-0.6	-0.6	0.4	0.6	**13.1**
Universal banking	**21.4**	-5.1	-1.9	-3.4	-0.9	9.3	-0.1	2.6	-0.1	1.1	-9.8	-0.7	-2.3	0.1	0.8	**16.3**

Sources: CSSF

34. Macroprudential policy could be adjusted to increase banks' resilience and avoid build-up of vulnerabilities, especially in the real estate sector. The authorities appropriately kept countercyclical capital buffers unchanged at 0.5 percent, given the closing credit gap, tightening of credit standards, and the uncertain outlook. Given persistent house price overvaluation, and in view of the high households' indebtedness and concentration of real estate exposures in some credit institutions, and drawing on the Mortgage Credit Directive principles, the CSSF has required banks to perform sensitivity analysis including a 2 percentage points increase in rates at loan origination) and (+200, +300, +400 bps) on RRE stock exposures. The authorities should assess the effectiveness of these measures and their impact on banks' lending standards. If the risk profile of mortgages does not improve, the authorities should consider complementing them with income-based limits (DSTI, DTI), calibrated to reduce excessive risk-taking, while avoiding depressing significantly the activity in

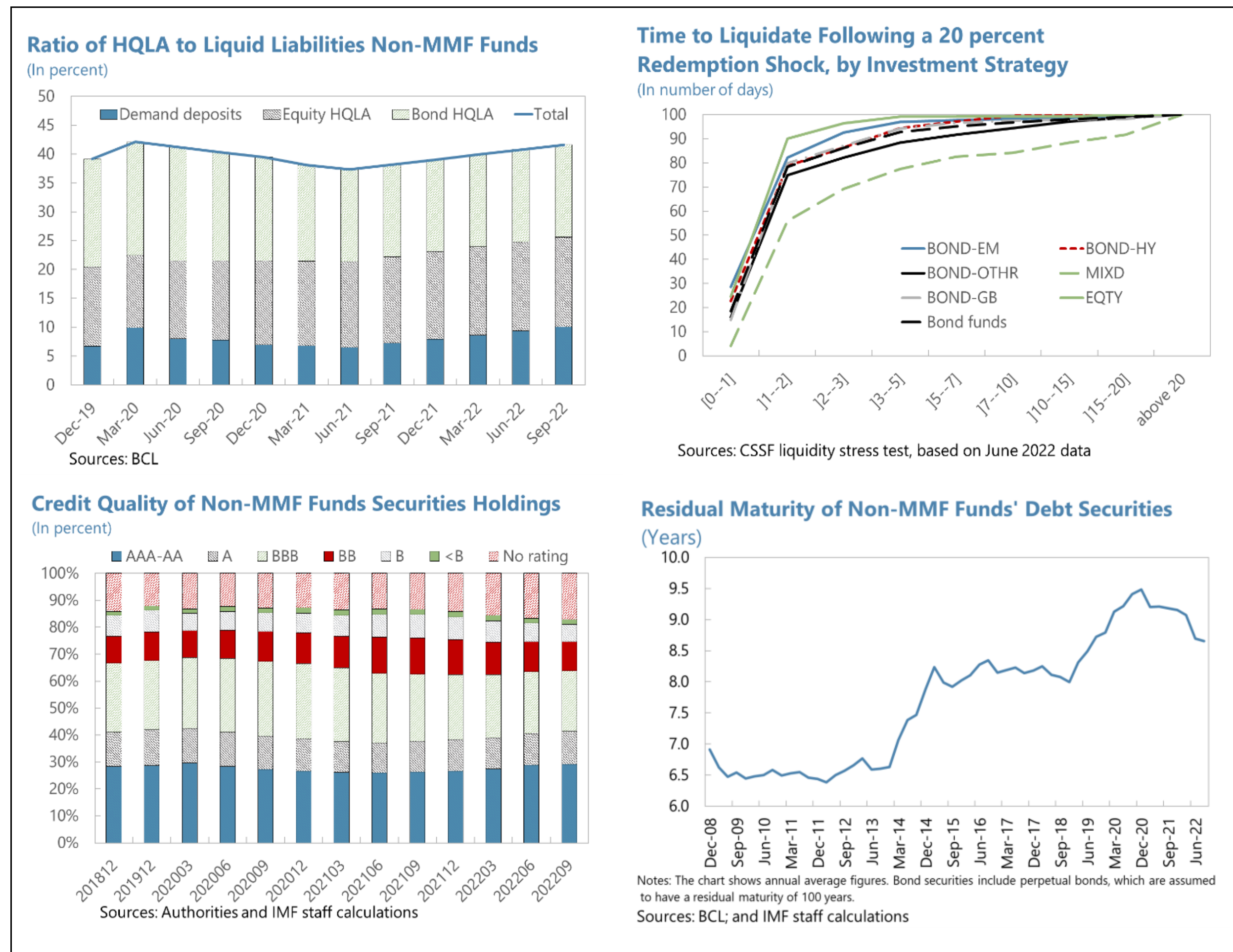
the real estate sector. Moreover, targeted capital-based measures (higher minimum risk weights (which are relatively low by EU standards), linking them to the risk of the loan or real estate focused systemic risk buffer) could be warranted to enhance loss absorption capacity in the case of a severe shock to real estate. Should the credit cycle deteriorate considerably, with widespread disruptions in credit and/or an abrupt correction in real estate prices, the authorities could consider relaxing the CCyB but the LTV limit should not be loosened.



Investment funds

35. Overall, investment funds weathered well the tightening of global financial conditions so far but remain vulnerable to disorderly market corrections. Against the background of increased redemptions, most investment funds categories have increased their high-quality liquid assets (HQLA) with a higher share of cash holdings (demand deposits). CSSF's stress tests show that most equity and bond funds would be able to honor a 20 percent redemption request in less than 5 days. However, some fund categories with less-liquid assets remain vulnerable to liquidity risk, in

particular high-yield, emerging market, and mixed funds. Credit and duration risks remain high despite some de-risking.[13]

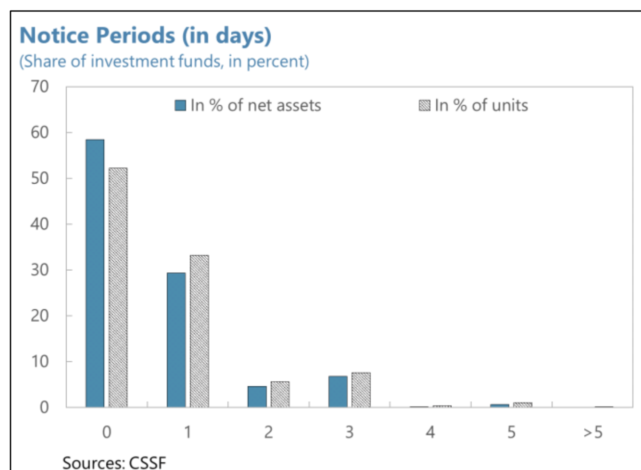


36. Anti-dilution tools (e.g., swing pricing, anti-dilution levies) could be better calibrated and complemented with other tools to improve their efficacy during market stress. Luxembourg stands out as a good example in terms of availability and usage of liquidity management tools (LMTs,), in particular, swing pricing. Their usage helped reduce the first mover advantage, lowering redemptions and volatility, and improving returns in normal times. The effectiveness of these tools could be improved through better calibration in stress episodes to adequately transfer the cost of trading to transacting investors.[14] They could be also complemented with policies aiming at better aligning redemption terms with asset liquidity and investment strategy (e.g., notification periods or lower redemption frequencies on the liabilities side and larger liquidity

[13] Credit risk has deteriorated when measured by credit spreads as of June 2022. However, the latter have been volatile and recently declined.

[14] See GFSR October 2022, chapter 3: Asset Price Fragility in Times of Stress: The Role of Open-End Investment Funds, CSSF (2022): An Assessment of Investment Funds' Liquidity Management Tools. Staff is working with CSSF on a study of how can funds better calibrate their swing pricing.

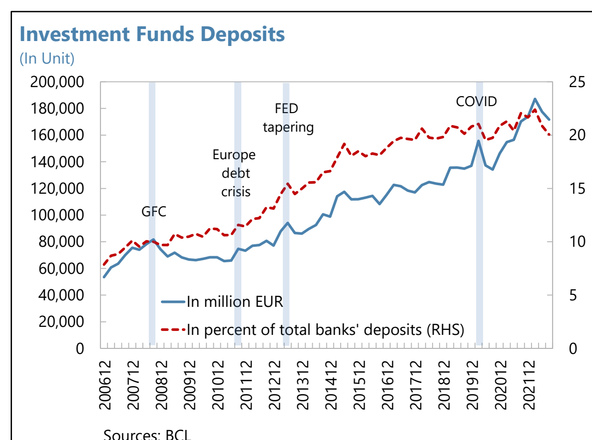
buffers on the assets side). At the supervisory level, close monitoring of large redemptions and regular liquidity stress-tests should continue and should be complemented with system-wide stress testing. Finally, given the central role of Luxembourg in the global financial architecture, CSSF should continue to coordinate with peers, including in monitoring cross-border spillovers, and contribute to international efforts to strengthen oversight and regulatory requirements, especially concerning liquidity and leverage.



37. The UK bond market turmoil exposed the need to better assess and regulate at the global level leverage and liquidity for alternative investment funds (AIFs). The systemic importance of alternative investments has been growing rapidly both in Luxembourg and globally in recent years. Pockets of elevated leverage, in particular in real estate and other alternative funds, could increase vulnerability of these funds to market and duration risks, and amplify liquidity risks. Synthetic leverage embedded in derivative positions should be carefully monitored. In addition, data gaps (e.g., investor base, unregulated investment funds), low frequency of some reporting, and reporting inconsistencies identified by the AIF analysis conducted in the context of art. 25 of the AIFMD should be addressed.

Interconnectedness

38. With significant banks-funds interlinkages, while systemic financial risks appear manageable, continued close monitoring is warranted despite mitigating factors. The investment funds deposits have increased as a share of banks' liabilities in recent years (reaching 20 percent) along with rising funds' assets, which account for over 90 percent financial sector assets. These connections are particularly concentrated on some banks (mainly custodian banks) that are themselves connected to the rest of the banking sector and make them a potential vehicle of contagion. That said, these banks are in general subject to systemic capital requirements, which together with large liquidity and capital buffers, reduce systemic risk. Moreover, historically, investment funds tended to transform their liquid assets into cash in stress episodes, hence increasing deposits in banks.



Insurance

39. Prolonged high inflation and low economic growth could pose challenges for insurers. For life insurance companies, weaker growth and deteriorated financial market conditions could lead to a decrease of tied assets which would lead to lower technical provisions (mostly for unit-linked life insurance liabilities which represent more than 70 percent of the Luxembourg life insurance market). Since the fees are mostly proportionate to the amount of technical provisions, this could result in a medium-term profitability issue. For non-life (re)insurers, the main risk stems from rising claims due to inflation, and the impact of rising interest rates will depend on the duration gaps and level of reserves. This calls for continued monitoring of risks in the insurance sector as well as its interconnectedness with other financial institutions.

Structural risks

40. Staff welcome the authorities' efforts to increase resilience of the financial sector to structural and operational risks.

- *Climate-related and environmental (CR&E) risks*. For banks, the implementation of Circular 21/773 on the management of CR&E risks issued in June 2021 is at early stages and an assessment of challenges is underway. This will pave the way for developing a macroprudential approach for systemic aspects of climate-related risks. For investment funds, staff concur with the authorities' views that despite the adoption of taxonomies and disclosure requirements, more harmonization of definitions at the global level is needed to limit greenwashing.
- *AML/CFT*. Luxembourg is undergoing an AML/CFT mutual evaluation by the Financial Task Action Force, and the resulting report will be discussed in June 2023. An AML/CFT questionnaire is sent to banks and other financial entities to collect information on risk on a yearly basis. Information on cross border flows is also considered. This data is analyzed by the CSSF to develop its ML/TF risk assessment of sector and entities. The authorities' plan to enhance the tools for the monitoring of cross-border payments to help maintain an up-to-date understanding and ensure an effective mitigation of related risks is welcome. On the Beneficial Ownership Registry (BOR), following European Court of Justice decision from November 2022, public access to BORs in the European Union have been invalidated. In December, an application process has been introduced by the Luxembourg Business Registers to restore access to the BOR for professionals and journalists. Luxembourg is currently working on amending the BOR law to provide access to the other legitimate interest users.

Authorities' Views

41. The authorities broadly shared staff's assessment of risks and will continue to monitor closely pockets of vulnerabilities and act as needed. There was a broad agreement that financial risks have increased, globally as well as domestically, with slower world growth and tighter and more volatile financial conditions. They noted that the Luxembourgish banking sector has comfortable

capital and liquidity buffers to absorb severe shocks and see a positive impact of the interest rates rise on banks' profitability in the short-term. However, given the high level of indebtedness in the non-financial private sector, the longer-term impact remains unclear. They assessed contagion risks, if any, from investment funds to banks as manageable. The authorities noted there are mitigating factors to real estate sector vulnerabilities. While income-based limits are a possible tool in the national framework, they cautioned against procyclical risks and argued that sensitivity analysis at loan origination is a good substitute at this juncture. They noted that the increase in debt service to income ratio masks a shift of new loans to higher income borrowers. They indicated that capital-based measures could be considered if needed to tackle identified risks, but highlighted that not all capital-based measures would be appropriate in light of procedural complexities. Regarding investment funds, the authorities agreed that liquidity mismatches and financial leverage are the main risks for some investment funds and shared staff's recommendations to mitigate those risks.

C. Structural Policies: Bolstering Socio-economic Resilience

Luxemburg's economy requires a balance between maintaining high wages and living standards, meant to attract talent including foreign workers, and ensuring continued competitiveness of firms in global markets. Maintaining the balance may prove challenging and fiscally costly, notably in case of persistent supply shocks. In this context, automatic wage indexation could lead to higher and more volatile inflation, while failing to fully compensate the most vulnerable, and possibly lock-in unsustainable increases in nominal wages, especially for sectors exposed to competitive pressures. This could harm external competitiveness, and/or lead to higher fiscal costs for compensatory measures. Reforms of the indexation scheme, together with measures to reduce housing imbalances and enhance employability and participation of the domestic labor force, may ensure a more sustainable balance, and improve outcomes for the domestic labor force.

Contain the Increase in Housing Costs

42. Persistent imbalances in the housing market and higher mortgage rates could further worsen affordability. High mortgage rates and tighter credit standards make it more difficult to access credit for new buyers in the short term as prices take time to adjust. It also increases demand for rental properties, putting pressure on rent and penalizing already overburdened tenants. At the same time, a slowdown in construction activity, potentially driven by insolvencies in the sector and delays due to high construction costs, may hinder further price moderation.

43. Building on their efforts to curb speculative demand and land hoarding, the authorities should maintain the focus on boosting supply. The planned reform of land taxation and vacant dwelling taxation, and the reduction of the accelerated depreciation rate, are welcome, even though effects are likely to be felt only over the medium term. In staff's views, the recent measures to support demand (increase in the tax credit for first-time homebuyers and in the ceiling of interest payments deductibility) are not targeted and could impede adjustment of housing prices to more affordable levels. Staff also cautioned against public purchases of dwellings under construction by the private sector. Instead, it recommended to frontload public investment in social and affordable housing, expedite efforts to reduce supply bottlenecks, including by allowing greater density of buildings and reducing administrative costs.

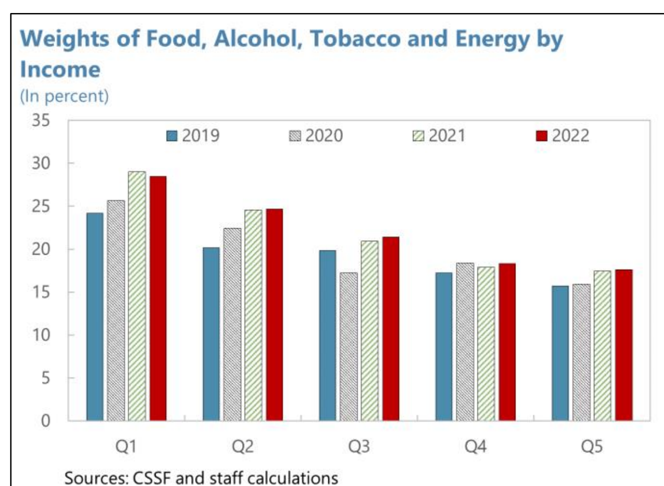
44. The government also announced a lease contract reform aimed to enhance rental affordability. The bill included a reform of the rent ceiling, cutting the maximum increase in rental prices from 5 percent of the capital invested to 3.5 percent. It also includes provisions that tenants, and landlords equally split fees paid to real estate agencies. Security deposits would be limited to the value of two months' rent, down from three currently. Charges for furniture in a furnished dwelling would be limited to 1.5 percent of their purchase price per month. The costs/benefits from these reforms are difficult to assess and there is a risk that they impede supply in the medium term.

Enhance Competitiveness and Productivity

45. Reforming the automatic wage indexation would mitigate inflationary spiral risks, assuage distributional concerns, and preserve firms' ability to respond to shocks.[15] The policies presented below could strengthen the resilience of the system along these three dimensions. They could be applied either separately or could be combined to address all concerns jointly.

- *Mitigating wage-price spiral risks, notably in case of large supply shocks.* Very high inflation rates have led the government to delay the application of the automatic wage indexation, owing possibly to concerns of triggering a wage-price spiral. While beneficial because of the implied wage moderation, this policy could increase uncertainty for both firms and workers. Furthermore, as recent events show, this may eventually lead to imposing price controls or costly compensatory measures. Model-based analyses show that, in the face of a supply shock, changing the indexation rule to exclude volatile components leads to a relatively lower probability of an indexation event taking place, with correspondingly lower second round effects on domestic inflation (see selected issues paper for details). Switching to a less volatile benchmark that excludes energy prices would make the system more resilient. At the same time, targeted compensatory measures can be envisaged to ensure that the most vulnerable are not disproportionally affected by the relatively less frequent triggering of indexations.

- *Assuaging distributional concerns*. The weight of energy, food, alcohol and tobacco in the national price index is significantly higher for lower income quantiles than for higher income quantiles. Hence, ad-hoc suspensions or postponements of indexation imply that poorer households will suffer disproportionally more from higher cost of living. At the same time, given the relatively high marginal tax rates applied to the middle class, its application may be too generous for top earners, which in turn may put upward pressure on housing demand. Reforming the scheme to make it more



15 See Selected Issues Paper "Automatic wage indexation in Luxembourg: Limitations and reform options".

progressive, for instance by tapering the wage increase or excluding higher quantiles of the income distribution from a proportional adjustment of the wage, could not only improve its fairness, but also reduce its costs for both public finances and firms.

- *Safeguarding external competitiveness*. Indexation may lead to unsustainable employment costs for firms in those sectors that cannot easily adjust their prices or that are already hit by supply shocks. This could lead to employment losses, reduction in external competitiveness, or to higher fiscal costs in case the government decides to step in with compensatory measures. While the government has successfully delayed the implementation of the indexation scheme thus far, as in the past, it could also define competitiveness benchmarks to automatically suspend its application and possibly trigger more decentralized bargaining.[16]

46. Other reforms to enhance domestic labor force employability/participation and reduce the increased reliance on the foreign labor force are needed.

- *Education*. The dropout rate is also particularly elevated for immigrants. The authorities' decision to extend mandatory schooling by 2 years (to 18) is a good first step. This could be complemented with additional measures to orient the youth to other pathways and facilitate their employment.
- *Gender Gap (Annex VI)*. Luxembourg made remarkable progress in reducing the gender gap (lower women participation and pay gap relative to men). That said, one third of employed women is working part-time. Participation is lower for female foreigners and seniors. In education, females are underrepresented in technical and scientific studies. In this context, the authorities could consider measures to further enhance work flexibility (e.g., remote work) and work-life balance, relaxing access to work permits for spouses of immigrants, developing apprenticeships and internships (in STEM firms) for female students and promoting female entrepreneurship in STEM fields, and transition toward the individualization of taxation.
- *Participation of seniors*. Labor force participation of the 55+ years old is among the lowest in Europe. Reducing the generosity of the pension system by lowering the replacement rate—the highest in Europe—and disincentivizing early retirement, while promoting long-life learning, could not only contribute to the long-term sustainability of the pension system, but also reduce the need to hire externally.

Authorities' Views

47. The authorities emphasized the difficult trade-off between supporting the construction sector given the sharp drop in demand and allowing housing price adjustment. They noted that the recent measures to support demand, including by buying private projects under development at a discounted price, are meant to reduce the risk of sharp fall in construction activities that would

[16] Similar provisions exist in Belgium, which also has an automatic wage indexation system. Specifically, the 1996 "Law on the Promotion of Employment and Maintaining Competitiveness" includes the possibility of suspending the application of the wage increase in those sectors for which the expected annual rate of increase in salaries of comparator markets (Netherlands, France, Germany) would imply a rate of wage increase that is too high in Belgium.

exacerbate imbalances in coming years. They indicated that the increase in the interest payment deductibility will provide a relief for households in the face of increasing debt service. On the supply side, they agreed with staff's proposals to frontload public investment and reduce bottlenecks to supply, including increasing density of buildings, emphasizing this will continue to be their medium-term objective.

48. The authorities reiterated the country's attachment to automatic wage indexation and welcomed staff's proposals to overcome potential shortcomings in the face of supply shocks. The authorities highlighted that, so far, the system has contributed to social peace and gave some predictability to firms in terms of budgeting personnel costs, while contributing to talent attraction. That said, there was broad agreement that wage indexation could pose more challenges during supply shocks, mainly through potential impacts on competitiveness. In this context, they indicated that the system was implemented with some flexibility in response to shocks. They saw merit in exploring different options to improve the calibration of the system in the future.

STAFF APPRAISAL

49. Reflecting a more challenging external environment, the economy appears resilient, though the outlook is uncertain, and risks to growth tilted to the downside. Although GDP growth is expected to slow from strong levels, the labor market and private consumption are likely to remain robust. The energy support measures will reduce the number of wage indexations and firms' need to adjust. While headline inflation is projected to moderate, core inflation is expected to remain persistently high, though slightly lower than in other euro area members. The recent global banking stress has added to uncertainty and downside risks.

50. The planned fiscal stimulus is assessed to be excessive and should be significantly reduced. With a robust labor market and strong households' position, the fiscal stimulus risks fueling inflation persistence and impeding an adjustment of housing prices to more affordable levels. Staff recommend keeping the cyclically adjusted overall balance broadly unchanged in 2023 and 2024 by switching to more targeted and less-distortive price measures. Should recessionary pressures turn out to be greater and inflation falls by more than expected, the authorities should allow automatic stabilizers to fully operate and consider targeted stimulus.

51. In the medium term, high fiscal risks and increasing ageing-related costs call for more prudent current spending and fiscal reforms to preserve buffers. The authorities could consider better controlling the wage bill and improve targeting of social benefits. Early action on the pension system would enhance intergenerational equity and long-term fiscal sustainability. To preserve buffers and reduce procyclicality, the authorities could better anchor fiscal policy by adopting a medium-term objective based on the general government balance and a ceiling on expenditure growth as an operational rule.

52. The tax brackets should be adjusted more frequently for inflation, within a comprehensive tax-benefit reform. Delaying tax brackets indexation for a prolonged period has

led to a notable increase of the real tax burden, with potentially unintended distributional effects. At the same time, adjusting the tax brackets on an ad-hoc basis could result in a large and procyclical fiscal stimulus. Hence, going forward, staff see merit in increasing the frequency of the tax brackets adjustments in a budget-neutral way. This could be achieved within a comprehensive review and simplification of the tax and social benefits system to enhance its efficiency and distributional impact.

53. While the banking system appears resilient, close monitoring of risks and pockets of vulnerabilities, especially in the real estate market, should continue and action taken as needed. While banks 'capital and liquidity buffers are well-above minimum requirements, heightened vigilance is warranted in light of recent global developments. The authorities appropriately kept countercyclical capital buffers unchanged, given the closing credit gap, tightening of credit standards, and high uncertainty. Continued prudent provisioning should be encouraged. To avoid further buildup of vulnerabilities in the real estate, the authorities could consider introducing income-based limits. To address risks of unexpected losses on the stock of real estate exposures, the authorities could consider targeted sectoral capital measures.

54. The authorities' efforts to bolster resilience of investment funds should continue. The effectiveness of liquidity management tools would benefit from better calibrating them to stress episodes and investment strategy. At the supervisory level, close monitoring of large redemptions and regular liquidity stress tests should continue. Data gaps should be addressed. Finally, given the Luxembourg's central in the global financial architecture, the authorities should continue to coordinate with peers and contribute to international efforts to strengthen regulation.

55. The authorities should continue to focus on boosting housing supply, while avoiding measures that increase housing demand. Recent measures to boost supply are welcome, while those that increase demand should be avoided. The authorities could instead frontload public investment in social and affordable housing and expedite efforts to reduce supply bottlenecks.

56. While the automatic wage indexation (AWI) has not posed major challenges during low inflation periods, its operation during supply shocks could be improved. On one hand, suspending or postponing AWI could adversely impact lower income workers. At the same time, it has been relatively generous to more affluent households, which puts upward pressure on housing prices, and is costly for the government. On the other hand, frequent rounds of AWI limit firms' ability to adjust, especially those facing external competition, which may induce suboptimal employment and investment decisions. The authorities could consider reforms that could reduce wage-price spiral risks, make indexation more progressive, and enhance firms' ability to adjust.

57. Using the workforce more efficiently could increase growth potential. Luxembourg has made remarkable progress in reducing the gender gap, but more could be done to unlock the full potential of women, including increasing work flexibility, transitioning to individual taxation, and means-testing family benefits. Seniors' labor market participation and employment could be improved by reducing the generosity of the pension system while promoting life-long learning.

58. It is recommended that the next Article IV consultation be held on the standard 12-month cycle.

Table 1. Luxembourg: Selected Economic Indicators, 2019-28

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
				Projections						
Real Economy (percent change)										
Gross domestic product	2.3	-0.8	5.1	1.5	1.1	1.7	2.5	2.4	2.3	2.3
Total domestic demand	4.1	-2.8	8.2	2.0	2.5	2.3	2.7	2.6	2.5	2.5
Private consumption	2.3	-7.3	9.4	2.8	3.7	3.2	3.2	2.8	2.6	2.6
Public consumption	2.6	7.8	5.4	3.8	3.7	1.8	2.3	2.5	2.5	2.5
Gross investment	9.0	-4.8	8.8	-1.1	-0.5	1.0	2.3	2.3	2.3	2.3
Foreign balance 1/	-0.3	1.1	-0.3	0.3	-0.7	0.1	0.6	0.6	0.5	0.5
Exports of goods and nonfactor services	4.5	0.2	9.7	-0.6	-0.5	1.8	2.5	2.4	2.4	2.4
Imports of goods and nonfactor services	5.7	-0.4	11.8	-0.9	-0.1	2.0	2.6	2.5	2.5	2.5
Labor Market (thousands, unless indicated)										
Resident labor force	287.0	294.1	298.8	303.8	309.3	315.5	321.8	328.0	334.4	341.0
Unemployed (average)	15.4	18.7	17.1	14.6	15.7	17.1	18.2	18.4	18.7	19.1
(Percent of total labor force)	5.4	6.4	5.7	4.8	5.1	5.4	5.6	5.6	5.6	5.6
Resident employment	271.6	275.4	281.7	289.2	293.6	298.4	303.6	309.6	315.7	321.8
(Percent change)	2.7	1.4	2.3	2.7	1.5	1.6	1.8	2.0	2.0	2.0
Cross-border workers (net)	191.9	196.2	203.9	213.3	216.8	220.4	225.7	231.2	236.7	242.2
Total employment	463.5	471.6	485.6	502.6	510.3	518.8	529.3	540.7	552.3	564.1
(Percent change)	3.5	1.7	3.0	3.5	1.5	1.7	2.0	2.2	2.1	2.1
Prices and costs (percent change)										
GDP deflator	1.4	4.7	6.2	6.4	3.6	3.1	2.9	2.1	2.0	2.0
CPI (harmonized), p.a.	1.7	0.0	3.5	8.1	2.6	3.1	3.4	2.0	2.0	2.0
CPI core (harmonized), p.a.	1.8	1.2	1.5	4.2	3.8	3.6	2.5	2.0	2.0	2.0
CPI (national definition), p.a.	1.7	0.8	2.5	6.3	3.2	2.9	2.9	2.0	2.0	2.0
Wage growth 2/	2.0	1.2	6.0	5.5	5.5	3.5	2.9	2.3	2.3	2.3
Nominal unit labor costs 2/	3.2	3.8	3.8	7.5	6.0	3.5	2.5	2.1	2.1	2.1
Public finances (percent of GDP)										
General government revenues	45.4	43.3	43.6	43.5	43.4	44.2	44.5	44.8	45.1	45.5
General government expenditures	43.1	46.8	42.9	43.3	46.1	46.0	45.4	45.2	45.5	45.9
General government balance	2.2	-3.4	0.7	0.2	-2.8	-1.8	-1.0	-0.5	-0.4	-0.5
General government cyclically-adjusted balance	2.1	-2.6	0.3	-0.1	-2.7	-1.5	-0.9	-0.5	-0.4	-0.5
General government structural balance	2.1	1.1	1.4	1.4	-0.3	-1.1	-0.9	-0.5	-0.4	-0.5
General government gross debt	22.4	24.5	24.5	24.6	27.5	29.2	29.6	29.6	29.4	29.2
Balance of Payments (percent of GDP)										
Current account	3.4	3.2	4.6	5.0	4.5	4.4	4.5	4.5	4.5	4.5
Balance on goods	2.3	1.8	1.3	0.2	1.1	1.1	1.1	1.1	1.1	1.0
Balance on services	30.3	30.9	33.4	28.2	26.1	25.9	25.7	25.7	25.6	25.5
Net factor income	-29.5	-29.3	-31.0	-24.2	-23.5	-23.4	-23.0	-23.0	-22.9	-22.7
Balance on current transfers	0.3	-0.3	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Exchange rates, period averages										
U.S. dollar per euro	1.12	1.14	1.18	1.05	...	...	...	...	...	...
(Percent change)	-5.2	1.9	3.7	-11.0	...	...	...	...	...	...
Nominal effective rate (2010=100)	101.7	103.4	104.0	102.7	...	...	...	...	...	...
(Percent change)	-0.6	1.7	0.6	-1.3	...	...	...	...	...	...
Real effective rate (CPI based; 2010=100)	99.6	100.9	101.1	97.9	...	...	...	...	...	...
(Percent change)	-0.7	1.3	0.2	-3.2	...	...	...	...	...	...
Credit growth and interest rates										
Nonfinancial private sector credit (eop, percent change) 3/	7.2	5.0	5.3	4.4	3.1	4.5	5.7	4.8	4.7	4.6
Government bond yield, annual average (percent)	...	...	...	...	...	...	...	...	...	...
Memorandum items: Land area = 2,586 sq. km; population in 2019 = 626,108; GDP per head = €101,446										
GDP (billions of euro)	62.4	64.8	72.3	78.1	81.8	85.8	90.4	94.5	98.6	102.9
Output gap (percent deviation from potential)	0.4	-1.8	1.0	0.5	-0.2	-0.5	-0.1	0.0	0.0	0.0
Potential output growth	1.9	1.5	2.2	2.0	1.9	2.0	2.1	2.2	2.3	2.3

Sources: Luxembourg authorities; IMF staff estimates and projections.

1/ Contribution to GDP growth.

2/ Overall economy.

3/ Including a reclassification of investment companies from financial to non-financial institutions in 2015.

Table 2. Luxembourg: Balance of Payments, 2019-28[1/]

(Percent of GDP)

						Projections				
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Current account	3.4	3.2	4.6	5.0	4.5	4.4	4.5	4.5	4.5	4.5
Balance on goods and services	32.6	32.7	34.7	28.4	27.3	27.0	26.8	26.7	26.6	26.5
Trade balance 1/	2.3	1.8	1.3	0.2	1.1	1.1	1.1	1.1	1.1	1.0
Goods exports	38.5	33.0	34.4	35.2	34.8	35.3	35.8	36.7	37.7	38.6
Goods imports	36.2	31.2	33.1	35.1	33.6	34.2	34.8	35.7	36.6	37.6
Balance on services	30.3	30.9	33.4	28.2	26.1	25.9	25.7	25.7	25.6	25.5
Services exports	161.4	163.5	175.1	163.6	162.3	163.1	162.9	163.3	163.5	163.6
Services imports	131.1	132.6	141.6	135.3	136.2	137.2	137.2	137.6	137.9	138.1
Net factor income	-29.5	-29.3	-31.0	-24.2	-23.5	-23.4	-23.0	-23.0	-22.9	-22.7
Compensation of employees, net	-17.2	-16.0	-16.8	-16.0	-16.4	-16.4	-16.4	-16.4	-16.5	-16.6
Compensation of employees, credit	2.9	3.0	2.7	2.6	2.6	2.6	2.6	2.7	2.7	2.7
Compensation of employees, debit	20.0	18.9	19.6	18.6	19.0	19.1	19.1	19.1	19.2	19.2
Investment income, net	-12.3	-13.4	-14.2	-8.2	-7.2	-6.9	-6.6	-6.6	-6.4	-6.2
Investment income, credit	492.5	424.4	362.3	370.9	359.8	349.0	339.0	332.2	325.9	319.8
Investment income, debit	504.8	437.8	376.5	379.1	367.0	355.9	345.6	338.7	332.2	325.9
Balance on current transfers	0.3	-0.3	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Capital and financial account	-1.7	-2.8	-7.5	-4.6	-4.5	-4.4	-4.5	-4.5	-4.5	-4.5
Capital account	-0.1	-0.1	1.2	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Financial account	1.6	2.7	8.6	5.1	4.9	4.9	5.0	5.0	5.0	5.0
Direct investment, net	107.6	-32.6	176.5	47.2	42.5	38.3	34.4	31.0	27.9	25.1
Abroad	-462.5	-198.2	-54.3	-478.9	-430.8	-387.6	-348.9	-314.0	-282.6	-254.4
In reporting economy	-570.1	-165.6	-230.8	-526.1	-473.3	-425.9	-383.4	-345.0	-310.5	-279.5
Portfolio investment, net	-160.0	-5.6	-240.8	-120.5	-120.5	-120.5	-120.5	-120.5	-120.5	-120.5
Portfolio investment, assets	281.4	329.1	526.0	-217.1	-128.7	-99.2	-89.4	-86.1	-85.1	-84.7
Portfolio investment, liabilities	441.4	334.6	766.8	-96.6	-8.2	21.2	31.1	34.3	35.4	35.8
Financial derivatives, net	16.4	7.0	16.5	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Other investment, net	37.4	33.9	54.3	56.4	60.9	65.1	69.1	72.5	75.6	78.4
Other investment, assets	120.3	209.8	216.3	-71.6	-71.6	-71.6	-71.6	-71.6	-71.6	-71.6
Other investment, liabilities	82.9	176.0	162.0	-128.0	-132.6	-136.8	-140.7	-144.1	-147.2	-150.0
Reserve assets	0.1	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Errors and omissions	-1.7	-0.4	2.9	-0.3	0.0	0.0	0.0	0.0	0.0	0.0

Sources: STATEC and IMF Staff calculations.

1/ Includes merchanting trade operations.

Table 3. Luxembourg: General Government Operations, 2019-28
(Percent of GDP)

				Est.	Projections					
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Revenue	45.4	43.3	43.6	43.5	43.4	44.2	44.5	44.8	45.1	45.5
Taxes	28.2	26.6	27.4	27.3	26.9	27.6	27.9	28.2	28.5	28.9
of which, corporate income taxes	6.0	4.8	4.5	4.4	4.1	4.0	4.0	4.0	4.0	4.0
of which, personal income taxes	10.8	11.0	11.3	11.5	11.8	12.2	12.5	12.8	13.1	13.4
of which, taxes on international trade & transactions	2.6	2.2	2.4	2.2	2.2	2.2	2.1	2.1	2.1	2.1
Social contributions	12.4	12.5	11.9	11.9	12.2	12.4	12.3	12.3	12.4	12.4
Grants	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other revenue	4.8	4.1	4.3	4.3	4.2	4.2	4.2	4.2	4.2	4.2
Expenditure	43.1	46.8	42.9	43.3	46.1	46.0	45.4	45.2	45.5	45.9
Expense	41.3	44.4	41.1	41.6	44.3	44.1	43.6	43.5	43.8	44.2
Compensation of employees	10.2	10.7	10.2	10.2	10.7	11.1	11.1	11.2	11.3	11.4
Use of goods and services	4.3	4.3	4.2	4.3	4.6	4.5	4.4	4.3	4.3	4.3
Interest	0.3	0.2	0.2	0.2	0.2	0.3	0.4	0.5	0.5	0.5
Subsidies	1.1	1.1	1.0	1.2	1.5	1.3	1.1	1.1	1.1	1.1
Social benefits	18.5	20.7	18.3	18.6	18.9	19.2	19.2	19.3	19.5	19.6
Other expense	8.0	8.5	8.3	8.4	9.9	9.1	8.6	8.3	8.3	8.3
Gross public investment	4.1	4.7	4.1	4.1	4.6	4.6	4.4	4.1	4.1	4.1
Net acquisition of nonfinancial assets	1.9	2.4	1.8	1.7	1.9	1.9	1.8	1.7	1.7	1.7
Gross operating balance	6.5	1.4	4.9	4.3	1.9	2.8	3.4	3.7	3.7	3.7
Net operating balance	4.1	-1.0	2.5	1.9	-0.9	0.1	0.8	1.2	1.3	1.2
Net lending / borrowing	2.2	-3.4	0.7	0.2	-2.8	-1.8	-1.0	-0.5	-0.4	-0.5
Net acquisition of financial assets	5.0	-0.6	3.7	...	...	…	…	…	…	
Monetary gold and SDRs	...	...	...	...	...	…	…	…	…	
Currency and deposits	3.6	-1.7	2.4	...	...	…	…	…	…	
Securities other than shares	0.5	1.0	2.0	...	...	…	…	…	…	
Loans	0.1	0.1	0.2	...	...	…	…	…	…	
Shares and other equity	1.0	0.5	-1.1	...	...	…	…	…	…	
Insurance technical reserves	...	...	...	...	...	…	…	…	…	
Financial derivatives	0.3	-0.3	0.3	...	...	…	…	…	…	
Other accounts receivable	-0.5	-0.2	0.0	...	...	…	…	…	…	
Net incurrence of liabilities	2.8	2.9	2.7	...	...	…	…	…	…	
Special Drawing Rights (SDRs)	...	...	...	...	...	…	…	…	…	
Currency and deposits	0.0	0.0	0.0	...	...	…	…	…	…	
Securities other than shares	2.5	3.1	3.5	...	...	…	…	…	…	
Loans	-0.1	-0.2	-0.9	...	...	…	…	…	…	
Shares and other equity	0.0	0.0	0.0	...	...	…	…	…	…	
Insurance technical reserves	0.0	0.0	0.0	...	...	…	…	…	…	
Financial derivatives	0.0	0.0	0.0	...	...	…	…	…	…	
Other accounts payable	0.5	0.0	0.1	...	...	…	…	…	…	
Memorandum items:										
GDP (in billions of euro)	62.4	64.8	72.3	78.1	81.8	85.8	90.4	94.5	98.6	102.9
Structural balance	2.1	1.1	1.4	1.4	-0.3	-1.1	-0.9	-0.5	-0.4	-0.5
Output gap	0.4	-1.8	1.0	0.5	-0.2	-0.5	-0.1	0.0	0.0	0.0
Public gross debt (Maastricht definition)	22.4	24.5	24.5	24.6	27.5	29.2	29.6	29.6	29.4	29.2

Sources: Luxembourg authorities; and IMF staff estimates.

Table 4. Luxembourg: International Investment Position, 2016–22[1/]

	2016	2017	2018	2019	2020	2021	2022
Billions of Euros							
International investment position	31.2	46.9	36.7	42.3	41.4	29.2	22.0
Assets	10,923.2	11,019.4	10,744.2	11,331.7	11,162.7	12,425.2	11,381.3
Liabilities	10,892.0	10,972.5	10,707.5	11,289.5	11,121.4	12,396.0	11,359.3
Direct investment	783.6	763.6	804.6	862.2	755.9	860.5	944.9
Assets	5,827.1	5,584.0	5,274.9	5,135.4	4,791.4	4,933.5	4,777.5
Liabilities	5,043.5	4,820.4	4,470.3	4,273.2	4,035.4	4,073.1	3,832.6
Portfolio investment	-1,080.7	-1,065.9	-1,143.8	-1,171.4	-909.5	-1,063.9	-1,161.7
Assets	3,588.2	3,936.7	3,913.7	4,588.4	4,866.4	5,720.4	4,915.3
Liabilities	4,668.9	5,002.6	5,057.5	5,759.8	5,776.0	6,784.3	6,077.0
Financial derivatives	-1.2	5.6	9.9	12.1	22.1	29.5	40.7
Assets	155.6	146.0	136.2	126.2	131.9	192.3	218.7
Liabilities	156.9	140.4	126.3	114.1	109.9	162.8	178.0
Other investment	328.7	342.9	365.2	338.5	172.0	200.6	195.5
Assets	1,351.4	1,352.0	1,418.6	1,480.8	1,372.1	1,576.5	1,467.0
Liabilities	1,022.7	1,009.2	1,053.4	1,142.3	1,200.1	1,375.9	1,271.5
Reserve assets	0.9	0.7	0.8	0.9	0.9	2.6	2.7
Percent of GDP							
International investment position	55.5	80.6	61.1	67.8	63.9	40.4	28.2
Assets	19,433.5	18,943.8	17,870.9	18,167.5	17,231.5	17,186.9	14,567.1
Liabilities	19,378.0	18,863.3	17,809.9	18,099.7	17,167.6	17,146.5	14,538.9
Direct investment	1,394.0	1,312.7	1,338.3	1,382.3	1,166.9	1,190.2	1,209.4
Assets	10,367.0	9,599.6	8,773.8	8,233.3	7,396.2	6,824.1	6,114.8
Liabilities	8,972.9	8,286.9	7,435.5	6,851.0	6,229.3	5,633.9	4,905.4
Portfolio investment	-1,922.8	-1,832.5	-1,902.5	-1,878.0	-1,404.0	-1,471.7	-1,486.9
Assets	6,383.8	6,767.7	6,509.6	7,356.3	7,512.2	7,912.5	6,291.2
Liabilities	8,306.5	8,600.1	8,412.1	9,234.4	8,916.2	9,384.2	7,778.1
Financial derivatives	-2.2	9.6	16.4	19.4	34.0	40.8	52.1
Assets	276.9	251.0	226.6	202.3	203.6	265.9	279.9
Liabilities	279.1	241.4	210.1	182.9	169.6	225.2	227.9
Other investment	584.7	589.4	607.4	542.6	265.5	277.5	250.2
Assets	2,404.2	2,324.3	2,359.6	2,374.0	2,118.1	2,180.7	1,877.7
Liabilities	1,819.5	1,734.9	1,752.2	1,831.4	1,852.5	1,903.2	1,627.5
Reserve assets	1.6	1.3	1.4	1.5	1.4	3.6	3.5

Sources: STATEC and IMF Staff estimates.
1/ Balance of Payments Manual 6 (BPM6) presentation.

Table 5. Luxembourg: Financial Soundness Indicators, 2016–22

(Percent)

		2016	2017	2018	2019	2020	2021	2022 [1/]
All Banks								
Capital Adequacy	Regulatory capital to risk-weighted assets	25.0	25.9	25.0	22.0	24.8	24.0	23.0
	Regulatory Tier 1 capital to risk-weighted assets	24.0	25.1	24.3	21.5	22.8	22.3	22.0
	Capital to assets	7.0	8.4	8.0	7.4	8.6	8.0	8.0
Profitability And Efficiency	Return on assets	0.8	0.7	0.6	0.5	0.5	0.6	0.7
	Return on equity	11.0	8.1	7.4	7.4	6.2	7.9	8.0
	Interest margin to gross income	25.0	27.9	27.1	26.7	24.9	21.2	26.0
Asset Quality And Structure	Residential real estate loans to total loans	6.2	6.2	6.8	6.9	8.5	8.0	10.0
	Household debt to GDP	60.0	59.5	59.8	64.3	69.7	70.1	74.0
	Nonperforming loans to total gross loans	0.9	0.8	0.9	0.7	1.0	0.8	1.0
	Sectoral distribution of loans (in percent of total loans)							
	Residents	33.0	33.4	33.7	32.0	36.9	40.5	37.0
	Deposit Takers	5.0	3.7	3.3	3.3	1.6	2.0	2.0
	Central Bank	15.0	15.4	15.8	14.1	20.6	24.9	20.0
	Other Financial Corporations	4.0	4.4	4.2	4.5	4.4	4.1	5.0
	General Government	0.4	0.4	0.3	0.3	0.3	0.2	0.2
	Nonfinancial Corporations	4.0	4.0	4.4	4.2	4.1	3.6	4.0
	Other Domestic Sectors	5.0	5.5	5.6	5.7	5.9	5.6	6.0
	Non Residents	67.0	66.6	66.3	68.0	63.1	59.5	63.0
Liquidity	Liquid assets to total assets	21.2	22.9	24.9	24.7	29.8	31.8	33.0
	Liquid assets to short-term liabilities	31.8	31.7	34.6	33.2	38.8	35.2	37.0
	Customer deposits to total (non interbank) loans	106.0	102.9	106.2	107.7	109.0	107.0	97.0
Domestically Oriented Banks								
Capital Adequacy	Regulatory capital to risk-weighted assets	23.0	23.0	22.9	22.5	22.9	23.1	22.0
	Regulatory Tier 1 capital to risk-weighted assets	23.0	22.1	22.1	21.8	22.2	22.4	21.0
	Capital to assets	9.0	8.2	8.8	8.7	8.9	8.7	8.0
Profitability And Efficiency	Return on assets	1.0	0.8	0.8	0.7	0.7	0.8	0.8
	Return on equity	11.0	9.7	8.8	8.6	7.6	9.0	9.0
	Interest margin to gross income	56.2	54.8	52.8	51.5	52.2	47.6	52.0
	Trading income to total income	1.8	2.2	3.6	5.8	2.0	1.2	-6.0
Asset Quality And Structure	Residential real estate loans to total loans	28.0	26.7	24.9	25.6	35.1	27.0	26.0
	Household debt to GDP	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	Nonperforming loans to total gross loans	2.4	2.0	1.8	1.7	1.9	0.8	1.0
	Sectoral distribution of loans (in percent of total loans)							
	Residents	71.0	69.5	67.5	71.0	76.4	80.9	81.0
	Non Residents	29.0	30.5	32.5	29.0	23.6	19.1	19.0
Liquidity	Liquid assets to total assets	19.5	20.3	20.9	23.4	24.0	29.1	29.0
	Liquid assets to short-term liabilities	26.0	27.2	28.0	30.7	32.3	35.2	36.0
	Customer deposits to total (non interbank) loans	124.0	128.0	112.0	108.1	101.0	93.6	92.0

Sources: Financial Soundness Indicators Database; BCL; and CSSF.

1/ Preliminary figures

Annex I. External Sector Assessment

Overall Assessment: *The external position of Luxembourg in 2022 was broadly in line with the level implied by medium-term fundamentals and desirable policies.* This assessment is based on EBA-lite quantitative models, a review of developments in the balance of payments and net foreign asset positions, as well as consideration of Luxembourg's roles as a financial hub and center for intra-corporation cash pooling. However, this assessment is subject to uncertainty due to the war in Ukraine, both domestically and abroad.

Potential Policy Responses: The economy has recovered strongly from the Covid-19 pandemic but is being hit by the energy price shock in the wake of Russia's invasion of Ukraine. In response to the shock, Luxembourg deployed significant fiscal resources to alleviate the impact on consumers.

Foreign Assets and Liabilities: Position and Trajectory

Background. Luxembourg's net international investment position (NIIP) declined to around 28.2 percent of GDP in 2022 from around 40.4 percent in 2021, and also a bit lower than its average of about 40.3 during 2007-21. The decline in the NIIP reflects a decline in net portfolio inflows, reflecting in part the adverse financial market conditions, and despite some improvements in FDI, financial derivatives, and net other investment, due in part to valuation effects arising from euro depreciation. FDI as a percent of GDP remains below the 2017 levels, however, due to a change in international taxation, most notably the U.S. tax reform which lowered the U.S. corporate tax rate by 14 percent.

Assessment. The NIIP is positive and is projected to improve in the medium term. The current NIIP and its projected path do not imply risks to external sustainability.

2022 (% GDP)	NIIP: 28.2	Gross Assets: 14,567	Debt Assets: 3,023	Gross Liab.: 14,539	Debt Liab.: 1,118

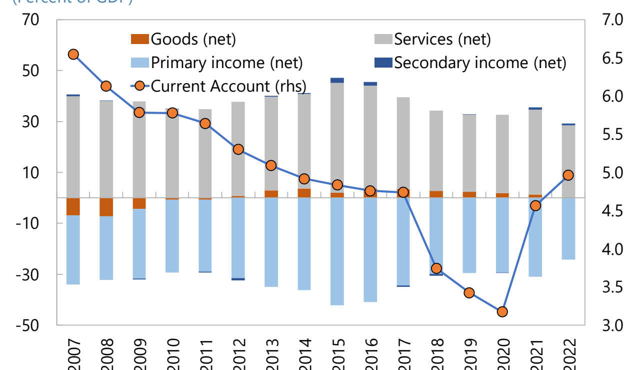
Current Account

Background. The CA surplus averaged around 4.1 percent of GDP over 2015-20, improving slightly to 5 percent of GDP in 2022 (from 4.6 percent of GDP in 2021), due to an improved net factor income balance and despite the fall in the net goods and services exports. Net goods exports have averaged around 2½ percent of GDP over the past several years, declining since 2020 due primarily to an increase in the value of goods imports as pent-up demand from the pandemic and the energy price shock increased import value. The surplus in services declined in 2022 compared to 2021 due in part to financial conditions as services are mainly related to private banking, the investment fund industry, and corporate cash management entities.

Assessment. Staff's bottom-line assessment is that Luxembourg's external position is broadly in line with medium-term fundamentals and desirable policy settings. This assessment is based on the quantitative External Balance Assessment (EBA-lite), supplemented with staff judgement. The EBA-lite models can only

partially capture some important specificities of Luxembourg, such as being a financial center with a large investment fund industry and a very small open economy with a large share of non-resident workers. Exports and imports of financial services which drive Luxembourg's current account are less sensitive to relative prices changes, and the large number of non-resident workers affects net factor income and population-based variables in the models. In this sense, as in previous years, staff has adjusted the EBA-lite explanatory variable "output per worker" to reflect that over 40 percent of Luxembourg's labor force is non-resident. Also, there was a temporary positive terms of trade effect due to higher export values in 2022 (especially steel exports, which grew by close to 20 percent in nominal terms) and lower than expected energy imports, mostly because of a mild winter. Based on this adjustment, the current account norm for 2022 is estimated at 2.9 percent of GDP. In comparison with the norm, the current account gap is estimated at 0.9 percent of GDP based on the CA model. The current account gap includes a policy gap of 3 percent of GDP, reflecting lower-than-expected public health expenditure and a fiscal stance that is somewhat looser than the country-specific norm, but less loose compared to the rest of the world. Over the medium term, staff projects that the CA surplus will recover to about 4.5 percent of GDP.

Current Account
(Percent of GDP)



Sources: Haver Analytics; and IMF staff calculations

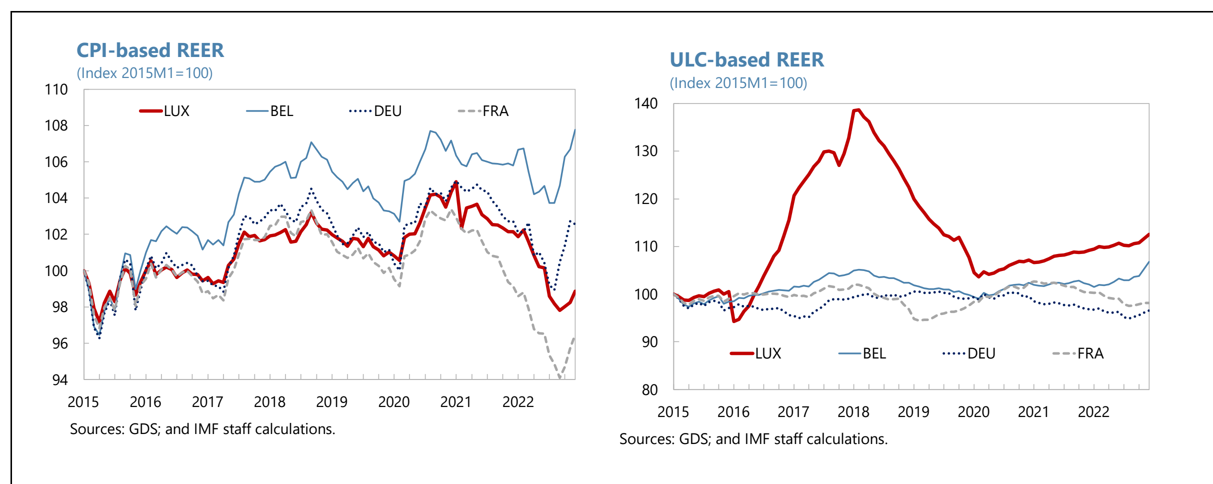
Luxembourg: Model Estimates for 2022 (in percent of GDP)

	CA model 1/	**REER model** 1/
	(in percent of GDP)	
CA-Actual	**5.0**	
Cyclical contributions (from model) (-)	-0.2	
COVID-19 adjustors (-) 2/		
Additional temporary/statistical factors (-)	1.9	
Natural disasters and conflicts (-)	-0.5	
Adjusted CA	**3.8**	
CA Norm (from model) 2/	**7.5**	
Adjustments to the norm (-)	-4.6	
Adjusted CA Norm	**2.9**	
CA Gap	**0.9**	**7.5**
o/w Relative policy gap	3.0	
Elasticity	-1.3	
REER Gap (in percent)	**-0.7**	**-5.7**

1/ Based on the EBA-lite 3.0 methodology
2/ Cyclically adjusted, including multilateral consistency adjustments.

Real Exchange Rate

Background. The real effective exchange rates (REER) based on the CPI depreciated in 2022 while the ULC-based REER remained relatively unchanged. Luxembourg's CPI-based REER depreciated by about 3.3 percent yoy compared to December 2021 as in neighboring countries while the ULC-based REER appreciated by around 3 percent yoy.



Assessment. Staff assess the REER to be broadly in line with fundamentals and desirable policy settings based on the Real Effective Exchange Rate (REER) gap suggested by the CA gap model that indicates an overvaluation of 0.7 percent. The REER index model suggests an overvaluation of 5.7 percent.

Capital and Financial Accounts: Flows and Policy Measures

Background. The financial account declined to 5.1 percent of GDP in 2022 from 8.6 percent in 2021 due to lower net direct investment. The capital account was around 0.5 percent of GDP in 2022.

Assessment. Risks related to capital flows are assessed to be small.

FX Intervention and Reserves Level

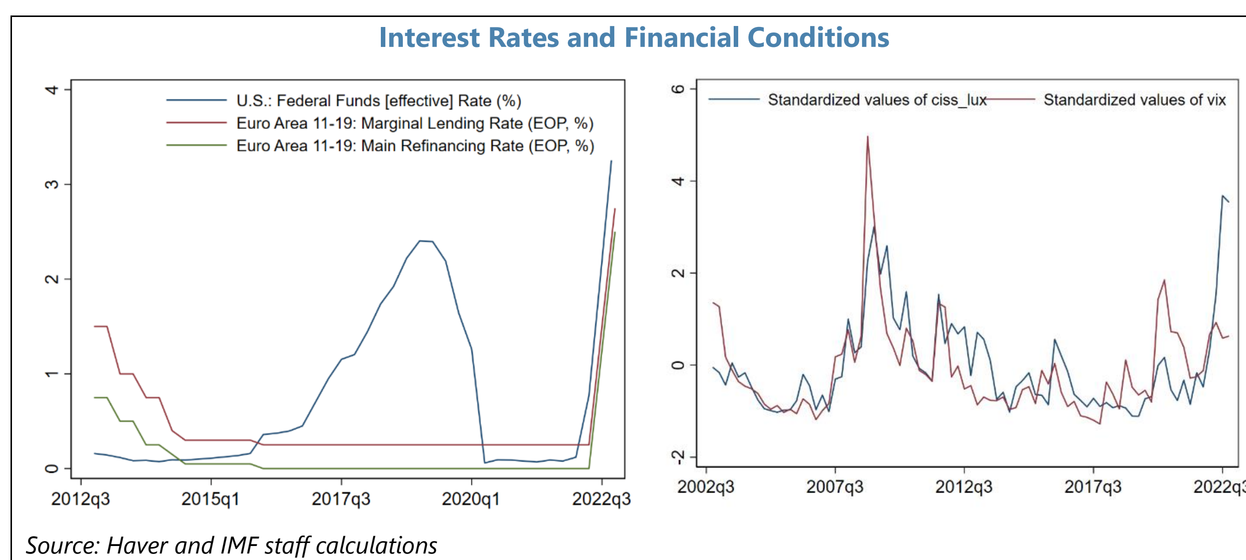
Background. The euro has the status of global reserve currency. The allocation by the IMF in 2021 of 1,321 million SDRs (around 2.1 percent of GDP) will be channeled to help other countries manage the pandemic.

Assessment. Reserves held by euro area countries are typically low relative to standard metrics. The currency is free floating.

Annex II. The Impact of Financial Tightening in Luxembourg

1. This Annex analyses the impact of financial tightening on Luxembourg's economy, given its role as a major financial center. We use two measures of market-based financial conditions: i) country-level indicator of financial stress (CLIFS) compiled by the ECB and ii) global financial conditions—captured by the Chicago Board Option Exchange volatility index (VIX). After loosening considerably over the decade following the 2007-09 Global Financial Crisis, market-based financial conditions both globally and in Luxembourg, tightened in early-2020 at the onset of the Covid-19 pandemic, before easing up due to unprecedented monetary and fiscal policy stimulus towards mid-2021 (right chart). Since early-2022 however, inflationary pressures have prompted major central banks to steadily hike their policy rates to levels not seen over the past decade (left chart). Accordingly, both the VIX and the CLIFS have tightened, though the CLIFS has increased by more, probably due to the sharp increase in energy prices in Europe, and in Luxembourg in particular.[1]

Interest Rates and Financial Conditions



Source: Haver and IMF staff calculations

2. Global financial tightening is associated with notable lower GDP growth in Luxembourg, while euro area demand is positively correlated with domestic GDP growth. Table 1 presents the results of dynamic OLS linear regressions of real GDP growth in Luxembourg on the above proxies of global and domestic financial conditions. As can be seen, the CLIFS is insignificant whereas the VIX is highly significant and negatively associated with real GDP growth in Luxembourg. The impact of a one standard deviation tightening of the VIX (roughly 10 points increase of the VIX) on real GDP growth varies from around -0.8 to -1.1 percentage points. External

[1] The correlation of the CLIFS and the VIX has been low at around 0.2 since the beginning of the Covid-19 pandemic, dropping from around 0.6 over the full sample period (2000Q1:2022Q4). However, the CLIFS is highly correlated with euro area financial conditions, as measured by the ECB's CISS index for the euro area with the correlation at around 0.8 over the full sample and 0.9 since the pandemic.

demand as measured by real euro area GDP growth is also highly significant and positively correlated with real GDP growth in Luxembourg.[2]

Table 1. Luxembourg: The Impact of Financial Conditions on GDP Growth in Luxembourg

	Real GDP (y-on-y growth)		
	1	2	3
Real GDP growth (-1)	0.49***	0.46***	0.31***
	(0.09)	(0.10)	(0.10)
VIX Index	-0.94***	-1.06***	-0.78***
	(0.27)	(0.30)	(0.27)
CLIFS Index (-1)	-0.19	-0.14	0.01
	(0.34)	(0.35)	(0.38)
Real credit growth (-1)		0.22	0.34
		(0.25)	(0.24)
Euro area real GDP growth			0.40***
			(0.08)
Constant	1.30***	1.11***	0.91**
	(0.33)	(0.40)	(0.38)
Observations	91	87	87
R-squared	0.45	0.45	0.54

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: IMF staff calculations

Notes: The table reports results of dynamic OLS linear regressions with robust standard errors. The VIX and CLIFS indices are standardized by subtracting the means and dividing by the standard deviations for each variable. Growth of all variables is in year-on-year terms. The sample extends from 2000Q1: 2022Q4.

3. **While domestic and global financial conditions are correlated, the analysis suggests that CLIFS matters more for banks, while global financial conditions matter more for investment funds and economic activity at large.** While the funds are domiciled in Luxembourg, they are highly interconnected with global investors and destinations, and, therefore, are affected more by global financial conditions. At the same time, notwithstanding the correlation between the CLIFS and global financial conditions as proxied by the VIX, the banks seem to be more affected by domestic financial conditions. This could be partly because of the high correlation of the CLIFS with the euro area financial conditions (see footnote 1 above). Finally, given that the financial sector accounts for about ¼ of gross value added in Luxembourg, there is a significant association of GDP with global financial tightening.

[2] A number of robustness checks corroborate these results including, using an alternate sample to exclude the Covid-19 pandemic and the VIX and CISS in non-standardized terms, as well as estimating the regressions in (log) levels.

4. Global versus domestic financial tightening have significant but differing effects on banks and investment funds. Table 2 below presents the results of dynamic linear regressions of bank total assets and fund net assets in Luxembourg on global and domestic financial conditions. As can be seen, the banking sector activities, as measured by bank balance sheet asset growth is significantly negatively correlated with the domestic financial conditions (the CISS index), while the correlation with the VIX is insignificant. Luxembourg bank asset growth is also positively correlated with real GDP growth in the euro area. We obtain similar results for real bank GVA as well as bank credit (not reported here). Conversely, the growth of investment funds' net assets is not correlated with domestic financial conditions but highly correlated with global financial conditions, reflecting Luxembourg's status as a major international hub for funds.[3]

Table 2. Luxembourg: The Impact of Financial Conditions on Luxembourg's Financial Sector

	Bank Assets (y-on-y growth)		**Fund Assets (y-on-y growth)**	
	1	**2**	**3**	**4**
Assets growth (-1)	0.84***	0.81***	0.73***	0.74***
	(0.05)	(0.05)	(0.06)	(0.07)
VIX Index	-0.27	0.06	-4.10***	-4.29***
	(0.31)	(0.37)	(0.53)	(0.57)
CLIFS Index (-1)	-1.45***	-1.18***	1.30	1.21
	(0.41)	(0.37)	(1.01)	(1.02)
LUX real GDP growth (-1)		0.21**		0.06
		(0.10)		(0.25)
Euro area real GDP growth		0.18**		-0.26
		(0.09)		(0.29)
Constant	0.23	-0.45	2.41***	2.43***
	(0.32)	(0.34)	(0.76)	(0.79)
Observations	86	86	86	86
R-squared	0.85	0.87	0.80	0.80

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: IMF staff calculations

Notes: The table reports results of dynamic OLS linear regressions with robust standard errors. The VIX and CLIFS indices are standardized by subtracting the means and dividing by the standard deviations for each variable. Growth of all variables is in year-on-year terms. The sample extends from 2000Q1: 2022Q4.

[3] A number of robustness checks corroborate these results including, using an alternate sample to exclude the Covid-19 pandemic and the VIX and CLIFS in non-standardized terms, as well as estimating the regressions in (log) levels, and growth of real bank GVA as the dependent variable to proxy for bank profitability. As a robustness test, we also use as a dependent variable growth of bank credit to residents and find similar results.

Annex III. Risk Assessment Matrix[1]

Source of risks	Relative Likelihood	Impact if Realized	Policy Response
Global Risks			
Monetary policy miscalibration. Amid high economic uncertainty and volatility, major central banks slow monetary policy tightening or pivot to loosen monetary policy stance prematurely, de-anchoring inflation expectations and triggering a wage-price spiral in tight labor markets.	Medium	**High/Medium.** Higher inflation will feed into wages, through automatic indexation, hindering, competitiveness, or increase fiscal cost for the government. Tighter financial conditions could heighten credit risk, reduce lending growth. Higher for longer interest rates could severely affect the performance of non-banks, increase unemployment and lower fiscal revenue.	Tighten fiscal policy. Allow greater pass-through while shifting to more targeted support and suspend or reform the automatic wage indexation scheme to break the wage-price spiral. Strengthen financial supervision to identify most affected groups and pockets of vulnerability and relax cyclical buffers if needed. Further strengthen the liquidity management framework for investment funds, to better tailor it to stress episodes.
Commodity price volatility. A succession of supply disruptions (e.g., due to conflicts and export restrictions) and demand fluctuations (e.g., reflecting China reopening) causes recurrent commodity price volatility, external and fiscal pressures, and social and economic instability.	Medium		
Abrupt global slowdown or recession. Global and idiosyncratic risk factors combine to cause a synchronized sharp growth downturn, with recessions in some countries, adverse spillovers through trade and financial channels, and markets fragmentation. In Europe, intensifying fallout from the war in Ukraine, worsening energy crisis and supply disruptions, and monetary tightening exacerbate economic downturns and housing market corrections.	Medium High	**High/ Medium.** Luxembourg export demand could weaken further, with potentially more severe impact on the economy. Inflation is lower due to lower commodity prices	Allow the automatic stabilizers to fully operate. Strengthen financial supervision to identify most affected groups and pockets of vulnerability and relax cyclical buffers, if needed. Further strengthen the liquidity management framework for investment funds, to better tailor it to stress episodes.
Systemic financial instability. Sharp swings in real interest rates, risk premia, and assets repricing amid economic slowdowns and policy shifts trigger insolvencies in countries with weak banks or non-bank financial institutions, causing markets dislocations and adverse cross-border spillovers.	Medium:	**High.** Banks appear resilient but some banks may face capital shortfalls in an adverse scenario. Private and custodian banks are vulnerable to market risks while corporate and universal banks are more exposed to credit risks. Investment funds could face large redemptions, resulting in fire sales and further liquidity pressures.	Deploy policy buffers and levers, with additional actions to address specific gaps/pockets. Continue to closely monitor credit, liquidity and market risks. Further strengthen the liquidity management framework for investment funds, to better tailor it to stress episodes.

[1] The Risk Assessment Matrix (RAM) shows events that could materially alter the baseline path (the scenario most likely to materialize in the view of IMF staff). The relative likelihood is the staff's subjective assessment of the risks surrounding the baseline ("low" is meant to indicate a probability below 10 percent, "medium" a probability between 10 and 30 percent, and "high" a probability between 30 and 50 percent). The RAM reflects staff views on the source of risks and overall level of concern as of the time of discussions with the authorities. Non-mutually exclusive risks may interact and materialize jointly. "Short term" and "medium term" are meant to indicate that the risk could materialize within 1 year and 3 years, respectively.

Structural Risks			
Cyber-attacks Cyberattacks on critical domestic and/or international physical or digital infrastructure (including digital currency and crypto ecosystems) trigger financial and economic instability.	Medium **ST/MT**	**Medium/High** Payment and financial systems are disrupted with potentially reputational risks.	Continue efforts to strengthen the cybersecurity framework.
Extreme climate events. Extreme climate events cause more severe than expected damage to infrastructure (especially in smaller vulnerable economies) and loss of human lives and livelihoods, amplifying supply chain disruptions and inflationary pressures, causing water and food shortages, and reducing growth.	Medium **ST/MT**	**Low.** Physical risk in Luxembourg is relatively low. **Medium.** The impact on the financial sector could be large.	Continue to strengthen the climate risks management framework for banks and non-banks.
Luxembourg's Specific Risks			
Sharp correction in house prices. A sharp drop in demand for housing could lead to a large correction in prices.	Low **ST/MT**	**Low.** Structural imbalances render a large correction unlikely in the short term. Risks on the financial sector are mitigated by banks' strong capital and liquidity positions, households' high level of income and financial wealth, as well as strong labor markets.	Continue close monitoring of risks and adjust macro-prudential policy, through the introduction of income-based measures or tightening of sectoral capital measures to avoid build-up of vulnerabilities.
Possible changes in international corporate and personal taxation.	Medium **ST/MT**	**Medium.** This could weaken Luxembourg's attractiveness for businesses, weakening fiscal revenues and foreign investment.	Diversify revenue, enhance spending efficiency. Adopt an ambitious medium-term objective for the overall balance that takes into account fiscal risks.

Annex IV. Sovereign Risk and Debt Sustainability Analysis

Figure 1. Luxembourg: Risk of Sovereign Stress

Horizon	Mechanical signal	Final assessment	Comments
Overall	…	Low	The overall risk of sovereign stress is low. In the medium term, while debt is stabilizing, some idiosyncratic risks related for example to changes in international taxation may be higher than expected, which calls for prudent recurrent spending. Notwithstanding the automatic assessment of the pension system, an early reform could create space of additional capital and targeted social spending while achieving intergenerational equity.
Near term 1/			
Medium term	Low	Low	Medium-term risks are assessed as low against a mechanical low signal as well as the strength of institutions, the depth of the investor pool, and adequate fiscal resources.
Fanchart	Low	…	
GFN	Low	…	
Stress test	...	…	
Long term	…	Moderate	The authorities actuarial assessment shows that benefits are expected to exceed contributions by 2027. Reserves are projected to be depleted by 2046-49.
Sustainability assessment 2/	Not required for surveillance countries	n.a.	Not applicable
Debt stabilization in the baseline			No

Source: Fund staff.

Note: The risk of sovereign stress is a broader concept than debt sustainability. Unsustainable debt can only be resolved through exceptional measures (such as debt restructuring). In contrast, a sovereign can face stress without its debt necessarily being unsustainable, and there can be various measures—that do not involve a debt restructuring—to remedy such a situation, such as fiscal adjustment and new financing.

1/ The near-term assessment is not applicable in cases where there is a disbursing IMF arrangement. In surveillance-only cases or in cases with precautionary IMF arrangements, the near-term assessment is performed but not published.

2/ A debt sustainability assessment is optional for surveillance-only cases and mandatory in cases where there is a Fund arrangement. The mechanical signal of the debt sustainability assessment is deleted before publication. In surveillance-only cases or cases with IMF arrangements with normal access, the qualifier indicating probability of sustainable debt ("with high probability" or "but not with high probability") is deleted before publication.

Figure 2. Luxembourg: Debt Coverage and Disclosures

						Comments
1. Debt coverage in the DSA: 1/	CG	GG	NFPS	CPS	Other	Debt/GDP for the DSA is projected based on the stock of General Government debt in 2022, but evolves from 2023 according to Central Government flows, given the social security surplus.
1a. If central government, are non-central government entities insignificant?					n.a.	
2. Subsectors included in the chosen coverage in (1) above:						

					Subsectors captured in the baseline	Inclusion
CPS	NFPS	GG: expected	CG	1	Budgetary central government	Yes
				2	Extra budgetary funds (EBFs)	No
				3	Social security funds (SSFs)	Yes
				4	State governments	Yes
				5	Local governments	Yes
				6	Public nonfinancial corporations	Yes
				7	Central bank	Yes
				8	Other public financial corporations	Yes

3. Instrument coverage:	Currency & deposits	Loans	Debt securities	Oth acct. payable 2/	IPSGSs 3/

4. Accounting principles:	Basis of recording		Valuation of debt stock		
	Non-cash basis 4/	Cash basis	Nominal value 5/	Face value 6/	Market value 7/

5. Debt consolidation across sectors:	Consolidated	Non-consolidated

Color code: chosen coverage; Missing from recommended coverage; Not applicable

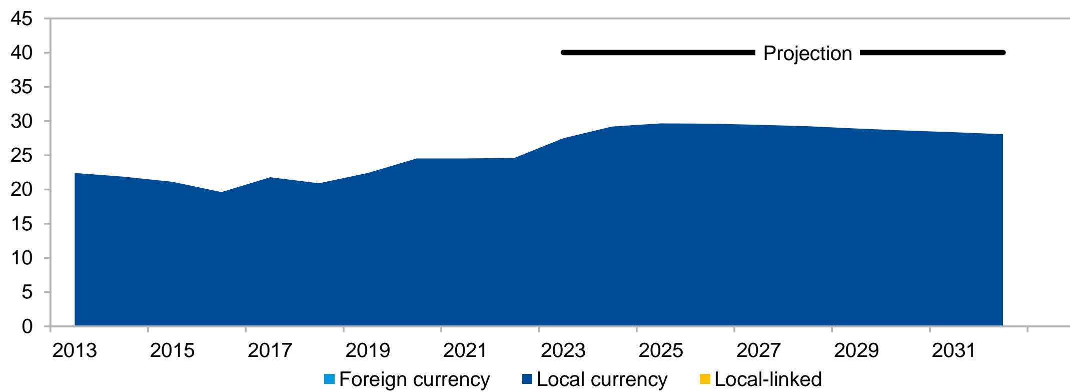
Reporting on intra-government debt holdings

					Issuer \ Holder	Budget. central govt	Extra-budget. funds	Social security funds	State govt.	Local govt.	Nonfin. pub. corp.	Central bank	Oth. pub. fin corp	Total
CPS	NFPS	GG: expected	CG	1	Budget. central govt									0
				2	Extra-budget. funds									0
				3	Social security funds									0
				6	Nonfin pub. corp.									0
				7	Central bank									0
				8	Oth. pub. fin. corp									0
					Total	0	0	0	0	0	0	0	0	0

1/ CG=Central government; GG=General government; NFPS=Nonfinancial public sector; PS=Public sector.
2/ Stock of arrears could be used as a proxy in the absence of accrual data on other accounts payable.
3/ Insurance, Pension, and Standardized Guarantee Schemes, typically including government employee pension liabilities.
4/ Includes accrual recording, commitment basis, due for payment, etc.
5/ Nominal value at any moment in time is the amount the debtor owes to the creditor. It reflects the value of the instrument at creation and subsequent economic flows (such as transactions, exchange rate, and other valuation changes other than market price changes, and other volume changes).
6/ The face value of a debt instrument is the undiscounted amount of principal to be paid at (or before) maturity.
7/ Market value of debt instruments is the value as if they were acquired in market transactions on the balance sheet reporting date (reference date). Only traded debt securities have observed market values.

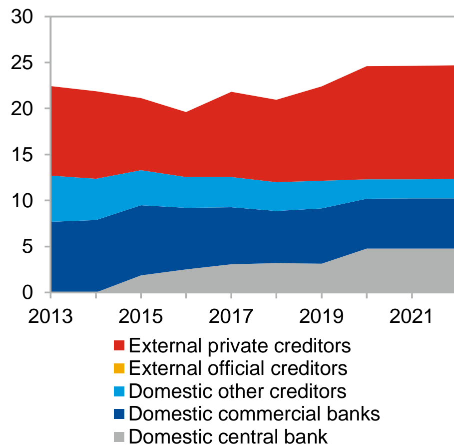
Figure 3. Luxembourg: Public Debt Structure Indicators

Debt by Currency (Percent of GDP)



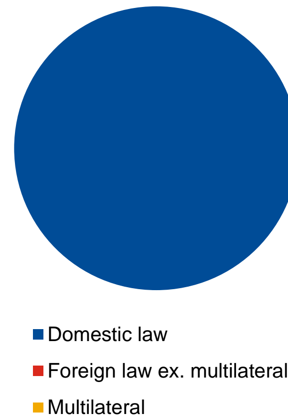
Note: The perimeter shown is general government.

Public Debt by Holder (percent of GDP)



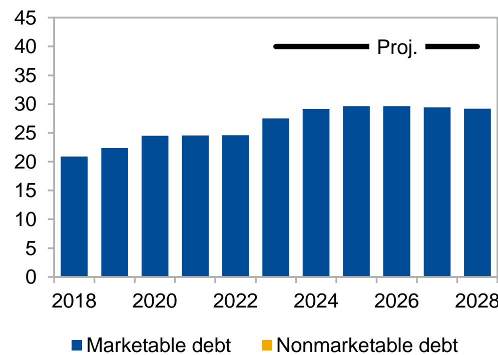
Note: The perimeter shown is general government.

Public Debt by Governing law, 2022 (percent)



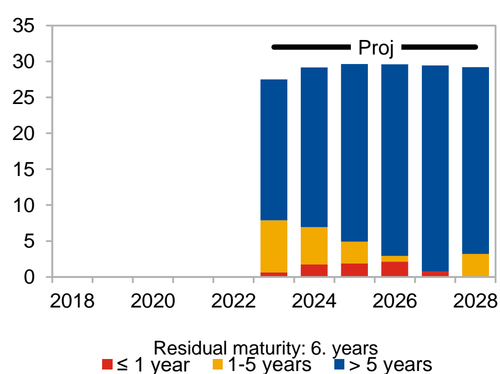
Note: The perimeter shown is general government.

Debt by Instruments (percent of GDP)



Note: The perimeter shown is general government.

Public Debt by Maturity (percent of GDP)



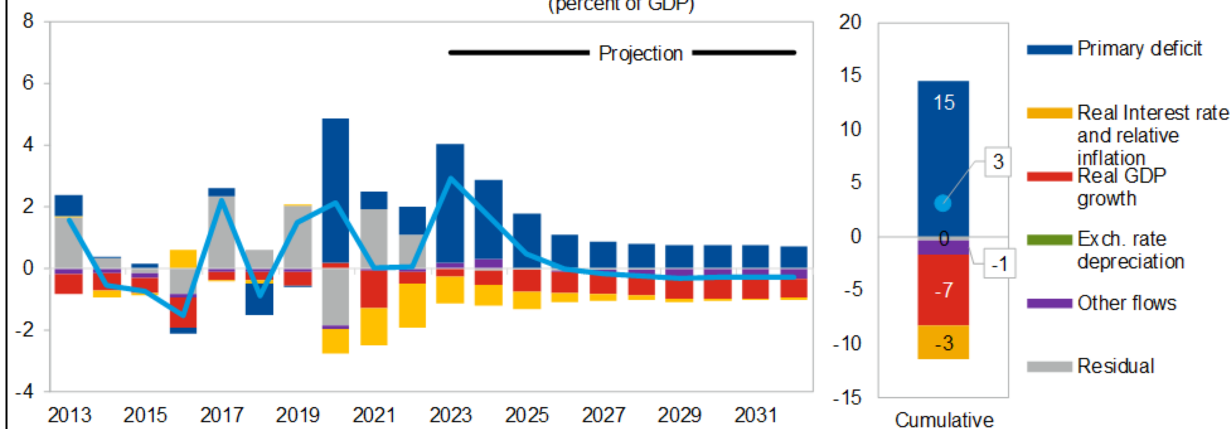
Note: The perimeter shown is general government.

Commentary: The debt is held exclusively by external private creditors and is held in domestic currency limiting exchange rate risk. With the bulk of the debt having a maturity > 5 years, the impact of the current increase in interest rates will only be felt gradually.

Figure 4. Luxembourg: Baseline Scenario

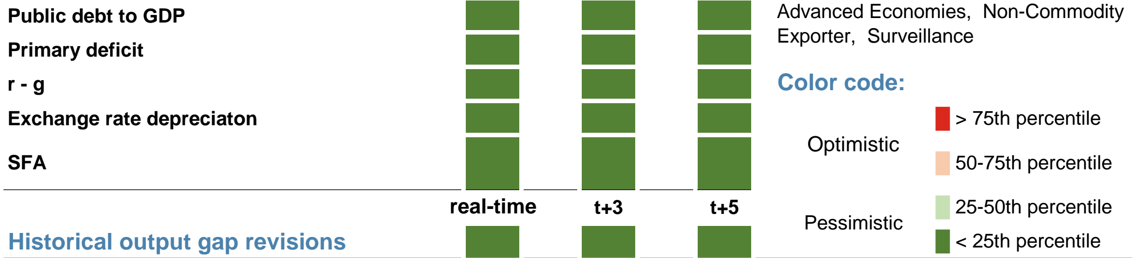
(percent of GDP unless indicated otherwise)

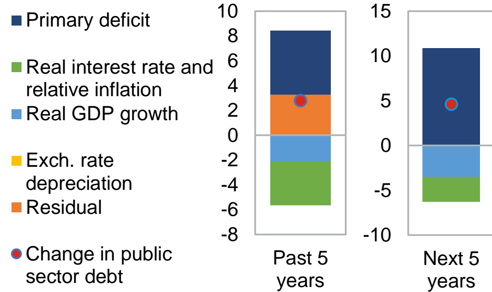
	Actual	Medium-term projection						Extended projection			
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Public debt	24.6	27.5	29.2	29.6	29.6	29.4	29.2	28.9	28.6	28.3	28.1
Change in public debt	0.1	2.9	1.7	0.5	0.0	-0.2	-0.2	-0.3	-0.3	-0.3	-0.3
Contribution of identified flows	-1.0	2.9	1.7	0.5	0.0	-0.1	-0.2	-0.3	-0.3	-0.3	-0.3
Primary deficit	0.9	3.8	2.6	1.8	1.1	0.9	0.8	0.8	0.8	0.7	0.7
Noninterest revenues	30.0	29.8	30.5	30.7	30.9	31.5	31.6	31.0	30.4	29.8	29.2
Noninterest expenditures	30.9	33.6	33.1	32.5	32.0	32.4	32.4	31.7	31.1	30.5	29.9
Automatic debt dynamics	-1.8	-1.1	-1.1	-1.3	-1.0	-0.9	-0.8	-0.8	-0.7	-0.7	-0.7
Real interest rate and relative inflation	-1.5	-0.8	-0.7	-0.6	-0.3	-0.2	-0.2	-0.1	-0.1	-0.1	-0.1
Real interest rate	-1.5	-0.8	-0.7	-0.6	-0.3	-0.2	-0.2	-0.1	-0.1	-0.1	-0.1
Relative inflation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Real growth rate	-0.4	-0.3	-0.5	-0.7	-0.7	-0.7	-0.7	-0.7	-0.6	-0.6	-0.6
Real exchange rate	0.0	...	...	...	...	...	...	...	...	...	...
Other identified flows	-0.1	0.2	0.3	0.0	-0.1	-0.1	-0.2	-0.3	-0.3	-0.3	-0.3
Contingent liabilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other transactions	-0.1	0.2	0.3	0.0	-0.1	-0.1	-0.2	-0.3	-0.3	-0.3	-0.3
Contribution of residual	1.1	0.0	-0.1	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0
Gross financing needs	2.3	6.2	3.1	3.5	3.7	4.0	3.0	2.7	3.0	3.3	3.5
of which: debt service	1.5	2.5	0.7	1.9	2.8	3.4	2.6	2.3	2.6	2.8	3.1
Local currency	1.5	2.5	0.7	1.9	2.8	3.4	2.6	2.3	2.6	2.8	3.1
Foreign currency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Memo:											
Real GDP growth (percent)	1.5	1.1	1.7	2.5	2.4	2.3	2.3	2.3	2.3	2.3	2.3
Inflation (GDP deflator; percent)	6.4	3.6	3.1	2.9	2.1	2.0	2.0	2.0	2.0	2.0	2.0
Nominal GDP growth (percent)	8.1	4.7	4.9	5.4	4.5	4.4	4.3	4.3	4.3	4.3	4.3

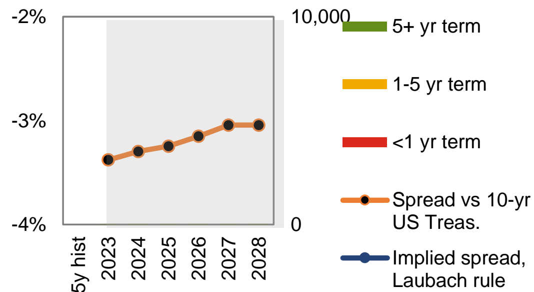


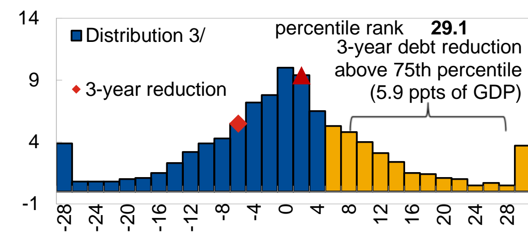
Staff commentary: Public debt will rise a bit but then stablize, reflecting expectations of a narrowing of primary deficits and stable economic conditions.

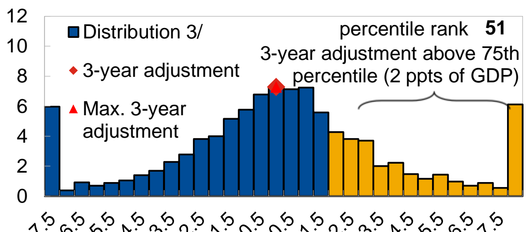
Figure 5. Luxembourg: Realism of Baseline Assumptions

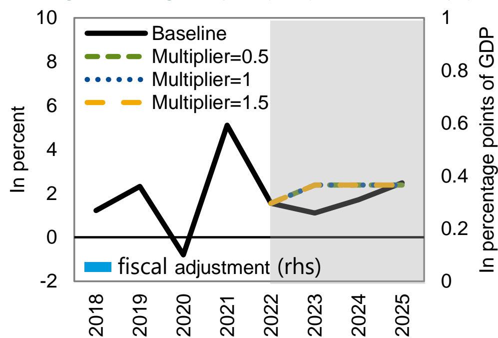


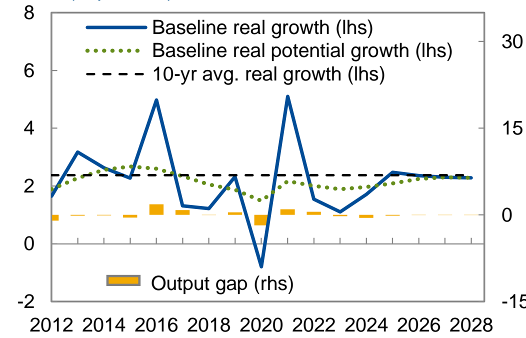












Commentary: The realism analysis does not point to major concerns: past forecast errors do not reveal any systematic biases and the projected fiscal adjustment and debt reduction are well within norms.

Figure 6. Luxembourg: Medium-term Risk Analysis

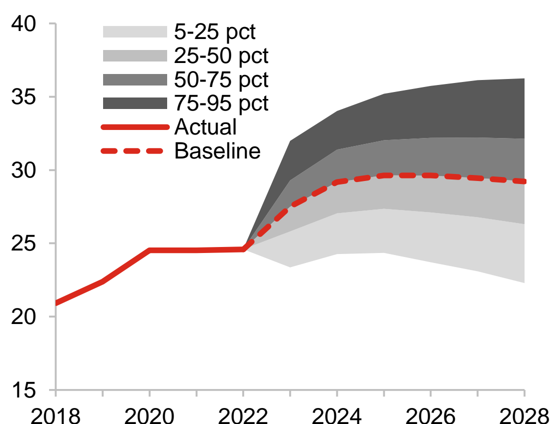
Debt fanchart and GFN financeability indexes

(percent of GDP unless otherwise indicated)

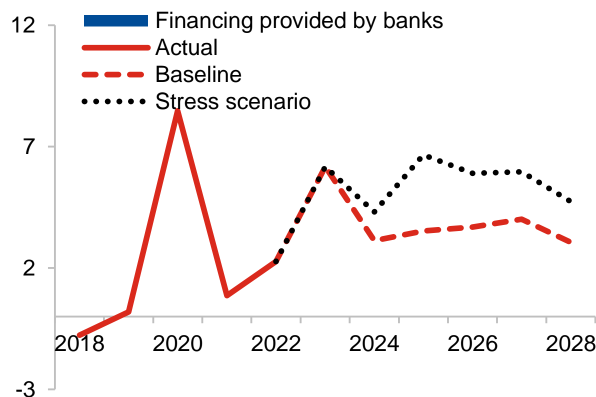
Module	Indicator	Value	Risk index	Risk signal	Adv. Econ., Non-Com. Exp, Program (0 – 25 – 50 – 75 – 100)
Debt fanchart module	Fanchart width	14.0	0.2	…	
	Probability of debt not stabilizing (pct)	51.2	0.4	…	
	Terminal debt level x institutions index	3.3	0.1	…	
	Debt fanchart index	**…**	**0.7**	**Low**	
GFN finance-ability module	Average GFN in baseline	3.9	1.3	…	
	Bank claims on government (pct bank assets)	1.2	0.4	…	
	Chg. in claims on govt. in stress (pct bank assets)	0.9	0.3	…	
	GFN financeability index	**…**	**2.0**	**Low**	

Legend: Interquartile range; Luxembourg

Final Fanchart (pct of GDP)



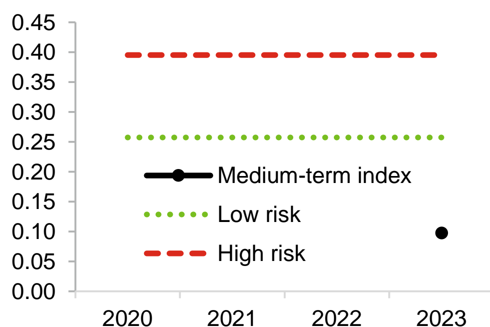
Gross Financing Needs (pct of GDP)



Triggered stress tests (stress tests not activated in gray)

Banking crisis | Commodity prices | Exchange rate | Contingent liab. | Natural disaster

Medium-term Index



Medium-term Risk Analysis

Debt fanchart index	1.1	2.1	0.5	0.2
GFN finaceability index	7.6	17.9	0.5	0.0
Medium-term index (MTI)	0.3	0.4	…	0.1, Low

Prob. of missed crisis, 2023-2028 (if stress not predicted): 0.0 pct.

Prob. of false alarm, 2023-2028 (if stress predicted): 89.8 pct.

Commentary: Of the two medium-term tools, the Debt Fanchart Module is pointing to higher levels of risk, while the GFN Financeability Module suggests lower level of risk. In both cases, risks of debt distress are low.

Annex V. Implementation Status—FSAP Update 2017 Recommendations

Table 1. Luxembourg: FSAP Update 2017: Key Recommendations		
Recommendations	**Timeframe**	**Status**
General/Cross-Cutting		
1. Continue resource allocation toward risk-based supervision at BCL, CSSF and CAA.	NT	• The CSSF assesses the correspondence between resources and needs from a risk-based perspective on an ongoing basis. • The CAA regularly hires new staff—all will be involved in risk-based supervision. The CAA grew by approximately 13 units (FTE) in 2021 and by 12 units (FTE) in 2022. • In line with the principle of risk-based supervision, BCL has expanded its resources dedicated to the direct supervision of credit institutions (e.g., for liquidity risk) as well as general risk analysis on the financial sector by 30 percent.
2. Increase engagement with supervision and resolution authorities in countries where Luxembourg's Less Significant Institutions (LSIs) and investment funds conduct significant activities.	NT	• Banking supervision: The CSSF's participation in joint supervisory teams and colleges and the establishment of annual meetings covers 80 percent of bank assets. For the rest, memoranda of understanding have been concluded. • Resolution: The CSSF has bilateral contacts and participates in resolution colleges, either as group level resolution authority or resolution authority of a subsidiary. • Investment funds: The CSSF has regular bilateral meetings and exchanges, including regarding the delegation of activities, with EU/third-party supervisory authorities (such as France, Ireland, Germany, Switzerland, the United Kingdom, the United States and Asian jurisdictions). These bilateral exchanges continued in 2021 and 2022, being more frequent of course due to the outbreak of the Russia-Ukraine crisis in March as well as at the height of the "mini-budget" episode in the UK in September/October. The CSSF has continued its firm engagement in relation to regular bilateral discussions which its peers in the EU and third-party countries. Since 2020, the CSSF requests standardized information from regulators of the jurisdictions to which Luxembourg fund managers mostly delegate portfolio management activities. In 2021, these also cover distribution activities performed by delegates abroad. The CSSF plans to perform in 2023 a thematic inspection on the oversight performed by IFMs on their delegated portfolio managers based outside Luxembourg. In this context, it is foreseen to actively engage with regulators in the relevant jurisdictions.
3. Enshrine in legislation the operational independence of the CSSF and CAA, and introduce (CSSF, CAA) or update (BCL) board member codes of conduct	NT	• The ECB modified in 2022 its 2019 Code of conduct for High-Level ECB Bodies (the "Single Code"). The Single Code applies to the Governing Council member and his/her alternate and to the Supervisory Board member and his/her alternate. The 2022 Single Code entered into force on 1 January 2023. • The CAA Board's internal rules have been formally updated in mid-2021 and now include a "conflict of interest" policy. • The BCL Code of conduct is in the process of being reviewed, further to the adoption by the ECB of two Guidelines laying down the principles of the Ethics Framework: 1) Guideline for the Eurosystem (EU) 2021/2253 (ECB/2021/49), repealing Guideline (EU) 2015/855 (ECB/2015/11), and 2) Guideline for the SSM (EU) 2021/2256 (ECB/2021/50), repealing Guideline (EU) 2015/856 (ECB/2015/12).
Risk Analysis		

Table 1. Luxembourg: FSAP Update 2017: Key Recommendations		
Recommendations	**Timeframe**	**Status**
4. Examine merits of a regulatory LCR requirement in FX at the group level and step-up monitoring of related FX liquidity risk.	MT	• This recommendation is being considered by the ECB and the EC.
5. Provide industry guidance on liquidity stress test modalities and liquidity management tools for investment funds, and develop internal liquidity stress testing capacity.	NT	• The CSSF has actively contributed to IOSCO and EU level initiatives on liquidity risk management, including the ESRB Expert Group on Investment Funds (http://www.iosco.org/news/pdf/IOSCONEWS486.pdf). ESRB Recommendations on liquidity and leverage risks in investment funds (ESRB/2017/6) have been addressed to the European Commission to take legislative action on liquidity risk management, including making more Liquidity Management Tools (LMTs) available in Europe, but also thereafter to provide ESMA guidance on the enhanced scope. This will be implemented via the AIFMD/UCITS review which is currently being negotiated. The CSSF supports guidance on LMTs at a European level, but has also provided guidance to the industry in the context of the Covid-19 and the Russia-Ukraine crises. • FSB and IOSCO have performed further analysis on the appropriateness and effectiveness of their respective 2017 and 2018 recommendations, especially relating to liquidity risk. Based on the outcome of this 2022 analysis further work will be performed in 2023, including revisions to the FSB 2017 recommendations, IOSCO work on developing detailed guidance regarding the design and use of LMTs, enhancement of the availability of OEF-related data for financial stability monitoring and the organization of a workshop to promote sharing of experiences among authorities on the design and use of fund- and system-level stress tests. Some of the work has already started in January this year with CSSF actively participating in this work. • The study on the effectiveness of LMTs in collaboration with the BIS has been published on 14 June 2022. • ESRB Recommendations (as above) addressed to ESMA also cover guidance on liquidity stress testing by asset managers. The CSSF actively contributed to ESMA's guidelines on liquidity stress testing in UCITS and AIFs published in September 2019, which became applicable at end-September 2020, and which the CSSF has implemented into the local regulatory framework via CSSF Circular 20/752. The CSSF also actively contributed to ESMA's development of stress testing guidelines under the MMF Regulation as well as related MMF reporting guidelines. The CSSF also contributes to and implements the yearly update of the ST parameter calibration. End of January 2023, ESMA has started a consultation on the review of the methodology in the guidelines on stress test scenarios for MMFs under the MMFR. • Internally, the CSSF implemented an annual liquidity stress testing (LST) framework, and continues to improve it (2021 exercise: second round effects, extension of asset classes) based amongst others on experience with the 2020 CSA Liquidity, ESMA-ESRB work (and 2021 follow-up (data collection)), as well as experience from the COVID-19 crisis. In this context, the CSSF very recently published on 9 March 2023 a dedicated working paper on its own liquidity stress testing framework applicable to Luxembourg investment funds. • The CSSF considers the recommendation on LST industry guidance and development of internal liquidity stress testing capacity to be finalized, while the

Table 1. Luxembourg: FSAP Update 2017: Key Recommendations		
Recommendations	**Timeframe**	**Status**
		work on guidance on LMTs for investment funds currently is ongoing within the AIFMD/UCITS review as well as at FSB and IOSCO Level. • The BCL contributes to the work of the ESRB Non-Bank Financial Intermediation Expert Group. In this context, the BCL actively contributed to the elaboration of the ESRB Recommendation on reform of money market funds (ESRB/2021/9), which covered, among other elements, liquidity management tools (LMTs) for MMFs. • Following the outbreak of the COVID-19 pandemic, the BCL contributed to the work of the *ad hoc* ESRB workstream on market illiquidity and implications for asset managers and insurers. The group's work resulted in (i) the publication of a public statement by the ESRB emphasizing the importance of the availability and timely use of LMTs, especially in times of stressed market conditions, and (ii) the ESRB Recommendation on liquidity risks in investment funds (ESRB/2020/4). Industry participants were informed about the content of the ESRB public statement and the ESRB Recommendation via a BCL/CSSF press release. • The BCL contributed to the development of a system-wide stress testing framework by the ECB Working Group on Stress Testing. The framework combines liquidity stress for investment funds and liquidity-solvency feedback loops for banks and was published as an ECB Working Paper. • The BCL contributes to the work of the ESRB Task Force on Stress Testing, which develops the adverse scenarios for ESMA's MMF stress testing. • To better assess the risks related to investment funds, the BCL has developed a set of forward-looking conditional systemic risk measures. These measures are applicable to various categories of investment funds, conditional on severe market declines, and are based on a dynamic multivariate copula approach to calibrate shocks. The measures can capture the non-linear time-varying dependence structure in the tails of the distributions of IF returns and flows, thereby facilitating the identification of potential spill-over effects across fund categories. The BCL applies these measures to both the flows and net asset values of seven categories of investment funds in Luxembourg. This work was published in the BCL's 2022 Financial Stability Review.
6. Continue to contribute to discussions within ESMA on leverage, with a view to developing a single methodology for measurement of leverage across the fund industry.	MT	• The discussion at IOSCO on a consistent measure of leverage was finalised and the final report was published in December 2019. These recommendations will possibly be implemented in EU rules in the context of the currently negotiated AIFM/ UCITS review, which has also been highlighted in ESMA's letter to the EU Commission. IOSCO has agreed on the global collection/ publication of consistent measures of leverage (Recommendation 4) and published its second yearly report in January 2023. • An ESRB Recommendation (Feb. 2018) requested ESMA to develop guidance on the design, calibration and implementation of macroprudential leverage limits in the context of the AIFMD (Art. 25) for National Competent Authorities (NCAs). ESMA finalized these guidelines in December 2020 with active contribution by the CSSF. The CSSF actively contributed at the ESMA level in 2021 to develop a methodology for the concrete implementation of those guidelines, which became applicable on August 23, 2021. In line with the ESMA guidelines, the CSSF is performing such Art. 25 analysis on a quarterly basis now. • ESMA has done an analysis of real estate investment funds in Europe with respect to leverage and liquidity risks, in connection with the regular AIFMD Art. 25 analysis and Recommendation ESRB/2022/9 on vulnerabilities in the commercial real estate sector in the European Economic Area. These ESRB recommendations dated 25

Table 1. Luxembourg: FSAP Update 2017: Key Recommendations		
Recommendations	**Timeframe**	**Status**
		January 2023 require NCA (including CSSF) notably to consider taking measures in order to improve the monitoring of systemic risks stemming from the CRE market and to increase resilience of financial institutions in this area (including investment funds).
Macroprudential Policy		
7. Expand the macroprudential policy toolkit to include borrower-based lending limits.	I	• The law establishing a legal framework for borrower-based measures (BBMs) was adopted by Parliament in December 2019 (Law of 4 December 2019). It expands the existing macroprudential policy toolkit with a comprehensive set of BBMs. • Based on this law, in the event of persistent increases in house prices and in the volume of mortgage loans, coupled with a significant deterioration of lending ratios, the Systemic Risk Committee (CdRS) assesses whether such developments pose a risk to financial stability. Following a comprehensive risk assessment of residential real estate developments conducted by the BCL during 2020 in cooperation with the CSSF, the CdRS issued a Recommendation addressed to the CSSF in order to activate legally-binding loan-to-value (LTV) limits, differentiated across categories of borrowers (see CdRS Recommendation of 9 November 2020, (CRS/2020/005). • Following the above CdRS Recommendation, and after consultation with the BCL in order to find a common position, the CSSF issued Regulation N°20-08 (December, 2020) introducing differentiated LTV limits for mortgage loans as follows: (1) for first-time buyers (FTBs), the LTV limit is set at 100 percent; (2) for non-FTBs acquiring their primary residence, the LTV limit is 90 percent (some flexibility is introduced as banks may provide up to 15 percent of their annual portfolio of new mortgage loans with an LTV ranging from 90 to 100 percent); (3) for borrowers buying a property to be rented out (buy-to-let property), the maximum LTV limit is 80 percent. • The measure applies both to residential real estate (RRE) loans contracted by private households as well as legal entities such as a real-estate company constituted under civil law ("société civile immobilière" – SCI). • The CdRS is monitoring the implementation of the BBMs. To this end, the BCL conducts regular assessments of residential real estate developments, which are done at least quarterly and include the monitoring of house prices, mortgage credit and lending standards (on the basis of the CSSF's semi-annual reporting). The assessment takes into account the evolution of relevant indicators and model-based approaches. The BCL has published a short analysis on the effectiveness of the differentiated LTV limits in the Financial Stability Review 2022 (see Box 1.4 of the BCL FSR).
8. Continue to strengthen risk-based monitoring of the residential real estate market and bank-investment fund interlinkages, and close remaining related data gaps.	I	• Risk-based monitoring: The CSSF conducts a regular semiannual liquidity stress test of fund deposits for all depositary banks. It also performs an annual assessment of maturity transformation between liabilities and intragroup assets at all banks. • Investment funds-related data gaps: Discussions with the BCL and ECB are ongoing on access to the centralized securities data base (CSDB), possibly via an MoU between the CSSF and BCL. • Bank-investment fund interlinkages: Based on the network of exposures between banks and investment funds, the BCL conducts a network analysis on a quarterly basis to identify the banks that are most systemic. The analysis is based on connectivity measures that characterize the overall network (density, number of

Table 1. Luxembourg: FSAP Update 2017: Key Recommendations		
Recommendations	**Timeframe**	**Status**
		circuits as measured by the alpha index) and centrality measures that identify the most systemic individual banks (e.g., PageRank, degree, closeness). The results of this analysis are published on an annual basis in the BCL's Financial Stability Review. In addition, one of the centrality measures (PageRank) is used as one of twelve indicators in the Luxembourg *Other systemically important institution* (O-SII) framework. The inclusion of this indicator has led to the identification of additional O-SIIs since its introduction in the 2017 assessment. To complement the analysis of interlinkages between banks and investment funds, the BCL also developed an extensive monitoring framework for funds that covers liquidity, interest rate, credit and currency risk, as well as financial leverage. Further details are provided under item 10 below. In addition, as indicated under item 6 above, the BCL contributed to the development of a system-wide stress testing framework for banks and investment funds at the level of the ECB. The framework was published as an ECB Working Paper. • Monitoring of risks in the real estate market: The CSSF conducts an annual stress test of banks' exposures to residential real estate and regular analyses of the lending standards based on its semiannual bank level survey (CSSF Circular N°18/703 amended by CSSF circular N°20/737). The BCL continued to strengthen its risk-based monitoring of the residential real estate market and conducts regular assessment of the latest developments in the housing market. The BCL's risk assessment framework includes a comprehensive analysis of house price growth, overvaluation indicators (including statistical and model-based indicators of overvaluation, as well as estimates of downside risk with house price-at-risk modeling), mortgage credit developments (credit growth, credit-to-GDP gap, lending standards, pockets of risky lending), household debt, domestic bank exposures and mortgage risk-weights. Both the BCL and the CSSF participate in SSM and ECB/ESRB working groups on residential real estate. The BCL also participates in the BIS CGFS Study Group on housing policies. • Real estate-related data gaps: CSSF Circular N°18/703 issued in December 2018 and amended by CSSF circular N°20/737 of 19 February 2020 formalizes the data collection on real estate-related indicators. The Circular is based on the ESRB's recommendation on closing real estate data gaps (ESRB/2016/14) and provides harmonized definitions of relevant borrower-related residential real estate indicators. The data are collected on a semiannual basis. Since June 2020, new data on residential real estate loans are also available on a quarterly basis in the financial reporting (FINREP), including LTV distributions. The BCL has also participated in the ESRB's Assessment Team for the compliance with ESRB/2016/14; as a result of the progress made in closing real estate data gaps, Luxembourg has been assessed as Largely Compliant for residential real estate and Fully Compliant for commercial real estate. (Please refer also to item 16.)
9. Strengthen monitoring of systemic risk in the investment fund industry and, in alignment with international and European efforts, develop instruments	NT	Monitoring of systemic risk: The CSSF has further increased surveillance of systemic risks in the fund sector, including by continuing to close data gaps via use of multiple data sources (such as UCITS risk reporting, AIFMD reporting, EMIR, external data providers), by developing its risk surveillance framework (based on risk categories / risk drivers), by building a risk dashboard for the sector, by conducting regular liquidity stress testing of funds, and by preparing regular thematic risk analyses (e.g. exposure of bond funds to interest rate risk in a context of rising yields, on real estate funds, on LDI funds). The BCL developed an extensive monitoring framework for funds that covers liquidity risk (e.g., cash, HQLA

Table 1. Luxembourg: FSAP Update 2017: Key Recommendations		
Recommendations	**Timeframe**	**Status**
to take preemptive measures to mitigate these as appropriate.		holdings), interest rate risk (duration), credit risk (credit ratings) and currency risk, as well as financial leverage. To ensure that systemic risk in the investment fund sector is adequately monitored, the risk indicators are calculated at a monthly frequency for the aggregate investment fund sector, different types of funds, as well as individual funds. The data underlying the risk indicators comes from the BCL's statistical and security-by-security reporting. The main results of the monitoring exercise are regularly presented in the Surveillance Note prepared by the BCL for the CdRS and a summary of the results is published annually in the BCL's Financial Stability Review. • At the European and international level, the BCL also participates actively in the monitoring of systemic risk in the investment fund industry by contributing to the analytical work and drafting of the ESRB's *EU Non-Bank Financial Intermediation Risk Monitor* and the FSB's *Global Monitoring Report on Non-Bank Financial Intermediation* (GMR). In the context of the FSB's GMR, the BCL also provides the majority of the data for Luxembourg underlying the FSB's monitoring exercise. Ad hoc (IT backed and integrated in the eDesk platform) crisis reporting to be used in times of stress as well as a daily Undertakings for Collective Investment (UCI) monitoring dashboard initially set up in the context of the COVID-19 crisis are continuously being used in the context of the still ongoing Russia-Ukraine crisis as well as the recent bank turbulences, complementing the early warning reporting that has been in place already since before the crisis. The CSSF actively participates in relevant working groups both at the European and international level. • Please also refer to our regular work on Art. 25 AIFMD, as already pointed out under recommendation 6, especially looking at highly leveraged investment funds and possibly taking regulatory actions (macroprudential leverage limits), if deemed necessary. This follows related ESRB recommendations in 2018. • In 2020, a common supervisory action has been conducted in Europe to check for compliance with the UCITS liquidity risk management rules. The CSSF contributed and reported to ESMA at end-2020, while ESMA published the results in its final report in March 2021. After further follow-up work, the CSSF informed the local market on its local findings in June 2021. • Also in 2020, the CSSF contributed to an ESRB liquidity risk exercise for funds with significant exposures to corporate debt and real estate assets (ESRB/2020/4)), to assess the preparedness of these two segments to potential adverse shocks. ESMA's report to the ESRB was published in November 2020 (see ESMA34-39-1119) and follow-up work on identified outliers was performed in 2021. In this context, the CSSF launched a follow-up industry questionnaire in July 2021 (encompassing also identified CSA liquidity and LST outliers) and reported back to ESMA on its findings by end-October 2021. • The CSSF also performed analytical work on large redemptions in investment funds during Covid-19 and published a related working paper in October 2021. As mentioned under recommendation 5, the CSSF also published a working paper on the effectiveness of LMTs as well as its internal liquidity stress testing approach.
		• Preemptive measures: The operationalization of ESRB-Recommendations (2018) has been finalized at the ESMA-Level (including the implementation of liquidity stress testing guidelines, and the implementation of Art. 25 AIFMD in August this year (see higher)).

Table 1. Luxembourg: FSAP Update 2017: Key Recommendations

Recommendations	Timeframe	Status
10. Strengthen the institutional framework to increase the willingness to act, including by enshrining in the law the *de facto* leading role of the BCL.	MT	• The authorities consider the current institutional framework to be adequate.
11. Publish the risk dashboard and a note assessing systemic risk.	MT	• The CdRS has published the substance of the macro-financial risk analysis in 2019. • As part of its annual report, the CdRS publishes each year an overview of its actions and activities as well as a subset of risk dashboard indicators.
Banking Regulation and Supervision		
12. Increase the intensity of supervision over intra-group exposures, with banks required to demonstrate continued eligibility in their use of large exposure limit waivers.	NT	• The ongoing monitoring by the CSSF has been strengthened, including ongoing supervision by line supervisors, quarterly monitoring of large exposures, including also intragroup exposures, and an escalation process to reevaluate eligibility for the waiver in case of ad hoc information, also in the context of the SREP. • Since mid-2018, the monitoring has been enhanced with the new EU monthly reporting on maturity mismatches. In early-2019 an additional resource dedicated to reviewing existing waivers has been recruited. • The CSSF continues to weekly (daily in case of crisis) monitor the Rating and CDS of parent entities and other main intra-group counterparties and to conduct its annual horizontal review of intra-group exposures and waivers, which serves as a basis for individual waiver reviews. • In January 2021, the CSSF finished an extensive stock taking on the treatment of LU banks' intra-group exposures in case of a bail-in of the group, per jurisdiction of the consolidating entity. • In accordance with paragraph 2 of Article 56-1 of the LFS, the CSSF has used its powers to limit the use of the waiver on some occasions. Thus far, these limitations have, in the end, meant a complete withdrawal of the waiver (or an objection to start using the waiver when it comes to a new bank).
13. Continue monitoring the ability of banks to absorb a real estate market price decline	C	• The CSSF continues to conduct an annual stress test analysis based on bank individual LTV distributions. The analysis takes into account extreme price declines and high default rates in Luxembourg's residential real estate market, leading to capital losses and risk-weighted asset increases at the same time. The results are incorporated in the annual CSSF-Solvency Stress Test. • Results are shared and discussed with the supervisors in charge and are considered in ongoing supervision as well as in the SREP.
14. Increase frequency of on-site inspections of subsidiaries of SIs.	C	• This recommendation should be addressed to the ECB as the SSM is implementing this recommendation.
15. Harmonize data reporting standards	I	• Harmonized definitions for the LTV and DSTI ratios as well additional relevant indicators are included in CSSF circular N°18/703, following the ESRB's

Table 1. Luxembourg: FSAP Update 2017: Key Recommendations		
Recommendations	**Timeframe**	**Status**
for loan-to-value and debt-to-income ratios.		recommendation ESRB/2016/14. The data requested under the CSSF circular is semiannual. • Data reporting has been further harmonized through the issuance of CSSF circular N°20/737 (18/703 amended). • The results of the data collection are assessed twice a year by the CSSF and the BCL in order to identify potential risks linked to the residential real estate market. The CSSF also makes sure that the entities apply the harmonized definitions of the ratios collected and ensures the quality and accuracy of the data received. • In its capacity as hosting the Secretariat of the Systemic Risk Committee (CdRS), the BCL chairs the national working group on real estate data gaps ("Groupe de travail sur les données immobilières") established in 2019. The national working group is composed of representatives of the BCL, the CSSF, the CAA, the Ministry of Finance and STATEC and facilitates the coordination and development of a harmonized set of real estate indicators for banks, funds and insurers (where applicable) as well as a set of physical CRE market indicators as recommended in ESRB/2016/14 and ESRB/2019/3. In 2021, after coordination with the national working group and the BCL, the CSSF has launched a regular data collection on commercial real estate for investment funds. To date, as part of its follow-up of recommendations, the ESRB has assessed LU as fully compliant with respect to commercial real estate and largely compliant with respect to residential real estate (please refer also to item 9). In line with the ESRB's recommendations, the national working group will continue and complete its work on physical CRE market indicators under the aegis of the CdRS Secretariat ensured by the BCL.
Investment Fund Regulation and Supervision		
16. Strengthen guidance on substance in the context of delegated activities and actively engage with regulators in jurisdictions where such activities are prominent.	NT	• The CSSF issued specific guidance on substance requirements in the context of delegated activities in CSSF Circular 18/698. • The CSSF has regular bilateral meetings with EU/third-party supervisory authorities (such as, France, Ireland, Germany, Switzerland, and Asian jurisdictions) as well as the U.S. securities regulator. These exchanges do not only cover general topics, but are often also centered around individual companies, often with a particular focus on specific issues with such firms, including delegation. • The CSSF initiated standardized information requests to regulators of jurisdictions to which Luxembourg fund managers mostly delegate collective portfolio management activities. In 2021, these also cover distribution activities performed by delegates abroad. • The CSSF plans to perform in 2023 a thematic inspection on the oversight performed by IFMs on their delegated portfolio managers based outside Luxembourg. In this context, it is foreseen to actively engage with regulators in the relevant jurisdictions.
17. Issue guidance on the holdings of directorships of funds and their managers.	NT	• The CSSF has issued specific guidance on the holdings of directorships of funds and their managers in CSSF Circular 18/698 (published on August 23, 2018).
18. Assess whether safeguards to ensure depositary	NT	• The CSSF started revisiting this issue internally in 2018. Discussions with industry representatives within the CSSF UCI Committee started in early 2019. The CSSF concluded that it is neither necessary nor appropriate to implement depositary

Table 1. Luxembourg: FSAP Update 2017: Key Recommendations		
Recommendations	**Timeframe**	**Status**
independence are adequate.		independence requirements beyond the requirements outlined in the EU Directive 2014/91/EU relating to undertakings for collective investment in transferable securities as regards depositary functions, remuneration policies and sanctions (the UCITS V Directive).
Insurance Regulation and Supervision		
19. Implement revised early warning system under Solvency II regime.	NT	• The CAA has designed a risk-based early warning system based on a risk appetite level chosen by insurance and reinsurance undertakings. The early warning system is based on the risk appetite which every insurance and reinsurance undertaking must define internally (as a part of its Own Risk and Solvency Assessment (ORSA) process). • The CAA has introduced a new dashboard in 2022 which is not an early warning system per se but is still relevant to explain under this point. If a direct insurance undertaking shows a solvency ratio under 110% (end of the year or end of any given quarter), the case is brought before our executive board which can then decide to mandate an expert (for instance the statutory auditor) to verify their solvency calculations. The cost is borne by the undertaking itself.
Contingency Planning and Financial Safety Nets		
20. Develop policies on intragroup exposures and the transfer of custodian functions in recovery and resolution.	I	• Recovery: – As part of the recovery plan assessment, the CSSF verifies whether the list of recovery options includes the option of selling/transferring the custodian functions to another institution. The impact and credibility of each recovery option are assessed pursuant to provisions set forth in the EBA Single Supervisory Handbook's module on the supervisory assessment of recovery plans. – As regards intra-group exposures, recovery plans typically include, within the section on inter-connectedness, information about the exposure to the Group, if material. – However, given structural developments in the custodian bank market, the largest depositaries (almost all of the top ten) operate locally as branches of banks having their head-office in another member state and are thus not required to submit a recovery plan to the CSSF.
		• Resolution: – In the absence of a Single Resolution Board (SRB) formal policy regarding depositary banks—particularly for collective investment schemes (CIS), the CSSF has not put in place its own policy regarding the use of transfer tools for the purpose of transferring the depositary function. Nonetheless, the SRB has elaborated a set of guidance notes, including on the sale of business tool, and a resolution planning manual (RPM) requiring Internal Resolution Teams (IRTs) to assess whether the preconditions for the effective use of a transfer strategy, e.g., the sale of business tool, can be met. Thus, the SRB requires banks under its direct remit where a (partial) transfer tool is the preferred or variant resolution strategy to develop a separability analysis as well as a transfer playbook. A new chapter on transfer tools has been added to the RPM to support IRTs in the assessment of the separability analysis reports submitted

Table 1. Luxembourg: FSAP Update 2017: Key Recommendations		
Recommendations	**Timeframe**	**Status**
		by the banks. Furthermore, it can be mentioned that the CSSF and the SRB have exchanged regularly on the topic of the criticality of the depositary function. – Resolution plans have been drafted and approved by the CSSF, both for banks with a specialized business model and for banks providing the custodian function next to other functions (such as private banks), covering all LSIs (with the exception of those who were recently established). The drafting of these plans and notably the identification of the preferred resolution strategy, including any assessment of the use of transfer tools, other resolution tools, or winding up under normal insolvency proceedings, has been undertaken on a case-by-case basis taking into consideration notably the volume of net assets from CIS as well as any potential contagion effects (e.g., funds of funds). Consistency throughout resolution plans has nevertheless been ensured. In line with legal and operational requirements, the draft plans have been submitted to the SRB to enable the latter to ensure its oversight function. – For intragroup exposures, the new point (h) of article 44(2) BRRD (as added by article 1, point (15)(a)(ii) of Directive (EU) 2019/879 (BRRD2)) provides the mandatory exclusion from bail-in of certain intragroup exposures, i.e., liabilities to institutions that are part of the same resolution group without being themselves resolution entities. This provision was transposed into national law on May 20, 2021.
Financial Market Infrastructure Oversight		
21. Reduce Clearstream Banking Luxembourg (CBL)'s exposure to commercial banks vis-à-vis CSDs and central banks.	NT	• CBL's dependencies on commercial banks have been reduced for most of the relevant currencies (i.e., EUR, GBP, USD) by having multiple (at least three) Correspondent Central Banks (CCBs) to reduce the concentration risk on a particular CCB. Additional CCBs will still have to be appointed for CHF and JPY. • In addition to this, Clearstream has defined contingency measures aimed at executing a switchover from an appointed CCB to another defined CCB, in case of unavailability of services of the first one. • Robust testing and communication plans have already been defined for the USD currency. Similar contingency measures are planned to be implemented and tested for the other major currencies in the course of the coming year in order to ensure that in case of unavailability of services, CBL can switch over all payments flows from one CCB to another CCB within Clearstream, with a Recovery Time Objective (RTO) of 2 hours.
22. Require establishment of third data center and conduct a full failover test.	NT	• Establishment of a third data centre: CBL is currently in the process of re-evaluating its data-centre strategy, including cloud strategy. No final decisions have been made yet. The discussions (including the proposed way forward as regards the third data centre) are ongoing. (Note: Situation is currently still the same) • Conduct of a full failover test: CBL has successfully performed a failover test on January 29, 2019, which covered all critical Clearstream functions based in Luxembourg. Full failover tests are conducted every year as part of the Business Continuity testing framework, simulating the loss of CBL's primary facilities in Luxembourg and/or its staff according to a yearly test plan. Test parameters and simulated scenarios change from year to year to allow validation of different

Table 1. Luxembourg: FSAP Update 2017: Key Recommendations		
Recommendations	**Timeframe**	**Status**
		dimensions of CBL's recovery ability (e.g., duration of the test, announced/unannounced, full/scope or reduced scope).
AML/CFT		
23. Ensure the 2016/2017 national risk assessment focus adequately on Trust and Company Service Provider (TCSP) risks.	I	Luxembourg finalized its first National Risk Assessment (NRA) in September 2018 based on data available as end of 2017. The NRA covered, among others, TCSPs, and analyzed both the inherent risk as, well as mitigating actions. From an AML/CFT perspective, risks inherent in TCSPs' activities were assessed as "High". The update of the first NRA, covering 2018–19, was adopted in September 2020 and published in 2020. The 2020 NRA confirms the inherent risk linked to TCSP activity by financial and non-financial sectors as "High". A second update of the NRA is currently being finalized, to be published in 2023. • In addition, the NRA assessed the specific risk exposure of "legal entities and arrangements" and the inherent risk allocated to this category is "High". As a follow-up, the national coordination committee decided to perform a vertical (more granular) risk assessment (VRA LP&LA) on this subject which has been published in early 2022. It examines notably the different forms of legal persons and legal arrangements and categorizes them in different risk buckets. It also assesses the mitigation measures and the role of TCSPs in that context. Finally, to mention also the vertical risk assessment on terrorism financing adopted and published in a sanitized form in May 2022, which focuses inter alia. on the specific risks posed by the financial sector and notably non-profit organizations as they had been highlighted in the VRA LP&LA. • Following up on the 2018 NRA recommendations, the 2004 AML/CFT Law has been adapted in 2020 and requires every professional providing TCSP activity to register with their respective authority/self-regulatory body (SRBs), thereby improving supervision of these professionals from a national point of view. The SRBs were given similar powers for supervision and sanctioning as those of authorities and have since implemented a fully-fledged risk-based AML/CFT supervision. Exchanges at national or bi-lateral level among authorities and/or SRBs take place in order to harmonize TCSP supervision, where required (e.g., CSSF is regularly exchanging with the Luxembourg Bar or the Ordre des Experts Comptables). Ministry of Justice keeps a list of all persons providing TCSP activities in Luxembourg. In a wider context of fostering transparency of legal persons and legal arrangements, it should be mentioned that Luxembourg has put in place the 2019 Beneficial owner register and the 2020 Register of *fiducies* and trusts. • The CSSF is supervising the professionals offering TCSP services in the financial sector which fall under its remit. Considering the risk exposure highlighted in the NRAs, the CSSF has undertaken and published a sub-sectoral risk assessment (SSRA) in July 2020 to raise awareness and to provide guidance/supervisory expectations to professionals supervised by it and performing TCSP activity. This SSRA will be updated in 2023. CSSF AML/CFT questionnaires that are submitted annually by professionals include updated information on inherent risks and mitigation measures linked to TCSP activity, which is taken into account for the entity-level risk assessment. For example, the AML/CFT dedicated team supervising specialized PFS is composed of 5 persons (31.12.2022). Moreover, in 2022, specialized PFS department of the CSSF has created an AML/CFT expert working group focusing inter alia on TCSP activities (EWG). This EWG is composed of representatives of private sector

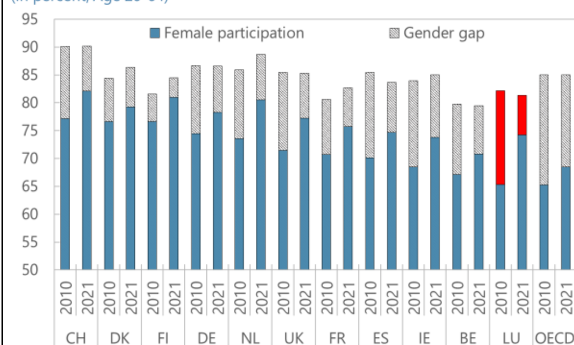
Table 1. Luxembourg: FSAP Update 2017: Key Recommendations		
Recommendations	**Timeframe**	**Status**
		associations, the CSSF and the Luxembourg FIU and aims to exchange on best practices of AML/CFT, typologies and ML/FT risks. CSSF is regularly raising awareness of the sector to the specific ML/FT risks present in that sector (e.g., in its annual AML/CFT Conference, dedicated podcasts, Newsletters, industry organized conferences, etc.). • More broadly, the legal framework and institutional set-up have been regularly updated in line with higher international standards, including the latest modifications to the AML/CFT legal framework (see for example the last change by the Law of 29 July 2022 further specifying the definition of TCSP in the 2004 AML/CFT Law).
24. Agree on the roles and responsibilities in dealing with a system-wide crisis.	NT	• This recommendation is being considered by the Ministry of Finance.
25. Finalize the operational modalities of emergency liquidity assistance provision.	MT	• The operational and legal framework for the provision of emergency liquidity assistance s in the process of being completely reviewed. In particular, the collateral framework has been reviewed and a monitoring of selected counterparties, including early warning indicators has been put in place. The process will be finalized during the first semester 2023.
Agencies: BCL = Banque centrale du Luxembourg; CAA = Commissariat aux Assurances; CBL = Clearstream Banking Luxembourg S.A.; CdRS = Comité du Risque Systémique; CSSF = Commission de Surveillance du Secteur Financier; ECB = European Central Bank; MoF = Ministry of Finance; MoJ = Ministry of Justice; SRB = Single Resolution Board; SREP = Supervisory Review and Evaluation Process. Time Frame: C = continuous; I (immediate) = within one year; NT (near term) = 1–3 years; MT (medium term) = 3–5 years.		

Annex VI. Gender Gap In Luxembourg: Recent Developments and Room for Further Progress

Luxembourg needs to use more efficiently its workforce to increase growth potential. Cognizant of this goal, the authorities have made great strides in reducing the gender gap during the last decade. This annex takes stock of these achievements and offers further actions to build on this success.

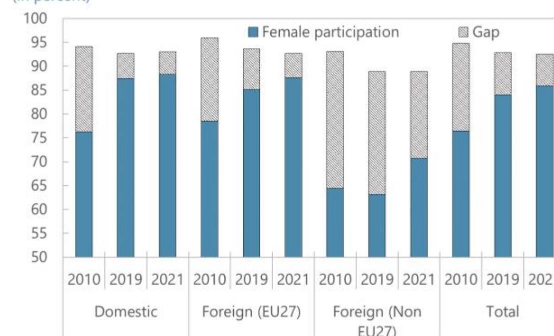
1. **Luxembourg has made remarkable progress in closing the gender participation gap over the last decade.** The authorities' introduction of parental/paternity leave, optional individual taxation, and measures to make the childcare costs more affordable have likely contributed to boosting female participation (employment) rate by 9 percentage points (ppt) over 2010-21. The gender participation gap has declined by 11 ppt, one the best performance in OECD countries. The COVID pandemic appears to have benefited female participation, especially for foreign non-EU women, likely reflecting tighter labor market, higher demand for female-dominated jobs (nurses, teachers, etc.) and greater work flexibility (remote work and flexible work arrangements). However, the activity rate for non-EU female workers remains well below male and other females. Similarly, while also closing, the reduction of gender participation gap for senior women (55-64) has been less impressive and female participation remains well below peer countries.

Gender Participation gap
(In percent, Age 20-64)



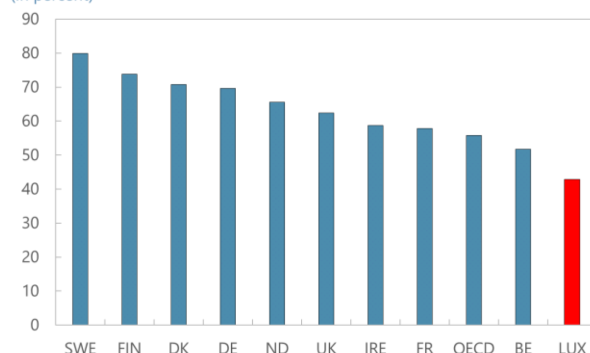
Sources: OECD and IMF staff calculations

Gender Participation by Citizenship (Prime Age Workforce)
(In percent)



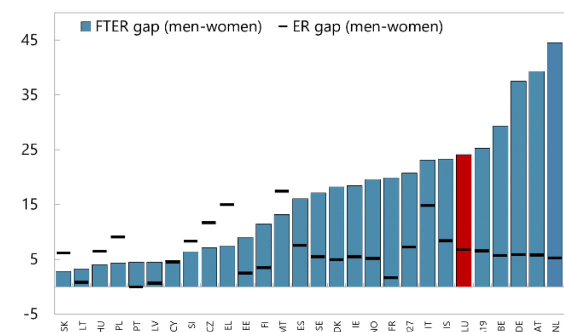
Sources: Eurostat and IMF staff calculations

Female Participation, Age 55-64
(In percent)



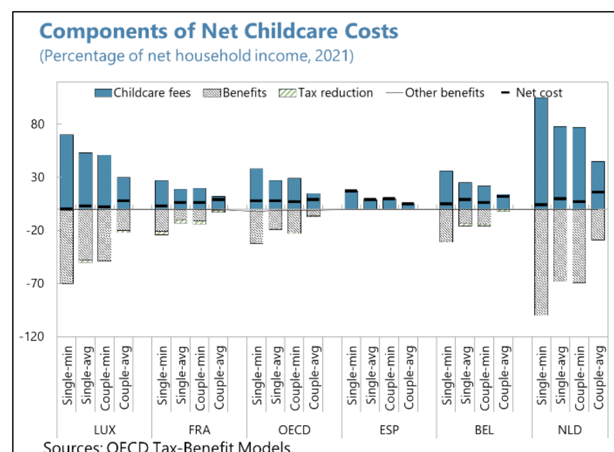
Sources: OECD

Gaps between male and female full-time equivalent employment rates (FTER) and employment rate (ER) in 2021

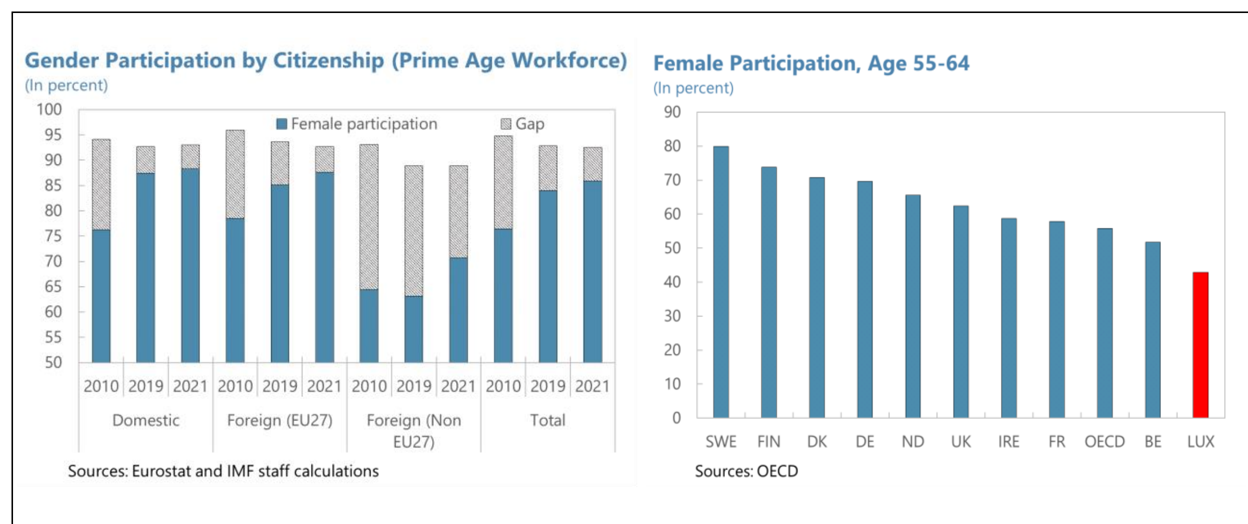


Sources: Eurostat.

2. The gender employment gap has also narrowed but about 30 of percent of employed women are working part-time, compared to 7 percent for men. The share of women working part-time increases to 38 percent for female Luxembourgers. Family care is in general cited as the most important reason for part-time employment. Childcare costs have been significantly reduced in the past for the low income. They remain nonetheless significant for couples with average wage, although comparable to peer countries. The authorities have recently made free after-school care and school meals.



3. Wage inequality at work has been also reduced significantly, although with some heterogeneity across sectors. Luxembourg has the lowest adjusted gender pay gap (controlling for characteristics such as age, experience, etc.) in Europe at 0.7 percent. In adjusted terms however, the wage gap varies substantially across sectors, reaching 22 percent in financial services. In part, this reflects differences in education levels, experience, occupation, and work time. Nonetheless, this could be also attributed to women underrepresented in managerial positions (e.g., in other financial auxiliaries), although there seems to be an upward trend for female managers.



4. Women are under-represented in technical jobs. Around a quarter of women work in education, health, and social work, compared to less than 10 percent of men. Women are 7 times less likely to work in science, technology, engineering, and mathematics (STEM) occupations (4 percent compared to 28 percent for men). The same picture seems to prevail for education pathways despite broadly similar PISA scores in math. While this is common across EU countries, in Luxembourg, the phenomenon could be strengthened by the large share of public employment and high public wage premium.

5. Building on recent progress, the authorities could consider several measures. While most of these measures are not necessarily gender-specific, potential gains in participation/employment could be more material for women.

- *Enhancing integration of (non-EU) foreign female workers.* To lock-in gains in participation during COVID, it would be useful to further facilitate work permits for spouses of expatriates and extend language support programs.
- *Incentivizing higher participation of seniors*. With the highest replacement rate in Europe, Luxembourg's generous pension system could encourage early retirement.[1] Reducing these disincentives to work, while promoting long-life learning may help keeping seniors in the labor force.
- *Increasing work flexibility and reducing commute time*. In addition to traditional flexible work arrangements, remote work offers a new opportunity to achieve a better work-life balance. In parallel, the authorities should continue investing in public transport to facilitate mobility, acknowledging travel hours and patterns, bus-stop proximity to key facilities (schools, daycare), increasing security in public transport, and more generally getting jobs closer to residential areas (spatial planning).[2]
- *Rethinking education and vocational training*. To encourage women to choose STEM occupations, the authorities should develop apprenticeships and internships (in STEM firms) for students. Promoting female entrepreneurship in STEM fields could serve as a role model for students and young professionals.
- *Taxation*. The increased tax credit for single parent wage earner could increase female labor supply as the elasticity of labor supply is generally found to be considerably higher for women than for men (Evers et al. 2008). Switching to individual taxation is more gender-neutral and less distortive for labor supply of women (by providing incentives for higher labor participation of the second earner). The resultant increase of the average tax burden for married or registered couples could be mitigated through progressive deductions or allowances over the first years. In the absence of such reform, the authorities could follow the Netherlands' example whereby the basic tax deduction of a non-working spouse could no longer be transferred to the breadwinner—an important step towards full individualization.[3]

---

[1] The average retirement age in Luxembourg is 59 ½ years old compared to a statutory retirement age of 65.

[2] According to EIB and EIGE studies, Luxembourg—the first EU country with free public transport—is the country in which the greatest proportion of women (56 percent) consider that giving up their car would be the hardest choice in contributing to climate action. 10 percent of women in Luxembourg identified public transport as the most likely place for such violence to occur.

[3] For more details, see De Mooij et al. (2020).

INTERNATIONAL MONETARY FUND

LUXEMBOURG

May 2, 2023

STAFF REPORT FOR THE 2022 ARTICLE IV CONSULTATION—INFORMATIONAL ANNEX

Prepared By European Department

CONTENTS

FUND RELATIONS 2

STATISTICAL ISSUES 4

FUND RELATIONS

(As of Feb 27, 2023)

Membership Status: Joined December 27, 1945; Article VIII.

General Resources Account:

	SDR million	Percent of quota
Quota	1,321.80	100.00
Fund holding of currency	967.35	73.18
Reserve Tranche Position	354.52	24.82
Lending to the Fund		
New Arrangements to Borrow	4.74	

SDR Department:

	SDR million	Percent of allocation
Net cumulative allocation	1,513.51	100.00
Holdings	1,562.27	103.22

Outstanding Purchases and Loans: None

Latest Financial Arrangements: None

Projected Payments to Fund (SDR Million); based on existing use of resources and present holdings of SDRs):

	Forthcoming				
	2023	2024	2025	2026	2027
Principal	0.02	0.02	0.02	0.02	0.02
Charges/Interest	0.02	0.02	0.02	0.02	0.02

Implementation of HIPC Initiative: Not applicable

Safeguards Assessments: Not applicable

Exchange Rate Arrangement: The exchange rate arrangement of the euro area is free floating. Luxembourg's participates in a currency union (EMU) with 19 other members of the EU and has no separate legal tender. The euro, the common currency, floats freely and independently against other currencies. Luxembourg has accepted the obligations of Article VIII, Sections 2, 3, and 4, and maintains an exchange system free of multiple currency practices and restrictions on the making of payments and transfers for current international transactions, other than restrictions maintained solely for security reasons, which have been notified to the Fund pursuant to the Executive Board Decision No. 144 (52/51).

Last Article IV Consultation: The last Article IV consultation was concluded on May 27, 2022. The associated Executive Board assessment is available at IMF Executive Board Concludes 2022 Article IV Consultation with Luxembourg and the staff report (IMF Country Report No. 21/93) at 1LUXEA2021001.pdf. Luxembourg is on the standard 12-month consultation cycle.

Financial Sector Assessment Program (FSAP) Participation and ROSC: The Financial System Stability Assessment (FSSA) for the last mandatory FSA was discussed by the Board on May 05, 2017. The FSSA and accompanying Reports on the Observation of Standards and Codes (ROSCs) are available at http://www.imf.org/en/Publications/CR/Issues/2017/05/15/Luxembourg-Financial-System-Stability-Assessment-44907

Anti-Money Laundering/Combating the Financing of Terrorism (AML/CFT): In February 2014, the Financial Action Task Force (FATF) recognized that Luxembourg had made significant progress in addressing deficiencies identified in the February 2010 mutual evaluation report and decided to remove the country from the regular follow-up process. The FATF report is available at http://www.fatf-gafi.org/countries/j-m/luxembourg/documents/fur-luxembourg-2014.html.

STATISTICAL ISSUES

A. Assessment of Data Adequacy for Surveillance

General: Data provision is adequate for surveillance, although macroeconomic data are sometimes released with a lag, and subject to substantial revisions. The Central Service for Statistics and Economic Studies (Statec) regularly publishes a full range of economic and financial data and provides an advance release calendar for main statistical releases at http://www.statistiques.public.lu/fr/agenda/calendrier-diffusion/index.html.

Online access to Statec's databases is available to all users simultaneously at the time of release through the Statistics Portal of Luxembourg. Key publicly accessible websites for macroeconomic data and analysis are:

Statistics Portal of Luxembourg	http://www.statistiques.public.lu/fr/
Statec	http://www.statec.public.lu/fr/index.html
Central Bank of Luxembourg	http://www.bcl.lu/en/index.php
Ministry of Finance	http://www.mf.public.lu/.

Monetary and Financial Statistics (MFS): Luxembourg reports monetary data to STA through the European Central Bank using standardized report forms (SRFs). The data cover only the depository corporations' sub-sector, which is central bank and the other depository corporations. Luxembourg also reports data on some key series and indicators of the Financial Access Survey (FAS), including two indicators of the United Nations' Sustainable Development Goals.

Financial soundness indicators (FSIs): The Central Bank of Luxemburg compiles FSIs in line with the *FSI Guide* methodology and reports to STA on a quarterly basis for posting on the IMF FSI website. The data cover 12 core and 11 encouraged FSIs for Deposit-takers; 1 encouraged FSIs for households; and 2 encouraged FSIs for real estate markets.

B. Data Standards and Quality

Luxembourg has moved up from the Special Data Dissemination Standard (SDDS) to the SDDS Plus on November 18, 2019. Luxembourg became the 22nd country in the world—and 12th country in the euro area—to adhere to the highest tier of the IMF Data Standards Initiatives. Luxembourg uses SDDS flexibility options on the timeliness of the analytical accounts of the central bank.

No data ROSC is available.

Luxembourg: Table of Common Indicators Required for Surveillance

(As of April 3, 2023)	Date of Latest Observation	Date Received	Frequency of Data[7]	Frequency of Reporting[7]	Frequency of Publication[7]
Exchange Rates	04/03/23	04/02/23	D	D	D
International Reserve Assets and Reserve Liabilities of the Monetary Authorities[1]	M2 23	M3 23	M	M	M
Reserve/Base Money	M2 23	M3 23	M	M	M
Broad Money	M2 23	M3 23	M	M	M
Central Bank Balance Sheet	M2 23	M3 23	M	M	M
Consolidated Balance Sheet of the Banking System	M2 23	M3 23	M	M	M
Interest Rates[2]	03/31/23	03/31/23	D	D	D
Consumer Price Index	M2 2023	M3 2023	M	M	M
Revenue, Expenditure, Balance and Composition of Financing[3]—General Government[4]	2022	M4 2023	A	A	A
Revenue, Expenditure, Balance and Composition of Financing[3]—Central Government	Q3 2022	M12 2022	Q	Q	Q
Stocks of Central Government and Central Government-Guaranteed Debt[5]	2022	M3 2023	A	A	A
External Current Account Balance	Q4 2022	M3 2023	Q	Q	Q
Exports and Imports of Goods	Q4 2022	M3 2023	M	M	M
GDP/GNP	Q4 2022	M3 2023	Q	Q	Q
Gross External Debt	Q4 2022	M3 2023	Q	Q	Q
International Investment Position[6]	Q4 2022	M3 2023	Q	Q	Q

[1] Including reserve assets that are pledged or otherwise encumbered.
[2] Both market-based and officially-determined, including discount rates, money market rates, and rates on treasury bills, notes, and bonds.
[3] Foreign, domestic bank, and domestic nonbank financing.
[4] The general government consists of the central government (budgetary funds, extra budgetary funds, and social security funds) and the state and local governments.
[5] Including currency and maturity composition.
[6] Includes external gross financial asset and liability positions vis-à-vis nonresidents.
[7] Daily (D); weekly (W); monthly (M); quarterly (Q); annually (A); irregular (I); and not available (NA).

Statement by Mr. Dresse and Mr. Scholer on Luxembourg Executive Board Meeting

May 17, 2023

The Luxembourg authorities thank Mr. Stavrev and his team for constructive and positive exchanges during the 2023 Article IV consultation. They broadly agree with staff's appraisal and, as in previous years, will carefully consider their thoughtful policy advice.

The authorities' comprehensive policy actions have successfully shielded the Luxembourg economy from the negative effects of recent years' significant global shocks. Since Russia's invasion of Ukraine, the government's actions – designed in close collaboration with social partners – provided much-needed predictability in an uncertain external environment and focused on protecting households' purchasing power, preserving companies' competitiveness, and maintaining employment. Against that backdrop, the independent national statistics agency now forecasts an economic recovery in 2023 and 2024 (2.4 percent and 3.8 percent respectively) with headline inflation expected to recede gradually to 2.6 percent over the medium-term.

In line with their proven track record and in view of continued high uncertainty, the authorities reiterate their firm commitment to far-sighted budgetary, financial, and economic policymaking. Notwithstanding multiple policy packages, the government adheres to its self-imposed target of maintaining public debt below 30 percent of GDP and aims to rebuild buffers to address potential future shocks. Amid financial market volatility, the authorities also reaffirm their strong commitment to a prudent regulatory and supervisory framework for the financial sector that maintains high capital and liquidity ratios. Finally, the recent external shocks serve as a powerful reminder that Luxembourg's tried-and-tested tradition of social dialogue is an effective tool to ensure social peace and economic resilience, which provides a favorable environment to adapt to structural developments, notably the green and digital transitions.

Macroeconomic outlook

Amid a challenging external environment in 2022, the Luxembourg economy has fared better than initially expected. Despite a weaker fourth quarter, the economy recorded a growth rate of 1.5 percent, notably driven by private consumption on the back of COVID-era savings and government support measures. And while an automatic wage indexation system could in principle have entrenched higher inflation, the policy support contributed to one of the lowest inflation rates in the European Union. Meanwhile, the labor market also performed well, with a net *creation* of 17.000 jobs in 2022 – a level that eclipsed pre-COVID numbers and maintained unemployment below 5 percent. Looking ahead, the authorities expect growth to be higher than projected by staff, while sharing staff's forecast of persistent, though moderating, inflation that remains below European peers.

The authorities agree that the outlook remains uncertain with the balance of risks tilted to the downside. While growth is expected to rebound faster than in European neighbor economies and inflation is set to gradually fall, this baseline scenario is subject to a number of external risks. Above all, higher-than-expected and/or stickier inflation could drag down growth prospects, notably in the event of a renewed energy price shock in the 2023/24 winter. Relatedly, monetary policy tightening could weigh more heavily on private consumption and investments by lowering credit demand, notably in the real estate sector. Finally, the authorities note that the macroeconomic impact of international taxation reforms on Luxembourg will also depend on behavioral responses by companies and other countries.

Fiscal policy

Despite successive shocks, the authorities have managed to maintain a sound fiscal position, as evidenced by the successive AAA ratings from all the major rating agencies. While slightly higher than expected prior to Russia's invasion of Ukraine, staff projects public debt levels to revert to a downward trend over the medium-term, as the general government deficit is expected to gradually narrow to -0.5 percent of GDP in 2026. Though inflation-related support packages weigh on public finances, inaction would have likely caused much deeper pain, both economically and socially, and would have ultimately led to a worse fiscal outcome over the medium-term. The recent shocks have thus reconfirmed the authorities' strong commitment to conducting forward-looking fiscal policies. In view of rising spending pressures to finance climate action, digitalization, education, and defense, this commitment remains as important as ever.

Notwithstanding this difficult short-term environment, the authorities have steadfastly continued to address structural challenges through an ambitious public investment policy. Over the entire projection horizon, public investment remains at high levels above 4 percent of GDP both to accommodate the needs of a growing population and to foster the twin transition. The development of an intermodal mobility network favoring sustainable modes of transportation is a central piece of the investment strategy that will both address transportation bottlenecks and lower emissions. Luxembourg's Recovery and Resilience Plan, which is progressing well, is also a clear illustration of these policy priorities, as 69 percent of investments support the green transition and 30 percent target the digital transformation.

The authorities stand ready to address any fiscal risks that may materialize. They remain committed to addressing any further inflationary spikes through the established mechanisms of social dialogue. As regards more frequent inflation adjustments of the tax brackets, they share staff's advice that this needs to be done in a budget-neutral way and embedded within a comprehensive review of the tax-benefit system.

Financial sector

As noted by staff, Luxembourg's financial sector has demonstrated a high level of resilience in the face of successive shocks thanks to strong capital and liquidity ratios as well as effective policy actions. Banks have maintained CET1 and LCR ratios far above regulatory requirements and, according to the most recent stress tests, can withstand even severe adverse shocks. Higher interest rates will improve profitability in the short-term, while banks are well-positioned to deal with potential increases of non-performing loans in the medium-term. Recent pressures in the global banking system have had limited impact on the Luxembourg banking sector. Nevertheless, the authorities continue to closely monitor developments and stand ready to act, should the need arise.

Similarly, the investment fund sector in Luxembourg has weathered well the tightening of global financial conditions. The impact from recent volatility episodes associated to the UK liability-driven investment fund sector and the US regional banking sector/Credit Suisse events has been contained, as investment fund managers made proficient use of liquidity management tools, based on supervisory guidance. While investment funds managed a gradual outflow in 2022, driven mainly by a generalized global financial market downturn, stress tests by the national supervisor show that they would remain overall resilient to larger redemption shocks. A number of structural factors – especially the diversified nature of Luxembourg's investment fund sector – constitute important mitigants to any further external stress episodes.

As regards potential financial sector vulnerabilities from the real estate sector, the authorities agree that a sharp price correction is unlikely and emphasize the existence of important mitigating factors. In particular, the strong capital and liquidity buffers of domestically-oriented banks provide an important safeguard against potential vulnerabilities. In view of the risk of households' over-indebtedness and having regard to the context of rising interest rates, the authorities put increased focus on banks' compliance with the standards on sound credit granting foreseen in the EU mortgage credit lending directive. The authorities also note that, even prior to the recent monetary-policy-related deceleration in house price growth, the implementation of differentiated loan-to-value ratios had been effective.

The authorities remain fully committed to maintaining a regulatory framework that fosters a sound financial system while working to further diversify the sector. In this context, they look forward to constructive exchanges during the upcoming 2024 FSAP mission, building on the considerable progress made since the 2017 assessment. Building on its first-mover advantage, Luxembourg has also established itself as a leading hub for sustainable finance. For instance, the Luxembourg Green Exchange, which to date issued close to EUR 900 billion of sustainable bonds, has been recognized by the UNFCCC as the world's leading platform for green, social, and sustainable securities. Similarly, the authorities have established a wide-ranging Fintech ecosystem that leverages the international nature of Luxembourg's financial sector to provide cutting-edge technological solutions along the entire financial sector value chain.

Structural policies

The authorities thank staff for the timely analysis of the automatic wage indexation (AWI) system and potential reform options. While they acknowledge that periods of sudden and sizable inflation surprises can lay bare potential pitfalls in the system, they emphasize that the deeply ingrained tradition of social dialogue is an effective tool to navigate such exceptional circumstances and maintain both economic competitiveness and social peace, as illustrated in recent months. In addition, in normal times, AWI provides important predictability for businesses without unduly reinforcing inflationary pressures, given the open nature of Luxembourg's economy. Nevertheless, they will analyze the benefits of potential adjustments to make the system more resilient, as conditions allow.

Following years of steady growth, real estate prices have recently decelerated in the wake of higher interest rates and rising construction costs. In that context, and given the short-term drop in housing demand, the authorities are considering a host of targeted measures to maintain productive capacity in the construction sector at a sufficient level to ensure continued supply in the medium-term. Despite this short-term trend, the authorities agree that underlying housing price trends continue to be driven primarily by insufficient supply to accommodate a steadily expanding population, itself caused by continued economic growth. They thus share staff's advice to maintain the medium-term objective of ensuring affordability through addressing structural supply-side bottlenecks.

The authorities share staff's finding that – despite remarkable progress – gender gaps remain and inhibit the economy's potential. The authorities welcome the comprehensive policy advice that seeks to reap the economic dividends of fully integrating women into the labor force, especially in the context of persistent skills mismatches. While Luxembourg has successfully closed the adjusted gender pay gap, labor market reforms could further enhance women's full participation in the economy, notably by reducing the large share of women employed on part-time contracts. In addition, as women tend to be second earners in households, there is substantial scope to improve incentives for them to join the labor force by switching to individual taxation.