IMF Country Report No. 19/130

LUXEMBOURG

May 2019

2019 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 2019 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 8, 2019 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 8, 2019, following discussions that ended on March 8, 2019, 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 April 23, 2019.
- 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.

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May 13, 2019

International Monetary Fund
700 19th Street, NW
Washington, D. C. 20431 USA

IMF Executive Board Concludes 2019 Article IV Consultation with Luxembourg

On May 8, 2019, the Executive Board of the International Monetary Fund (IMF) concluded the Article IV consultation with Luxembourg.[1]

Luxembourg has benefited from strong growth in recent years, supported by sound economic policies, a qualified workforce, and favorable global economic conditions. Driven by strong private consumption and a positive contribution of the external sector, GDP growth reached 2.6 percent in 2018, above the EU average. Thanks to buoyant corporate and personal income tax revenues, the fiscal position has remained strong with fiscal surplus estimated at about 2.4 percent of GDP. With unemployment at record post-crisis lows and confidence indicators well above long-term averages, the economy is currently operating close to its potential.

Growth prospects remain favorable, but downside risks arise from a weaker-than-expected global growth, a disorderly Brexit, changes in international tax rules, and a sharp tightening of global financial conditions. Domestically, rising real estate prices could exacerbate already elevated household indebtedness and increase affordability challenges.

Executive Board Assessment[2]

Executive Directors commended the authorities for the sound economic policies that continue to support a favorable growth outlook, while noting that risks are tilted to the downside from both external and domestic factors. Against this backdrop, Directors encouraged the authorities to maintain prudent fiscal policies, continue to implement new

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[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] At the conclusion of the discussion, the Managing Director, as Chairman of the Board, summarizes the views of Executive Directors, and this summary is transmitted to the country's authorities. An explanation of any qualifiers used in summings up can be found here: http://www.imf.org/external/np/sec/misc/qualifiers.htm.

international tax standards, further enhance the resilience of the financial system, and address key structural gaps.

Directors praised the authorities for the strong fiscal position and low public debt. While stressing the need to maintain adequate buffers, they welcomed the fiscal plans aimed at lifting the economy's potential and making growth more inclusive, by increasing public investment and introducing more growth-friendly, equitable, and "green" taxation. They commended the authorities' continued commitment to implement the European and global tax transparency and anti-tax avoidance initiatives. Directors noted the need to quantify revenue risks arising from the changing international tax environment and consider mitigating measures.

Directors welcomed the progress in implementing the 2017 Financial Stability Assessment Program recommendations while emphasizing efforts to further enhance the oversight of the highly interconnected financial sector. In particular, Directors noted the need to continue to strengthen the supervision of banks' large cross-border exposures and complete resolution plans for less systemic banks and implement Luxembourg's component of the euro area credit register. In the investment fund sector, system-wide supervision and cooperation with relevant jurisdictions should be further enhanced. Directors commended the authorities for strengthening AML/CFT legislation and finalizing their first National Risk Assessment.

While welcoming recent measures to enhance macroprudential surveillance, Directors called for close monitoring of developments in the real estate market and vulnerabilities arising from high household indebtedness. In this context, they also encouraged the authorities to alleviate housing supply constraints and to expand the macroprudential policy toolkit, introducing borrower-based mortgage lending limits.

While acknowledging that Luxembourg's pension system is sound over the near term, Directors saw merits in further reforms to ensure its long-term sustainability. Given the long lags of pension reforms, they considered it essential to engage with key stakeholders in a timely manner, taking into account intergenerational equity and the tradeoffs of various reform options.

Directors noted that key structural gaps need to be addressed to boost Luxembourg's economic potential and make growth more inclusive. While the youth and low-skilled were benefiting the most from the recent strong job creation, they noted that more needs to be done to tackle structural unemployment and low elderly labor market participation.

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

Luxembourg: Selected Economic Indicators, 2014–19[1/]

	2014	2015	2016	2017	2018 Est.	2019 Proj.
Real economy	(Change in percent, unless otherwise indicated)					
Real GDP	4.3	3.9	2.4	1.5	2.6	2.6
Gross investment	12.2	-4.7	7.6	1.2	0.6	2.6
Unemployment (percent of the labor force)	7.1	6.8	6.3	5.9	5.5	5.0
Resident employment (thousands)	239.7	244.8	250.3	257.3	264.5	271.7
Total employment (thousands)	396.0	406.1	418.4	432.8	449.0	464.3
CPI (harmonized), p.a.	0.7	0.1	0.0	2.1	2.0	1.6
Public finances	(Percent of GDP)					
General government revenues	43.3	43.3	43.7	44.4	45.5	44.6
General government expenditures	42.0	41.9	41.9	43.0	43.1	43.6
General government balance	1.3	1.4	1.9	1.4	2.4	0.9
General government gross debt	22.7	22.2	20.7	23.0	21.4	21.5
Balance of payments						
Current account balance	5.2	5.1	5.1	5.0	4.7	4.6
Balance of trade in goods and services	33.3	36.8	35.5	33.0	31.0	29.2
Factor income balance	-28.6	-33.0	-31.7	-27.5	-25.9	-25.0
Transfer balance	0.5	1.3	1.3	-0.5	-0.5	0.3
Exchange rates						
U.S. dollar per euro	1.3	1.1	1.1	1.1	1.2	…
Nominal effective rate (2010=100)	100.5	97.0	98.9	101.5	103.5	…

Sources: Data provided by the authorities; IMF, WEO database; and IMF staff estimates.

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INTERNATIONAL MONETARY FUND

LUXEMBOURG

STAFF REPORT FOR THE 2019 ARTICLE IV CONSULTATION

April 22, 2019

KEY ISSUES

The growth outlook remains favorable, but risks are tilted to the downside. Sound economic and fiscal policies together with favorable global conditions in recent years translated into solid growth and a decline in unemployment to record post-crisis lows. Growth prospects remain favorable, but risks are to the downside and include a weaker-than-expected global growth, a disorderly Brexit, changes in international tax rules, and a sharp tightening of global financial conditions. Domestically, rising housing prices pose affordability challenges and could exacerbate the already high household indebtedness.

Fiscal policy should aim to maintain a strong fiscal position and preserve buffers. The recently reelected government envisages an ambitious reform program to foster inclusive growth and boost the economy's potential. The government's plans, while appropriate, will result in a slightly expansionary budget in 2019. The cost and timeline of the planned measures over the medium term remain to be determined. Given risks ahead, including from potential changes in international taxation, Luxembourg should build on its strong fiscal record and preserve sizeable buffers.

The authorities should continue to enhance the resilience of the large and highly interconnected financial sector. Risks in the financial sector appear contained, partly reflecting steps taken to strengthen financial supervision and regulation in line with the 2017 Financial Stability Assessment Program (FSAP) recommendations. These efforts should continue, including by increasing system-wide surveillance of the large and interconnected investment fund sector. Risks related to money laundering and financing of terrorism, and challenges arising from Fintech should continue to be closely monitored.

Structural policies should focus on addressing key gaps in the economy. Further reforms of the pension system are needed to ensure its sustainability, while considering intergenerational equity and tradeoffs of various reform options. The authorities should take action to enhance housing affordability and stand ready to introduce measures to contain excessive household indebtedness. Additional efforts to reduce structural unemployment and increase labor market participation for the most vulnerable are needed. The government should improve public investment efficiency to achieve better value-for-money and enhance the allocation of public resources.

Approved By
Ms. Detragiache (EUR), Mr. Flanagan (SPR)

Discussions took place in Luxembourg during February 25–March 8, 2019. The team comprised Messrs. E. Stavrev (head), M. Souissi, R. Varghese and Ms. L. Antoun de Almeida, and was assisted from headquarters by Mses. T. Mohd Nor and K. Vanegas (all EUR). Mr. N. Jost (OED) joined the discussions. The mission met with Minister of Finance Gramegna, Governor Reinesch, other officials, and representatives from the private sector and civil society.

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APPENDICES

CONTEXT

1. **Luxembourg's business model has served the country well, but the economy continues to face a number of structural issues**. Sound economic and fiscal policies, openness, firm prudential oversight, and business-friendly environment have led to strong economic performance. Nonetheless, structural bottlenecks in housing and infrastructure as well as long-term challenges in the pension system need to be addressed to foster sustainable and more inclusive growth.

2. **In this context, the new government tabled a broad program of reforms**. The government envisages several expansionary measures in 2019 and likely over the medium term aimed at making growth more inclusive and greener while lifting the economy's potential. These include, among others, cutting the overall corporate income tax rate, a one-off increase of the minimum wage in 2019, reforming personal income and real estate taxation, and stepping up public investment spending. Meanwhile, the government remains strongly committed to comply with EU and international anti-tax avoidance and transparency initiatives.

3. **The consultation focused on policies needed to cope with risks ahead and address structural gaps**. The discussion centered on fiscal policy, risks from changes in international taxation, measures to enhance financial sector resilience against shocks, and reforms to address key structural issues in the economy.

RECENT DEVELOPMENTS

4. **The economic performance remained solid in 2018, supported by a robust domestic demand and a strong labor market**. GDP figures need to be analyzed with caution given the frequent and substantial revisions to the national accounts. While average headline growth in 2014–17 was revised downwards from 3.5 to 3.0 percent, momentum remained strong.[1] Growth in 2018 increased to 2.6 percent from 1.5 percent in 2017, driven by strong private consumption and a positive contribution of the external sector. With unemployment at 5 percent (seasonally adjusted)—its lowest level since 2009—and high-frequency indicators above historical average, the economy is operating close to potential. Average CPI and core inflation (HICP) declined to 1.5 and 0.9 percent, respectively, partly reflecting lower day care fees. However, core inflation increased to 1.4 percent year-over-year (yoy) in December due to base effects fading out and the August wage indexation.

5. **The fiscal outturn surprised on the upside in 2018, reflecting stronger-than-expected corporate and personal income tax revenues**. The general government budget surplus is estimated at 2.4 percent of GDP in 2018 driven by strong corporate income tax (CIT) revenues—largely attributable to sizable tax arrears payments—and personal income tax (PIT) revenues due to high employment and wage growth. Other categories—notably VAT revenues which experienced large losses from the EU e-commerce VAT reform in previous years—also contributed to the

[1] These revisions were due to the transactions of a few multinationals that lowered the contribution of net exports to growth.

stronger-than-expected performance of tax revenues in 2018. Higher revenues more than offset the increase in spending, driven in part by higher wages. Public debt declined to about 22 percent of GDP.

6. Luxembourg remains strongly committed to comply with international anti-tax avoidance and transparency initiatives (Appendix I). Luxembourg's rating as *largely compliant* was maintained in the 2019 peer review by the Global Forum on Tax Transparency and Exchange of Information for Tax Purposes.[2] It was rated as *fully compliant* in the category of exchange of information on tax rulings in the latest OECD peer review. In line with past staff advice, the authorities transposed the EC's Anti-Tax Avoidance Directive (ATAD) I into national law in December 2018, and plan to transpose ATAD II by end-2019. The authorities appealed in court the EC's decision that the advance tax rulings to Amazon, Engie, and Fiat constituted illegal state aid. The EC concluded that a tax ruling involving McDonalds did not constitute State Aid.

7. The financial sector remained profitable in 2018, despite recent bouts of volatility in global financial markets.

- *Banks*. The banking system as a whole is highly capitalized and liquid, with the overall Tier 1 capital ratio above 25 percent and a median Liquidity Coverage Ratio of 174 percent—well above the 100 percent minimum requirement. Asset quality remained high, with the overall non-performing loans ratio at about 1 percent in 2018:Q3—amongst the lowest in the euro area. Overall, net profits (before loan loss provision) remained flat in 2018 due to lower other net operating income, partly reflecting revaluation adjustments on available-for-sale securities amid higher financial market volatility. Rising costs—partly driven by efforts to comply with various regulatory requirements—weighed on profitability, notably in smaller banks. Credit to the resident non-financial private sector continued to grow rapidly, above 10 percent yoy, driven by credit to the business sector, including to resident multinationals for investment abroad.
- *Investment funds*. At the end of 2018, aggregate net assets declined (2.3 percent) for the first time in 8 years. This was driven by the negative valuation effects following the pullback in global equity markets in 2018:Q4 as well as slower net inflows, reflecting portfolio rebalancing effects.

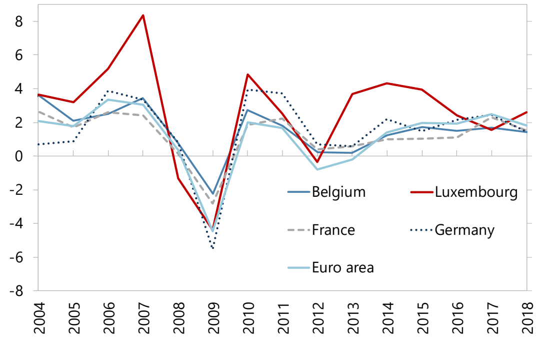
8. Staff's bottom line assessment is that Luxembourg's external position is broadly consistent with fundamentals and desirable policies (Annex II). The current account surplus remained stable at around 5 percent of GDP in 2018, driven by strong net services exports. The EBA-lite current account model estimates a current account gap (actual minus norm) of -1.5 percent of GDP and a corresponding REER overvaluation of 0.9 percent. The current account gap includes a policy gap of 1.4 percent of GDP, mostly reflecting the deviation of the favorable fiscal balance outcome in 2018 from its medium-term objective.

[2] In the report, Luxembourg is requested, among other areas, to improve the availability of beneficial ownership information on stock companies and partnerships.

Figure 1. Real Sector Developments

Luxembourg's GDP growth has been, in general, above the EA average and …

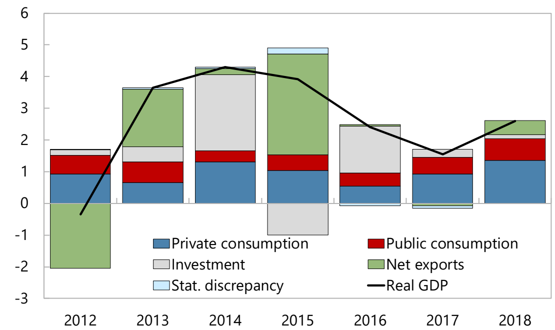
Real GDP Growth
(Percent, YoY growth)



Sources: Haver Analytics and IMF staff calculations.

… driven by strong domestic demand in recent years.

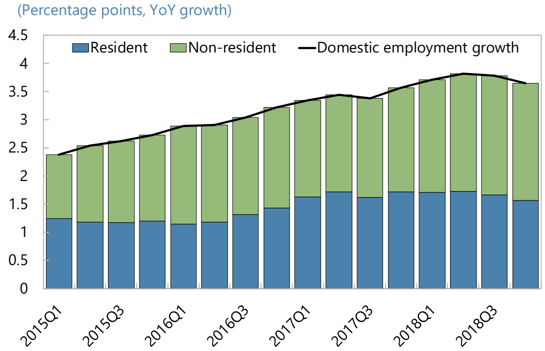
Contribution to Annual Real GDP Growth
(Percentage points)



Sources: STATEC and IMF staff calculations.

Buoyant employment growth, partly driven by cross-border workers, …

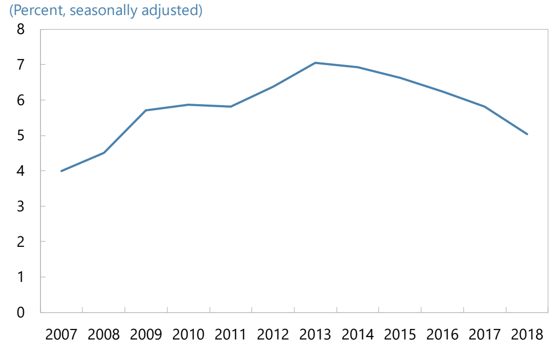
Contribution to Domestic Employment Growth
(Percentage points, YoY growth)



Sources: STATEC and IMF staff calculations.

… reduced unemployment to its lowest level since 2009.

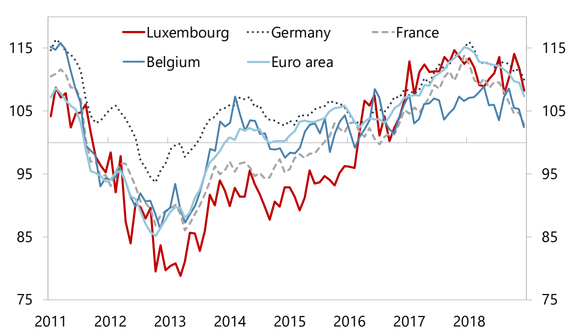
Unemployment Rate
(Percent, seasonally adjusted)



Sources: STATEC, and IMF staff estimations.

Economic sentiment indicators, …

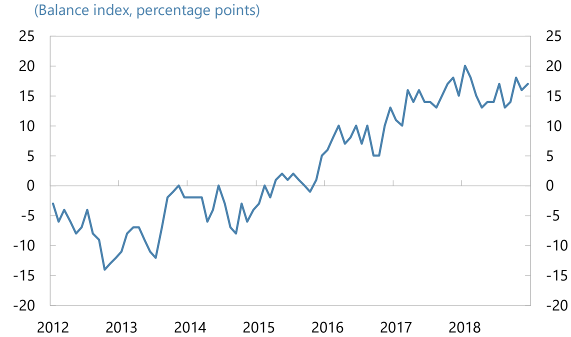
Economic Sentiment Indicator
(Index, long-term average = 100)



Source: Haver Analytics.

… notably consumer confidence, are above historical averages.

Consumer Confidence
(Balance index, percentage points)

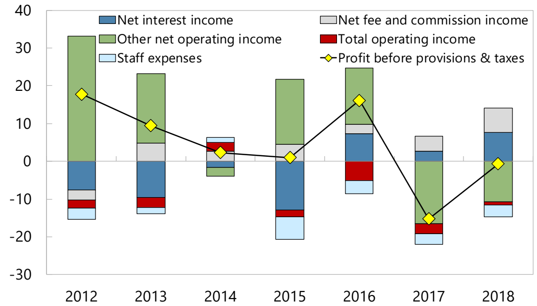


Note: Percent point difference between positive and negative responses.
Source: STATEC.

Figure 2. Financial Sector Developments

Despite the strong performance of banks' core business, valuation effects weighed on banks' net income in 2018.

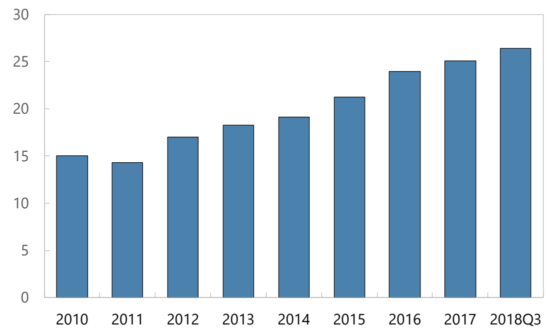
Contribution to Growth in Bank Net Income
(Percent)



Sources: CSSF; and IMF staff calculations.

Banks are increasingly well capitalized.

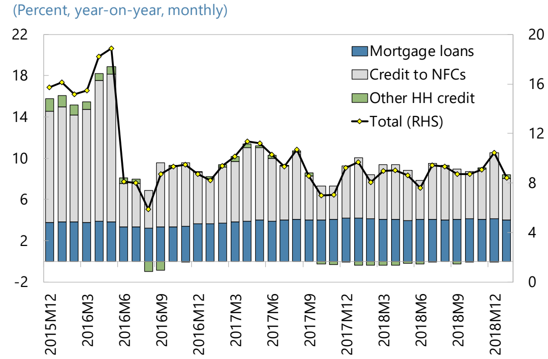
Regulatory Tier 1 Capital Ratio
(Percent of risk-weighted assets)



Source: BCL.

The strong growth in credit to the private sector has been largely driven by credit to non-financial corporations.

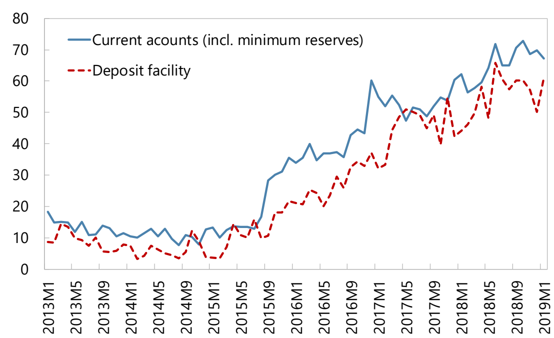
Contribution to Growth in Credit to Non-financial Sector
(Percent, year-on-year, monthly)



Sources: BCL; and IMF staff calculations.

Banks have increased their deposits at the central bank to comply with regulatory liquidity requirements.

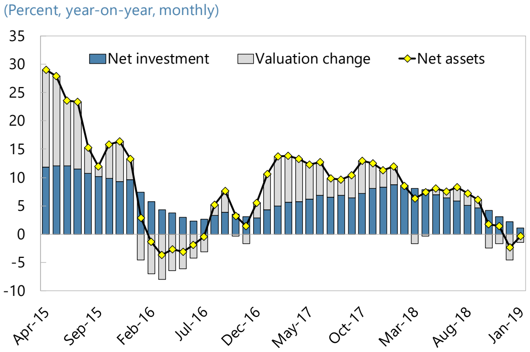
Bank Deposits at the Central Bank
(Billions of euros)



Sources: BCL; and IMF staff calculations.

Funds' net assets declined in 2018 due to valuations effects and slowing net investment flows…

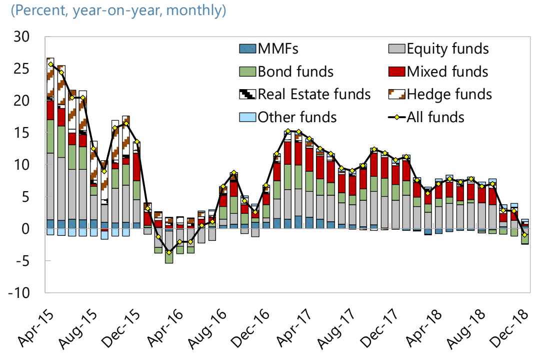
Contribution to the Change in Funds' Net Assets
(Percent, year-on-year, monthly)



Sources: CSSF, BCL and IMF staff calculations.

… while growth in fund assets slowed in 2018, mainly driven by UCITS.

Contribution to Growth in Funds' Assets
(Percent, year-on-year, monthly)

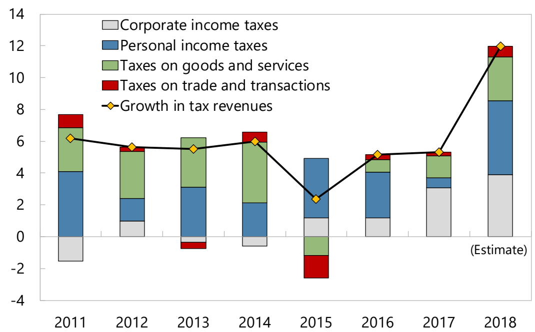


Sources: CSSF, BCL; and IMF staff calculations.

Figure 3. Fiscal Sector Developments

Buoyant tax revenues were driven by the strong performance of PIT and CIT proceeds in 2018.

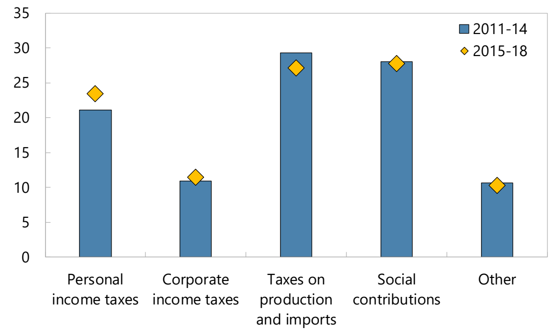
Contribution to Tax Revenue Growth
(Percent)



Sources: STATEC; and IMF staff calculations.

The share of PIT revenues in total revenues increased slightly, reflecting strong employment and wage growth.

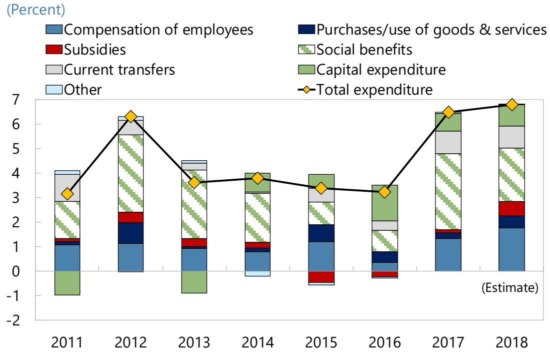
Share in General Government Revenues
(Percent, average)



Sources: STATEC; and IMF staff calculations.

Social benefits and wages continue to be the main driver of growth in public spending.

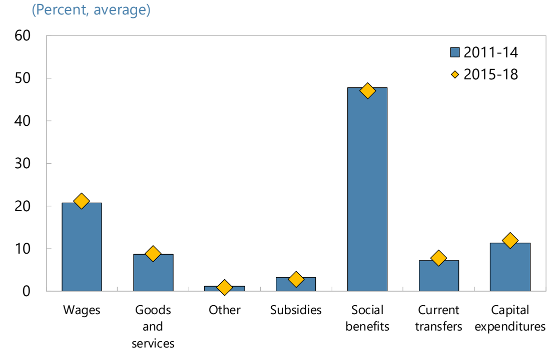
Contribution to Growth in General Government Spending
(Percent)



Sources: STATEC; and IMF staff calculations.

The composition of public spending remained broadly unchanged.

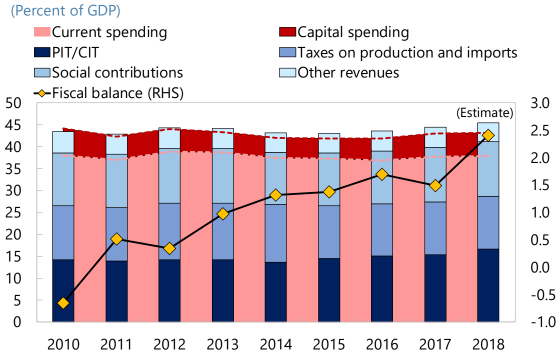
Share in General Government Spending
(Percent, average)



Sources: STATEC; and IMF staff calculations.

Fiscal balance improved significantly in 2018 mainly due to exceptionally buoyant revenues.

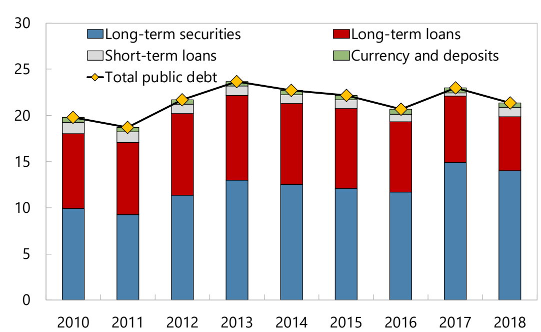
General Government Budget Balance
(Percent of GDP)



Sources: STATEC; and IMF staff calculations.

Public debt, mainly comprised of long-term securities, remained stable.

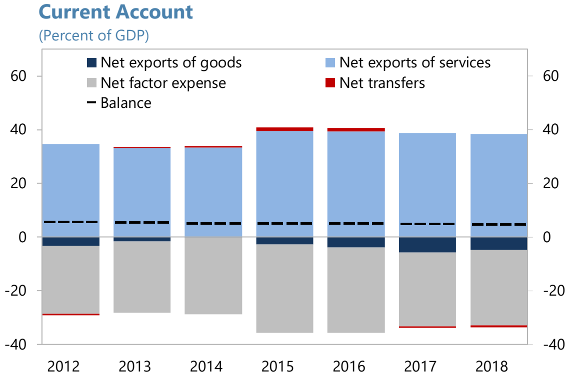
Composition of Public Debt
(Percent of GDP)



Source: STATEC.

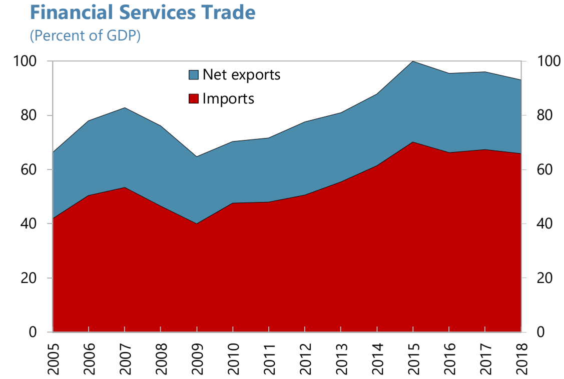
Figure 4. External Sector Developments

The current account surplus has remained stable at around 5 percent of GDP, …



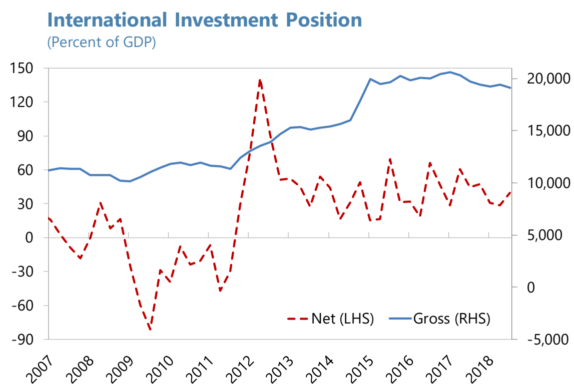
Sources: BCL and IMF staff calculations.

… supported by a large share of financial services exports and imports.



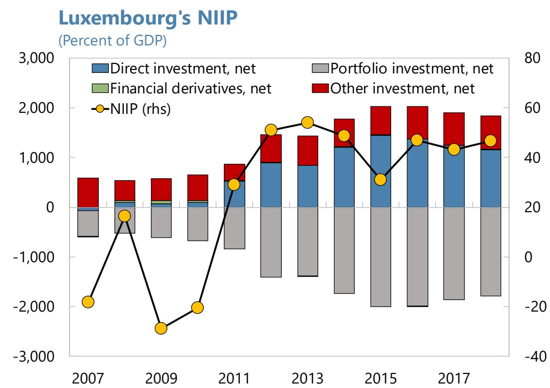
Sources: BCL and IMF staff calculations.

The gross IIP has stabilized since 2015, while the net IIP is relatively volatile and…



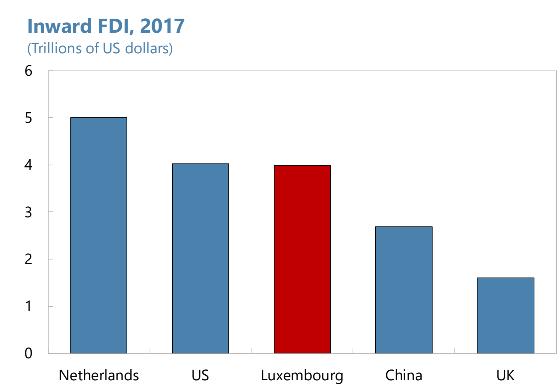
Sources: BCL and IMF staff calculations.

… driven by a large positive net FDI position.



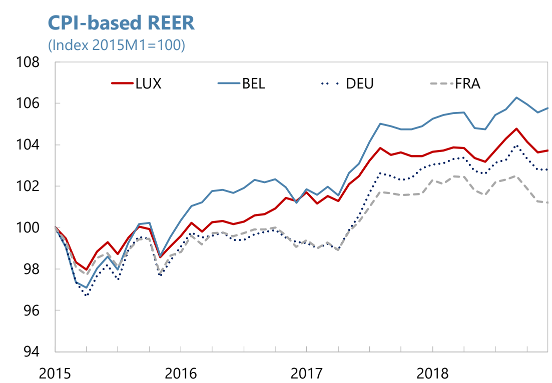
Sources: Haver Analytics and IMF staff calculations.

Luxembourg is the third destination of FDI due to multinational corporations' treasury operations.



Sources: IMF CDIS and IMF staff calculations.

The REER has appreciated moderately since 2015.



Sources: GDS and IMF staff calculations.

OUTLOOK AND RISKS

9. The outlook remains favorable, underpinned by robust domestic demand (Tables 1–4). The financial sector will remain a key driver of growth in the medium term. Real GDP growth is projected at 2.6 percent in 2019, picking up to 2.8 percent in 2020 in line with the expected growth rebound in the euro area, and declining gradually to its potential growth of 2.6 percent thereafter. Some fiscal expansion, combined with the recent wage indexation, and improving confidence will support a strong domestic demand, while the contribution of the external sector will be moderate. Solid growth is expected to keep the unemployment rate at about 5 percent over the medium term. Driven by strong wage growth, core inflation is projected to increase to 1.9 percent in 2019 and remain at that level over the medium term. Headline inflation follows a similar path, as a weaker contribution of oil prices is partly compensated by higher services inflation.

10. However, the balance of risks is tilted to the downside (Table 9). Key risks include:

- *Weaker-than-expected global growth*. A synchronized slowdown across major world economies, including in the euro area, could adversely impact Luxembourg's exports and FDI inflows. Weaker global growth prospects could lower asset price and credit performance, possibly leading to a spike in risk aversion and volatility in financial markets and weakening the profitability of Luxembourg's financial sector and fiscal performance.

- *Changes in international taxation* (Box 1). Changes in the international taxation landscape remain a challenge for Luxembourg, as they are likely to alter the tax planning strategies of multinational firms, which represent a large source for inward FDI and tax revenues.

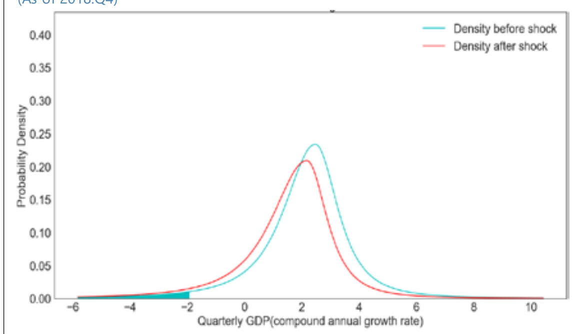
- *Brexit*. Luxembourg is likely to benefit from higher economic activity as some U.K.-based financial services firms relocate to Luxembourg to enjoy EU passporting rights. Advanced contingency planning of asset managers, and regulatory coordination at both national and EU levels, should mitigate challenges associated with the delegation model.[3] However, a disorderly Brexit could pose challenges through investment funds' exposure to U.K. assets and trading venues as well as their exposure to market risk in case of heightened market volatility.

- *Sharp tightening of global financial conditions*. This could result from a sustained rise in risk premiums, or debt sustainability concerns in some high-debt euro area countries. Tighter financial conditions would weaken the profitability of Luxembourg's highly interconnected

[3] The delegation model permits investment funds to be set up by asset managers in one EU state (such as Luxembourg) while outsourcing the investment management and distribution to entities in another country (such as the United Kingdom). The Memorandum of Understanding between the European Securities and Markets Authority (ESMA) and the U.K. Financial Conduct Authority (FCA), signed on February 1st, 2019 (ESMA71-99-1096), will assure the continuation of delegation of investment management to U.K.-based entities in the event of a no-deal Brexit. The private sector has established EU-based sub-distributors and branches to minimize disruption in the distribution of UCITS in the EU by U.K.-based entities. In addition, the Luxembourg parliament proposed a legislation (Draft Bill 7401) on 31 January 2019 to confer national supervisors (i.e. the CSSF and the CAA) powers for a transitionary period of 21 months to adopt temporary measures dealing with a disorderly Brexit.

financial sector, with adverse implications for tax revenues and growth. A shock scenario using the Growth-at-Risk methodology suggests that a one-standard deviation negative shock to the Eurostoxx50 index growth would shift the one-quarter ahead GDP growth distribution to the left, reducing the 5th percentile growth from -1.3 to -2.9 percent yoy.[4]

One Quarter-ahead Quarterly GDP growth Distribution
(As of 2018:Q4)



Source: IMF staff calculation.

Authorities' Views

11. The authorities agreed that the economic outlook for Luxembourg remains favorable but clouded by external risks. They concurred that a sharp tightening in financial conditions, including due to a repricing of credit and liquidity risks, could pose risks to the outlook. The overall impact on banks from Brexit is deemed low, partly reflecting the limited direct net exposures of Luxembourg banks towards the United Kingdom. For investment funds, the authorities are of the view that the measures taken at the European and the national level, including the Memorandums of Understanding signed with the U.K. authorities, will help mitigate potential negative impacts of Brexit. However, they consider that a disorderly Brexit could increase market volatility as well as performance risk. The authorities concurred that the challenges from the changes in international taxation should be analyzed with a view to determining the impact on the economy and tax revenues. Finally, they agreed with staff that Luxembourg's external position is broadly consistent with fundamentals.

POLICIES

A. Fiscal Policy: Maintaining Strong Buffers

12. The 2019 draft budget envisages some fiscal expansion this year. Key measures include: (i) a reduction of the overall CIT rate by 1 percentage point from 26 to 25 percent, while increasing the income threshold to which the minimum rate applies; (ii) a tax credit for wage earners to partly cover the 5 percent increase in net minimum wages; (iii) an increase in excise duties on fuel; (iv) an extension of reduced VAT rates to several products, including electronic publications and phytosanitary products; and (v) higher spending on education, healthcare, infrastructure and the digitalization of the economy. The net cost of these measures will be about 0.5 percent of GDP.

13. Beyond 2019, fiscal plans aim at lifting the economy's potential and making growth more inclusive. The government announced the following key measures: (i) step up public investment to close infrastructure gaps and increase the supply of social housing; (ii) generalize the

[4] We use quantile regressions with lagged growth and financial conditions indicators (Eurostoxx50 and Vix) to predict the one-quarter ahead distribution of yoy quarterly growth. For details, see Global Financial Stability Report, Chapter 3, "Financial Conditions and Growth at Risk", October 2017.

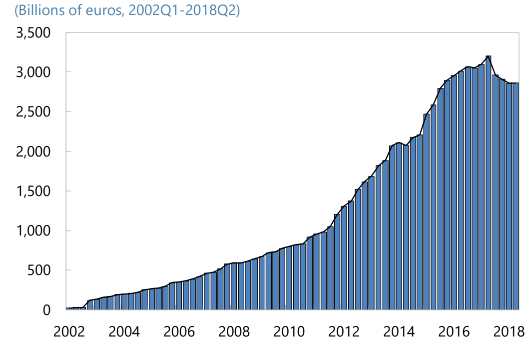
individual income taxation to enhance female labor market participation; (iii) reform the real estate taxation to counter speculation, boost housing supply, and enhance housing affordability; and (iv) introduce free public transport in 2020 to support more inclusive and greener mobility. The cost and timeline of these measures are yet to be determined, partly reflecting the complexity of some intended reforms.

14. The fiscal surplus is expected to decline in 2019, and its medium-term evolution hinges on the size of future fiscal impulses. Accounting for the planned fiscal impulse and assuming the non-recurrence of temporary factors, including strong tax arrears payments, the 2019 fiscal surplus is estimated at 0.9 percent of GDP. Not accounting for the cost of the announced initiatives over the medium term, the fiscal surplus is projected to increase to 1.3 percent of GDP by 2024, driven by higher social contributions and VAT revenues.[5] The structural balance is projected to remain well above the MTO, which was revised from a deficit of 0.5 percent of GDP to a surplus of 0.5 percent of GDP for 2020–22, reflecting fiscal pressures from higher ageing-related spending over the long term. Public debt–to-GDP ratio is projected to decline to about 20 percent, among the lowest in the EU, and is expected to remain sustainable under different scenarios over the medium term (Table 7). In a scenario of a sizable contingent liability shock, possibly related to the financial sector, public debt would increase but remain below 35 percent of GDP.

15. The government plans should be implemented while preserving sizeable buffers given external risks to tax revenues. While Luxembourg has fiscal space to fund higher spending in 2019 and over the medium term, the spending composition should be geared towards promoting inclusive growth and lifting the economy's potential. Given the volatility of the tax base and potential contingent liabilities related to the financial sector, fiscal policy should aim to preserve sizeable buffers by continuing to comfortably meet the MTO.[6] For instance, the generalization of the individual income taxation should be done in a budget neutral way. This would provide room for maneuver should downside risk materialize, notably revenue risks from possible future changes in international taxation. These changes—including potentially higher impact on revenues from the ongoing U.S. tax reform than assumed in staff's baseline projections—could reduce multinationals' incentives to locate assets in Luxembourg, eroding the country's corporate tax base and potentially leading to non-negligible tax revenue losses (see Box 1). For example, FDI in Special Purposes Vehicles (SPVs) has already started to decline, indicating possibly diminishing incentives to conduct business through Luxembourg.

Cumulative FDI in Special Purposes Vehicles

(Billions of euros, 2002Q1-2018Q2)



Source: Haver Analytics.

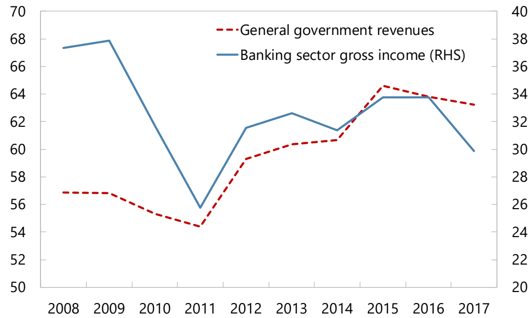
[5] Baseline projections use the authorities' spending assumptions in their multiyear budget plan. Furthermore, the U.S. tax reform is assumed to reduce Luxembourg's CIT revenues by about 0.3 percent of GDP over the medium term.

[6] Other fiscal vulnerabilities include the high concentration of CIT tax proceeds, with nearly three-quarters paid by less than 1 percent of tax payers.

Figure 5. Indicators of Fiscal Vulnerabilities

Past budget overperformance was largely due to cyclical revenue strength, …

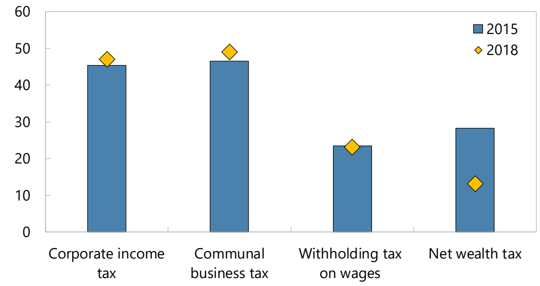
Budget Revenues and Banking Sector Income
(Percent of GNI)



Sources: Luxembourg authorities; and IMF staff estimates.

… driven by the financial services sector.

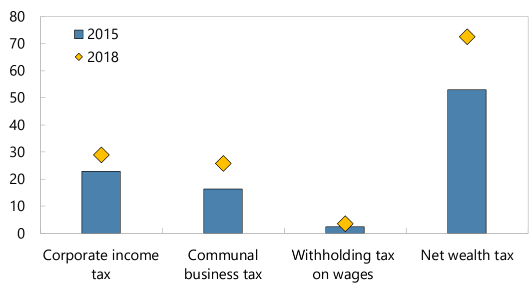
Contribution of the Financial Sector to Tax Revenues
(Percent)



Note: Includes banks, fund management companies, insurance and reinsurance companies, and other financial services businesses. SOPARFIs are excluded.
Sources: Ministry of Finance; and IMF staff calculations.

Tax revenues have been driven by a volatile tax base…

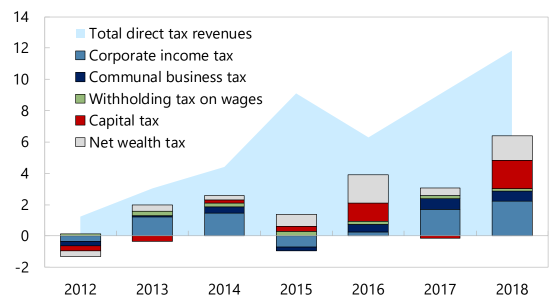
Contribution of SOPARFIs to Tax Revenues
(Percent)



Note: SOPARFIs are the most common vehicles dedicated to holding and financing activities in Luxembourg.
Sources: Ministry of Finance; and IMF staff calculations.

… reflecting large, yet volatile contribution of Soparfis to growth in direct taxes.

Contribution of SOPARFIs to Growth in Direct Tax Revenues
(Percentage points)



Note: SOPARFIs are the most common vehicles dedicated to holding and financing activities in Luxembourg.
Sources: Ministry of Finance; and IMF staff calculations.

16. **The authorities should assess the risks to fiscal revenues and explore growth-friendly options to mitigate them**. The authorities have taken welcome steps to implement the EU and international transparency and anti-tax avoidance agenda, including the introduction of a new (BEPS-compliant) IP regime and the timely transposition of the EC's Anti-Tax Avoidance Directive (ATAD) I into national law. Although opportunities may arise from a more level playing field in international taxation considering Luxembourg's other comparative advantages, the changes in international tax rules could erode the tax base. Hence, the authorities should try to quantify revenue risks under alternative scenarios and explore growth-friendly options to mitigate them. Possible options include: (i) adjusting low property taxes which are based on outdated property values; (ii) increasing revenues from environmental taxes which are among the lowest in the EU;[7] and (iii) reducing tax exemptions including the numerous non-compulsory exemptions in the VAT system. Finally, further reducing the CIT rate may help widen the tax base but could also result in lower CIT revenues, as the gains from a wider base may not offset the loss from a lower rate.

[7] Revenues from environmental taxation accounted for less than 2 percent of GDP in 2016. See 2019 European Semester-Luxembourg Country Report.

Authorities' Views

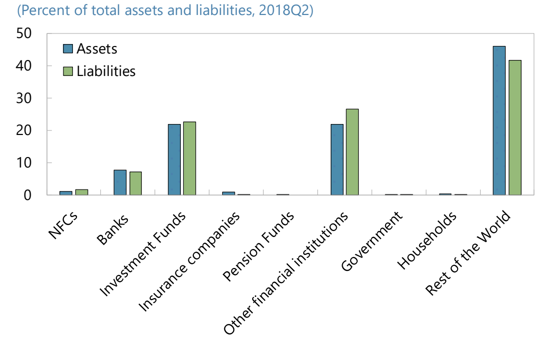
17. The government is committed to implementing the new international tax standards and expects their revenue impact to be limited. The authorities highlighted that Luxembourg already transposed ATAD I and is on a good path to implement ATAD II by end-2019. They underlined that the 2019 peer review report by the OECD Global Forum confirmed the rating of Luxembourg as "*largely compliant*" with the internationally agreed transparency standards for tax purposes. While acknowledging potential challenges from changes in international taxation, they highlighted that Luxembourg has not yet observed any significant impact. They noted that the strong performance of tax revenues in recent years partly reflects the country's various comparative advantages such as its political and social stability and well-developed ecosystem surrounding the financial industry.

18. Building on its strong record, the government is committed to maintaining a sound fiscal policy. The authorities concurred that sizable fiscal buffers should be preserved in case adverse external risks materialize. Accordingly, they reiterated the government's commitment to consistently meeting the MTO and to keep public debt below 30 percent of GDP. They agreed that the composition of public spending should be attuned to structural needs. They concurred with staff's advice that growth-friendly options to mitigate revenue risks from changes in international taxation should be explored.

B. Financial Sector: Enhancing Resilience Against Increasing Risks

19. The financial system remains strongly interconnected, both globally and domestically, with investment funds being a major player worldwide. Luxembourg continues to be both a conduit and recipient of shocks originating abroad. Financial linkages with the rest of the world represent the bulk of the domestic financial sector's assets and liabilities. This reflects Luxembourg's role as a financial center and a hub for multinational companies' treasury activities. Domestic inter- and intra-sectoral linkages remain large, notably for investment funds which are highly interconnected with the rest of the sector.

Share in Assets and Liabilities by Sector, Luxembourg
(Percent of total assets and liabilities, 2018Q2)



Sources: ECB's Euro Area Sectoral Accounts; and IMF staff calculations.

Interlinkages Among Institutional Sectors in Luxembourg[1/]
(In billions of euros, 2018:Q2)

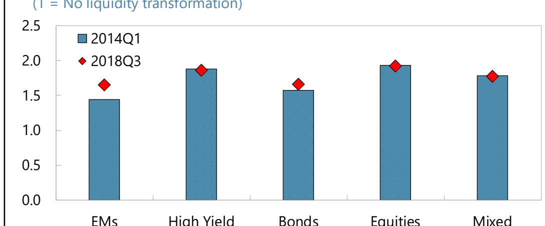
Assets of: Domestic sectors	Non-financial corporations	Banks	Investment Funds	Insurance companies	Other Financial Institutions	Government	Households	Rest of the World	Total assets
Non-financial corporations	54.9	21.0	0.3	0.1	18.8	0.1	0.0	83.5	178.9
Banks	26.3	157.1	6.8	0.2	32.6	6.4	34.0	1005.9	1269.3
Investment Funds	13.7	143.3	302.4	0.0	87.7	0.2	-	3401.7	3949.1
Insurance companies	0.6	10.7	40.5	0.4	2.1	0.2	-	104.1	158.5
Pension Funds	0.0	0.1	1.0	0.0	0.4	0.0	-	0.6	2.1
Other Financial Institutions	60.6	61.9	21.3	0.0	928.0	0.5	0.1	1960.6	3032.9
Government	1.0	8.3	0.7	0.0	0.0	0.2	0.0	17.8	28.0
Households	0.7	40.0	9.4	0.0	0.3	0.1	0.5	10.2	61.1
Total domestic liabilities	157.7	442.4	382.4	0.6	1069.9	7.7	34.6		
Rest of the World	102.6	763.8	3690.7	0.7	2786.5	5.7	3.5	-	7353.6
Total liabilities	260.3	1206.2	4073.1	1.3	3856.4	13.5	38.1	6584.4	16033.4

[1/] Source: ECB Sectoral Accounts; and IMF staff estimations. Data do not cover all instrument classes, notably unlisted shares, which make up about 50 percent of other financial institutions' liabilities. Instruments classes covered are: deposits, debt securities, loans, listed shares, and investment fund shares. Banks include the central bank.

20. **While financial stress in the investment fund sector remained contained, there are growing vulnerabilities, partly due to increased common-risk taking strategies** (Box 2). Risk metrics based on fund-by-fund data until 2018:Q3 suggest that systemic risk has declined since the start of the U.S. monetary policy normalization in 2016. However, sector-wide data indicate increased common risk-taking behavior, partly reflecting similar search-for-yield strategies.[8] This would increase interconnectedness—including through overlapping exposures—and contagion risks. Should global financial conditions tighten sharply, potential liquidity strains and resulting spillovers would constitute a growing risk.

- *Liquidity transformation ratios remained high and even increased in some investment funds (such as emerging market and bond funds).* BCL data indicate that, overall, investment funds have reduced their holdings of highly liquid assets from 17.7 to 16.2 percent of total assets since end-2014.[9] Funds with relatively lower holdings of highly liquid assets and/or investing in assets whose underlying liquidity is lower may be unable to sell assets quickly if confronted with large redemptions. They can thus contribute, along with funds from other jurisdictions, to generating systemic risk through the asset liquidation channel well beyond Luxembourg's borders.

Liquidity Transformation
(1 = No liquidity transformation)



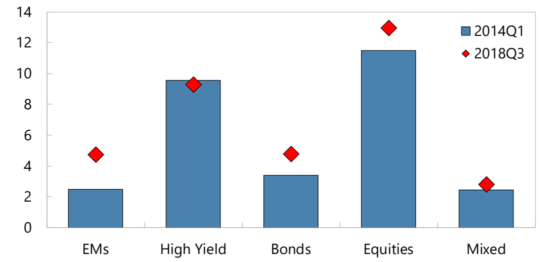
Note: This indicator is derived as the ratio of (Assets under management – liquid assets (broad) + short-term liabilities ≤ 30 days + redeemable equity ≤ 30 days) to assets under management. Liquid assets include demand deposits, MMF shares, AAA and AA-rated government bonds, and A-rated government bonds (subject to a 15 percent haircut). The higher this indicator, the larger the liquidity mistmtach.
Sources: BCL; and IMF staff calculations.

[8] The measures of liquidity and maturity transformation follow FSB's definitions used in the exercise on the assessment of Non-Bank Financial Intermediation.

[9] Following the FSB's broad measure for liquidity, highly liquid assets include demand deposits, money-market fund shares, AAA and AA rated government bonds, and 85 percent of A rated government bonds.

- *Maturity transformation intensified in most investment funds*. BCL data indicate that the weighted average residual maturity of debt securities held by investment funds has increased from 6.9 to 8.2 years since early-2014. Higher maturity mismatches, such as for high-yield funds, indicate increased sensitivity to interest rate risk. Abrupt changes in debt yields due to the decompression of risk premia could lead to large negative valuation effects. This could ultimately result in widespread portfolio reshuffling, impairing market liquidity and amplifying the adverse implications of increased liquidity mismatches.

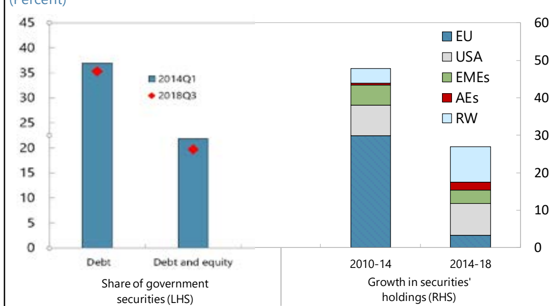
Maturity Transformation
(1 = Short-term liabilities fully covered by short-term assets)



Note: This indicator is derived as the ratio of (short-term liabilities of ≤ 12 months + redeemable equity of ≤ 12 months) to short-term assets of ≤ 12months. Value exceeding 2 implies short-term funding dependence.
Sources: BCL; and IMF staff calculations.

- *Investment funds maintained large exposures to sovereign debt and increased their holdings of securities issued outside the euro area*. Sovereign securities account for a significant share of funds' debt security holdings (about 35 percent). In addition, overall, investment funds have increased their exposure to sovereign securities issued in the United States and other advanced economies. A higher degree of international portfolio diversification increases the resilience to shocks in the euro area. However, it also increases funds' exposure to exchange rate risk.

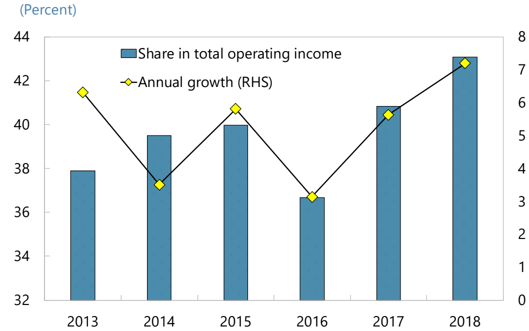
Change in Investment Funds' Holdings of Sovereign Securities
(Percent)



Note: Includes both money market and non-monetary funds. Securities can be valued at fair value (changes in share of sovereign securities reflect changes in stocks and valuation effects).
Sources: BCL; and IMF staff calculations.

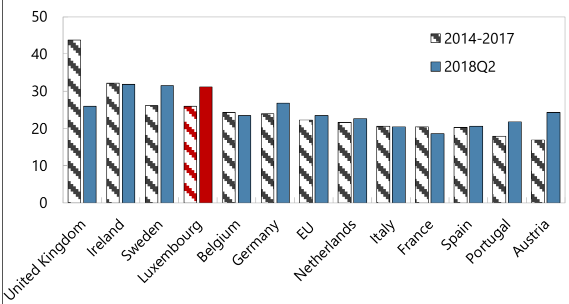
21. The banking system appears resilient, but profitability risk has increased, especially at smaller banks. Overall, Luxembourg banks are more efficient, and have larger capital and liquidity buffers than an average EU bank. Banks' profitability remains comfortable, partly reflecting increased income diversification in an environment of continued low interest rates. Commission and fee income, which has increased by 5 percent on average since 2013, contributed about 43 percent to overall bank income in 2018. Rising operational costs—including those related to regulatory compliance as well as investment in new technology—have increased profitability risk, especially for smaller banks. Increased liquidity requirements led to shifting bank exposures from group entities to short-term deposits at the central bank, partly mitigating risks from cross-border exposures. In addition, the results of liquidity stress tests run by the *Commission de Surveillance du Secteur Financier* (CSSF) suggest that most banks have sufficient buffers to counterbalance severe deposit outflows. Finally, solvency stress tests

Commission and Fee Income
(Percent)



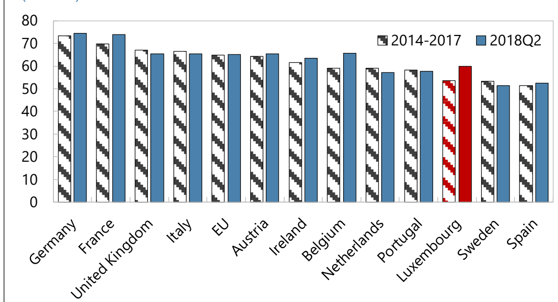
Sources: CSSF; and IMF Staff Calculations indicate that the banking system as a whole remains resilient to severe macro shocks. While low profitability and high available-for-sale positions could lead a few small banks to breach minimum capital requirements under severe stress conditions, systemic implications are unlikely.

Liquid Assets to Short-term Liabilities
(Percent)



Note: Domestic banking groups and stand alone banks, foreign (EU and non-EU) controlled subsidiaries and foreign (EU and non-EU) controlled branches.
Source: ECB - Consolidated Banking data.

Cost-to-Income Ratios
(Percent)



Note: Domestic banking groups and stand alone banks, foreign (EU and non-EU) controlled subsidiaries and foreign (EU and non-EU) controlled branches.
Source: ECB - Consolidated Banking data.

22. The authorities took steps to enhance regulation and supervision in line with past staff advice, and should continue to follow up on the 2017 FSAP recommendations (Annex IV).

- Recent efforts to strengthen supervision of *investment funds*, such as the issuance of specific guidance on substance requirements in the context of delegated activities, are welcome. Progress is also being made on providing guidance on liquidity stress testing in coordination with the *European Securities and Market Authority* (ESMA). The authorities should continue to engage with regulators in jurisdictions where delegated portfolio and risk management are prominent. Furthermore, they should continue to enhance macroprudential-based surveillance of the sector, including by closely monitoring liquidity and maturity mismatches and market risks emanating from common risk-taking behaviors. For this purpose, they should pursue efforts to close existing data gaps, including system-wide indicators for leverage and asset quality. Building on recent progress in developing internal liquidity stress testing methodologies, they should further strengthen capacity for system-wide stress testing.

- Efforts to strengthen the supervision of *banks*' large cross-border exposures should continue. In this regard, the recent increase in resources dedicated to reviewing existing waivers for large exposure limits is welcome. The authorities should also reinforce the oversight of non-bank holding companies of banks in line with the upcoming European approach. Building on recent progress, appropriate resolution plans for the less systemic banks should be completed. While a contingent framework of emergency liquidity assistance (ELA) is in place, efforts to finalize some operational modalities as specified in the 2017 FSAP should continue. Finally, the BCL should continue working closely with the ECB to include household credit data as soon as possible in the ECB's initiative of creating a harmonized credit bureau across the euro area.

- *Macroprudential oversight* appears to be working well but should be strengthened. To signal a tighter macroprudential stance, the authorities appropriately announced the introduction of a 0.25 percent countercyclical capital buffer to be implemented by January 2020. They took steps to standardize the reporting of borrower-related indicators and are planning to publish the substance of the risk dashboard this year. The institutional framework for macroprudential policy could be reinforced by: (i) swiftly approving the draft bill from December 2017 to implement borrower-based mortgage lending limits; and (ii) enshrining into law the de-facto lead role of the *Banque Centrale du Luxembourg* (BCL) in financial stability analysis.

- *Governance arrangements* should be upgraded by enshrining in legislation the operational independence of the CSSF and *the Commissariat aux Assurances* (CAA), further aligning the code of conduct for non-executive members of the BCL Supervisory Board to best practices, and introducing codes of conduct for the members of the non-executive boards of the CSSF and the CAA. The relationship between the government and banks with state participation should be formalized on an arms-length basis.

- *Risks related to money laundering and terrorism financing (ML/TF)* should continue to be addressed. Luxembourg transposed the 4th EU Anti-Money Laundering Directive into national law in 2018. The CSSF took welcome steps to strengthen its AML/CFT legal framework and enhance the oversight of the risks in private banking and wealth management. The authorities finalized the first National Risk Assessment (NRA) report. They should move forward with implementing the national strategy developed based on the NRA, and focus on mitigating risks identified in the NRA, particularly those related to private banking and foreign trusts.

23. Steps taken to address risks in the real estate market are welcome, but the authorities should continue monitoring them closely and take further action as needed (Box 3). Mortgage lending grew above 8 percent in 2018, broadly in line with the historical trend. High levels of household indebtedness could expose some vulnerable households to increased debt service burden in the event of faster-than-anticipated monetary policy normalization.[10] However, based on recent sensitivity analysis run by the CSSF, most domestically-oriented banks would withstand well extreme real estate price shocks and high default rates. Efforts to standardize the reporting of borrower-related indicators and the activation of the countercyclical capital buffer are steps in the right direction to enhance the monitoring and mitigation of risks in the real estate market. The authorities should continue to closely monitor these risks and stand ready to introduce measures to contain excessive household indebtedness.

24. Challenges arising from Fintech developments should continue to be addressed following a risk-based approach. Luxembourg is actively engaged in Fintech developments, which could bring efficiency gains and new business opportunities to the financial sector.[11] However, they could also increase operational, cyber, compliance, and ML/TF risks. To encourage innovation while minimizing the risks, regulatory and supervisory arrangements should keep pace with Fintech developments in a technology-neutral approach. The recent initiative to close gaps in the blockchain's legal framework is a step in the right direction.

[10] A recent macroprudential stress test run by the BCL suggests that extreme negative shocks to residential real estate prices would increase borrowers' probabilities of default much more than adverse shocks to real GDP growth or interest rates. Results also show that, overall, banks would remain adequately capitalized.

[11] These include blockchain technology, cryptocurrency, automated investment services, and mobile and e-payments.

Authorities' Views

25. The authorities emphasized that the financial system remains resilient. The supervisors concurred with staff that there has been a structural change in banks' revenue sources, with increasing weight of fee and commission income. They closely monitor developments in bank profitability—especially for smaller stand-alone banks—as well as in intragroup credit risk, which remains among their key supervisory priorities. The authorities consider that potential vulnerabilities in the investment fund sector arise from factors, such as the potential repricing of risk premia (credit and liquidity risks) or via common investment strategies. They agreed with staff's assessment that efforts to further enhance investment fund supervision, including from a system-wide perspective, should continue. They are working to further close data gaps and build up internal risk analysis capacities. They concurred that risks from increasing household indebtedness should continue to be closely monitored and that additional actions could be taken as needed.

26. They highlighted concrete progress in implementing the 2017 FSAP recommendations. The authorities have been actively participating in EU and international forums to develop consistent leverage measures, guidance for liquidity stress testing by investment fund managers, and standardized stress testing for Money Market Funds. The CSSF is working to analyze the effectiveness of liquidity management tools and is developing liquidity stress testing capacity. The authorities stressed that the reinforcement of the oversight of non-bank holding companies of banks as well as the operationalization of the credit register will be pursued via a European approach. On the governance of supervisory bodies, the national authorities continue to feel comfortable with their model in which the Ministry of Finance representative chairs the non-executive boards of supervisors. The CSSF took steps to strengthen its AML/CFT legal framework and enhance the oversight of the risks in private banking and wealth management. The authorities are confident that they will be able to transpose the 5th EU AML Directive in a timely manner and are implementing a national strategy based on the NRA findings.

C. Structural Reforms: Preparing for Long-Term Challenges

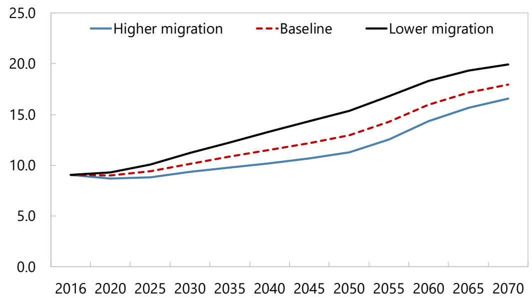
27. To boost potential, make growth more inclusive, and ensure long-term fiscal sustainability continuous efforts are needed to address Luxembourg's main structural gaps. Specifically:

- *Long-term sustainability of the pension system (Box 4)*. Thanks to dynamic population growth, Luxembourg's pension system remains in surplus and has accumulated appreciable reserves in recent years. However, given less favorable migration flows and population ageing in the future, the European Commission's 2018 Ageing Report projects pension expenditures to increase from 9 to 15 percent of GDP within one generation (by 2058) under a no-policy change scenario.[12] This would increase the fiscal deficit and the debt by 9 and 76 percent of GDP, respectively. Luxembourg has currently the lowest

[12] The increase in pension expenditures remains significant even under the most optimistic scenario of higher migration flows.

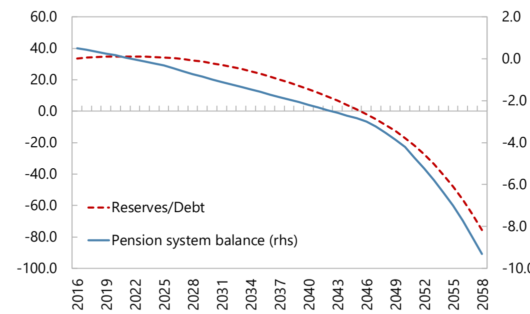
effective retirement age in the EU (60 vs. 63 years) and the second largest replacement rate (73 vs. 46 percent). Given the long lags of pension reforms, the authorities should engage key stakeholders in a timely way to agree on a pension reform over the medium term to ensure a gradual adjustment and more intergenerational equity. Reform options include increasing contributions, reducing replacement rates, and increasing the retirement age. Staff simulations show that, while all reform options can ensure the pension system's long-term sustainability, they have important macroeconomic tradeoffs. Higher retirement age increases GDP per capita and consumption relative to the baseline, while lower replacement rates and higher contributions reduce disposable income and consequently consumption per capita. Moreover, higher contribution rates introduce labor market distortions, reducing GDP per capita.

Public Pension Expenditures under Different Migration Scenarios
(Percent of GDP)



Source: European Commission 2018 Ageing Report.

Fiscal Costs Implied by the Pension System
(Percent of GDP)



Sources: EC's 2018 Ageing Report; and IMF staff calculations.

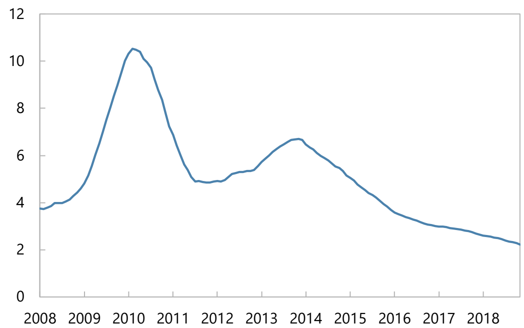
- *Supply constraints in the housing market*. House prices have continued to rise rapidly driven by limits on housing supply as well as demand factors reflecting high population growth. These dynamics continue to contribute to affordability pressures. Mobilization of housing supply remains difficult, as available buildable land remains underutilized, potentially in anticipation of future price increases. While municipalities have tools to discourage land hoarding (i.e. taxation on unused land), they rarely use them. Announced policies to expand housing supply such as the creation of a centralized committee to speed up the acquisition of land by the state to build social housing and increasing social housing available for rent are steps in the right direction.

- *Structural unemployment*. The labor market is buoyant with signs of labor shortages and skills mismatches, as reflected in the historically low job seekers to vacancies ratio. Above all, the young and less qualified benefitted from strong job creation in construction and services to enterprises. However, long-term unemployment, while it has declined, remains high relative to 2009. Furthermore, elderly labor market participation (55–64 years old)—at 40 percent—is significantly lower than the EU average of 57 percent. The recently implemented Digital Skills Bridge program can help employees to better adapt to digital transformation and reduce skill mismatches. Furthermore, the introduction of the *Revenu d'Inclusion Sociale* (RevIS) in January 2019 can increase incentives to actively search for a job by allowing its beneficiaries to keep a higher part of their welfare benefits after accepting a job offer. The authorities' plan to move to fully individual income taxation should increase incentives for female labor market participation. In recent years the government has also taken measures to increase elderly labor market participation, such as the reform of the professional reclassification scheme which could reduce the share of disability pensions, the creation of subsidized jobs, and the abolishment of some pre-retirement schemes. However, further actions are needed to raise labor market participation of seniors, including by phasing out benefits for early retirement.

Figure 6. Labor Market Developments

Historically low job seekers to vacancies ratio signals a tight labor market.

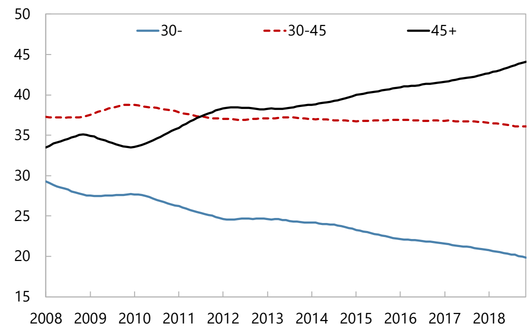
Job Seekers to Vacancies Ratio
(12-month moving average)



Sources: ADEM and IMF staff calculations.

The recent decline in unemployment has benefitted above all the youth, while…

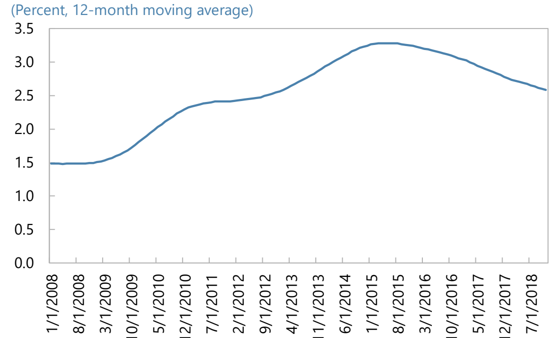
Unemployment by age groups
(Percent of total unemployment, 12-months moving average)



Sources: ADEM and IMF staff calculations.

… structural long-term unemployment remains high compared to 2009 and…

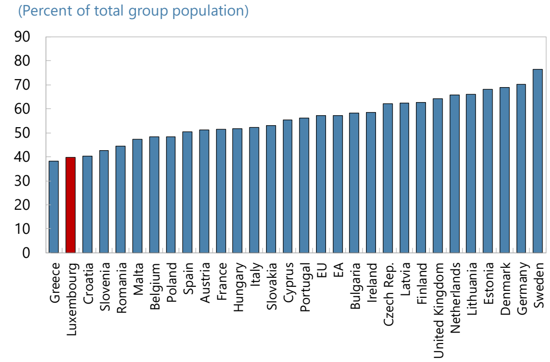
Long-Term Unemployment Rate
(Percent, 12-month moving average)



Sources: STATEC, ADEM, and IMF staff estimations.

… participation among seniors is one of the lowest in the EU.

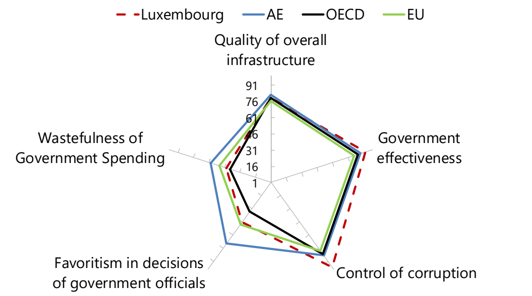
Labor Market Participation, Aged 55-64 years
(Percent of total group population)



Source: Eurostat.

- *Infrastructure and efficiency gaps*. Luxembourg has maintained relatively high public investment spending (above 5 percent of GDP since 2000 on average), which helped the country achieve one of the highest public capital stock-to-GDP ratios among EU countries. However, more needs to be done to upgrade the country's infrastructure and remove potential bottlenecks, such as in transportation. A comparison of public investment efficiency scores across countries points to notable room for efficiency improvements in Luxembourg.[13] Luxembourg's public investment efficiency scores indicate that the country could have built up to 35 percent more infrastructure and improved the infrastructure quality by 12 percent for the same cost. Improving public investment efficiency would help achieve better value-for-money, enhance resource allocation, and assist the government in maintaining a strong fiscal position. According to several survey-based indicators, Luxembourg's governance framework for public spending appears relatively adequate (Worldwide Governance Indicators and World Economic Forum).[14] However, public investment policy could be better articulated with a multiyear expenditure planning to ensure that investment expenditures are driven by policy priorities and fiscal objectives. For this purpose, Luxembourg should move forward with implementing a medium-term expenditure framework to enhance coordination among line ministries and, in turn, improve the prioritization of investment projects.

Indicators of Spending Efficiency and Governance
(1=minimum, 100=maximum)



Sources: World Bank's Governance indicators and Global Competitiveness Report, 2017/18.

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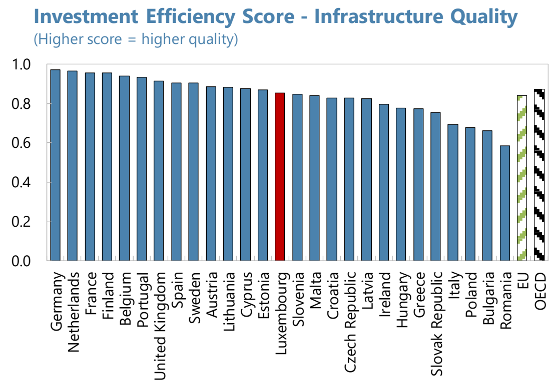
[13] Investment efficiency scores reflect how far a country is from the frontier determined by the best performers. Efficiency is measured in terms of both the quality (using the infrastructure sub-component of the global competitiveness indicator of the World Economic Forum) and the quantity (measured as an index of physical infrastructure) of infrastructure. Luxembourg's efficiency scores for infrastructure quality and quantity are 0.87 and 0.65, respectively.

[14] Caution is needed when comparing the indicators across countries. Although they are updated yearly and survey methodologies are revised frequently, they are partly constrained by the data that can realistically be collected and are based on perceptions. The worldwide governance project reports aggregate and individual governance indicators for over 200 countries and territories over the period 1996–2017, for six dimensions of governance, including control of corruption. They are based on a mix of quantitative measures and survey-based indicators. The World Economic Forum's Global Competitiveness report includes several indicators on the quality of institution, which are based on executive opinion surveys.

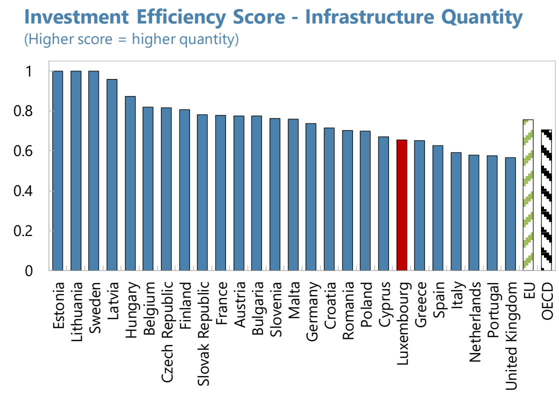
Figure 7. Indicators of Public Investment Efficiency

The infrastructure quality gaps relative the average of EU or OECD countries are small…



Source: "Making Public Investment More Efficient." IMF FAD Policy Paper.

…while, infrastructure quantity gaps relative to the euro-area average are large…



Source: "Making Public Investment More Efficient." IMF FAD Policy Paper.

Authorities' Views

28. The authorities agreed that continuous efforts are needed to address Luxembourg's main structural gaps in order to boost potential growth and make it more inclusive. The authorities noted that there is considerable uncertainty around future demographic evolution, which influences the assessment of the sustainability of the pension system. They agreed with staff that the pension system is sound over the short and medium term, but that there are challenges in the long run. They underlined the importance of actively engaging with key stakeholders and taking intergenerational equity considerations into account. The authorities also concurred with staff that low elderly labor participation remains a challenge but stressed that recent policies have already had a positive impact. In line with staff's assessment, the authorities find that increasing price-to-income and price-to-rent ratios point to growing affordability problem. They reiterated that the government has made alleviating housing supply constraints one of its main priorities. Accordingly, they tabled plans to change urban planning laws, boost the construction of social housing, and reform real estate taxation to reduce speculation. Finally, the authorities concurred with staff that there is scope to improve public investment efficiency, including by strengthening the budgetary framework.

STAFF APPRAISAL

29. Luxembourg's growth outlook remains favorable, but risks are tilted to the downside. The favorable prospects reflect sound economic policies, firm prudential oversight, and a business-friendly environment. Growth is projected to remain robust on the back of solid employment growth and low unemployment. The external position is broadly consistent with fundamentals and desirable policy settings. External downside risks include a weaker-than-expected global growth, changes in international tax rules, a disorderly Brexit, and a sharp tightening of global financial conditions. Domestically, continuously increasing real estate prices could lead to excessive indebtedness of some households.

30. Given risks, particularly with regards to tax revenues, the authorities should implement the announced fiscal measures while preserving sizable fiscal buffers. The authorities' plans to lift the economy's potential and make growth more inclusive and greener are appropriate. Luxembourg's welcome steps to comply with EU and international anti-tax avoidance and transparency initiatives may lead some multinationals to expand their local presence. However, changes in international taxation could also prompt others to relocate assets, posing non-negligible risks to tax revenues. The authorities should quantify these risks under alternative scenarios and explore growth-friendly options to mitigate them.

31. Building on recent progress, the authorities should continue to implement the 2017 FSAP recommendations to further enhance the resilience of the financial sector. In the banking sector, efforts to strengthen the supervision of banks' large cross-border exposures, complete the resolution plans for the less systemic banks, and implement the country's component for the euro area credit bureau should continue. In the investment fund sector, the issuance of specific guidance on substance requirements in the context of delegated activities is welcome. The authorities should continue to engage with regulators in jurisdictions where delegated portfolio and risk management are prominent, and to increase macroprudential-based surveillance.

32. Macroprudential oversight appears to be working well but should be strengthened. The activation of the countercyclical capital buffer, steps to standardize the reporting of borrower-related indicators and plans to publish the substance of the risk dashboard are welcome. The draft bill to implement borrower-based mortgage lending limits should be swiftly approved. Moreover, they should continue to monitor financial stability risks stemming from the real estate sector and vulnerabilities emerging from excessive household indebtedness.

33. Further action should be taken to strengthen governance arrangements of the central bank and financial supervision authorities. The operational independence of the CSSF and the CAA should be enshrined in legislation. The code of conduct for non-executive members of the central bank supervisory board should be aligned with best practice and codes of conduct for the members of the non-executive boards of the CSSF and the CAA should be adopted.

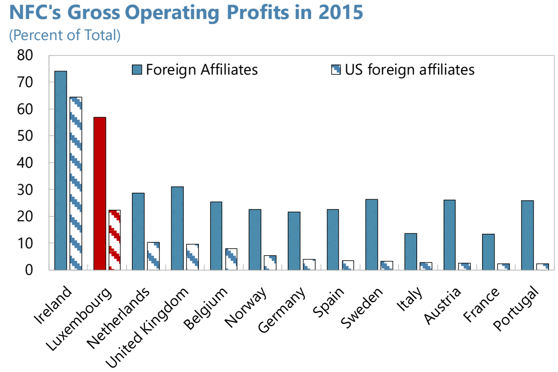
34. Risks related to ML/TF and challenges arising from Fintech should continue to be closely monitored. Having transposed the 4th EU Anti-Money Laundering Directive into national law in 2018 and finalized the first National Risk Assessment (NRA) Report, the authorities should move forward with implementing the national strategy developed based on the NRA. Specifically, they should focus on mitigating risks identified in the NRA, particularly those related to private banking and foreign trusts. Fintech-related risks should continue to be addressed following a risk-based approach.

35. Luxembourg should ensure the long-term sustainability of the pension system considering intergenerational equity and the tradeoffs of various reform options. Dynamic population growth has kept Luxembourg's pension system in surplus and led to the accumulation of appreciable reserves. However, less favorable migration flows and population ageing in the future would put the pension system under pressure over the long run. To avoid undue deterioration of the system, and given the long lags of pension reforms, it would be appropriate to engage with key stakeholders in a timely manner on reforms to secure the system's long-term sustainability.

36. Key structural gaps still need to be addressed to boost potential and make growth more inclusive. Rapid growth in house prices continues to pose affordability challenges. The government should follow through on its medium-term reform agenda to alleviate supply constraints. While the young and low-skilled benefitted the most from the recent strong job creation, structural unemployment remains relatively high. Further actions, including phasing out benefits for early retirement, is needed to raise labor market participation of elderly, which is significantly lower than the EU average. Notwithstanding one of the highest public capital stock-to-GDP ratios in the EU, Luxembourg faces infrastructure bottlenecks, such as in transportation. Improving public investment efficiency would assist the government in maintaining a strong fiscal position as it continues to upgrade the infrastructure.

37. Staff recommends that the next Article IV consultation with Luxembourg be held on the standard 12-month cycle.

Box 1. U.S. Tax Reform: Spillovers to Revenues in Luxembourg[1]



Sources: Eurostat's foreign affiliates statistics.

Multinational profits are a major source of fiscal revenue in Luxembourg. About 30 percent of Luxembourg's tax revenue originates from the taxation of capital—the highest percentage within the EU28 (European Commission, 2018)[2]. Eurostat's foreign affiliate database indicates that foreign-owned entities generate almost 60 percent of gross operating surpluses in the non-financial sector, with U.S.-owned firms contributing around 22 percent, the second largest share after Ireland.[3]

The recent U.S. tax reform reduced the CIT rate by 14 percentage points and introduced a host of additional measures aimed at expanding the U.S. tax base. The combined (state and federal) CIT fell from around 40—one of the highest rates globally—to 26 percent, close to the OECD average of 24 percent. This cut follows a period of three decades of a global downward trend in corporate tax rates, during which the United States had kept its rate roughly constant. Moreover, the United States introduced a territorial system, meaning that dividends received by U.S. parent companies are no longer subject to U.S. corporate income tax.

While estimates are prone to uncertainty, Luxembourg's tax revenues could fall due to the changed incentives for firms where to report profit and invest capital. Beer, Klemm, and Matheson (2018)[4] estimate revenue spillovers from a decrease in the U.S. CIT rate by combining elasticity estimates from the empirical literature in a formula that captures both investment and profit shifting reactions of multinational corporations (MNCs).[5] Applying the same set of empirical elasticity estimates used by Beer, Klemm, and Matheson (2018) and assuming a country-specific weight of 19 percent,[6] suggests that long-term revenue losses in Luxembourg could be 7 percent of CIT revenues (about 0.4 percent of GDP). However, the impact could be larger if the elasticities are higher or the weights underestimate the importance of the United States for MNCs in Luxembourg.

A reduction in Luxembourg's CIT rate could aggravate revenue losses. The U.S. tax reform could trigger a new round of CIT rate cuts globally and various countries, including in the EU, have already announced plans to reduce their rates.[7] While a reduction in headline rates dampens incentives for outward profit shifting, the direct revenue loss from applying a lower rate typically outweighs the relative gains from changed MNC behavior. Following the methodology outlined in Beer, Klemm, and Matheson (2018), revenue

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[1] Prepared by Sebastian Beer (FAD).

[2] Taxation Trends in the European Union 2018.

[3] The dataset does not provide information on the ownership structure in the financial sector, which contributes around 25 percent to the country's GDP.

[4] Beer, S., A. Klemm, and T. Matheson, 2018, "Tax Spillovers from U.S. Corporate Income Tax Reform," IMF Working Paper, No. 18/166.

[5] Specifically, the formula Revenue Loss $(\text{in } \%) = (\varepsilon_K \alpha + \varepsilon_S)\omega_{LUX}\Delta t_{US}$, is used, where ε_K denotes the semi-elasticity of capital with respect to the tax differential, α is the capital intensity of production, ε_S is the semi-elasticity of reported profits with respect to the tax differential, ω_{LUX} is a country-specific weight, and Δt_{US} is the change in the U.S. statutory tax rate (14 percentage points). Following Beer, Klemm, and Matheson (2018) it is assumed that $\varepsilon_K = 2.4$, $\alpha = 0.5$, and $\varepsilon_S = 1.5$

[6] The relative importance of U.S.-linked MNEs in Luxembourg is calculated as a weighted average between the financial and non-financial sector. Due to a lack of information on the ownership structure in the financial sector, the calculation uses the relative share of U.S. FDI in Luxembourg according to UNCTAD to extrapolate that 10 percent of financial firms in Luxembourg are affected by the U.S. reform, implying 0.19=0.75*0.22+0.25*0.1.

[7] Belgium announced that it will further reduce its CIT rate to 25 percent in 2020, while France and Austria will reduce their CIT rates from 33.3 percent to 25 percent and from 25 to 20 percent, respectively, in 2022.

Box 1. U.S. Tax Reform: Spillovers to Revenues in Luxembourg (concluded)

losses in Luxembourg could increase to 11 percent of CIT revenue in the long run (about 0.6 percent of GDP), if the government reduced the headline rate by one percentage point.[8]

Beyond the U.S. reform, the international taxation landscape is undergoing fundamental changes which pose risks to Luxembourg's fiscal revenues. Luxembourg is strongly committed to implement the BEPS actions (see Appendix I). It adopted the EU's Anti-Tax Avoidance Directive I (ATAD I) in December 2018 and plans to adopt ATAD II by January 2020. As an EU member, Luxembourg has been required to automatically exchange information on cross-border tax rulings since January 2017 and will need to update its double tax treaties to satisfy the inclusive framework's minimum standards. The European Union has decided to relaunch the debate on a Common Consolidated Corporate Tax Base (CCCTB). The OECD (2019)[9] as well the IMF (2019)[10] have recently discussed reform options, including to deal with the challenges posed by digitalization, and further reduce profit shifting incentives and tax competition. These include the allocation of tax rights to user jurisdictions where business value is created through user participation, minimum tax rates, destination-based taxation, a formula apportionment taxation, and a residual profit taxation.

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[8] Revenue losses with a policy response are calculated using: Revenue Loss (in %)=[μ/t+(1-μω_LUX)(ε_K α+ε_S)] 〚ω〛_LUX Δt_US, where μ, a parameter capturing the response in Luxembourg's tax rate is set to 0.5, t=0.25 and the remaining variables are defined in footnote 4.

[9] OECD, 2019, "Addressing the Tax Challenges of the Digitalization of the Economy – Policy Note," OECD/G20) Base Erosion and Profit Shifting Project, January 23, 2019.

[10] International Monetary Fund, 2019, "Corporate Taxation in the Global Economy," IMF Policy Paper.

Box 2. Risks in the Investment Fund Sector and Implications for the Economy[1]

Drawing on a representative dataset, and expanding the 2017 FSAP analysis, we derive risk metrics for investment funds that capture well past episodes of systemic financial stress. Using fund-by-fund market monthly data covering more than 80 percent of the fund sector from 2005:M1 to 2018:M9, we derive several risk metrics. We compute probabilities of distress (PoDs) for each fund class following a value-at-risk methodology[2]. We also derive two system-wide measures: (i) the fund stability index which quantifies the probability of any fund class becoming stressed given at least one fund class has already been under stress; and (ii) the joint probability of stress, which gauges the likelihood that all fund classes become stressed simultaneously.[3] The derived metrics spike during well documented past episodes of financial systemic stress, such as the global financial, the European debt crises, and the pickup in financial market volatility in 2016 when the Fed started its interest rate normalization.

Financial stress in the investment fund sector has decreased since 2016, but vulnerabilities have built up. Most indicators show that financial stress in the sector has remained contained since 2016—a prolonged period of loose global financial conditions.[4] However, in this environment, while investment funds have benefitted from strong inflows and valuation effects, partly reflecting search-for-yield, they have accumulated vulnerabilities, such as increased liquidity and maturity mismatches. In fact, the likelihood of being under stress tend to be higher for fund classes with larger vulnerabilities.

Against this background, tighter financial conditions would lead to increased financial stress, with adverse implications for the real economy. To assess the impact of a tightening in global financial conditions on stress in the investment fund sector and its implications for the economy, we followed a vector autoregressive (VAR) approach using quarterly data from 2006:Q1 to 2018:Q3. We find that:

- *Tighter financial conditions would increase stress, especially for funds with larger vulnerabilities*. The bi-variate VAR includes the global financial conditions index and PoDs. A one-standard deviation shock to the global financial conditions index is significantly associated with higher stress for most fund classes. The cumulative impact is greater for EM, mixed, and HY funds. Should global financial conditions tighten sharply, funds with large liquidity/maturity mismatches and high leverage can experience liquidity strains arising from idiosyncratic redemptions and could generate spillovers through the asset liquidation channel to other parts of the sector.
- *Financial stress in the fund sector could reduce GDP growth through different channels.* The three-variate VAR included systemic risk metrics, household credit, and real GDP growth. We find that bank credit channel could play a role in the transmission of financial stress in the investment fund sector to the economy. Higher systemic risk is associated with lower household credit growth in the near term, potentially reflecting the interconnectedness of the investment fund and the banking sectors.[5] Other channels, for example a direct impact of a lower fund performance on GDP, are also at play. As a result, real GDP growth could be reduced by about 2 percentage points in a year, following a one standard deviation shock to systemic risk.

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[1] Prepared by Moez Souissi, in collaboration with Jana Bricco (EUR).

[2] Investment funds are grouped based on their investment policies, including equity, high-yield (HY), bond, mixed, and emerging-market (EM) funds as well as constant net asset value, variable net asset value, and other money market funds. Stress is the event where a fund needs to liquidate assets to meet large redemption demands which, depending on the liquidity characteristics of the underlying assets, could lead to extreme negative market returns. The likelihood of stress is proxied by the share of funds with returns falling in the tail of the overall distribution of returns of all funds over a 12-month rolling window.

[3] PoDs are used to recover the joint likelihood of stress applying the Consistent Information Multivariate Optimization methodology. See "A Comprehensive Multi-Sector Tool for Analysis of Systemic Risk and Interconnectedness" for more details.

[4] Available data do not cover financial stress resulting from the pullback in equity markets in Q4.

[5] See for details the 2016 AIV Selected Issues *Investment Fund-Bank Linkages: Luxembourg as a Case Study*.

Box 2. Risks in the Investment Fund Sector and Implications for the Economy (concluded)

The analysis covers a large sample of UCITS funds.

Luxembourg: Investment Funds Coverage, 2018M9

(Billions of euros, unless specified)

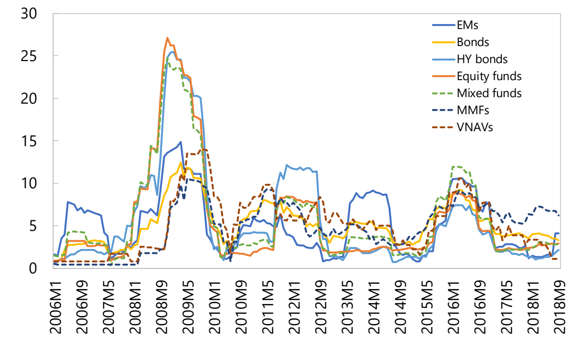
	Number of Funds	Total Net Assets	Total net assets universe	Coverage (percent)
Non-monetary Funds				
EM	53	150	120	80%
HY	46	146	117	80%
Other	633	978	782	80%
Equity funds	957	1,371	1,097	80%
Mixed funds	685	979	783	80%
Total bnon-monetary funds	*2,374*	*3,624*	*2,899*	*80%*
Money Market Funds				
CNAV	10	196	181	92%
VNAV	15	30	28	92%
Other MMFs	30	41	38	92%
Total MMFs	55	268	247	92%
Total	**2,429**	**3,892**	**3,145**	**81%**

Sources: CSSF; and IMF staff calculations.

Stress metrics pinpoint systemic episodes, such as Lehman collapse and the European sovereign debt crisis.

Probabilities of Distress by Fund Type

(Percent)

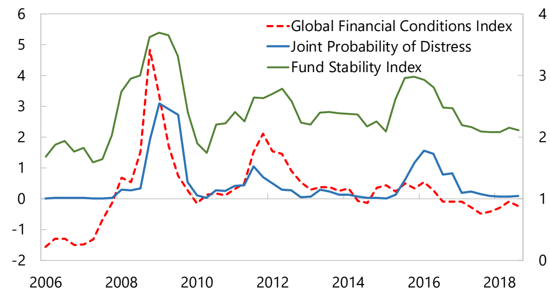


Sources: CSSF; and IMF staff calculations

Systemic risk in Luxembourg's investment fund sector is highly correlated with global financial conditions…

Systemic Risk Metrics and Global Financial Conditions Index

(Percent)



Note: A positive financial conditions index indicates a tightening in financial conditions.
Source: IMF staff calculations.

… reflected in the negative and significant impact of a tightening in global financial conditions (FGSI) on PoDs.

Change in PoDs
(due to one standard deviation in GFSI)

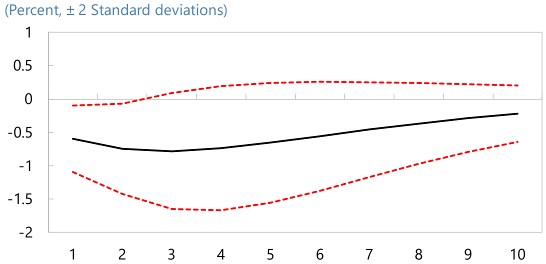
	1-quarter ahead	Cumulative impact
Bonds	0.4**	3.9**
EMs	0.3**	5.5**
Equity funds	0.7**	3.6**
HY bonds	0.5**	3.9**
Mixed funds	0.7**	5.2**
MMFs	0.9**	7.7**
CNAVs	0.2	4.0
VNAVs	0.3**	3.6**

Sources: IMF staff calculations.
Notes: Figures represent the impulse responses of PoDs to one standard-deviation shocks to the Global Financial Conditions index They were dervied using a bivariate vector autoregression (VAR) model for each fund calss.
** Statistically signficant at 5 percent

Growth in household credit is negatively impacted by an increase in systemic risk in the investment fund sector…

Response of HH Credit Growth to Systemic risk Shock

(Percent, ± 2 Standard deviations)

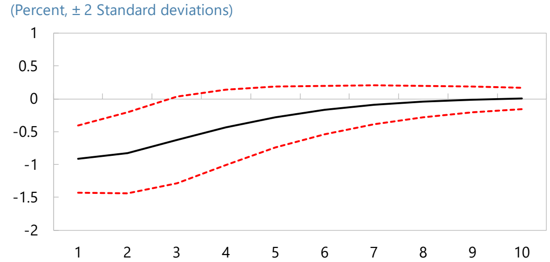


Notes: Impulse responses are derived using a structural VAR which includes the following variables: a logistic transformation of the systemic risk metric, yoy household credit growth and yoy real GDP growth. Chock identification is performed with the standard cholesky decomposition of the innovative matrix, placing the systemci risk metrics at the top of vraiables' ordering.
Source: IMF staff calculations.

…. amplifying the negative impact of the shock on real GDP growth.

Response of Real GDP Growth to Systemic risk Shock

(Percent, ± 2 Standard deviations)

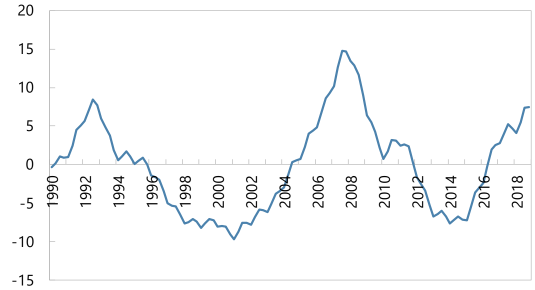


Notes: Impulse responses are derived using a structural VAR which includes the following variables: a logistic transformation of the systemic risk metric, yoy household credit growth and yoy real GDP growth. Chock identification is performed with the standard cholesky decomposition of the innovative matrix, placing the systemci risk metrics at the top of vraiables' ordering.
Source: IMF staff calculations.

Box 3. Risks Stemming from the Residential Real Estate[1]

Real house prices are estimated to be slightly overvalued in 2018. The percent deviation between the actual house price index and the predicted house price index suggests that real house prices were slightly overvalued, by about 7.5 percent in 2018.[2] Going forward, given supply constraints, Brexit-related immigration flows could add demand pressures and increase overvaluation of residential real estate (RRE) prices.

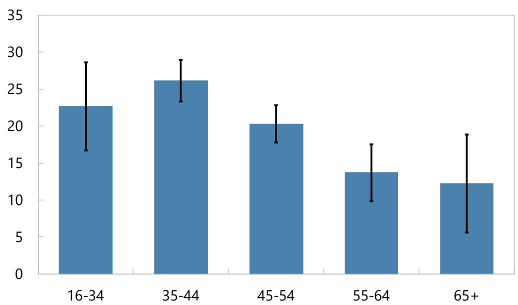
Real House Price Valuation
(Percent deviation of actual prices from equilibrium levels)



Note: deviation normalized by assuming no misalignment on average over 1990-2018.
Source: IMF Staff calculations.

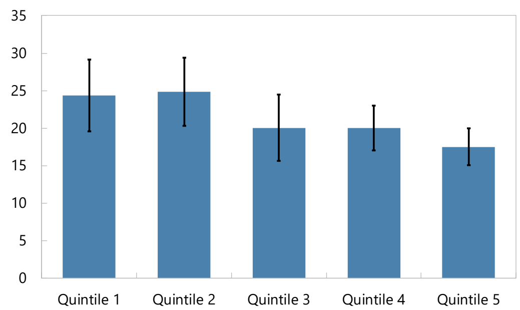
However, elevated household indebtedness indicates medium-term vulnerabilities, especially among younger age cohorts. Household debt remained high at about 170 percent of net disposable income in 2017, placing Luxembourg above the average of OECD countries. According to the latest available data from CSSF, 32 percent of households have a debt-service-to-income (DSTI) ratio greater than 45 percent. Disaggregated data from Household Finance and Consumption Survey (2014) indicates very high debt-to-income and DSTI ratios for younger cohorts (below 45 years old). The median and 75th percentile DSTI ratios were approaching 25 and 40 percent of disposable income, respectively. Classified by income quintiles, debt service burden is larger for poorer households (quintiles 1 and 2). In 2018, the share of adjustable rate mortgages in new mortgages remained stable at about 50 percent, indicating that some household balance sheets remain vulnerable to interest rate risks. These vulnerabilities would be exacerbated should monetary policy normalize faster than anticipated.

Median Debt-Service-To-Income Ratio: Age Cohorts
(Percent)



Source: BCL based on the Luxembourg Household Finance and Consumption Survey 2014.

Median Debt-Service-To-Income Ratio: Income Quintiles
(Percent)



Source: BCL based on the Luxembourg Household Finance and Consumption Survey 2014.

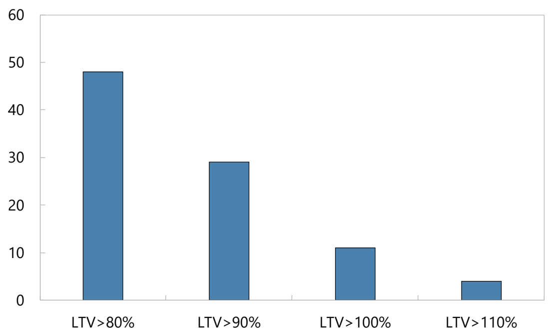
Rising RRE prices and elevated household indebtedness require continued monitoring of financial stability risks including banks' ability to absorb price declines. Non-performing loans (NPLs) in the real estate sector remain low, with the ratio of total NPLs in RRE to total assets of the domestic banking system at 0.18 percent. However, borrower-based indicators point towards the need for closer monitoring of financial stability risks. Loan-to-value (LTV) ratios above 80 percent, for instance, are high at 31 percent of the outstanding mortgage stock. This is expected to increase further as one half of all new mortgage loans continue to have LTV ratios above 80 percent.

[1] Prepared by Richard Varghese (EUR).

[2] The assessment of the price misalignment draws on the model estimated in the 2018 Article IV Selected Issues 'Housing Market: Assessment and Policy Recommendations'.

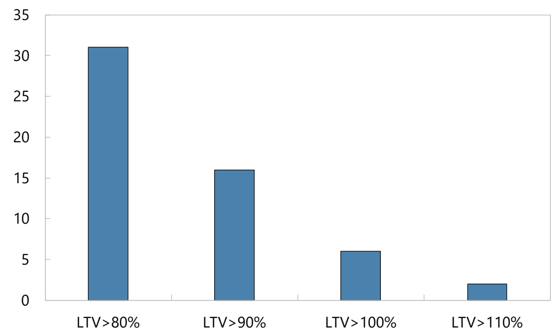
Box 3. Risks Stemming from the Residential Real Estate (concluded)

New Mortgage Loans (Flow)
(Percent)



Source: CSSF.

Outstanding Mortgage Loans (Stock)
(Percent)



Source: CSSF.

The authorities have taken measures to mitigate systemic risks stemming from RRE developments. The CSSF introduced a countercyclical capital buffer of 0.25 percent in the beginning of 2019 which will become effective from January 2020. It also issued a circular in December 2018 to harmonize the reporting of borrower-related indicators to address data gaps associated with RRE lending standards. The draft bill from December 2017 would allow the CSSF to implement borrower-based mortgage lending limits to further expand the toolkit and strengthen macroprudential oversight.

Box 4. Ensuring Long-Term Sustainability of Luxembourg's Pension System[1]

While Luxembourg's pension system is sound over the near term, it is expected to face considerable spending pressures in the long term. The 2012 pension reform was a step in the right direction but has not guaranteed the system's long-term sustainability. With the lowest old-age dependency ratio in Europe and strong net migration flows in recent years, the pension system is currently in surplus and has accumulated reserves exceeding 30 percent of GDP. However, given lower population growth and net migration flows, and higher life expectancy in the future, pension expenditures are expected to roughly double to 18 percent of GDP by 2070—the highest increase in Europe. Accordingly, our estimates—which are broadly in line with the authorities'—project the pension system to be in deficit already by the mid-2020s, and the pension reserves to decline below the legally required 1.5 times of annual pension outlays by the end of the 2030s, and to be exhausted by the mid-2040s. While long-term projections are subject to uncertainty, Luxembourg's pension expenditures are projected to increase considerably under different scenarios, contributing over 20 percent of GDP to the fiscal deficit by 2070 under a no-policy change scenario.

A cross-country comparison shows that Luxembourg has the lowest effective retirement age and the second highest replacement rate in the EU. The average effective retirement age in Luxembourg is slightly over 60 years (the statutory retirement age is 65 years), against a euro area average of 63 years. Accordingly, the elderly labor market participation (55–64 years old) is at 40 percent, much lower than the EU average of 57 percent. Under unchanged policies, Luxembourgish retirees will spend 28 years in retirement by 2070, against an EU average of 23 years, as many EU countries have started to link the statutory retirement age to higher life expectancy. A Luxembourgish pensioner receives on average a pension income equivalent to 73 percent of average wage, against an EU average of 46 percent. As a result, Luxembourgish pensioners have a gross pension wealth[2] equivalent to 19.4 times annual gross earnings, almost double the EU average.

A combination of reforms would ensure the long-term sustainability of the system. According to the law, the sustainability of Luxembourg's pension system should be reviewed every 10 years with a 5-year interim evaluation, with the next evaluation set for 2022. To help contribute to the debate, staff simulates three different illustrative scenarios: (i) an increase in the contribution rate from 24 to 30 percent implemented in 2023; (ii) a 15 percent reduction in the replacement rate foreseen in the 2012 reform,[3] implemented linearly between 2023 and 2052; and (iii) a 3-year increase in the statutory retirement age from 65 to 68 years (equivalent to a 3-year increase in the effective retirement age) implemented linearly between 2023 and 2052. As a result, the baseline fiscal deficit of 22 percent of GDP in 2070 would be reduced to 8, 11, and 9 percent of GDP, respectively. Any combination of two of the three reforms would reduce the deficit to about 3 percent of GDP by 2070, broadly in line with the Maastricht criterion. Comparing the reforms in a general equilibrium framework shows that, while all reforms improve the fiscal deficit, they affect differently GDP, consumption, and the labor market. Higher retirement age increases GDP per capita and consumption relative to the baseline, while lower replacement rates and higher contributions reduce disposable income and consequently consumption per capita. In addition, higher contribution rates reduce GDP per capita by increasing labor market distortions.

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[1] Prepared by Luiza Antoun de Almeida in collaboration with Keiko Honjo (RES). This box is based on the 2019 Selected Issues Paper "The Pension System in Luxembourg."

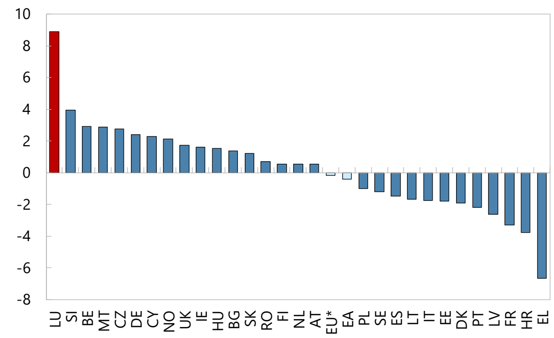
[2] A lump-sum equivalent to the net present value of pension payments.

[3] Under this reform scenario the replacement rate will be 53 percent of average wages by 2070, against a baseline of 63 percent and an EU average of 38 percent.

Box 4. Ensuring Long-Term Sustainability of Luxembourg's Pension System (concluded)

Luxembourg is projected to experience the highest increase in pension expenditures among EU countries....

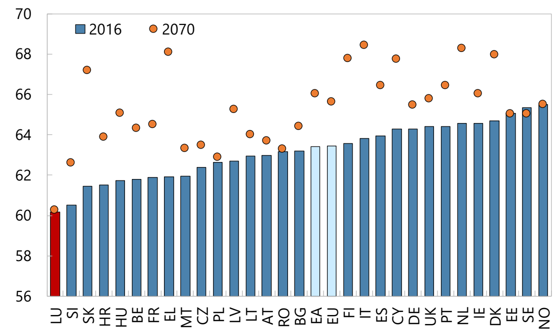
Change in Gross Public Pension Expenditures, 2016-70
(Percentage points of GDP)



Source: European Commission 2018 Ageing Report.

... has the lowest effective retirement age in Europe, and...

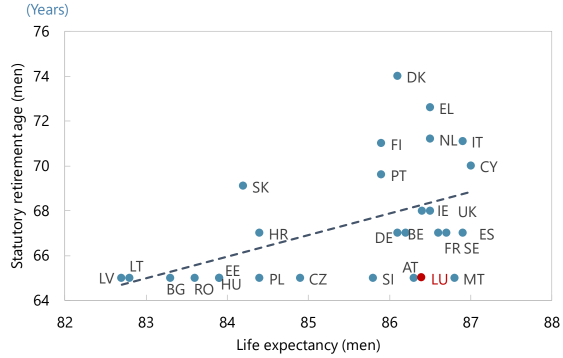
Average Effective Exit Age from Labor Market, 2017
(Years)



Source: European Commission 2018 Ageing Report.

... unlike other European countries, has not yet started to link retirement age to higher life expectancy.

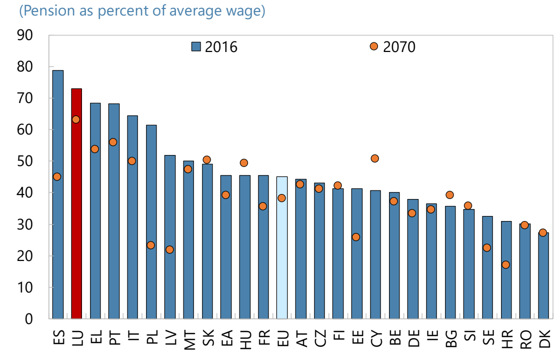
Life Expectancy vs Statutory Retirement Age, 2070
(Years)



Source: European Commission 2018 Ageing Report.

At the same time, Luxembourg has the second largest replacement rate in Europe, which ...

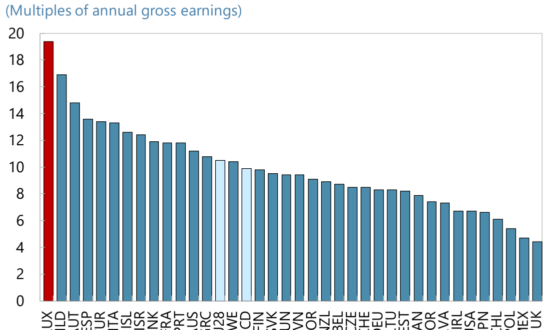
Replacement Rate, 2016
(Pension as percent of average wage)



Source: European Commission 2018 Ageing Report.

... given the low effective retirement age, leads to gross pension wealth almost double the EU average.

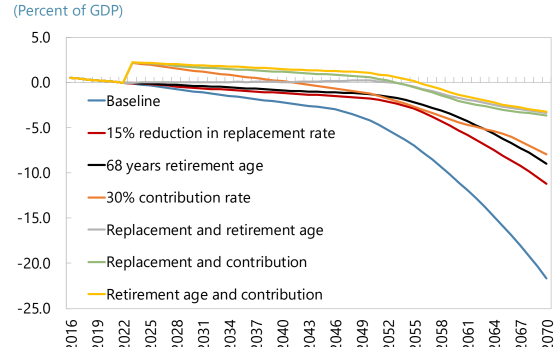
Gross Pension Wealth, 2016
(Multiples of annual gross earnings)



Source: OECD.

Gradual combined action on key pension parameters would ensure sustainability of the pension system.

Fiscal Balance Implied by Pension System Actuarial Model
(Percent of GDP)



Sources: EC's 2018 Ageing Report, Eurostat, and IMF staff estimations.

Table 1. Luxembourg: Selected Economic Indicators, 2015–24

				Est.	Projections					
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Real Economy (percent change)										
Gross domestic product	3.9	2.4	1.5	2.6	2.6	2.8	2.7	2.6	2.6	2.6
Total domestic demand	0.8	3.6	2.5	3.1	3.4	2.8	2.7	2.5	2.5	2.4
Private consumption	3.2	1.7	2.9	4.2	3.8	3.4	3.1	2.8	2.8	2.5
Public consumption	2.8	2.5	3.1	4.0	3.8	2.4	2.1	2.2	2.0	2.0
Gross investment	-4.7	7.6	1.2	0.6	2.6	2.2	2.5	2.4	2.4	2.6
Gross fixed investment										
Inventory accumulation 1/										
Foreign balance 1/	3.2	0.0	-0.1	0.4	0.3	0.8	0.8	0.9	0.8	0.9
Exports of goods and nonfactor services	5.3	3.8	-1.9	4.5	4.1	4.0	3.9	4.0	3.9	3.9
Imports of goods and nonfactor services	4.3	4.5	-2.2	5.1	4.6	4.2	4.0	4.2	4.0	4.1
Labor Market (thousands, unless indicated)										
Resident labor force	262.5	267.3	273.5	279.8	286.0	292.0	298.4	304.9	311.3	317.8
Unemployed	17.8	16.9	16.2	15.3	14.3	14.5	14.9	15.1	15.4	15.8
(Percent of total labor force)	6.8	6.3	5.8	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Resident employment	244.8	250.3	257.3	264.5	271.7	277.5	283.6	289.8	295.8	302.0
(Percent change)	2.1	2.3	2.8	2.8	2.7	2.1	2.2	2.2	2.1	2.1
Cross-border workers (net)	161.3	168.1	175.5	184.4	192.5	197.3	202.3	207.3	212.5	217.8
Total employment	406.1	418.4	432.8	449.0	464.3	474.9	485.9	497.1	508.3	519.9
(Percent change)	2.6	3.0	3.4	3.7	3.4	2.3	2.3	2.3	2.3	2.3
Prices and costs (percent change)										
GDP deflator	-0.4	0.9	2.2	3.8	1.9	2.0	2.0	1.9	1.9	1.9
CPI (harmonized), p.a.	0.1	0.0	2.1	2.0	1.6	1.9	1.9	1.9	1.9	1.9
CPI core (harmonized), p.a.	1.7	1.0	1.4	0.9	1.9	1.9	1.9	1.9	1.9	1.9
CPI (national definition), p.a.	0.5	0.3	1.7	1.5	1.8	1.9	1.9	1.9	1.9	1.9
Wage growth 2/	1.6	0.9	3.3	2.1	2.5	2.5	2.5	2.5	2.5	2.5
Nominal unit labor costs 2/	0.3	1.5	5.2	3.2	3.3	2.0	2.1	2.2	2.1	2.1
Public finances (percent of GDP)										
General government revenues	43.3	43.7	44.4	45.5	44.6	44.8	44.8	44.9	44.9	44.9
General government expenditures	41.9	41.9	43.0	43.1	43.6	43.7	43.7	43.6	43.6	43.6
General government balance	1.4	1.9	1.4	2.4	0.9	1.1	1.1	1.3	1.3	1.3
General government structural balance	0.9	1.4	1.5	1.5	0.9	1.0	1.2	1.2	1.2	1.2
General government gross debt	22.2	20.7	23.0	21.4	21.5	21.3	21.1	20.7	20.3	20.0
Balance of Payments (percent of GDP)										
Current account	5.1	5.1	5.0	4.7	4.6	4.8	4.9	4.9	4.8	4.9
Balance on goods	-2.6	-3.9	-5.7	-5.4	-5.7	-5.9	-6.0	-5.7	-5.5	-5.3
Balance on services	39.4	39.4	38.7	36.4	34.9	34.8	34.9	35.0	35.1	35.3
Net factor income	-33.0	-31.7	-27.5	-25.9	-25.0	-24.4	-24.4	-24.7	-25.1	-25.5
Balance on current transfers	1.3	1.3	-0.5	-0.5	0.3	0.3	0.3	0.3	0.3	0.3
Exchange rates, period averages										
U.S. dollar per euro	1.11	1.11	1.13	1.18	...	...	...	...	...	...
(Percent change)	-16.5	-0.3	2.0	4.6	...	...	...	...	...	...
Nominal effective rate (2010=100)	97.6	99.2	100.1	102.2	...	...	...	...	...	...
(Percent change)	-3.4	1.7	0.9	2.0	...	...	...	...	...	...
Real effective rate (CPI based; 2010=100)	97.1	98.1	98.9	100.3	...	...	...	...	...	...
(Percent change)	-3.7	1.0	0.8	1.4	...	...	...	...	...	...
Credit growth and interest rates										
Nonfinancial private sector credit (eop, percent change)[3]	15.7	8.7	9.2	8.5	10.7	6.5	4.8	4.6	4.7	4.7
Government bond yield, annual average (percent)	0.4	0.2	0.2	...	...	...	...	...	...	...
Memorandum items: Land area = 2,586 sq. km; population in 2018 = 602,000; GDP per head = €97,789										
GDP (billions of euro)	51.6	53.3	55.3	58.9	61.6	64.5	67.6	70.8	74.0	77.4
Output gap (percent deviation from potential)	1.3	0.8	-0.3	-0.1	0.0	0.2	0.3	0.3	0.2	0.1
Potential output growth	3.0	2.8	2.7	2.4	2.6	2.5	2.6	2.7	2.6	2.7

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, 2015–24[1/]

(Percent of GDP)

				Est.	Projections					
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Current account	5.1	5.1	5.0	4.7	4.6	4.8	4.9	4.9	4.8	4.9
Balance on goods and services	36.8	35.5	33.0	31.0	29.2	29.0	28.9	29.3	29.6	30.0
Trade balance 1/	-2.6	-3.9	-5.7	-5.4	-5.7	-5.9	-6.0	-5.7	-5.5	-5.3
Goods exports	36.3	33.5	32.4	30.4	29.4	29.4	29.3	29.1	28.9	28.6
Goods imports	38.9	37.4	38.1	35.8	35.1	35.3	35.4	34.9	34.4	33.9
Balance on services	39.4	39.4	38.7	36.4	34.9	34.8	34.9	35.0	35.1	35.3
Services exports	172.0	166.0	165.5	155.5	157.9	159.9	162.2	165.2	168.2	171.3
Services imports	132.5	126.6	126.8	119.1	122.9	125.1	127.2	130.2	133.1	135.9
Net factor income	-33.0	-31.7	-27.5	-25.9	-25.0	-24.4	-24.4	-24.7	-25.1	-25.5
Compensation of employees, net	-16.5	-16.7	-17.1	-16.0	-16.4	-16.4	-16.4	-16.5	-16.6	-16.6
Compensation of employees, credit	2.8	2.8	2.9	2.7	2.8	2.8	2.8	2.8	2.8	2.8
Compensation of employees, debit	19.3	19.5	20.0	18.8	19.2	19.2	19.2	19.3	19.4	19.5
Investment income, net	-16.5	-15.0	-10.4	-9.8	-8.6	-8.1	-7.9	-8.2	-8.5	-8.8
Investment income, credit	414.4	355.7	375.3	352.5	351.8	344.1	336.7	329.7	323.2	316.7
Investment income, debit	430.9	370.7	385.8	362.4	360.4	352.1	344.6	338.0	331.8	325.6
Balance on current transfers	1.3	1.3	-0.5	-0.5	0.3	0.3	0.3	0.3	0.3	0.3
Capital and financial account	-5.1	-4.3	-5.0	-4.7	-4.6	-4.8	-4.9	-4.9	-4.8	-4.9
Capital account	-0.6	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4
Financial account	4.6	3.9	4.6	4.3	4.2	4.5	4.5	4.5	4.4	4.5
Direct investment, net	154.3	-37.7	102.9	96.7	87.0	78.3	70.5	63.4	57.1	51.4
Abroad	1504.5	289.6	301.5	283.2	254.9	229.3	206.4	185.7	167.2	150.4
In reporting economy	1350.2	327.4	198.6	186.6	167.9	151.0	135.9	122.3	110.1	99.1
Portfolio investment, net	-277.1	-196.0	-121.9	-114.5	-114.5	-114.5	-114.5	-114.5	-29.5	-28.5
Portfolio investment, assets	465.3	161.7	585.4	549.9	314.5	203.9	145.5	111.8	91.0	77.7
Portfolio investment, liabilities	742.3	357.7	707.3	664.4	429.0	318.4	260.0	226.3	120.5	106.2
Financial derivatives, net	1.9	10.8	-27.7	-26.1	-26.1	-26.1	-26.1	-26.1	-26.1	-26.1
Other investment, net	125.5	226.5	51.5	48.4	57.9	66.8	74.6	81.6	3.0	7.7
Other investment, assets	132.6	303.1	130.1	122.2	122.2	122.2	122.2	122.2	122.2	122.2
Other investment, liabilities	7.0	76.7	78.6	73.8	64.4	55.5	47.6	40.6	119.3	114.5
Reserve assets	-0.1	0.4	-0.2	-0.2	-0.1	-0.1	0.0	0.0	0.0	0.0
Errors and omissions	0.0	-0.7	0.0	0.0	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, 2015–24
(Percent of GDP)

				Est.	Projections					
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Revenue	43.3	43.7	44.4	45.5	44.6	44.8	44.8	44.9	44.9	44.9
Taxes	26.5	26.9	27.3	28.8	27.8	27.9	27.9	28.0	28.1	28.2
of which, corporate income taxes	4.4	4.6	5.2	5.9	5.1	5.1	5.1	5.0	5.0	4.9
Social contributions	12.1	12.2	12.5	12.4	12.4	12.5	12.5	12.5	12.6	12.6
Grants	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other revenue	4.6	4.6	4.6	4.3	4.3	4.3	4.3	4.3	4.2	4.1
Expenditure	41.9	41.9	43.0	43.1	43.6	43.7	43.7	43.6	43.6	43.6
Expense	40.3	40.0	41.1	40.9	41.4	41.4	40.9	41.0	41.0	41.1
Compensation of employees	8.9	8.8	9.0	9.2	9.4	9.4	9.4	9.4	9.4	9.4
Use of goods and services	3.7	3.7	3.7	3.7	3.8	3.7	3.7	3.7	3.7	3.7
Interest	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1
Subsidies	1.2	1.1	1.1	1.3	1.2	1.2	1.1	1.1	1.1	1.1
Social benefits	20.0	19.7	20.2	19.9	20.0	20.1	20.0	20.0	20.0	20.0
Other expense	7.3	7.4	7.8	7.8	7.9	7.8	7.7	7.8	7.9	8.0
Net acquisition of nonfinancial assets	1.6	1.9	1.9	2.2	2.2	2.4	2.8	2.6	2.6	2.6
Gross operating balance	5.2	6.0	5.6	6.8	5.4	5.6	6.1	6.2	6.1	6.1
Net operating balance	3.0	3.7	3.3	4.6	3.2	3.4	3.9	4.0	3.9	3.9
Net lending / borrowing	1.4	1.9	1.4	2.4	0.9	1.1	1.1	1.3	1.3	1.3
Net acquisition of financial assets	2.7	0.6	4.6	...	...	...	...	...	...	
Monetary gold and SDRs	...	...	...	...	...	...	...	...	...	
Currency and deposits	0.7	-1.5	3.3	...	...	...	...	...	...	
Securities other than shares	1.4	0.7	0.9	...	...	...	...	...	...	
Loans	-0.2	-0.1	-0.1	...	...	...	...	...	...	
Shares and other equity	-0.5	1.6	0.7	...	...	...	...	...	...	
Insurance technical reserves	...	...	...	...	...	...	...	...	...	
Financial derivatives	0.5	0.1	-0.4	...	...	...	...	...	...	
Other accounts receivable	0.7	-0.2	0.2	...	...	...	...	...	...	
Net incurrence of liabilities	1.1	-1.1	3.2	...	...	...	...	...	...	
Special Drawing Rights (SDRs)	...	...	...	...	...	...	...	...	...	
Currency and deposits	0.0	0.0	0.0	...	...	...	...	...	...	
Securities other than shares	0.0	0.0	3.6	...	...	...	...	...	...	
Loans	0.2	-0.8	-0.6	...	...	...	...	...	...	
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	0.9	-0.3	0.2	...	...	...	...	...	...	
Memorandum items:										
GDP (in billions of euro)	51.6	53.3	55.3	58.9	61.6	64.5	67.6	70.8	74.0	
Structural balance	0.9	1.4	1.5	1.5	0.9	1.0	1.2	1.2	1.2	
Output gap	1.3	0.8	-0.3	-0.1	0.0	0.2	0.3	0.3	0.2	
Public gross debt (Maastricht definition)	22.2	20.7	23.0	21.4	21.5	21.3	21.1	20.7	20.3	

Sources: Luxembourg authorities and IMF staff estimates.

Table 4. Luxembourg: General Government Financial Balance Sheet, 2014–17
(Millions of euros unless noted otherwise)

	2014			2015			2016			2017		
	Trans-actions	Other economic flows	Closing balance	Trans-actions	Other economic flows	Closing balance	Trans-actions	Other economic flows	Closing balance	Trans-actions	Other economic flows	Closing balance
Net financial worth	655	979	24,045	685	39	24,860	868	796	26,571	659	376	27,644
Financial assets	1,209	1,680	39,296	1,366	40	40,702	313	877	41,892	2,447	183	44,522
Currency and deposits	622	-1	7,518	378	1	7,897	-777	1	7,121	1,813	-1	8,933
Debt securities	89	578	7,952	705	48	8,705	347	137	9,189	484	-402	9,271
Loans	-32	0	1,274	-94	0	1,180	-50	-1	1,129	-38	-1	1,090
Equity and inv. fund shares	226	1,285	18,227	-250	199	18,176	863	801	19,840	405	230	20,475
Financial derivatives	90	-181	-44	268	-208	16	38	-61	-7	0	34	27
Other financial assets	214	-1	4,369	359	0	4,728	-108	0	4,620	-217	323	4,726
Liabilities	456	701	15,251	590	1	15,842	-602	81	15,321	1,750	-193	16,878
Currency and deposits	-12	-2	260	11	1	272	10	-1	281	9	0	290
Debt securities	201	702	7,150	2	-3	7,149	2	80	7,231	1,993	-193	9,031
Loans	134	1	4,820	104	1	4,925	-432	0	4,493	-336	0	4,157
Other liabilities	133	0	3,021	473	2	3,496	-182	2	3,316	84	0	3,400
Statistical discrepancy	98			91			47			38		
Memorandum items:												
Net financial worth (percent of GDP)			48.3			48.2			49.8			50.0
Financial assets (percent of GDP)			78.9			78.9			78.6			80.5
Liabilities (percent of GDP)			30.6			30.7			28.7			30.5
GDP			49,824			51,579			53,303			55,299

Sources: IFS and IMF staff estimates.

Table 5. Luxembourg: International Investment Position, 2013–18[1/]

	2013	2014	2015	2016	2017	2018
Billions of Euros						
International investment position	25.1	24.3	16.0	25.0	23.8	27.4
Assets	7,112.5	8,906.6	10,436.9	10,873.3	10,990.1	10,588.7
Liabilities	7,087.4	8,882.3	10,420.9	10,848.3	10,966.3	10,561.4
Direct investment	390.7	601.3	746.1	733.5	686.6	679.5
Assets	3,399.9	4,566.5	5,649.7	5,757.9	5,521.1	5,148.1
Liabilities	3,009.2	3,965.2	4,903.7	5,024.4	4,834.5	4,468.6
Portfolio investment	-641.9	-862.8	-1,029.6	-1,056.1	-1,026.4	-1,051.8
Assets	2,543.4	2,998.5	3,363.9	3,587.9	3,933.3	3,834.5
Liabilities	3,185.3	3,861.3	4,393.4	4,644.0	4,959.7	4,886.3
Financial derivatives	-0.1	4.8	7.0	-1.5	2.3	8.1
Assets	165.6	127.5	186.2	212.5	204.0	216.2
Liabilities	165.7	122.7	179.2	213.9	201.7	208.1
Other investment	275.7	280.3	291.9	348.1	360.6	390.8
Assets	1,002.9	1,213.4	1,236.4	1,314.1	1,330.9	1,389.2
Liabilities	727.2	933.1	944.5	966.0	970.4	998.3
Reserve assets	0.7	0.7	0.7	0.9	0.7	0.8
Percent of GDP						
International investment position	53.9	48.8	31.1	46.9	43.1	46.5
Assets	15,295.8	17,876.0	20,234.9	20,399.0	19,873.8	17,986.9
Liabilities	15,241.9	17,827.2	20,203.8	20,352.1	19,830.7	17,940.4
Direct investment	840.2	1,206.8	1,446.4	1,376.2	1,241.6	1,154.2
Assets	7,311.7	9,165.1	10,953.6	10,802.2	9,984.0	8,745.0
Liabilities	6,471.4	7,958.3	9,507.2	9,426.1	8,742.4	7,590.7
Portfolio investment	-1,380.5	-1,731.8	-1,996.1	-1,981.4	-1,856.0	-1,786.7
Assets	5,469.7	6,018.1	6,521.8	6,731.1	7,112.7	6,513.6
Liabilities	6,850.2	7,749.8	8,517.9	8,712.4	8,968.7	8,300.3
Financial derivatives	-0.1	9.7	13.6	-2.8	4.1	13.8
Assets	356.2	255.9	361.1	398.6	368.9	367.2
Liabilities	356.3	246.2	347.5	401.4	364.8	353.5
Other investment	592.8	562.6	565.9	653.1	652.0	663.9
Assets	2,156.8	2,435.4	2,397.1	2,465.3	2,406.8	2,359.8
Liabilities	1,563.9	1,872.8	1,831.2	1,812.2	1,754.8	1,695.9
Reserve assets	1.5	1.4	1.4	1.7	1.3	1.4

Sources: STATEC and IMF Staff estimates.

1/ Balance of Payments Manual 6 (BPM6) presentation.

Table 6. Luxembourg: Financial Soundness Indicators, 2013–18

(Percent)

	2013	2014	2015	2016	2017	2018Q3
All Banks						
Capital adequacy						
Regulatory capital to risk weighted assets	21.0	20.0	22.0	25.0	25.9	27.2
Regulatory tier 1 capital to risk weighted assets	18.0	19.0	21.0	24.0	25.1	26.4
Capital to assets	6.0	6.0	7.0	7.0	8.4	8.6
Profitability and efficiency						
Return on assets	0.6	0.7	0.8	0.8	0.7	0.7
Return on equity	10.0	11.0	11.0	11.0	8.1	7.6
Interest margin to gross income	29.0	27.0	27.0	25.0	27.9	28.7
Trading income to total income	3.0	1.0	2.0	3.0	1.3	2.8
Noninterest expenses to gross income	65.0	67.0	67.0	69.0	73.6	76.5
Personnel expenses to noninterest expenses	33.0	31.0	29.0	25.0	25.9	25.0
Asset quality and structure						
Residential real estate loans to total loans	4.0	4.0	4.0	6.2	6.2	6.6
Household debt to GDP	54.0	55.0	57.0	60.0	60.7	63.7
Nonperforming loans to total gross loans	0.2	…	…	0.9 1/	0.8 1/	0.9 1/
Sectoral distribution of loans (in percent of total loans)						
Residents	21.0	21.0	27.0	33.0	33.4	34.7
Nonresidents	79.0	79.0	73.0	67.0	66.6	65.3
Liquidity						
Liquid assets to total assets	60.0	60.0	58.0 2/	…	…	…
Liquid assets to short-term liabilities	70.0	70.0	67.0 2/	…	…	…
Customer deposits to total (non interbank) loans	147.0	154.0	129.0	106.0 1/	102.9 1/	106.4 1/
Domestically Oriented Banks						
Capital adequacy						
Regulatory capital to risk weighted assets	26.3	23.1	22.6	23.0	23.0	23.4
Regulatory tier 1 capital to risk weighted assets	23.3	22.5	22.2	23.0	22.1	22.6
Capital to assets	8.9	8.5	8.4	9.0	8.2	8.5
Profitability and efficiency						
Return on assets	1.0	1.0	1.0	1.0	0.8	0.8
Return on equity	10.9	11.3	11.0	11.0	9.7	9.0
Interest margin to gross income	56.2	64.0	64.0	56.1 1/	54.8 1/	54.0 1/
Asset quality and structure						
Residential real estate loans to total loans	24.0	27.0	28.0	28.0	26.7	25.7
Household debt to GDP						
Nonperforming loans to total gross loans	0.3	…	…	2.4 1/	2.0 1/	2.0 1/
Sectoral distribution of loans (in percent of total loans)						
Residents	55.0	59.0	67.0	71.0	69.5	71.8
Nonresidents	45.0	41.0	33.0	29.0	30.5	28.2
Liquidity						
Liquid assets to total assets	43.2	42.9	44.0 2/	…	…	…
Liquid assets to short-term liabilities	53.2	50.6	51.0 2/	…	…	…
Customer deposits to total (non interbank) loans	151.1	143.6	137.6	124.0 1/	128.0 1/	134.0 1/

Sources: BCL, and CSSF.
1/ Change in underlying data source and calculation methodology.
2/ Q3 2015.

Table 7. Luxembourg: Public Sector Debt Sustainability Analysis (DSA)—Baseline Scenario

(In percent of GDP unless otherwise indicated)

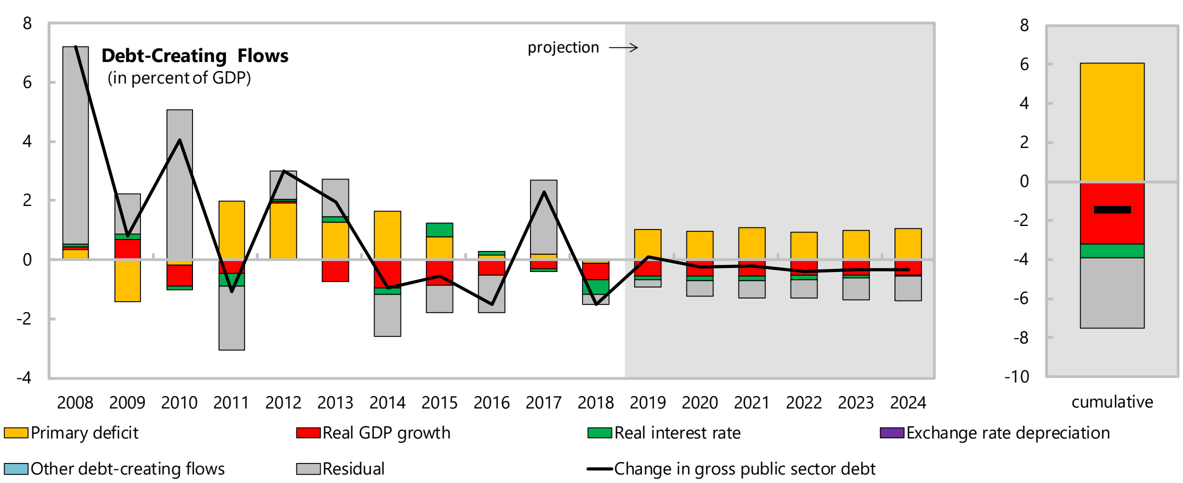
Debt, Economic and Market Indicators [1]

	Actual		Estimates	Projections					
	2008-2016 [2]	2017	2018	2019	2020	2021	2022	2023	2024
Nominal gross public debt	20.0	23.0	21.4	21.5	21.3	21.1	20.7	20.3	20.0
Public gross financing needs	0.8	0.3	0.0	1.4	6.3	3.3	5.4	7.8	6.8
Real GDP growth (in percent)	1.7	1.5	2.6	2.6	2.8	2.7	2.6	2.6	2.6
Inflation (GDP deflator, in percent)	2.4	2.2	3.8	1.9	2.0	2.0	1.9	1.9	1.9
Nominal GDP growth (in percent)	4.1	3.7	6.5	4.6	4.8	4.8	4.6	4.6	4.6
Effective interest rate (in percent) [4]	2.6	1.7	1.5	1.4	1.4	1.3	1.4	1.5	1.7

As of March 25, 2019		
Sovereign Spreads		
Bond Spread (bp) 3/		30
5Y CDS (bp)		n.a.
Ratings	Foreign	Local
Moody's	Aaa	Aaa
S&Ps	AAA	AAA
Fitch	AAA	AAA

Contribution to Changes in Public Debt

	Actual		Estimates	Projections							
	2008-2016	2017	2018	2019	2020	2021	2022	2023	2024	cumulative	debt-stabilizing primary balance [9]
Change in gross public sector debt	1.4	2.3	-1.5	0.1	-0.3	-0.2	-0.4	-0.3	-0.3	-1.4	
Identified debt-creating flows	0.4	-0.2	-1.2	0.3	0.3	0.4	0.3	0.4	0.5	2.1	
Primary deficit	0.7	0.2	-0.1	1.0	1.0	1.1	0.9	1.0	1.1	6.0	-0.6
Primary (noninterest) revenue and grants	26.9	27.8	31.0	30.3	30.5	30.4	30.5	30.5	30.4	182.6	
Primary (noninterest) expenditure	27.6	28.0	30.9	31.4	31.4	31.5	31.4	31.5	31.5	188.7	
Automatic debt dynamics [5]	-0.3	-0.4	-1.1	-0.7	-0.7	-0.7	-0.7	-0.6	-0.6	-3.9	
Interest rate/growth differential [6]	-0.3	-0.4	-1.1	-0.7	-0.7	-0.7	-0.7	-0.6	-0.6	-3.9	
Of which: real interest rate	0.0	-0.1	-0.5	-0.1	-0.1	-0.2	-0.1	-0.1	-0.1	-0.7	
Of which: real GDP growth	-0.4	-0.3	-0.6	-0.5	-0.6	-0.5	-0.5	-0.5	-0.5	-3.2	
Exchange rate depreciation [7]	0.0	0.0	0.0	...	...	...	...	...	...	...	
Other identified debt-creating flows	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Contingent liabilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Residual, including asset changes [8]	1.1	2.5	-0.3	-0.3	-0.5	-0.6	-0.6	-0.7	-0.8	-3.6	



Source: IMF staff.

1/ Public sector is defined as general government.

2/ Based on available data.

3/ Long-term bond spread over German bonds (bp).

4/ Defined as interest payments divided by debt stock (excluding guarantees) at the end of previous year.

5/ Derived as [r - π(1+g) - g + ae(1+r)]/(1+g+π+gπ) times previous period debt ratio, with r = effective nominal interest rate; π = growth rate of GDP deflator; g = real GDP growth rate; a = share of foreign-currency denominated debt; and e = nominal exchange rate depreciation (measured by increase in local currency value of U.S. dollar).

6/ The real interest rate contribution is derived from the numerator in footnote 5 as r - π (1+g) and the real growth contribution as -g.

7/ The exchange rate contribution is derived from the numerator in footnote 5 as ae(1+r).

8/ Includes asset changes and interest revenues (if any). For projections, includes exchange rate changes during the projection period.

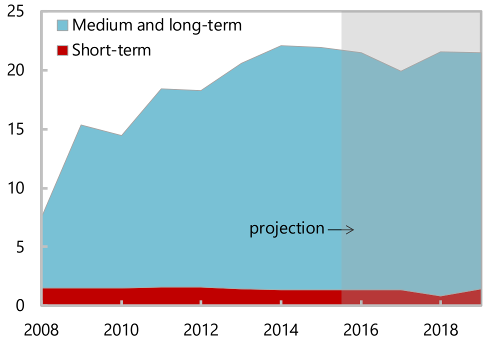
9/ Assumes that key variables (real GDP growth, real interest rate, and other identified debt-creating flows) remain at the level of the last projection year.

Table 8. Luxembourg: Public DSA—Composition of Public Debt and Alternative Scenarios

Composition of Public Debt

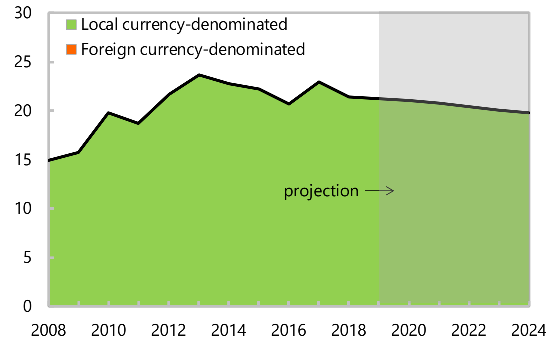
By Maturity

(in percent of GDP)



By Currency

(in percent of GDP)

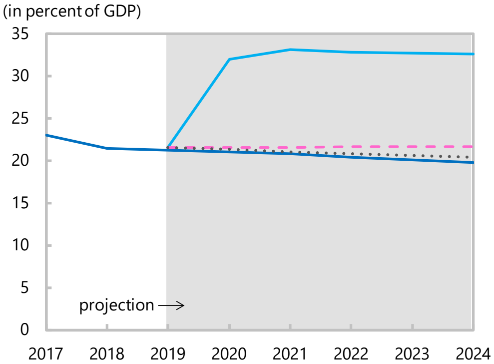


Alternative Scenarios

Baseline
Historical
Constant Primary Balance
Contingent Liability Shock

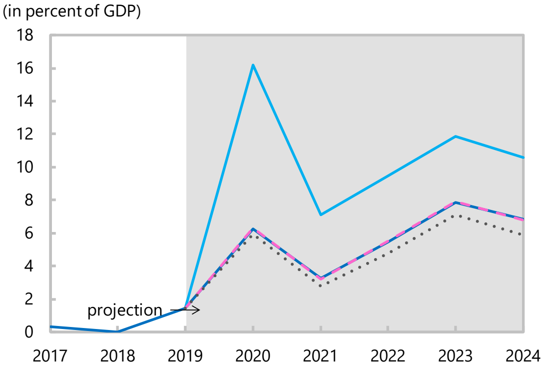
Gross Nominal Public Debt 1/

(in percent of GDP)



Public Gross Financing Needs

(in percent of GDP)



Underlying Assumptions

(in percent)

Baseline Scenario	2019	2020	2021	2022	2023	2024
Real GDP growth	2.6	2.8	2.7	2.6	2.6	2.6
Inflation	1.9	2.0	2.0	1.9	1.9	1.9
Primary Balance	-1.0	-1.0	-1.1	-0.9	-1.0	-1.1
Effective interest rate	1.4	1.4	1.3	1.4	1.5	1.7
Constant Primary Balance Scenario						
Real GDP growth	2.6	2.8	2.7	2.6	2.6	2.6
Inflation	1.9	2.0	2.0	1.9	1.9	1.9
Primary Balance	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Effective interest rate	1.4	1.4	1.3	1.4	1.5	1.7

Historical Scenario	2019	2020	2021	2022	2023	2024
Real GDP growth	2.6	2.1	2.1	2.1	2.1	2.1
Inflation	1.9	2.0	2.0	1.9	1.9	1.9
Primary Balance	-1.0	-0.6	-0.6	-0.6	-0.6	-0.6
Effective interest rate	1.4	1.4	1.4	1.5	1.7	2.0
Contingent Liability Shock						
Real GDP growth	2.6	0.0	0.0	2.6	2.6	2.6
Inflation	1.9	1.3	1.3	1.9	1.9	1.9
Primary Balance	-1.0	-10.6	-1.1	-0.9	-1.0	-1.1
Effective interest rate	1.4	1.7	2.4	2.1	2.1	2.2

1/ The financial sector contingent liability shock assumes a one-time non-interest expenditure increase of 10 percent of domestically-oriented banks' assets and a growth reduction by one standard deviation for two consecutive years.

Source: IMF staff.

Table 9. Luxembourg: Risk Assessment Matrix[1]

Source of risks	Relative likelihood and transmission channels	Impact if realized	Policy response
Global risk: Weaker-than-expected global growth.	**High** Luxembourg is particularly vulnerable to adverse shocks in the euro area given its strong trade and financial linkages.	**High** A slower growth in euro area could weigh on Luxembourg's exports and FDI inflows. Luxembourg investment funds increased international portfolio diversification, which would help mitigate risks.	Maintain prudent fiscal stance to preserve buffers and prepare contingency plans to diversify tax revenue base. Ensure robust contingency planning and stand ready to provide liquidity support to banks in collaboration with the ECB.
Business model risk: Changes in EU and international taxation rules and transparency standards for cross-border activities.	**Medium** A large share of fiscal revenues and some economic activity depends on cross-border operations.	**High** Tax base erosion, and reduction of budget revenues and activity.	Maintain prudent fiscal stance, diversify fiscal revenue base, develop contingency plans, and continue pension reform.
Global risk: A disorderly Brexit.	**High** While the economy stands to benefit from some UK-based financial services firms being relocated to Luxembourg, a disorderly Brexit could pose challenges including from heightened market volatility.	**Medium** The impact of a disorderly Brexit on asset management delegation would be limited given the advanced contingency planning by the private sector and ongoing regulatory coordination at both national and multilateral levels. Challenges could arise through funds' exposure to UK assets and trading venues as well as to market risk in case of heightened market volatility.	Ensure robust contingency planning for risks that may arise in the event of heightened market volatility and stand ready to provide liquidity support to banks in collaboration with the ECB.
Global risk: Rising protectionism and retreat from multilateralism.	**High** Escalating and sustained trade actions would adversely affect Luxembourg both directly and through adverse confidence effects. Luxembourg's exports of goods and services, which represented about 200 percent of GDP in 2018, and the financial sector, which account for significant share of tax revenues and GDP, could be severely affected if growth prospects in Europe weaken and financial market volatility increases.	**High** Adverse impact on exports, financial sector profitability, tax revenues from multinational companies, and GDP growth.	Ensure robust contingency plans to diversify tax revenue base. Advance structural reforms and infrastructure investments to boost competitiveness and support diversification of the economy.

Table 9. Luxembourg: Risk Assessment Matrix (concluded)

Source of risks	Relative likelihood and transmission channels	Impact if realized	Policy response
Global risk: Sharp tightening of global financial conditions.	**Medium** Increased volatility in asset markets and the resulting portfolio rebalancing effects could reduce the profitability of investment funds and trigger liquidity strains, with adverse implications for tax revenues and growth. Cross-border operations of multinational firms could also be impacted.	**High** The investment fund industry could suffer from aggregate redemptions, which together with valuation effects would weaken fund profitability and adversely impact the fees and commission of the banking system. Weaker performance of the financial sector could adversely affect economic activity in Luxembourg and reduce tax revenues.	Monitor risks in the investment fund industry, design macroprudential measures. Ensure robust contingency planning for operational risks that may arise from market volatility Diversify tax revenue base.
Global risk: Cyber-attacks	**Medium** Large-scale cyber attacks on critical financial infrastructure can trigger systemic financial instability, with adverse effects on the economy. Cyber attacks targeting individual financial institutions in Luxembourg could pose reputation risk, possibly triggering confidence and contagion effects.	**Medium** Cyber attacks can lead to disruptions in financial services. However, the magnitude of the disruptions would depend, among other things, on the scale of the attack.	Enhanced cybersecurity protection and coordination between the public and private sectors. Ensure robust contingency planning for operational risks and stand ready to provide liquidity support to banks in collaboration with the ECB.

[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.

Appendix I. Implementation of BEPS Actions in Luxembourg

- **Action 1: addressing the tax challenges of the digital economy and identifying the main difficulties that it poses for the application of existing international tax rules**.

  While action I has not led to final recommendations by the OECD, more than 110 countries and jurisdictions have agreed to review two key concepts of the international tax system, responding to a mandate from the G20 Finance Ministers to work on the implications of digitalisation for taxation. The members of the OECD/G20 Inclusive Framework on BEPS will work towards a consensus-based solution by 2020, as set out in their Interim Report on the Tax Challenges Arising from Digitalisation released on March 16, 2018[1].

  No agreement on the proposal for a (EU) Council Directive on the common system of a digital services tax on revenues resulting from the provision of certain digital services ("DST") has been reached by the Member States of the European Union. New technical discussions on a Digital Advertising Tax Directive (DAT) have started in January 2019. Luxembourg actively participates in related working groups.

- **Action 2: designing domestic rules to neutralize the effects of hybrid instruments and entities (e.g. double non-taxation, double deduction, long-term deferral)**.

  Luxembourg has regulations in place that aim to neutralize hybrid mismatches based on the EU Directive 2014/86/EU amending the Parent-Subsidiary Directive (2011/96/EU). Luxembourg has introduced these provisions by the Law of 18 December 2015 that has amended articles 147 and 166 of the Luxembourg Income Tax Law (LITL).

  Furthermore, Luxembourg transposed the whole ATAD I by the law of December 21, 2018, including the introduction of rules on hybrid mismatches. ATAD II, which provides further and more detailed rules regarding hybrid mismatches with third countries, will be transposed into national law by December 31, 2019.

- **Action 3: strengthening the rules for the taxation of controlled foreign corporations (CFC)**.

  Luxembourg has transposed the whole ATAD I by the law of December 21, 2018, including Article 7 of the ATAD I on CFC rules.

- **Action 4: preventing base erosion through the use of interest expense (such as the use of related-party and third-party debt to achieve excessive interest deductions or to finance the production of exempt or deferred income)**.

  Luxembourg transposed the whole ATAD I by the law of December 21, 2018, including the introduction of specific interest limitation rules.

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[1] http://www.oecd.org/tax/beps/tax-challenges-arising-from-digitalisation-more-than-110-countries-agree-to-work-towards-a-consensus-basedsolution.htm

- **Action 5: countering harmful tax practices with a focus on improving transparency, including compulsory spontaneous exchange on rulings related to preferential regimes, and on requiring substantial activity for preferential regimes, such as IP regimes**.

  Spontaneous exchange of certain information is also applicable in Luxembourg based on tax treaties and the Convention on Mutual Administrative Assistance in Tax Matters (MAC). The directive 2015/2376, the so-called DAC 3, transposed by the law of July 23, 2016, extends the automatic exchange of information in the field of taxation to decisions and agreements on advance cross-border tax rulings (to be considered as counterpart of Action 5 of the BEPS action plan).

  Furthermore, Luxembourg adopted a law (on April 17, 2018) introducing a new IP regime which includes the nexus approach advocated in Action 5.

- **Action 6: developing treaty provisions and recommendations regarding the design of domestic rules to prevent treaty abuse**.

  The measures highlighted in Action 6 will be implemented by Luxembourg via the Multilateral Convention to Implement Tax Treaty Related Measures to Prevent Base Erosion and Profit Shifting ("Multilateral Instrument" or "MLI"). On February 14, 2019, the Luxembourg Parliament passed the law 7333 on the ratification of the Multilateral Instrument into Luxembourg domestic tax law.

- **Action 7: preventing the artificial avoidance of permanent establishment status (test of substantial presence)**.

  The new definition of permanent establishment is part of the MLI.

- **Actions 8–10: aligning transfer pricing with value creation in relation to intangibles, including hard-to-value ones, to risks and capital, and to other high-risk transactions**.

  The Budget Law of December 23, 2016 introduced into the LITL a new article 56bis which incorporates the arm’s length principle, based on the OECD principles as revised by Actions 8–10. End of 2016, the authorities also issued an administrative circular in reference to the aforementioned article 56bis LITL on the transfer pricing framework for companies carrying out intra-group financing activities in Luxembourg.

- **Action 11: measuring and monitoring BEPS**.

  Luxembourg is participating in the corresponding working party at the OECD.

- **Action 12: designing mandatory disclosure rules for aggressive tax planning schemes**.

  On June 21, 2017, the EC issued a proposal for a directive amending Council Directive amending Directive 2011/16/EU as regards mandatory automatic exchange of information in the field of taxation in relation to reportable cross-border arrangements. Although Action 12 is not an OECD minimum standard, the European Commission aims to ensure a harmonized EU approach to implementing the recommended mandatory disclosure. On May 25, 2018, the Economic and Financial Affairs Council (ECOFIN) formally adopted Council Directive (EU) 2018/822 amending Directive 2011/16/EU as regards mandatory automatic exchange of information in the field of taxation in relation to reportable cross-border arrangements (commonly referred as "DAC6"). Member States have to implement DAC6 into their domestic law by December 31, 2019. Luxembourg is currently working on the transposition of the Directive into national law.

- **Action 13: designing guidance on transfer pricing documentation, including the template for country-by-country reporting (CbCR), to enhance transparency while taking into consideration compliance costs**.

  On December 23, 2016, the Luxembourg Parliament passed the law on CbCR thereby transposing into domestic law the EU Directive 2016/881 of May 25, 2016 amending Directive 2011/16/EU as regards mandatory automatic exchange of information in the field of taxation (to be considered as counterpart of Action 13 (minimum standard) of the BEPS Action plan).

- **Action 14: making dispute resolution mechanisms more effective**.

  On October 10, 2017, the Council of the EU adopted the Council Directive (EU) 2017/1852 on tax dispute resolution mechanisms in the EU. Luxembourg is currently working on the transposition of the Directive into national law. Several provisions of Action 14 will be implemented into Luxembourg's tax treaties via the MLI.

- **Action 15: developing a multilateral instrument to modify bilateral tax treaties**.

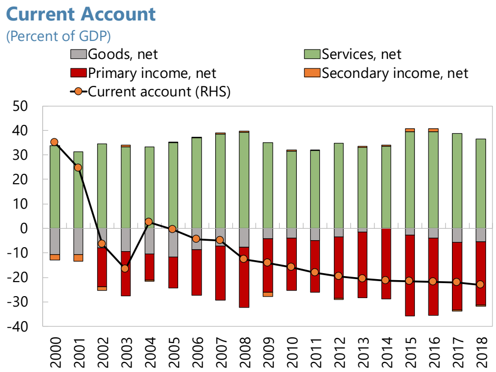
  Action 15 develops a multilateral instrument to automatically update tax treaties to BEPS minimum standards applicable to tax treaties. On February 14, 2019, the Luxembourg Parliament passed the law on the ratification of the Multilateral Instrument into Luxembourg domestic tax law.

Appendix II. External Sector Assessment

1. **Staff's bottom line assessment is that Luxembourg's external position is broadly consistent with fundamentals and desirable policy settings**. *This assessment is based on EBA-lite quantitative models, a review of developments in the balance of payments and net foreign asset position, as well as consideration of Luxembourg's roles as a financial hub and center for intra-corporation cash pooling.*

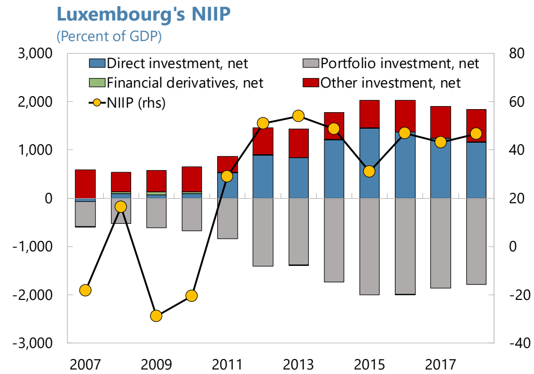
Figure 1. External Sector

The current account has remained around 5 percent of GDP since 2013, driven by financial services exports.



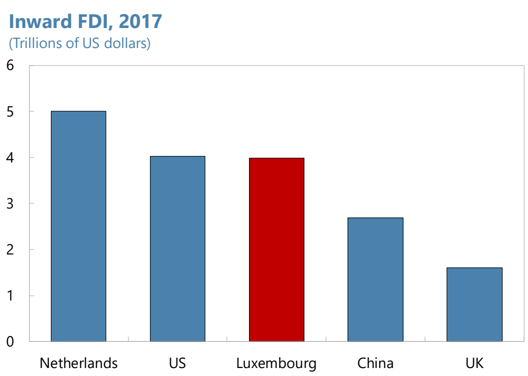
Sources: Haver Analytics, and IMF staff estimations.

Luxembourg's positive NIIP is mainly driven by a large positive net FDI position.



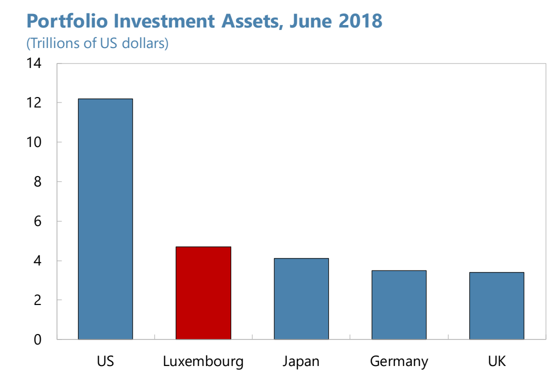
Sources: Haver Analytics and IMF staff calculations.

Luxembourg is the world's third destination for FDI and …



Sources: IMF CDIS and IMF staff calculations.

… has the second largest investment fund industry.

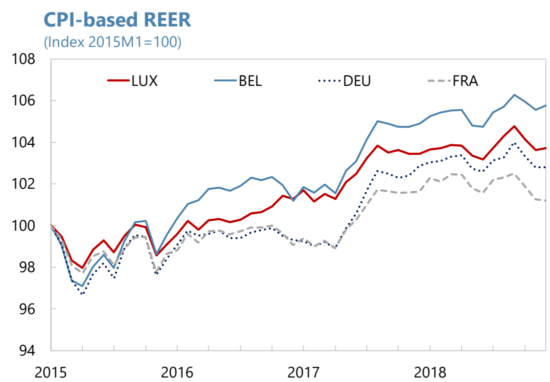


Sources: IMF CPIS, and IMF staff calculations.

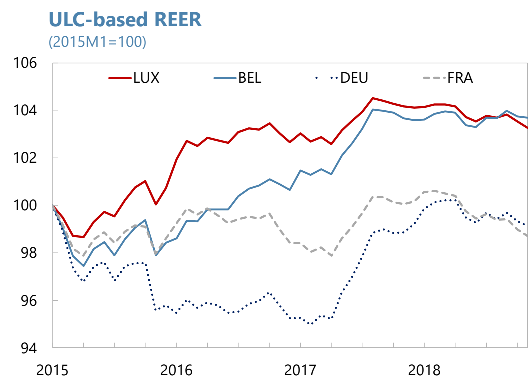
2. **The current account surplus has remained around 5 percent of GDP since 2013**. The persistent surplus is driven by strong net services exports which are only partly offset by a deficit in net factor income, reflecting Luxembourg's status as a global financial center. The surplus in services (about 36 percent of GDP) is mainly related to private banking, the investment fund industry, and corporate cash management entities. Most of these financial institutions are part of large international financial groups and multinational corporations which mainly operate cross-border. Net factor income outflows are equally shared between investment income and compensation of employees.

3. Luxembourg's net international investment position is volatile due to its role as an international financial center and has increased slightly in 2018. The NIIP reached 47 percent of GDP in 2018, against 43 percent of GDP at the end of 2017. The decline in net direct investment position (-87 percent of GDP) was offset by an increase in net portfolio (69 percent of GDP), net other investment (12 percent of GDP) and net financial derivatives (10 percent of GDP) assets. Hosting financial activities of many multinational firms makes Luxembourg the third destination and source of direct investment. Luxembourg's investment fund industry, second in the world after the US, gives rise to large gross positions in portfolio assets and liabilities and a negative net portfolio investment balance. Movements in asset prices as well as inflow of international liquidity explain the volatility and recent increase in gross portfolio assets and liabilities position.

4. Measures of real effective exchange rates (REER) suggest moderate appreciation over the past years. In particular, Luxembourg's CPI-based REER appreciated by 1.1 percent you relative to December 2017, while the ULC-based REER depreciated by 0.3 percent. Both the CPI and the ULC-based REERs appreciated moderately, about 3–4 percent, since the beginning of 2015 as well as relative to a long-term average (since 2000). Compared to neighboring countries, the appreciation of the REER has been smaller than in Belgium but higher than in Germany and France, above all in ULC terms.



Sources: GDS and IMF staff calculations.



Sources: GDS, and IMF staff calculations.

5. Staff's bottom line assessment is that Luxembourg's external position is broadly consistent with fundamentals and desirable policy settings. 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 price changes, and the large number of non-resident workers affects net factor income and population-based variables in the models. As in previous years, staff has adjusted the EBA-lite explanatory variable "output per worker" to reflect that almost half of Luxembourg's labor force is non-resident. This adjustment reduces the current account norm for 2018 by 5.6 percent of GDP.

Quantitative External Balance Assessment (EBA-lite) 2018

(Percent of GDP, unless otherwise indicated)

EBA lite Current Account Model		**EBA lite Index REER Model**	
CA actual (A)	4.7%	LN(REER) actual, in percent (J)	4.62
Cyclical contributions (from model) (B)	-0.2%	LN(REER) norm, in percent (I)	4.64
Cyclically-adjusted CA (C=A-B)	4.9%	**REER gap, in percent (K=J-I)[2]**	**-2.2%**
CA norm (D)	5.6%	o/w policy gap (H)[2]	-1%
o/w adhoc adjustment[1]	-5.6%		
Cyclically-adjusted CA norm (F=D-B)	5.8%		
Multilaterally Consistent Cyclically adj. CA Norm	6.4%		
CA gap (G=C-F)	**-1.5%**		
o/w policy gap (H)[2]	1.4%		
REER gap, in percent (J=G/I)[3]	**0.9%**		
Memorandum item:			
Elasticity of CA to REER (I)	-1.59		

[1] As in previous years, the variable output per worker was adjusted to reflect that almost half of Luxembourg's labor force is non-resident.

[2] Deviations of Luxembourg's actual policies from its optimal level and also the average policy misalignment relative to the rest of the world.

[3] " + " overvaluation, " - " undervaluation. Change in the REER (in percentage) needed to close gap.

6. **The EBA-lite current account (CA) model suggests that the external position of Luxembourg is moderately weaker than implied by fundamentals and desirable policies**. The current account norm is estimated at 6.4 percent of GDP, leading to a current account gap of -1.5 percent of GDP and a corresponding REER overvaluation of 0.9 percent. The current account gap includes a policy gap of 1.4 percent of GDP, mostly reflecting the deviation from the favorable fiscal balance outcome in 2018 from its medium-term objective. The good fiscal balance in 2018 was driven by one-off factors which are expected to disappear over the medium term.

7. **The Real Effective Exchange Rate (REER) index model suggests an undervaluation of 2 percent**. The policy gap is estimated at -1 percent, reflecting mainly a negative world average policy gap, explained by higher real interest rates and private credit growth in the rest of the world relative to desirable levels.

Appendix III. Implementation Status FSAP Update 2017 Recommendations

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 hired (partially also due to BREXIT) 16 new staff since 2017 (about 40 percent increase), all be involved in risk-based supervision. • The BCL also plans additional hiring in risk analysis.
2. Increase engagement with supervision and resolution authorities in countries where Luxembourg's LSIs and investment funds conduct significant activities	NT	• Banking supervision: The CSSF has contacts within SSM and EBA and BCBS networks, as well as in colleges. Bilateral contacts are being developed with the Chinese and Brazilian supervisors. • Resolution: The CSSF has bilateral contacts and participates in group level resolution colleges. • Investment funds: The CSSF has engaged with some supervisors in third-country jurisdictions where UCITS delegates are established (including Hong Kong, Switzerland, and the U.S.).
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 code of conduct for non-executive members of the BCL Supervisory Board has been revised but could be further aligned to best practices. • The code of conduct for the CAA board members will be discussed during the next board meetings of the CAA in 2019.
Risk Analysis		
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 at 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, including the ESRB Expert Group on Investment Funds (http://www.iosco.org/news/pdf/IOSCONEWS486.pdf). • ESRB Recommendations (Feb. 2018) have been addressed to the European Commission to take legislative action on liquidity risk management. Recommendations addressed to ESMA also cover guidance on liquidity stress testing by asset managers and liquidity management tools. • The CSSF is contributing to current ESMA work on liquidity stress testing guidance for funds with the view to publish a Consultation Paper in spring 2019; the CSSF has also contributed to ongoing work on Stress Testing guidelines for MMFs led by ESMA. Finally, the CSSF participated to the ESRB work on an occasional paper on macroprudential stress testing to be published soon. • Internally, the CSSF has progressed on a project on liquidity stress testing and has started a study on effectiveness of LMTs in a cooperation with the BIS research department.

Luxembourg: FSAP Update 2017: Key Recommendations (continued)		
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 on a consistent measure of leverage at IOSCO is still ongoing, with a consultation paper open for comments until Feb. 1st, 2019; and the results are expected in H1/ 2019. (http://www.iosco.org/library/pubdocs/pdf/IOSCOPD615.pdf); • ESRB Recommendation (Feb. 2018) requested ESMA to develop guidance in the context of the AIFMD for NCAs on the design, calibration and implementation of macroprudential leverage limits; ESMA work is dependent on IOSCO outcome and will likely start at a later stage in 2019.
Macroprudential Policy		
7. Expand the macroprudential policy toolkit to include borrower-based lending limits	I	• A draft bill to expand the toolkit to include borrower-based mortgage lending limits is currently pending approval in the Parliament. It should be revised to address the State Council's comments.
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	• The CSSF has developed a biannual liquidity stress test of fund deposits (i.e. outflow rates) to assess the impact on all Luxembourg depository banks. It also performs an annual assessment of the degree of maturity transformation between liabilities and intragroup assets within depository banks. • Investment funds-related data gaps: Discussions with BCL/ECB are ongoing on the access to the centralized securities data base (CSDB). • The BCL performs network analysis of interconnections among banks and investment funds. This work aims at identifying systemically important banks that have important interconnections with the fund sector. Two banks have been identified due to the importance of their interlinkages with the fund sector. A working group on bank-fund linkages prepared a draft report presented in the first CdRS meeting in 2018. The report has not been published. • The CSSF conducts annually a stress test of banks' exposures to residential real estate and the BCL has continued to strengthen its analysis of related macro-financial risks. Both the CSSF and the BCL participate in SSM and ECB working groups on residential real estate. • Real estate-related data gaps: CSSF Circular N°18/703 issued in December 2018 formalizes the data collection on real estate-related indicators. It follows the ESRB recommendation on closing real estate data gaps (ESRB/2016/14) and provides harmonized definitions of relevant indicators. The data will be collected on a semi-annual basis.
9. Strengthen monitoring of systemic risk in the investment fund industry and, in alignment with international and European efforts, develop instruments to take preemptive measures to mitigate these as appropriate.	NT	• The CSSF has further increased its risk surveillance of systemic risks in investment funds, including by closing data gaps via multiple data sources (such as UCITS risk reporting, AIFMD reporting, EMIR, external data providers). • The CSSF made progress in developing its liquidity stress testing capacity. It contributes to work at the ESRB-/ ESMA-Level, to develop preemptive measures to address risks from liquidity mismatch and leverage. It also actively participates in the dedicated working groups at both the European and international levels.

Luxembourg: FSAP Update 2017: Key Recommendations (continued)

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	• They are planning to publish the substance of the risk dashboard this year.
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 quarterly review of intragroup exposures, and an escalation process to reevaluate eligibility for the waiver in case of ad hoc information in the context of annual SREP. Since mid-2018, the monitoring has been enhanced with the new EU monthly reporting on maturity mismatches. • The CSSF continues to weekly monitor the Rating and CDS of parent entities and to conduct its annual horizontal review of intra-group exposures and waivers, which serves as a basis for individual waiver reviews. The CSSF hired an additional staff in 2019 to review existing waivers.
13. Continue monitoring 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 the Luxembourg residential real estate market leading to capital losses and risk-weighted assets increases at the same time. Results are incorporated within the annual CSSF-Solvency Stress Test. • Results are shared and discussed with the supervisors in charge and are considered in ongoing supervision, and in the SREP.
14. Increase frequency of on-site inspections of subsidiaries of SIs	C	The SSM is implementing this recommendation.
15. Harmonize data reporting standards for loan-to-value and debt-to-income ratios	I	• Work on harmonizing definition was conducted over the past year in close cooperation with the banks active in the real estate sector in order to increase awareness and ensure a smooth implementation. • Harmonized definitions for the LTV and DSTI ratios as well additional relevant indicators are included in CSSF circular N°18/703.
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 (published on August 23, 2018). • The CSSF has engaged with a few supervisory authorities in third-country jurisdictions where UCITS delegates are established (including Hong Kong, Switzerland, and the U.S.).
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).

Luxembourg: FSAP Update 2017: Key Recommendations (continued)		
18. Assess whether safeguards to ensure depositary independence are adequate	NT	• The CSSF started revisiting this issue internally in 2018. Discussions with industry representatives within the CSSF UCI Committee started in early 2019.
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).
Contingency Planning and Financial Safety Nets		
20. Develop policies on intragroup exposures and the transfer of custodian functions in recovery and resolution	I	• While no formal policies are in place to address the transfer of custodian functions, the CSSF has determined that the custody service is in general substitutable (due to the presence of numerous depositary banks in Luxembourg). However, a few banks have qualified their custodian functions as critical for the local economy within their recovery plans. The transfer may be time consuming due to legal and contractual constraints, and the volume of assets to be transferred. • The SRB is currently undertaking further work in collaboration with the CSSF and concerned banks to identify and address more clearly the relevant issues. • EU regulations do currently not explicitly exclude intra-group exposures from a bail-in and the likelihood of bail-in remains an important decision factor with respect to large-exposure intra-group exemptions. However, in the context of the negotiation at EU Council level of the BRRD2 package, there is a broad consensus for excluding intragroup exposures from bail-in regardless of their maturities. • In the absence of SRB's formal policy regarding depositary banks—particularly collective investment schemes, the CSSF has not yet put in place its own policy regarding the use of transfer tools (e.g. sale of business tool (share deal or assets deal) for the purpose of transferring the depositary function. • Notwithstanding the plans drawn up by the SRB, several resolution plans have been drafted and approved during the 2018 resolution planning cycle by the CSSF, both for banks with a specialized business model as well as for banks providing custodian functions (such as private banking). The drafting of these plans and the identification of the preferred resolution strategy has been undertaken on a case-by-case basis taking into consideration several important parameters, notably the volume of net assets from CIS and 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 in order to enable the latter to ensure its oversight function.

Luxembourg: FSAP Update 2017: Key Recommendations (concluded)		
Financial Market Infrastructure Oversight		
21. Reduce CBL's exposure to commercial banks vis-à-vis CSDs and central banks	NT	• Efforts by Clearstream to reduce its dependencies on commercial banks are ongoing. They include reducing concentration risk on cash correspondent banks (CCBs) in USD and GBP, by adding additional CCBs for those currencies. Target state is to be achieved by May 2019. Negotiations with the Bank of England on whether Clearstream could be granted access to GBP are ongoing.
22. Require establishment of third data center and conduct a full failover test	NT	• Negotiations and tests with possible vendors that meet Clearstream's standards are ongoing, and there is currently no concrete timeline for a final implementation.
AML/CFT		
23. Ensure the 2016/2017 national risk assessment focus adequately on TCSP risks	I	• Luxembourg finalized its first National Risk Assessment (NRA) in September 2018 based on data available as end 2017. The NRA focused, amongst others, on TCSPs, and analyzed both the inherent risk as well as mitigating actions. • The NRA, which covers but is not limited to TCSPs, represents the basis of the national AML/CFT strategy. The strategy forms the milestone of the broader national ML/FT risk assessment and mitigation exercise.
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	Operational modalities are in the process of being finalized.
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.		

INTERNATIONAL MONETARY FUND

LUXEMBOURG

April 22, 2019

STAFF REPORT FOR THE 2019 ARTICLE IV CONSULTATION—INFORMATIONAL ANNEX

Prepared By	European Department

CONTENTS

FUND RELATIONS

(As of March 31, 2019)

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	1,132.09	85.65
Reserve Tranche Position	189.73	14.35
Lending to the Fund		
New Arrangements to Borrow	37.49	

SDR Department:

	SDR million	Percent of allocation
Net cumulative allocation	246.62	100.00
Holdings	247.88	100.51

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				
	2018	2019	2020	2021	2022
Principal	0.00	0.00	0.00	0.00	0.00
Charges/Interest	0.00	0.00	0.00	0.00	0.00

Implementation of HIPC Initiative: Not applicable

Safeguards Assessments: Not applicable

Exchange Rate Assessment: Luxembourg's currency is the euro, which 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 restrictions on payments and transfers for current international transactions, other than restrictions notified to the Fund under Decision No. 144 (52/51).

Last Article IV Consultation: The last Article IV consultation was concluded on March 30, 2018. The associated Executive Board assessment is available at https://www.imf.org/en/News/Articles/2018/04/03/pr18119-imf-executive-board-concludes-2018-article-iv-consultation-with-luxembourg and the staff report (IMF Country Report No. 18/96) at https://www.imf.org/en/Publications/CR/Issues/2018/04/03/Luxembourg-2018-Article-IV-Consultation-Press-Release-Staff-Report-and-Statement-by-the-45781. 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 i.e. central bank and the other depository corporations.

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. The data cover mainly the deposit takers sector with few indicators for households and real estate markets. FSI data for other sectors are not compiled.

B. Data Standards and Quality

Luxembourg has been a subscriber to the Special Data Dissemination Standard (SDDS) since May 12, 2006. Luxembourg uses SDDS flexibility options on the timeliness of the analytical accounts of the central bank.

No data ROSC is available.

Table of Common Indicators Required for Surveillance					
(As of March 31, 2019)	Date of Latest Observation	Date Received	Frequency of Data[7]	Frequency of Reporting[7]	Frequency of Publication[7]
Exchange Rates	03/31/19	03/31/19	D	D	D
International Reserve Assets and Reserve Liabilities of the Monetary Authorities[1]	02/28/19	03/31/19	M	M	M
Reserve/Base Money	02/28/19	03/31/19	M	M	M
Broad Money	02/28/19	03/31/19	M	M	M
Central Bank Balance Sheet	02/28/19	03/31/19	M	M	M
Consolidated Balance Sheet of the Banking System	02/28/19	03/31/19	M	M	M
Interest Rates[2]	03/31/19	03/31/19	D	D	D
Consumer Price Index	02/28/19	03/06/19	M	M	M
Revenue, Expenditure, Balance and Composition of Financing[3]—General Government[4]	2018	03/05/19	A	A	A
Revenue, Expenditure, Balance and Composition of Financing[3]—Central Government	2018:Q3	11/30/18	Q	Q	Q
Stocks of Central Government and Central Government-Guaranteed Debt[5]	2017	10/19/18	A	A	A
External Current Account Balance	2018:Q4	03/25/19	Q	Q	Q
Exports and Imports of Goods	12/31/18	03/21/19	M	M	M
GDP/GNP	2018:Q4	03/21/19	Q	Q	Q
Gross External Debt	2018:Q4	03/25/19	Q	Q	Q
International Investment Position[6]	2018:Q4	03/25/19	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. De Lannoy, Executive Director for Luxembourg
and Mr. Jost, Senior Advisor to the Executive Director
May 8, 2019

The Luxembourg authorities thank Mr. Stavrev and his team for the constructive cooperation during the Article IV consultation and the thorough assessment presented in their report. They broadly agree with staff's appraisal and will, as in previous years, carefully consider the policy recommendations.

Luxembourg's economy remains strong with sound employment and economic growth prospects. Public debt levels are low compared to peers and are projected to decline further. Public investment and social spending remain high. A stable political and social environment, a skilled international labor force, a long-standing track record of fiscal prudence and a robust and predictable legal and regulatory framework, including in the financial sector, are key factors supporting growth. A continuous triple-AAA credit rating confirms the market's confidence in the country. The recently re-appointed Government is fully committed to prudent economic and fiscal policies supporting the country's competitiveness and resilience, while increasing its efforts to reduce the economy's ecological footprint and promoting inclusiveness.

The authorities concur with staff regarding mostly external downside risks, including a retreat from cross-border integration, and policy uncertainty at European and global level. On the national level, sustained increases in population, notably as a result of strong economic growth, lead to structural challenges including pressures on infrastructure and the housing market. The authorities continue to actively monitor and manage the existing risks, fully aware of the open nature of Luxembourg's economy, as, for instance, the preparations for a possible disorderly exit of the United Kingdom from the European Union show. Challenges arising from changes in international taxation are considered to be balanced, as the more level global playing field could also bring other traditional strengths of Luxembourg's socio-economic context to the fore.

Macroeconomic outlook

Economic growth is expected to remain strong. Despite lower growth expectations in the Euro Area, the Luxembourg economy is set to grow at 3.0 percent in 2019 and 3.8 percent in 2020, according to the national statistical agency. Similarly, employment growth, measured at 3.7 percent in 2018, is also projected to remain strong at 3.4 percent in 2019. Financial and business services, healthcare and ICT remain among the most dynamic sectors for job creation. Unemployment is expected to further trend down from 5.5 percent in 2018 to 4.8 percent in 2020, to reach post-crisis lows.

The current declining trend in unemployment is due to both the Government's targeted active labor market policies and favorable growth dynamics. In particular, the employment agency has devised personalized programs tailored to the needs of, often long-term, unemployed, in a high-skilled and rapidly evolving labor market. Examples include the reform of the *Revenu d'Inclusion Sociale* which aims at combating inactivity traps, or the novel *Digital Skills Bridge* program designed to provide technical and financial assistance to companies upskilling their employees even before their jobs may be digitized. The authorities remain committed to closely working with the private sector and adapting policies to the challenges posed by digitalization.

Public finances

Luxembourg's fiscal position remains structurally sound. The projected drop of the general government nominal surplus from +2.6 percent of GDP in 2018 to +1.0 percent in 2019 and +1.4 percent in 2020, primarily reflects a prudent approach in estimating fiscal revenues. It also reflects the Governments' strong commitment to the socio-economic resilience of the country and its focus on high levels of public investment to prepare the country for future challenges, notably by investing in climate- and ecologically-friendly infrastructure. At the same time, the authorities continue to set aside substantial amounts to a dedicated pension reserves fund, whose assets have accumulated to around 33 percent of GDP by the end of 2018. Reserves are destined to finance future pension obligations and would contribute to mitigating potential challenges arising from population ageing. Debt levels remain low at 21.4 percent of GDP in 2018 and are projected to decline to 20.2 percent and 19.9 percent in 2019 and 2020 respectively.

Low and declining public debt levels, a budget in surplus, the continued full respect of EU fiscal rules as well as its self-set public debt limit of 30 percent of GDP, demonstrate the Government's long-standing commitment to sound fiscal policies. The authorities are aware of the existing revenue risks and stand ready to actively address them, as past years have shown. Examples include fiscal remedies in response to the change to the EU VAT regime applicable to electronic commerce activities, or continued policy adjustment in the context of ongoing BEPS-related developments. In this vein, maintaining fiscal room for maneuver acts as a countercyclical fiscal buffer and adds to the economy's resilience to potential shocks. This prudent approach is in line with past and present IMF recommendations, notably for small and open economies.

While the short- and medium-term fiscal position remains favorable, the authorities agree that population ageing could pose challenges in the long-run, while noting that cost of ageing projections are subject to volatile assumptions on demographic and economic developments. The authorities thank staff for their thorough assessment and providing sensitivity analyses, which can help frame a policy debate. As noted by staff, past reforms have introduced a parametric framework that facilitates adjustments, but political economy considerations remain key. The authorities place strong emphasis on discussing possible reforms with social partners. Finally, a dedicated pension reserve fund provides a significant buffer, with assets amounting currently to some 33 percent of GDP, which allow to sustain pension expenditures over a substantial period into the future, even under a no-policy change scenario.

Economic policy

The Government remains committed to high levels of public investment, in both tangibles and intangibles, in line with IMF recommendations. Going forward, public investment spending is scheduled to amount to over 4 percent of GDP annually and aims at addressing infrastructure needs, including in housing and public transportation, and at preparing the economy for technological change, while continuing efforts to diversify the financial sector and the economy as a whole. Investments in ICT infrastructure and e-Government remain key. In addition, the Government's policies aim at making growth more socially inclusive and beneficial for all. Reducing the carbon footprint of the economy and supporting R&D are other areas of priority. The Government remains committed to the emission targets agreed under the Paris agreement. The planned increase in fuel taxation, among other measures, illustrates this commitment. The authorities look forward to working with staff to further improve public investment efficiency.

As the staff report highlights, Luxembourg has fully embraced the international tax transparency agenda. Over the last five years, the Government has taken and continues to take decisive actions to align its tax framework to international standards, including those set by the OECD, such as the BEPS action plan. Luxembourg is participating in the automatic exchange of information in the field of taxation and has put into place a *BEPS*-compliant IP box regime. In addition, in 2018 and 2019 respectively, parliament transposed the *Anti-Tax Avoidance Directive (ATAD) I*, as well as the *Multilateral Instrument (MLI)*. The authorities expect to transpose the *ATAD II* by the end of 2019.

This is in addition to earlier steps, such as the introduction of regulations aimed at neutralizing hybrid mismatches or the introduction of the arm's length principle into national law.

Reflecting some of these efforts, the 2019 peer review report by the *OECD Global Forum on Transparency and Exchange of Information for Tax Purposes* found Luxembourg to be "*largely compliant*" with the international standard of transparency and exchange of information on requests. The Government remains committed to staying actively engaged in all relevant fora and to aligning the tax framework to international developments. Recent efforts at the OECD level are a powerful example of a successful global consensus-based approach, which Luxembourg continues to fully support. In this sense, the authorities welcome staff's analysis of *BEPS* actions implemented in Luxembourg.

The authorities are aware of the challenges stemming from a changing international tax environment. They are monitoring the developments closely and stand ready to adapt where necessary. At the same time, the authorities stress the importance of a global level playing field, which would also bring about opportunities, considering Luxembourg's various other comparative advantages such as its political and social stability, prudent policies and an effective governance framework.

Financial sector

The financial sector remains sound. As staff points out, banks are profitable and maintain high levels of capital, liquidity and asset quality. NPLs are very low, both in absolute levels and compared to peers. Banks remain resilient to shocks as stress tests indicate. The fund industry, distributing to a diverse pool of investors both in the European internal market and globally, remains an important component of the financial industry in Luxembourg. The authorities continue to closely monitor existing and emerging risks, in both the fund industry and banking sector, including at the level of the *Systemic Risk Committee (CdRS).*

The authorities remain committed to implementing robust financial policies, notably by continuously adjusting the national regulatory framework and macroprudential surveillance to evolving international standards and best practices. Authorities are thereby also following up on IMF recommendations, as staff rightly highlights. As such, the frequency of on-site inspections for investment funds and banks has increased, engagement with authorities of other jurisdictions has been strengthened even further, revised early warning indicators under the *Solvency II* regime are used, and steps to standardize reporting of borrower-related indicators have been taken. The authorities are contributing to the development of consistent leverage measures, guidance for liquidity stress testing by investment fund managers, and standardized stress testing for money market funds.

Similarly, the authorities took a number of steps to continue to strengthen the AML/CFT framework. Luxembourg transposed the *4th EU AML Directive (AMLD4)*, and the transposition work relating to the *AMLD5* is on schedule. In addition, the authorities conducted a *National Risk Assessment (NRA)*, in line with OECD best practices and are in the process of implementing a strategy to ensure that measures to prevent or mitigate money laundering and terrorist financing are commensurate with the risks identified in the NRA. A *Register of Beneficial Owners* of corporate and other legal entities was established in January 2019 in conformity with *AMLD4* provisions.

The authorities believe that these efforts will further strengthen the robust and effective supervisory framework. In the same vein, the authorities are tracking evolving international regulatory standards and developments, and are actively engaged in discussions in all relevant fora such as ESMA, ESRB, FSB, IOSCO, SSM and SRM. The authorities also remain attached to the objective of further risk reduction in the banking sector at EU level to further strengthen financial stability in order to facilitate the completion of the banking union. At the same time, it is and remains crucial that institutions, including subsidiaries, maintain sufficient levels of own funds and eligible liabilities in order to allow for a smooth operationalization of resolution strategies.

Housing market

Economic developments and related population growth generate strong demand in the housing market. The Government has made alleviating housing supply constraints a priority, focusing in particular on increasing the availability of social housing. Accordingly, and in line with 2018 Article IV recommendations, the Government intends to change urban planning laws, boost the construction of social housing, and reform real estate taxation to reduce speculation. On the financial side, the authorities continue to actively monitor and manage potential risks, including within the *Systemic Risk Committee (CdRS)*. The introduction of macro-prudential measures contributes to the build-up of capital buffers in the banking system. A draft enabling bill extending the macroprudential toolkit by including tools allowing for borrower-based mortgage lending measures is in the legislative process.

Diversification efforts

Despite the positive economic outlook, and in order to increase the economy's resilience to shocks and facilitate employment across sectors, the Government maintains its efforts to diversify the financial sector itself and the economy as a whole.

Fostering innovation in the fields of financial technology and promoting climate finance, including in the form of public-private partnerships, remain priorities. The inception of the *Luxembourg House for Financial Technology (LHoFT)* and the *International Climate Finance Accelerator Luxembourg* showcase the ambitions of the Government to contribute to the continued development of the internationally oriented financial center, and to the mobilization of capital supporting climate change mitigation in Europe and beyond.

In addition to the efforts to further develop the ICT sector by providing first-class infrastructures and telecommunication, Luxembourg has implemented a legal and regulatory environment aimed at enabling private investors and companies to explore and use space resources via the *SpaceResources.lu* initiative. More generally, the Government continues to pay careful attention to developing a climate conducive to business, investment and innovation, as reflected in the 2019 Budget.