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LUXEMBOURG

May 2021

2021 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 2021 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 14, 2021 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 14, 2021, following discussions that ended on March 12, 2021, 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 29, 2021.
- An **Informational Annex** prepared by the IMF staff.
- A **Statement by the Executive Director** for Luxembourg.

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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PRESS RELEASE

PR21/138

IMF Executive Board Concludes 2021 Article IV Consultation with Luxembourg

FOR IMMEDIATE RELEASE

Washington, DC – May 26, 2021: On May 14, 2021, the Executive Board of the International Monetary Fund (IMF) concluded the Article IV consultation with Luxembourg.[1]

Luxembourg has weathered the pandemic relatively well, thanks to the unprecedented policy support, both domestically and globally, and a quick adjustment to teleworking. To support the economy, the government implemented in 2020 a large and multi-pronged policy package, followed by more targeted stimulus in 2021. Accordingly, the economy experienced a mild contraction in 2020 (-1.3 percent), driven by weak domestic demand, and is expected to rebound by about 4 percent in 2021.

The outlook is for recovery, but the output is expected to remain below its pre-crisis trend over the medium term, partly reflecting some impairment in corporate balance sheets and scarring in the labor market. Risks to the outlook are tilted to the downside and are dominated by the virus dynamics in the near term. On the upside, a quicker containment of the infection could bring back activity significantly faster. On the downside, a prolongation of the health crisis into 2021 could delay the recovery. Broader risks, such as tightening of global financial conditions, the acceleration of de-globalization, and revenue risk from changes in international taxation, could weigh on economic prospects.

Executive Board Assessment[2]

Executive Directors agreed with the thrust of the staff appraisal. They commended the authorities' timely and broad-based policy response to the pandemic, which supported households and firms and limited the economic fallout. While the outlook is for a recovery, global uncertainty remains, particularly related to the evolution of the virus in the near term. Directors stressed the importance of maintaining targeted policy support until the recovery is firmly established, addressing rising financial system risks, and focusing structural policies on mitigating scarring while supporting an inclusive recovery.

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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.

Directors emphasized that the unwinding of policy support should be state contingent and well calibrated to the economic conditions. As the recovery strengthens, fiscal policy should pivot toward further greening the economy, digitalization, and closing infrastructure gaps. It will be important to preserve buffers to guard against fiscal risks from changing international taxation and reaching CO2 targets. Directors recommended continuing to diversify revenues while reducing the carbon footprint, as well as strengthening public investment management and the procurement framework.

Directors highlighted the importance of continuing to address rising risks in the financial sector, in line with the FSAP recommendations. While the banking sector would remain resilient given its large capital and liquidity buffers, solvency risks could, as in other countries, materialize if state support is withdrawn prematurely or the recovery is delayed. Directors welcomed the intensification of the oversight of the investment fund sector and encouraged further strengthening the macroprudential surveillance and regulation of the sector. Directors stressed the need to continue monitoring high household indebtedness, and to revisit the loan-to-value limits and explore other tools in the legal framework if indebtedness continues to rise. The macroprudential stance may need to be revisited if pressures in credit markets reemerge as the recovery gains ground. Noting welcome steps taken by the authorities, Directors recommended further strengthening the AML/CFT framework.

Directors commended the authorities' efforts to support employment, particularly of the most vulnerable workers. As the recovery strengthens, the focus should shift from preserving jobs to facilitating the reallocation of workers to dynamic sectors, including through training programs. Directors encouraged further steps to increase housing supply, while improving inclusiveness in the housing market. Deepening the market for sustainable finance will help diversify the financial sector.

Table 1. Luxembourg: Selected Economic Indicators, 2019-22

			Projections	
	2019	2020	2021	2022
Real economy (change in percent)				
Real GDP	2.3	-1.3	4.1	3.6
Domestic demand	3.3	-4.4	4.4	3.5
Foreign balance (contr. to GDP growth)	0.2	1.3	1.9	1.3
CPI (national definition)	1.7	0.8	1.8	1.9
GDP deflator	3.4	2.3	3.3	2.5
Public finance (percent of GDP)				
General government balance	2.4	-4.1	-1.6	-0.6
Revenue	44.7	43.7	43.2	42.8
Expenditure	42.3	47.8	44.8	43.4
Structural balance (percent of pot. GDP)	2.1	-3.3	-1.3	-0.5
General government gross debt	22.0	24.9	26.7	27.3
Labor market (percent change)				
Total employment	3.6	2.0	1.6	2.4
Resident labor force	2.7	2.8	2.2	2.0
Unemployment rate (percent)	5.4	6.3	6.7	6.4
Credit growth (percent)				
Growth of credit to the private non-financial sector	7.2	5.0	11.3	9.4
Balance of payments (percent of GDP)				
Current account	4.6	4.3	4.9	4.9
Balance on goods	5.0	3.8	4.1	4.0
Balance on services	33.7	33.1	33.2	33.5
Net factor income	-33.4	-31.1	-32.7	-32.9
Balance on current transfers	-0.7	-1.5	0.3	0.3
Exchange rates				
U.S. dollars per euro, period average	1.1	1.1	...	...
NEER, CPI based (2010=100, +=appreciation)	101.5	103.2	...	...
REER, CPI based (2010=100, +=appreciation)	99.5	100.8	...	...
Potential output and output gap				
Potential output (change in percent)	3.2	1.0	3.1	3.0
Output gap	0.6	-1.7	-0.8	-0.2

Sources: Haver Analytics, INSEE, Banque de France, and IMF Staff calculations.

INTERNATIONAL MONETARY FUND

LUXEMBOURG

STAFF REPORT FOR THE 2021 ARTICLE IV CONSULTATION

April 29, 2021

KEY ISSUES

The economic impact of the pandemic has been much milder than initially foreseen, still the outlook remains challenging. The economy, dominated by financial services, adapted quickly to telework and benefited from unprecedented policy support, both domestically and globally. Uncertainty is unusually high, dominated by the virus dynamics in the short term, with downside risks relating to a sharp rise in global risk premia, deglobalization trends, and changes in international taxation.

The policy support should remain available and targeted toward the most vulnerable. Making good use of the accumulated fiscal space, the government's response to the pandemic was decisive. Fiscal policy should remain supportive until the recovery is firmly established to avoid a rise in inequality. As pandemic-related measures are unwound, drawing on the ample fiscal space, policy support should pivot towards facilitating the digitalization of the economy while pursuing climate commitments and closing infrastructure gaps. Comfortable fiscal buffers should be preserved to mitigate revenue risks from the ongoing global tax reforms.

Rising risks in the financial sector, while manageable, should continue to be closely monitored and addressed in line with the 2017 FSAP recommendations. On aggregate, the financial sector remains resilient, but the near-term outlook for bank asset quality and performance depends on the recovery and the continuation of policy support, especially to vulnerable households and businesses. Meanwhile, solvency risks in the non-financial sector and their adverse implications for bank profitability should be closely monitored. The authorities should continue to strengthen the oversight of the large investment fund sector, notably from a macroprudential perspective given the renewed search for yield. Should household indebtedness remain high, the authorities should revisit the current loan-to-value (LTV) setup and explore other available borrower-based tools. If credit market pressures reemerge, some tightening of the counter-cyclical capital buffer would help alleviate these pressures.

Structural policies should aim to mitigate scarring while supporting a recovery that benefits all segments of the population. As the recovery gains strength, the focus of labor market policies should shift from protecting existing jobs to facilitating labor reallocation to new and expanding firms and sectors. Efforts to alleviate structural supply constraints and improve inclusiveness in the housing market should continue.

Approved By
Mr. Pradhan (EUR), Mr. Rother (SPR)

Virtual discussions were held during March 1–12, 2021. The team comprised Messrs. E. Stavrev (head, EUR), M. Souissi (ICD), A. Murr (LEG), and C. Simpson-Bell (STA), and Ms. A. Solovyeva, and was assisted by Ms. K. Cerrato and Mr. Z. Jin (all EUR). Mr. M. Scholer (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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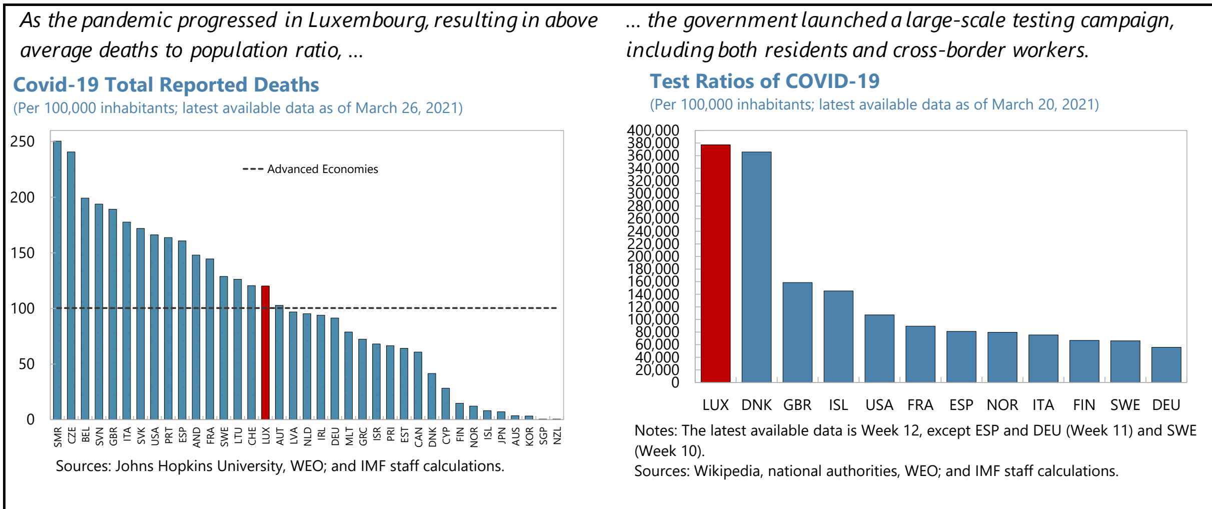
CONTEXT

1. Luxembourg has responded swiftly and decisively to the pandemic. It managed the first wave of the COVID-19 epidemic during March-April 2020 well thanks to an early and vigorous public health response. Sizeable and flexible policy support to preserve jobs and firms, and a quick reopening of the economy, underpinned by large-scale testing, supported a rapid, albeit incomplete economic recovery in the second half of 2020.



2. The unprecedented policy support, both domestically and globally, along with structural features of the economy helped limit the economic impact of the pandemic. Broad-based supportive domestic policies such as short-time work and financial aid schemes, tax deferrals, and loan guarantees, helped mitigate the economic impact of COVID. The economy, dominated by financial services, has also benefited from the ECB's and other major central banks' additional stimulus, and the financial sector's rapid transition to teleworking. While the economy has fared better than the average of the euro area with a mild GDP contraction in 2020, there will still likely be a permanent output loss over the medium term.

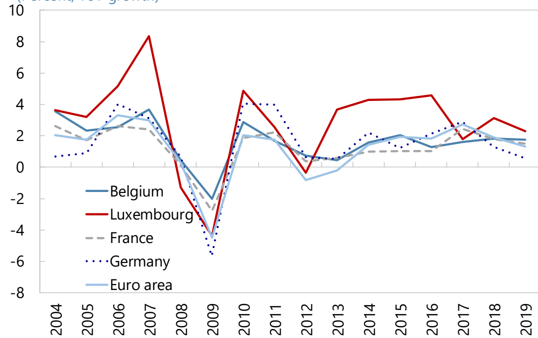
THE PRE-COVID LANDSCAPE

3. Pre-COVID, the economy expanded rapidly, although signs of moderation in activity had emerged. The economy grew by about 3.5 percent annually on average during 2014–19, translating into solid employment gains and a significant decline in unemployment. However, slowing growth and signs of softening in the labor market indicated that the economy had started cooling off.

Before the pandemic, Luxembourg's GDP growth had been above the euro area average, ...

Real GDP Growth

(Percent, YoY growth)

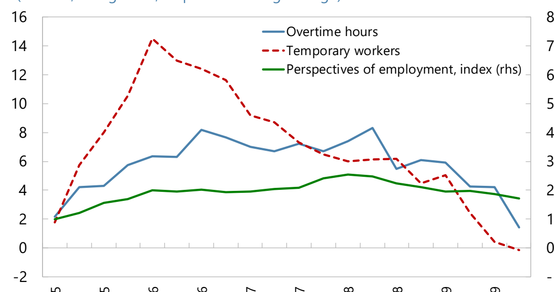


Sources: Haver Analytics; and IMF staff calculations.

... but signs of some softening of the labor market had emerged.

Leading Labor Market Indicators

(Percent, YoY growth; 4-quarter moving average)



Sources: STATEC, ADEM; and IMF staff calculations.

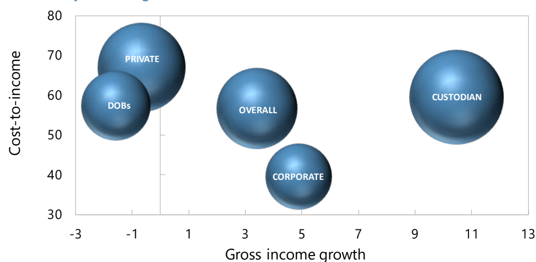
4. Luxembourg has accumulated substantial fiscal space, reflecting a persistently prudent fiscal stance and buoyant tax revenues. The country has consistently met its medium-term objectives, thanks to prudent fiscal management and dynamic tax revenues, reflecting strong economic performance as well as one-off factors (sizeable corporate income tax assessments for previous years). Accordingly, Luxembourg's gross debt is among the lowest in Europe (around 22 percent of GDP).

5. The financial sector has generally performed well amid continued search for yield in the prolonged low interest rate environment, but vulnerabilities have been building. On aggregate, banks remained well capitalized and liquid, but their profitability has been weakening due to increasing administrative costs and low interest rates. However, there is wide variation across the different segments with those focused on commission-based activities such as custodian banks generally faring better. Like in other jurisdictions, Luxembourg's investment funds have expanded rapidly, and search-for-yield in an environment of falling yields has led to the build-up of liquidity and maturity mismatches.

Relatively large cost inefficiencies and weak income growth have weighed on the domestically oriented banks' profitability.

Bank Profitability and Income Diversification

(Percent, 4-year average)

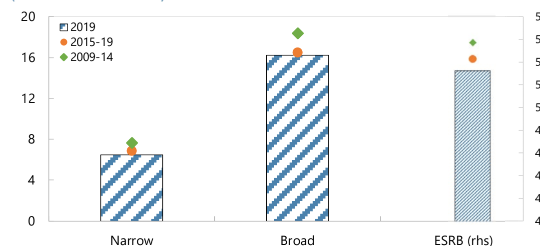


Notes: Bubble size indicates income diversification, measured with the share of non-interest income in total revenues. The domestically oriented banks (DOBs) are mostly focused on domestic retail/commercial banking. Custodian banks are focused on activities related to the investment fund management value chain. Private banks provide private wealth and asset management services. Corporate finance banks are involved in the provision of international loans to NFCs and treasury services.
Sources: CSSF; and IMF staff calculations.

Overall, Luxembourg's fund asset liquidity has continued to decrease during the past decade.

Aggregate Liquidity Indicators for the Fund Sector

(Percent of total assets)

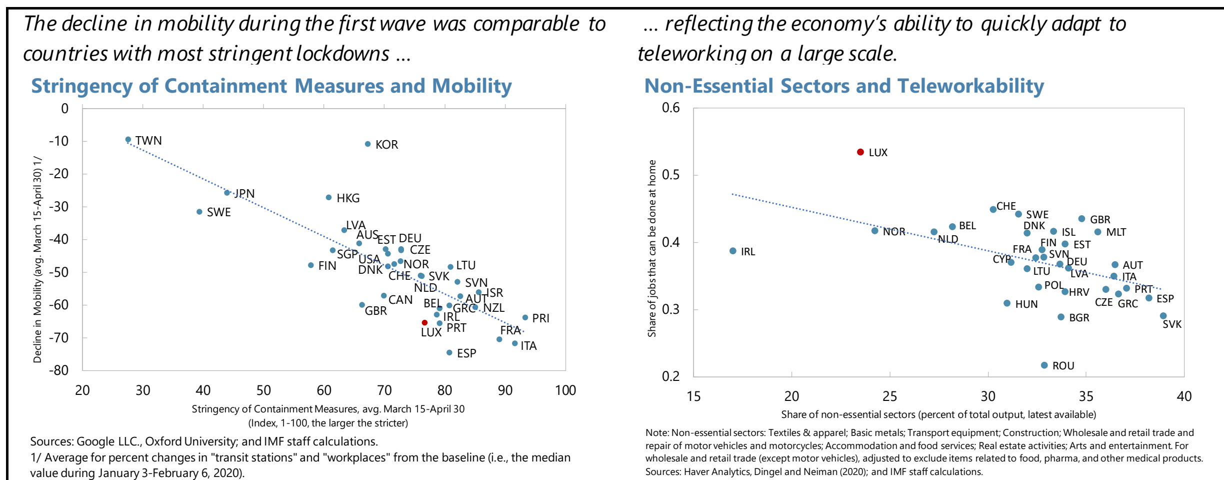


Notes: Following FSB's measures of asset liquidity, the narrow metric includes demand deposits and MMF shares, while the broad measure AAA-AA government bonds and 85 percent of A rated government bonds. The ESRB's metric, used in the EU Non-bank Financial Intermediation Risk Monitor, includes demand deposits, MMF shares, investment grade government bonds, listed equity and short-term debt securities.
Sources: BCL; and IMF staff calculations.

PANDEMIC IMPACT AND POLICY RESPONSE

A Significant, Albeit Much Milder than Initially Foreseen Economic Fallout

6. **The economy, dominated by financial services, adapted quickly to teleworking, which supported a rapid decline in infections after the first wave.** Thanks to a timely and decisive public health response, containment measures during the first wave of the pandemic were not as stringent as in some other European countries which experienced higher infection and mortality rates. In contrast, the decline in mobility was just as drastic, mainly reflecting structural features of the economy, notably the world's highest teleworkability and one of the lowest shares of the contact-intensive sectors which were most affected by the first lockdown.



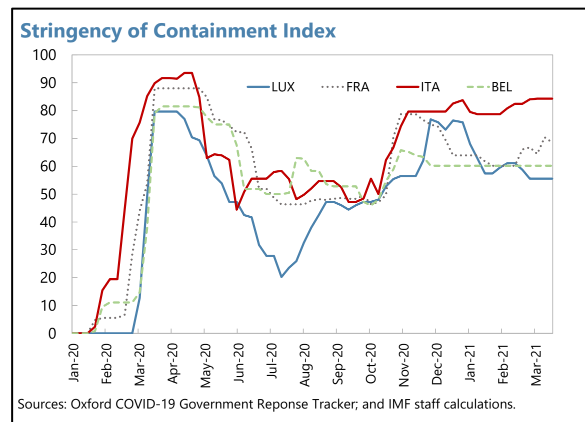
The decline in mobility during the first wave was comparable to countries with most stringent lockdowns …

Sources: Google LLC., Oxford University; and IMF staff calculations.
1/ Average for percent changes in "transit stations" and "workplaces" from the baseline (i.e., the median value during January 3-February 6, 2020).

… reflecting the economy's ability to quickly adapt to teleworking on a large scale.

Note: Non-essential sectors: Textiles & apparel; Basic metals; Transport equipment; Construction; Wholesale and retail trade and repair of motor vehicles and motorcycles; Accommodation and food services; Real estate activities; Arts and entertainment. For wholesale and retail trade (except motor vehicles), adjusted to exclude items related to food, pharma, and other medical products.
Sources: Haver Analytics, Dingel and Neiman (2020); and IMF staff calculations.

7. **This allowed for a quick reopening and helped limit the economic fallout from the pandemic.** The economy entered an unprecedented recession in H1 2020 (- 7.7 percent year-on-year, yoy, in Q2 2020), driven by the collapse in domestic demand (- 13.7 percent, yoy). However, following the significant flattening of the infection curve in late-April, a rapid lifting of the containment measures accompanied with an ambitious testing strategy led to a strong rebound in domestic demand in the second half of 2020, particularly consumption. Accordingly, the labor market has improved with the unemployment rate rapidly receding from its peak of around 7 percent in April 2020 to 6.1 percent in March 2021. At the same time, employment continued to grow, albeit more moderately, driven by the public sector, construction, and financial services (Figure 1). Overall, in 2020, real GDP has contracted much less than initially expected (1.3 percent), driven by weak private domestic demand despite a positive contribution from net exports. Core inflation has declined due to both the fall in aggregate demand and the introduction of free public transportation early in the year. Headline inflation fell even more as food inflation declined while global energy prices slumped.



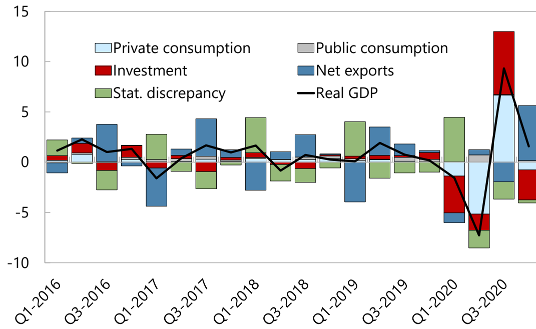
Sources: Oxford COVID-19 Government Reponse Tracker; and IMF staff calculations.

Figure 1. Real Sector Developments

Faster-than-expected rebound in H2 2020 was driven by private consumption and net exports.

Contribution to Real GDP Growth, Quarterly

(Percent; QoQ growth)

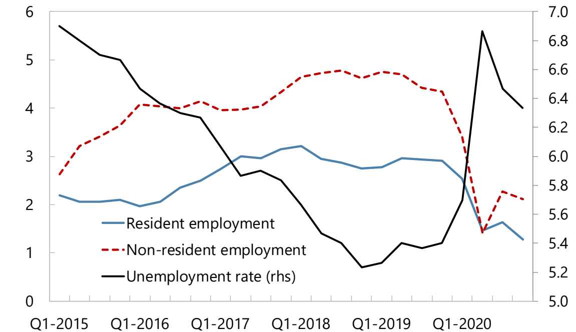


Sources: STATEC; and IMF staff calculations.

Employment growth slowed, and the unemployment rate has been on a downward trend since its peak in April 2020.

Luxembourg: Annual Employment Growth and Unemployment Rate

(Percentage points; percent)

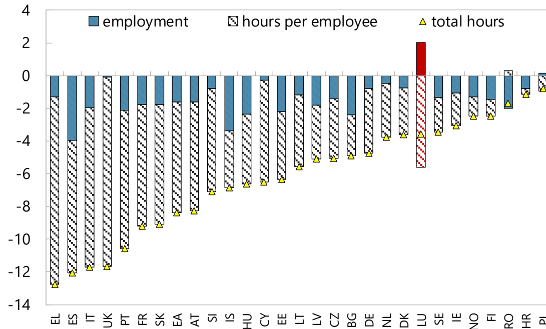


Source: STATEC.

In contrast to the rest of euro area, employment growth in Luxembourg remained positive ...

Euro area: Contributions to Total Hours Worked Growth

(Percent; 2020Q1-Q3 relative to 2019Q1-Q3)

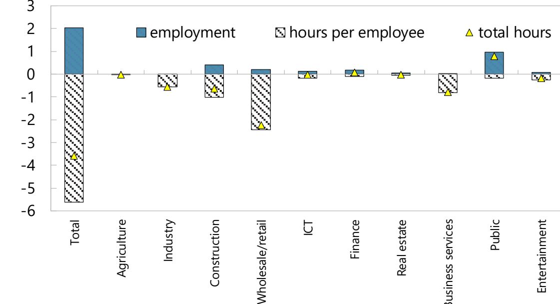


Sources: Eurostat; IMF staff calculations.

... driven by public sector, construction, and financial services.

Luxembourg: Contributions to Total Hours Worked Growth

(Percent; 2020Q1-Q3 relative to 2019Q1-Q3)

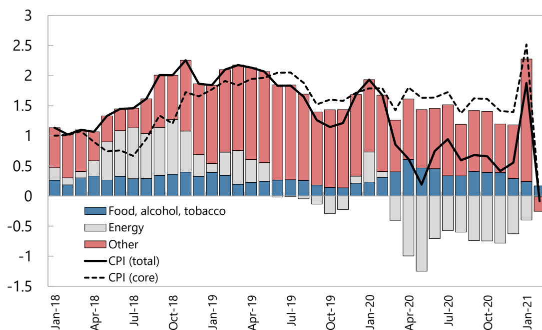


Note: Wholesale/retail corresponds to Wholesale, retail, transportation, accomodation & food services; Finance corresponds to Finance and insurance; Entertainment corresponds to Arts, entertainment & recreation, activities of households as employers, and other services.
Sources: Eurostat; and IMF staff calculations.

Headline inflation was driven by the drop in energy prices, while the impact of the pandemic on the core was milder.

Contribution to National CPI, YoY

(Percentage points; non-seasonally adjusted)

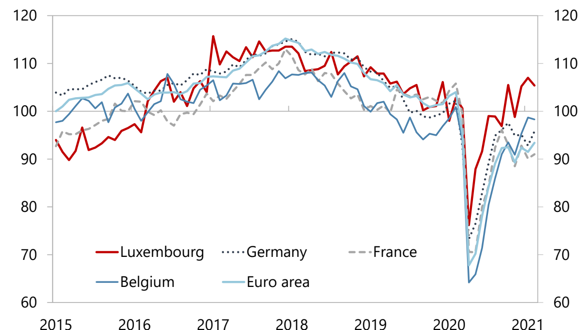


Sources: STATEC; and IMF staff calculations.

Economic sentiment recovered faster than in the euro area, reaching pre-Covid levels in early 2021.

Economic Sentiment Indicator

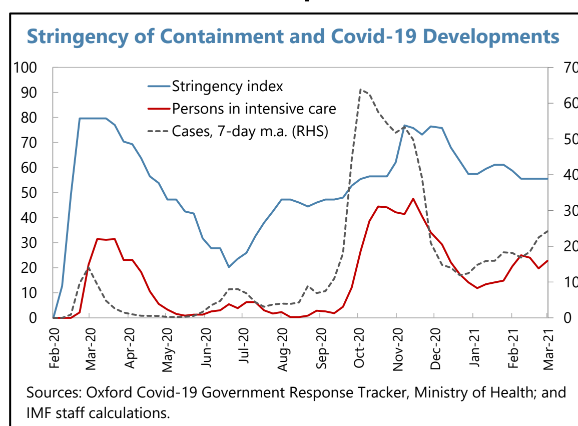
(Index, long-term average = 100)



Source: Haver Analytics.

8. The second wave triggered a tightening of restrictions, which helped reduce new cases appreciably. Infections started rising again in early October, with daily new cases being almost four times higher than during the spring peak and about a 50 percent increase in the number of patients in intensive care. While hospital capacity has remained adequate, the government tightened restrictions, reaching stringency levels close to the peak of the first wave by end-2020. These included a nighttime curfew and closures of non-essential businesses, which have been relaxed since early-2021. Together with a high capacity to telework, the still relatively tight containment measures have so far prevented a third infection wave.

Stringency of Containment and Covid-19 Developments



Sources: Oxford Covid-19 Government Response Tracker, Ministry of Health; and IMF staff calculations.

A Broad-Based Policy Response

9. Taking advantage of accumulated fiscal space, the government's response was timely, sizeable, and multi-pronged (Annex I)**.** The emergency measures implemented in March-April 2020 were duly focused on solidarity, including efforts to enhance the public health infrastructure and provide critical support to households and businesses. The government, broadened the coverage of the short-time work scheme, provided grants and repayable advances to businesses, allowed tax deferrals and rebates for H1 2020, and extended loan guarantees and moratoria. In mid-May, as the economy started reopening, Luxembourg adopted a

Luxembourg's COVID-19 fiscal measures in 2020

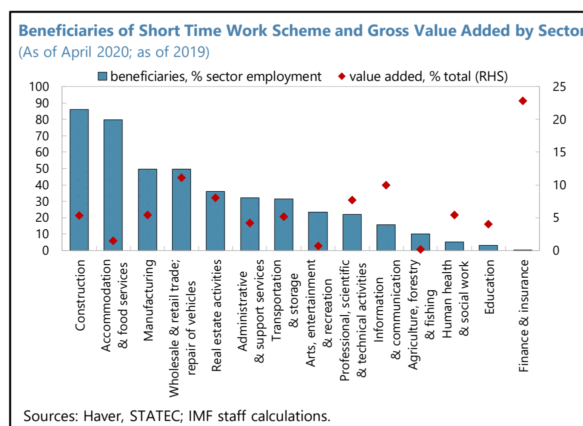
	Allocated		Uptake	
	Million euros	Percent of GDP	million euros	Percent of GDP
Direct support	**7,620**	**11.9**	**2635**	**4.1**
Revenue measures	*4,590*	*7.2*	*614*	*1.0*
- Direct taxes (PIT/CIT)	1,290	2.0	232	0.4
- Indirect taxes (VAT)	300	0.5	204	0.3
- Social security contribution	3,000	4.7	178	0.3
Expenditure measures	*3,030*	*4.7*	*2021*	*3.2*
- Health crisis management	240	0.4	221	0.3
- Grants to firms	540	0.8	178	0.3
- Reimbursable advances to businesses	400	0.6	152	0.2
- Measures to support investment and green recovery	50	0.1	3	0.0
- Short-time work	1,310	2.0	995	1.6
- Leave for extraordinary/sick reasons	410	0.6	384	0.6
- Social support	50	0.1	41	0.1
- Other current spending	30	0.0	47	0.1
Indirect support	**3,390**	**5.3**	**253**	**0.4**
State-guarantee for new loans	2,500	3.9	149	0.2
Other capital support/loan guarantee	890	1.4	104	0.2
Total	**11,010**	**17.2**	**2888**	**4.5**

Notes: The uptake figures are as of end-March 2021.
Source: 2021 Stability and Growth Programme; and IMF staff calculations

new stimulus package to boost the recovery. It appropriately encompassed targeted measures to the most vulnerable sectors, such as hospitality and retail. The measures included short-time work scheme and grants to businesses, as well as fiscal incentives for green investment, including aid for energy efficiency projects. The two packages totaled about 17 percent of the 2020 GDP but the actual impulse of the measures was significantly lower. A conservative assessment of financial needs together with a stronger-than-expected recovery explains the lower demand for assistance by firms and partial repayment of the support provided at the time of the first lockdown (about 4.6 percent of GDP in 2020).[1]

10. This unprecedented fiscal support helped preserve employment, cushion the income shortfall for households, and relieve pressure on firms' cash flows.

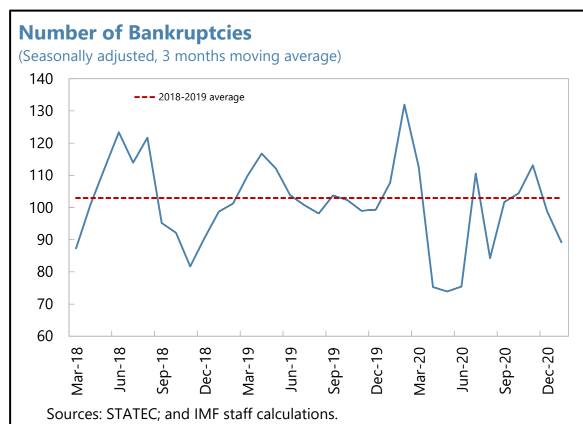
- *Preserving employment and providing income support*: The pre-existing short-time work scheme ("*chômage partiel*") was quickly scaled up to include all businesses with subdued activity due to the pandemic (Annex II). In April 2020, between 50 and 80 percent of workers in the sectors most hit by the pandemic, such as hospitality, retail, and construction, were participating in this scheme. The extraordinary support was slightly reduced in July—except for tourism, hospitality, and sectors not allowed to resume their activity due to containment restrictions—but remains generous and, under certain conditions, allows for permanent layoffs based on firms' job retention plans.



Beneficiaries of Short Time Work Scheme and Gross Value Added by Sector
(As of April 2020; as of 2019)

Sources: Haver, STATEC; IMF staff calculations.

- *Supporting firms' cash flows*: To support firms' liquidity and solvency conditions, a range of policy measures have been deployed, including deferrals of taxes and social security contributions, cash grants to small and medium-sized firms (SMEs) and the self-employed, capital advances to cover operating costs, and debt moratoria. Thanks to this unprecedented support, the number of bankruptcies has hovered around pre-COVID levels.

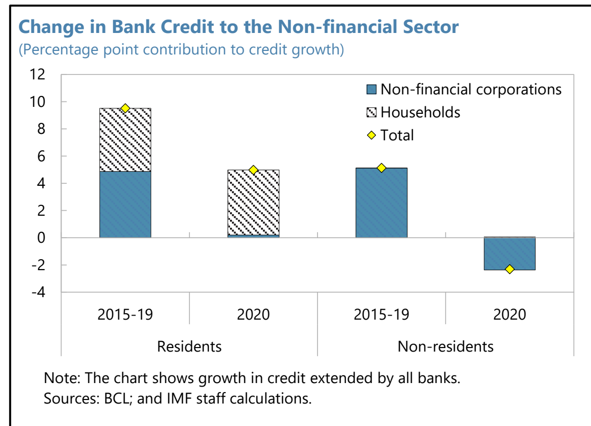


Number of Bankruptcies
(Seasonally adjusted, 3 months moving average)

Sources: STATEC; and IMF staff calculations.

[1] Further to enhancing health infrastructure, the government stepped up other infrastructure projects. Hence, public investment grew in nominal terms by 26 percent in 2020, much higher than the pre-COVID growth trend.

11. Thanks to the broad-based policy support, both domestic and global, the impact of the pandemic on the financial sector has been limited.



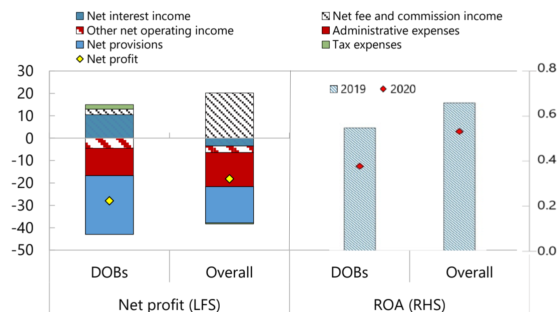
Change in Bank Credit to the Non-financial Sector
(Percentage point contribution to credit growth)

Note: The chart shows growth in credit extended by all banks.
Sources: BCL; and IMF staff calculations.

- *Banks.* Overall, in 2020, Luxembourg banks remained well capitalized (CET1 ratio at 23.5 percent on aggregate) and liquid (LCR ratio at 152 percent on aggregate). Solvency risks have not materialized so far, with the non-performing loans (NPLs) broadly stable at about 0.9 percent.[2] However, asset quality has started to deteriorate and inflows into stage 2 assets have increased. Supervisory data indicate that net profits declined significantly for the domestically oriented banks (DOBs) and overall, largely due to higher provisions for loan losses.[3] Growth in credit to resident non-financial corporations slowed to below 1 percent (compared to above 10 percent on average since 2016), mostly reflecting weak demand. In contrast, growth in household credit has remained robust at more than 8 percent, mainly driven by mortgages.

Bank profitability has weakened in 2020 due to higher provisioning and administrative expenses, and lower dividend income

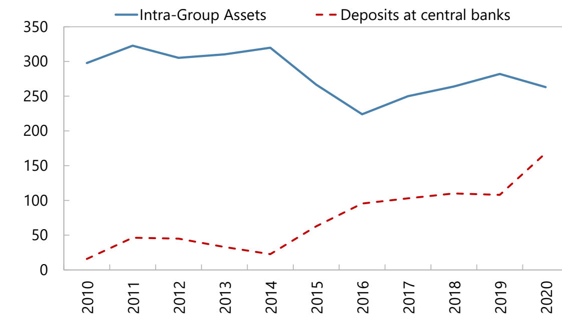
Changes in Bank Profits and Return-on-Asset
(Percentage point (contribution to annual profit growth), percent (ROA), 2020)



Note: Only banks with solvency requirements are coverd. DOBs stand for the domestically oriented banks.
Sources: CSSF; and IMF staff calculations.

Luxembourg banks have continued to increase their central bank deposits in this highly uncertain environment

Intra-group Assets and Central Bank Deposits
(Billion euros)



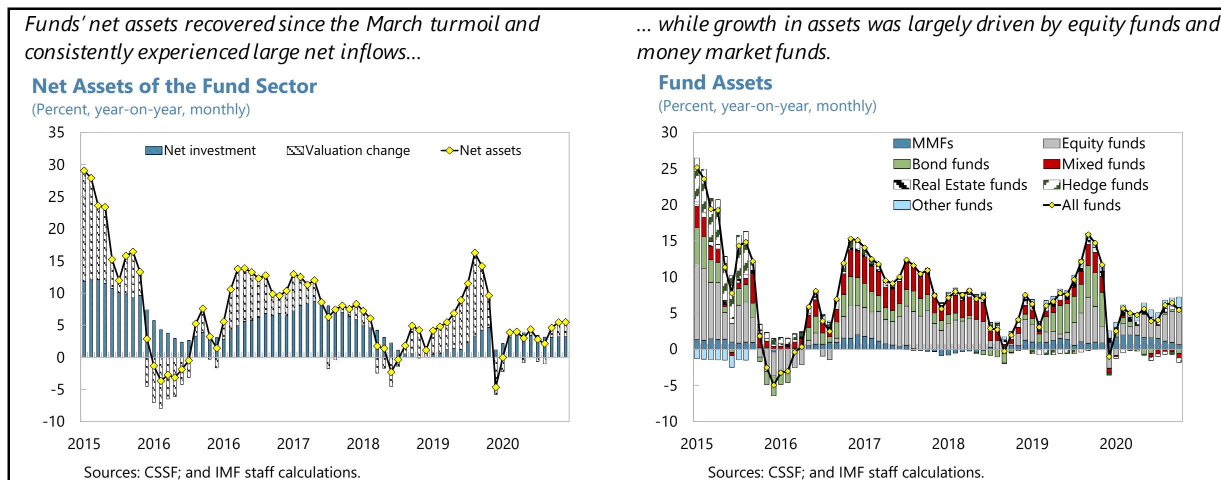
Sources: BCL.

- *Investment funds.* Like in other jurisdictions, Luxembourg funds faced significant financial stress during the March 2020 turmoil, which triggered heightened surveillance of the sector. Thanks to the decisive global policy action, including large liquidity provisions by the ECB and the other major central banks, funds recovered from their valuation losses and consistently experienced large net inflows. After the market stabilized, funds rebalanced

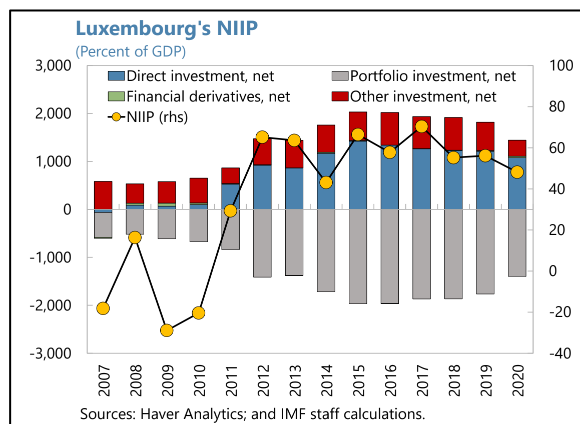
[2] NPL ratios for SMEs have increased slightly from very low levels.

[3] Bank net income (before provisions and taxes) remained rather stable in 2020. CSSF data indicate that about ¾ of the new provisions in 2020 were made on performing loans.

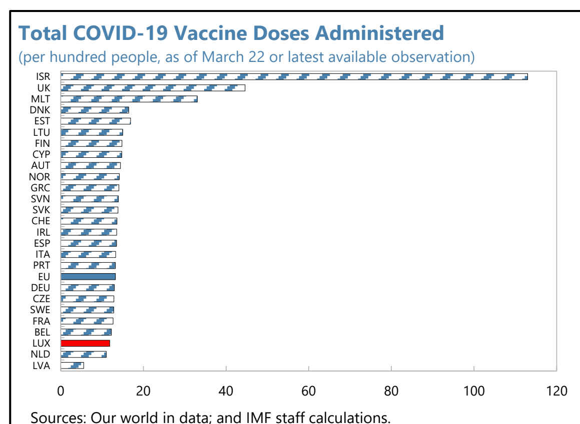
their portfolios towards riskier assets to increase returns, notably global equities and high-yield bonds.



12. Luxembourg's external position is broadly consistent with fundamentals and desirable policies (Annex III). In 2020, the current account surplus edged down to 4.3 percent of GDP, mainly driven by lower net goods exports and net transfers (Table 1). The net international investment position (NIIP) declined to 48 percent of GDP from 56 percent of GDP at end-2019, driven by both net direct and other investment and partly offset by the improvement in the net portfolio position. The EBA-lite current account model suggests a current account gap of 0.5 percent of GDP—including a policy gap of 3.6 percent mostly reflecting a looser world average fiscal stance—and a real effective exchange rate (REER) undervaluation of 0.4 percent.



13. Looking ahead, Luxembourg envisages an ambitious vaccination strategy, but is encountering delays due to supply constraints. The government has committed to purchase 1.3 million doses through the EU common procurement mechanism. Free vaccines will be administered to both residents and cross-border workers (on a voluntary basis) following a centralized approach. However, like in many other European countries, the vaccination has not progressed as planned due to supply shortfalls, posing downside risks to the baseline.



Authorities' Views

14. The authorities shared staff's assessment of Luxembourg's policy response to the pandemic. They attributed Luxembourg's relative success in handling the shock to the timely deployment of broad-based support measures, combined with the economy's low share of contact-intensive sectors and its high capacity to telework. They acknowledged that the financial services have also benefited from accommodative global financial conditions on the back of continued global policy support. The authorities emphasized that their policies have been closely calibrated to the pandemic dynamics and have become increasingly targeted to the most vulnerable sectors. They emphasized that the lower-than-initially budgeted uptake on key support measures is largely due to the overall resilience of the economy and a generous assessment of the initial needs given the unprecedented nature of the crisis and the resulting exceptional uncertainty. Finally, they agreed with staff that Luxembourg's external position is broadly in line with fundamentals.

OUTLOOK AND RISKS

15. The outlook is for a recovery but output is forecast to remain somewhat below the pre-crisis trend over the medium term (Tables 1-6)**.** While new infections increased somewhat in March 2021, they remain much lower than the peak of the second wave in October 2020. Accordingly, staff assume no significant tightening of the containment measures in the near term, with no major impact on the economy, and a widespread availability of an effective vaccine or treatment towards end-2021. Under these assumptions, real GDP growth is projected to rebound to about 4 percent in 2021, well above-potential growth. This recovery would be supported by both domestic and foreign demand amid continuing accommodative global financial conditions. A negative, albeit narrowing, output gap is expected as aggregate demand will trail the supply side recovery. Nonetheless, both core and headline inflation are set to increase in 2021, driven by higher services prices and the expected rebound in energy prices, and stabilize just under 2 percent thereafter. Over the medium term, higher corporate balance sheet impairment would be a drag on capital accumulation, and together with some scarring in the labor market, would weigh on output over the medium term. As a result, real output is forecast to remain slightly over 1 percent lower than its pre-COVID-19 trend by 2025.

16. Downside risks to the outlook prevail, amid considerable uncertainty in the near term due to virus dynamics (Table 7).

- ***Virus risk***: On the *downside*, a prolonged pandemic would weaken the recovery in Europe and may increase volatility in global financial markets, which would weigh on the performance of the large financial sector, tax revenues, and growth. Domestically, higher corporate balance sheet impairments and rising unemployment would undermine confidence, and weaken growth prospects. On the *upside*, a widespread availability of an effective vaccine with extensive immunization in advanced economies could bring back activity faster and consolidate financial market gains.

- ***Other risks***: A *sharp rise in global risk premia* due to a repricing of risk assets could lead to a renewed tightening of financial conditions. The resulting portfolio rebalancing could weigh on the fund sector performance, impairing bank profitability due to lower commission income, with negative spillovers for tax revenues and growth. *Accelerating deglobalization*, including lower international trade, could weigh on the outlook given Luxembourg's strong global trade and financial linkages. *Brexit* risks appear mitigated, thanks to actions taken by the supervisory bodies at both national and EU levels as well as the private sector's contingency planning, which should ensure the continuation of the delegation model for portfolio management and fund distribution. The *changing international taxation framework*, while providing opportunities for enhanced revenue mobilization, poses notable risks to revenue and the economy (Annex IV).

Authorities' Views

17. There was broad agreement on the outlook and risks. In view of the strong rebound in H2 2020 amid a significant tightening of domestic containment measures and the still large hospital capacity, the authorities do not expect a significant impact of the stricter containment measures on output in the near term. Like staff, they project a rebound of growth in 2021 but expect some scarring effects over the medium term, driven by lower private investment and higher long-term unemployment. Given the high degree of openness of the economy, the authorities viewed downside external risks, including a much slower economic recovery in Europe as well as a reversal in global financial conditions, as highly relevant. Regarding Brexit, they noted that steps taken at both national and EU levels should ensure post-Brexit business continuity.

ENSURING FIRMER AND MORE INCLUSIVE RECOVERY

A. Fiscal Policy: Supporting a Strong, Sustainable, and Greener Recovery

18. While worse than its pre-COVID path, the fiscal balance is expected to improve along with the recovery, and fiscal space to remain substantial over the medium term (Annex V)**.** The baseline assumes: (i) in line with the trend observed in recent months, some uptake on the main support measures that have been extended to mid-2021; (ii) a steady improvement of the economy over the medium term; (iii) a full execution of the government's 2021-24 multiyear spending plan; and (iv) some revenue loss from the U.S. tax reform. The structural fiscal balance would gradually improve from a 3.3 percent of GDP deficit in 2020 to a broadly neutral position by 2025, driven by the unwinding of COVID-related support. Public debt would stabilize around 27.3 percent of GDP over the medium term, signaling ample fiscal space, and would remain sustainable under all stress scenarios.

19. The fiscal stance remains adequately flexible in 2021, with key supportive measures extended and targeted. The composition and size of spending envisaged in 2021 appears appropriate amid the expiration of several emergency measures, including the extraordinary social

transfers and public health infrastructure expenditures. The key supportive measures were duly extended until mid-2021, notably the short-time work, financial-aid schemes, and the cancellation of tax advances, while targeting these to individuals and firms in the most affected sectors (hospitality, retail, culture and entertainment).[4] These measures, notably those directed at workers, which represented a significant share of the expenditure measures in 2020, will support demand in 2021. Also, they would provide some cushion to the most vulnerable, partly addressing increases in inequality, especially if a third wave were to materialize. In addition, the authorities maintained a high level of public investment at about 4.5 percent of GDP to support the recovery, including in infrastructure and digitalization projects. Accounting also for the impact of the economic rebound, the headline and structural balances are expected to improve by about 2 percent of GDP in 2021 but remain significantly lower than their 2019 levels.

20. Fiscal policy should remain supportive until a firm recovery is underway and focused on the most vulnerable. Given the unprecedented nature of the crisis and the exceptional uncertainty, fiscal policy should continue to be supportive and well communicated. Fiscal normalization should be state contingent and start only when output has broadly recovered to its pre-COVID level. Subsequent measures should continue to be targeted. For example, liquidity support would be most effective if provided to firms in the wholesale, retail, and hospitality sectors, which are most vulnerable to liquidity strains (see ¶26 below). Luxembourg's well-developed safety nets have proved instrumental in protecting the most vulnerable during the pandemic. Accordingly, allowing automatic stabilizers to operate fully would continue to support those groups, while unwinding the extraordinary policy measures. The 2021 budget is broadly in line with these principles. While no discretionary measures are included beyond 2021, the authorities stand ready to continue supporting the economy as needed, especially the most affected sectors.

21. Drawing on its ample fiscal space, Luxembourg should proceed with greening the economy and closing infrastructure gaps. Specifically:

- *Greening the economy*. Luxembourg should move forward with its National Energy and Climate Plan, which sets an ambitious goal to cut greenhouse gas (GHG) emissions by 55 percent by 2030. The 2021 budget includes welcome measures that will help Luxembourg reach its emissions target: (i) the introduction of a carbon tax (€20 per ton, equivalent to 5 cents per liter of fuel), set to increase further over the medium term. To shelter the lower income households, the tax was accompanied with a tax credit; (ii) a reduction of the subscription tax for sustainable investment funds; and (iii) several tax incentives to support green investment and energy-efficient modernization of buildings.

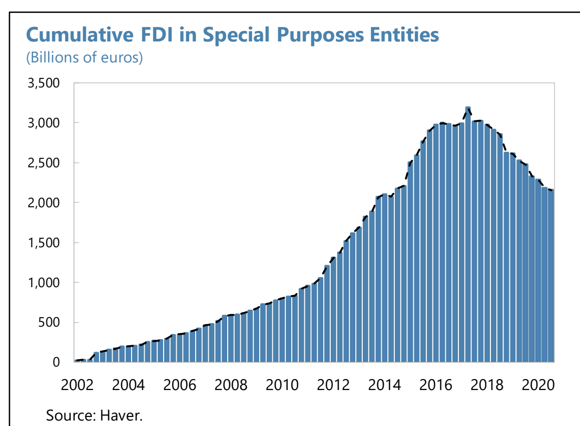
- *Closing infrastructure gaps*. Luxembourg should continue to strengthen its digital infrastructure. This requires accelerating the digitization of public services and further incentivizing business investment. It should also maintain a high level of public investment

[4] The extended measures will be largely financed with unused funds from the 2020 stimulus packages.

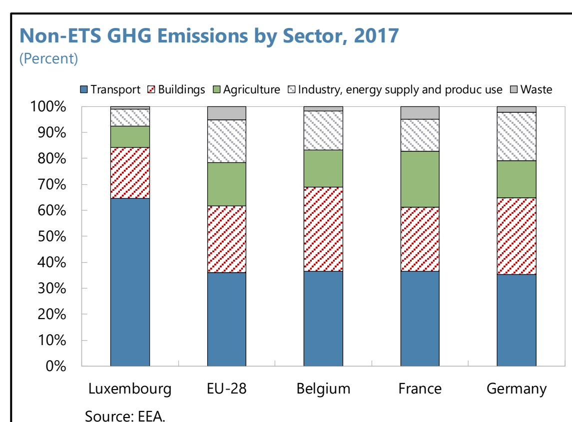
spending to support aggregate demand during the COVID-19 crisis while closing physical infrastructure gaps and raising potential growth.

22. At the same time, comfortable buffers should be preserved to alleviate non-negligible fiscal risks from changing international taxation and climate change mitigation targets.

- *Changes in international taxation (Annex IV)*. The welcome steps taken by Luxembourg to comply with the EU and international transparency and anti-tax avoidance initiatives could help strengthen the corporate tax base by limiting opportunities for tax avoidance by multinationals, and may have contributed to the strong CIT revenue performance in pre-COVID years (Annex VI).[5] However, a continued downward trend in inbound FDI flows channeled through Special Purpose Entities (SPEs) in Luxembourg indicates that these initiatives, along with revisions in the U.S. tax system, are affecting large multinational enterprises (MNEs) in a way that may reduce tax revenues in Luxembourg.[6] Other fundamental changes in international taxation currently under discussion in the EU and the OECD's Inclusive Framework would, among others, give greater taxing rights to jurisdictions where MNEs' customers are located and, if agreed, could pose a risk to the large tax revenues from SPEs (currently at about 3 percent of GDP).[7]



- *Climate change mitigation targets*. Road transportation—the largest GHG emitter given the high volume of non-resident road traffic and cheaper fuel in the neighboring countries—will account for the bulk of the ambitious emission reduction target. Given that non-resident fuel demand is likely to be price elastic, fuel tax hikes may pose a potentially non-negligible revenue loss due



[5] Luxembourg has been assessed as compliant with the OECD minimum standards on Base Erosion and Profit Shifting (BEPS) and the EU's anti-tax avoidance directives (ATAD I and II).

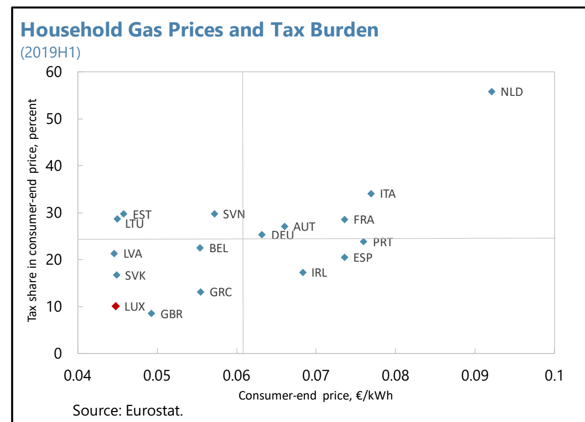
[6] The large capital withdrawal from SPEs in Luxembourg (above €1 trillion since mid-2017) is consistent with the expected responses of MNEs to the recent international tax changes, especially the U.S. tax reform.

[7] The impact of these changes on revenues would be significantly larger than what is assumed in the baseline (0.5 percent of GDP over the medium term), reflecting only the impact of the U.S. tax reform.

to lower sales of fuel as well as complementary goods (such as tobacco).[8]

23. Over the medium term, Luxembourg should explore ways to diversify revenues while reducing the carbon footprint (Annex IV)**.** Reform options, which would need to be carefully assessed regarding their distributional impact, include: (i) increasing the low level of taxation on private vehicles and introducing one-off car registration fees, penalizing vehicles with higher emissions; (ii) removing the preferential VAT treatment of energy products (such as electricity and natural gas) while protecting the most vulnerable (for example, by replacing the preferential VAT rates which mostly benefit the high income households with targeted cash transfers); (iii) modernizing the outdated property valuation process, and incentivizing municipalities to apply taxes on unused construction land; (iv) removing the distortionary corporate net wealth tax and replacing it with an annual registration fee for companies to offset any resulting revenue loss.

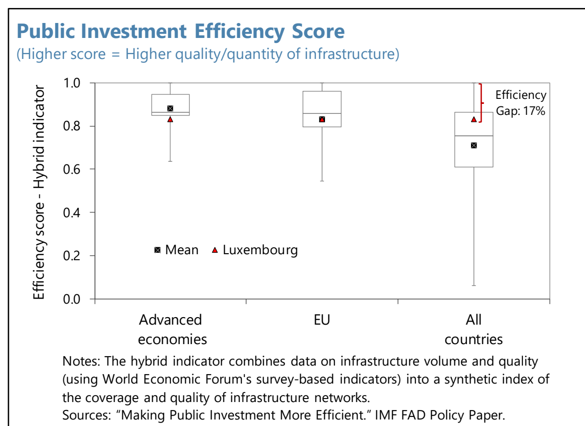
Household Gas Prices and Tax Burden
(2019H1)



Source: Eurostat.

24. Also, public investment management should be strengthened to improve spending efficiency (Box 1). Action should be taken to strengthen the budgetary framework, including by introducing a medium-term expenditure framework (MTEF) and spending review mechanism to ensure that investment expenditures remain well aligned with policy objectives. To fully benefit from the welcome move from a project-by-project to an overall approach underpinned by the country's long-term mobility plan, further improvement in planning, selecting, and ex-post assessment of major infrastructure projects is needed. Separately, staff welcome the authorities' readiness to further strengthen the effectiveness of the public procurement framework, including COVID-related spending. To this end, staff encourage the authorities to collect and publish information on beneficial ownership of winners of public tenders, and subject COVID-related contracts to an independent ex-post audit.

Public Investment Efficiency Score
(Higher score = Higher quality/quantity of infrastructure)



Notes: The hybrid indicator combines data on infrastructure volume and quality (using World Economic Forum's survey-based indicators) into a synthetic index of the coverage and quality of infrastructure networks.
Sources: "Making Public Investment More Efficient." IMF FAD Policy Paper.

[8] According to the National Statistical Agency (STATEC), the cost of the 2021 carbon tax would be about 0.1 percent of GDP, not incorporated in the baseline.

Authorities' Views

25. The authorities stand ready to deploy additional support as needed while remaining committed to fiscal discipline. In line with staff advice, the authorities' near-term focus remains on providing support for affected firms and individuals as needed. They concurred that policy support should be calibrated as the pandemic evolves, especially to avoid increases in inequality due to the necessary actions to contain the pandemic. At the same time, they stressed that the additional fiscal support should be temporary and future fiscal normalization should not be open-ended to mitigate moral hazard and facilitate efficient adjustment of the economy. The authorities were committed to safeguarding public resources, noting that they have already implemented checks to ensure, among other things, that financial aid is channeled to viable firms. They concurred with staff advice on the importance of collecting and publishing information on public procurement contracts of tender winners. Going forward, they plan to beef up resources to further green and digitalize the economy, while compensating the most vulnerable who may be disproportionately affected. The authorities agreed with staff that preserving comfortable buffers would help withstand adverse shocks, including from changes in international taxation. Finally, they considered that existing budgetary and governance frameworks for public investment management achieve a proper ex-ante analysis and budgeting of public investment projects. They also acknowledged that these frameworks could be strengthened further by enhancing sectoral coordination during the budgeting process as well as ex-post project oversight.

B. Financial Policies: Addressing Rising Vulnerabilities and Risks

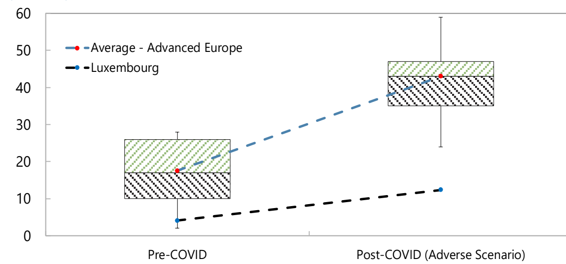
26. While corporates were shielded by government support in 2020, liquidity and solvency pressures could intensify should the support be ended prematurely or the recovery delayed. A favorable initial financial position and the strong policy support contributed to the resilience of Luxembourgish firms. High pre-COVID equity levels have helped prevent a large increase in insolvencies. However, without policy support, staff estimates that the proportion of illiquid firms would have tripled to about 12 percent. The short-time work scheme and loan moratoria have played an important role in supporting liquidity and solvency, especially in the sectors most exposed to the pandemic, which account for 22 percent of GDP. Potentially costly vulnerabilities concentrated in the wholesale and retail sector were also warded off by continued access to credit for larger companies. Going forward, illiquidity could turn into insolvency should state support be withdrawn prematurely or if the recovery is weak. Although only a small proportion of firms would be at risk in an extreme scenario, the cost of the insolvencies as percent of GDP may be large.[9] Accordingly, policies should continue to be targeted to the most affected sectors until a firm recovery is underway.

[9] The results for Luxembourg were derived using firm-level data and applying the methodology of Chapter 3 in the October 2020 EUR *Regional Economic Outlook (REO).* Liquidity and equity gaps (percent of GDP) in Luxembourg are smaller than the average estimates for European advanced economies, reflecting Luxembourgish firms' strong pre-COVID conditions (Figure 3.3 in the REO Chapter 3).

The number of illiquid companies in Luxembourg could have increased significantly without policy support….

Share of Illiquid Firms

(Percent)



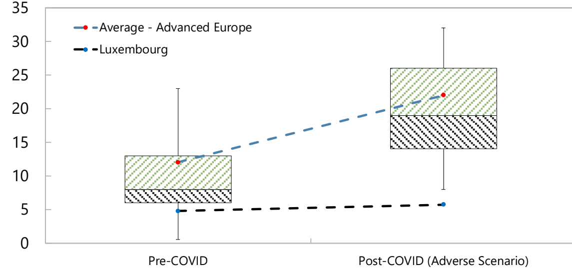
Notes: The sample includes firms from 17 Advanced European (AE) economies (excluding Luxembourg). The horizontal line in the middle of each box gives the median AE country, while the bottom and top of the box give the 1st and 3rd quartile respectively; the top and bottom whiskers give the maximum and minimum. Illiquid firms are defined as having a cash balance and projected cash inflows insufficient to cover projected cash outflows. Under the adverse scenario, companies can't rollover maturing bank loans and have no policy support. The distribution of illiquid firms was calculated using data from Orbis, based on businesses representing 30 percent of total turnover in Luxembourg.

Source: Orbis; and IMF staff calculations.

…although few companies would have become insolvent due to favorable initial equity positions

Share of Insolvent Firms

(Percent)



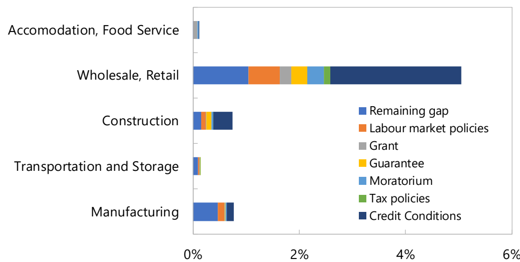
Note: The sample includes firms from 17 Advanced European (AE) economies (excluding Luxembourg). The horizontal line in the middle of each box gives the median AE country, while the bottom and top of the box give the 1st and 3rd quartile respectively; the top and bottom whiskers give the maximum and minimum. Insolvent firms are defined as being with negative book equity. Under the adverse scenario, companies can't rollover maturing bank loans and have no policy support. The distribution of insolvent firms was estimated using data from Orbis, based on businesses representing 30% of total turnover in Luxembourg.

Source: Orbis and IMF staff calculations

The policy response helped prevent potentially large liquidity deficits, especially in wholesale and retail …

Liquidity Deficit Covered by Support Policies

(Percent of GDP)



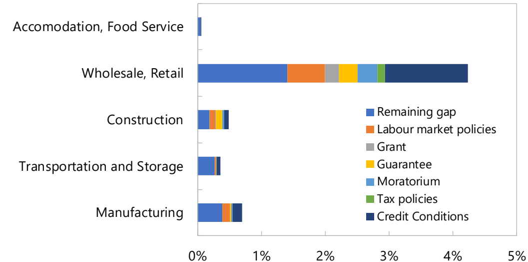
Notes: Liquidity deficits are calculated for companies in Luxembourg under the adverse scenario where firms can't rollover maturing bank debt. Policy support amounts are based on actual uptake from the available schemes. Credit conditions reflect observed volumes of new bank credit and bond issuance for NFCs in Luxembourg in 2020.

Source: Orbis; and IMF staff calculations.

… and also helped prevent large equity costs due to insolvencies in the most vulnerable sectors.

Equity Deficits Covered by Policies

(Perecnt of GDP)



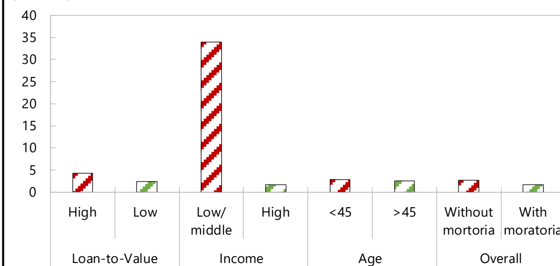
Note: Equity deficits are calculated for companies in Luxembourg under the adverse scenario where firms can't rollover maturing bank debt. Policy support amounts are based on actual take up from the available schemes. Credit conditions reflect observed volumes of new bank credit and bond issuance for NFCs in Luxembourg in 2020.

Source: Orbis, IMF staff calculations

27. A sharp rise in unemployment due to a sustained economic slowdown could weigh on household debt repayment capacity, especially amongst the most vulnerable. A protracted economic slowdown accompanied with a spike in unemployment could weigh on household incomes, increasing solvency risks on mortgage loans which represent the bulk of household debt service payments. Staff estimate that the overall probability of default on mortgages (within 5 years) conditional on job loss is around 3 percent, much lower than in the neighboring countries (about 10 percent on average), and that moratoria can temporarily—albeit marginally—mitigate the risk of default. As expected, low- and middle-income households who exhibit larger balance-sheet vulnerabilities face a much higher risk of default (over 30 percent, more than ten-fold higher default risk than higher-income households), making them the most vulnerable to possible cliff-edge effects from the ending of government

Mortgages: 5-year Probability of Default

(Percent)



Sources: Gross and Tressel (forthcoming).

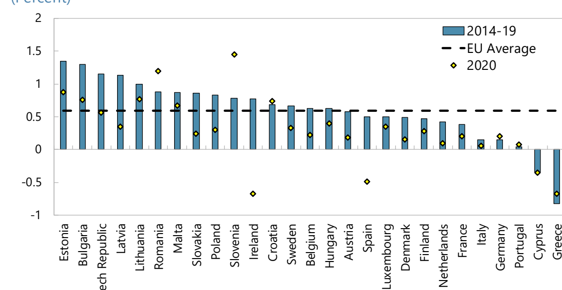
Notes: Estimates from "Household Sector Micro-Macro Simulation and Policy Analysis Amid COVID-19". Figures were drived, among others, using the 2020 ECB Household Finance & Consumption Survey. See Gross and Población (Economic Modelling, 2017) for a detailed description of a previous version of the simulation framework.

support.[10] Hence, maintaining state support to those experiencing income shortfalls, especially among the lower-income households, until the recovery firms up, would help mitigate the solvency risks and potential correction in the residential property market.

28. Thus, the outlook for bank asset performance and the resulting changes in lending standards depend on the speed of the recovery and the continuation of policy support. A rapid deterioration in asset quality would further expose pre-existing vulnerabilities in the banking sector, especially for the DOBs. These include relatively weak profitability due to the low-for-long interest rate environment (return on assets of about 0.5 percent, slightly below the EU average) and a non-negligible exposure to the sectors most affected by the pandemic (accounting for about 90 percent of CET1 capital at end-2019). Higher loan loss provisions or higher charge-offs for un-provisioned loan losses due to the delayed recovery will weigh on banks' profits. On aggregate, however, lower profits are unlikely—at least in the short term—to hamper the DOBs' overall capacity to extend credit to the real economy, thanks to their large capital buffers. In contrast, further tightening in bank lending standards amid higher credit risk perceptions and expectations of premature withdrawal of the key support measures (set to expire by mid-2021) could intensify corporate insolvencies and lead to an increase in credit losses.[11] To better assess solvency risks in the household sector, the inclusion of household credit data in the ECB's initiative of the harmonized credit bureau across the euro area is essential. While banks' exposure to the commercial real estate (CRE) sector is limited overall, rising risks—including from continued preference shifts as a result of the pandemic, such as lower demand for office space—should continue to be monitored.[12]

Like in other European jurisdictions, DOBs' profitability has remained relatively weak due to low-for-long interest rates.

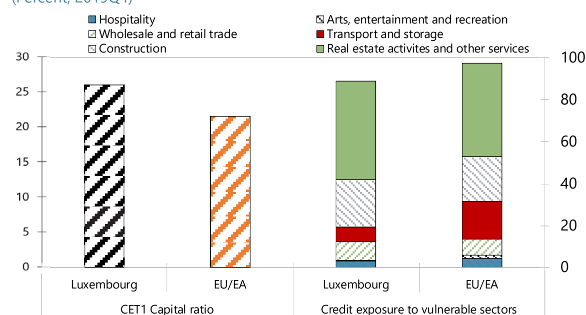
Return-on-Asset
(Percent)



Notes: Data cover Domestic banking groups and stand alone banks, foreign (EU and non-EU) controlled subsidiaries and foreign (EU and non-EU) controlled branches.
Sources: ECB - Consolidated Banking Data; and IMF staff calculations.

On aggregate, the DOBs have large capital buffers but are also exposed to the sectors hit hard by the pandemic.

Bank Capital Ratios and Exposure to Vulnerable Sectors
(Percent, 2019Q4)



Note: Luxembourg banks only include the domestically-oriented banks. European banks are those covered in the EBA 2020 Transparency Exercise.
Sources: CSSF; EBA 2020 Transparency Exercise; and IMF staff calculations.

[10] Data from BCL's 2018 Household Finance and Consumption Survey indicate that lower income households have higher debt-to-income and debt service-to-income ratios and hold less liquid assets.

[11] In Q1 2021, banks tightened their lending standards to non-financial corporations, especially SMEs, on the back of higher risk perceptions, including due to the recent unfavorable virus dynamics.

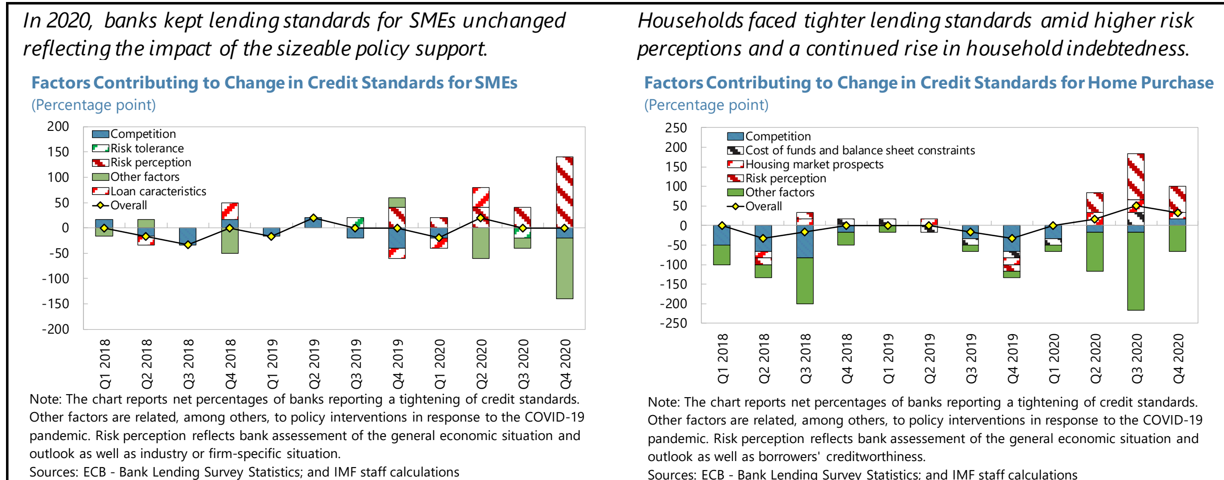
[12] On aggregate, Luxembourg banks' exposure to CRE represented about 3 percent of total loans and less than 12 percent of loans to NFCs at end-2020. While NPLs on CRE loans increased slightly in 2020 (to 3.9 percent, up from 2.7 percent in 2019), the coverage ratio of NPLs remained high at about 88 percent (including collateral).

In 2020, banks kept lending standards for SMEs unchanged reflecting the impact of the sizeable policy support.

Factors Contributing to Change in Credit Standards for SMEs
(Percentage point)

Households faced tighter lending standards amid higher risk perceptions and a continued rise in household indebtedness.

Factors Contributing to Change in Credit Standards for Home Purchase
(Percentage point)

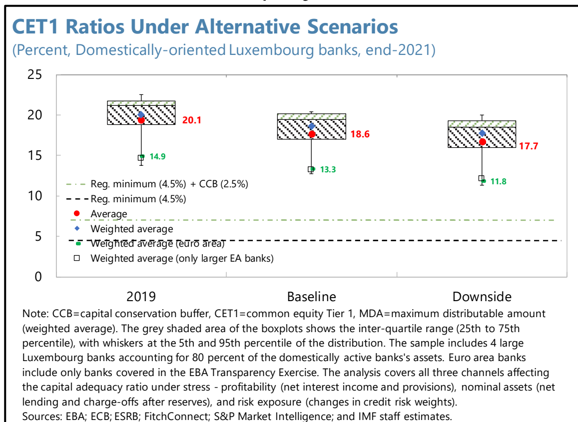


Note: The chart reports net percentages of banks reporting a tightening of credit standards. Other factors are related, among others, to policy interventions in response to the COVID-19 pandemic. Risk perception reflects bank assessement of the general economic situation and outlook as well as industry or firm-specific situation.
Sources: ECB - Bank Lending Survey Statistics; and IMF staff calculations

Note: The chart reports net percentages of banks reporting a tightening of credit standards. Other factors are related, among others, to policy interventions in response to the COVID-19 pandemic. Risk perception reflects bank assessement of the general economic situation and outlook as well as borrowers' creditworthiness.
Sources: ECB - Bank Lending Survey Statistics; and IMF staff calculations

29. Staff analysis indicates that, the DOBs would remain resilient overall and financial stability risks manageable, even in an adverse scenario. Considering a sub-sample accounting for about 80 percent of the DOBs' total assets, staff estimate that CET1 buffers would decline by only 1.5 percentage points by end-2021 under the baseline macroeconomic projection (from 20.1 percent at end-2019). Capital erosion would only be marginally larger if downside risks to growth materialize. This benign outcome is broadly consistent with the result of a recent stress test exercise run by the Commission de Surveillance du Secteur Financier (CSSF). It reflects banks' strong initial conditions, including a low NPL ratio and a high net coverage ratio, and the impact of supportive policies that cushioned the impact of the shock.[13] However, there is some heterogeneity among banks—for some banks, vulnerabilities stem from weaker initial capital positions.

CET1 Ratios Under Alternative Scenarios
(Percent, Domestically-oriented Luxembourg banks, end-2021)

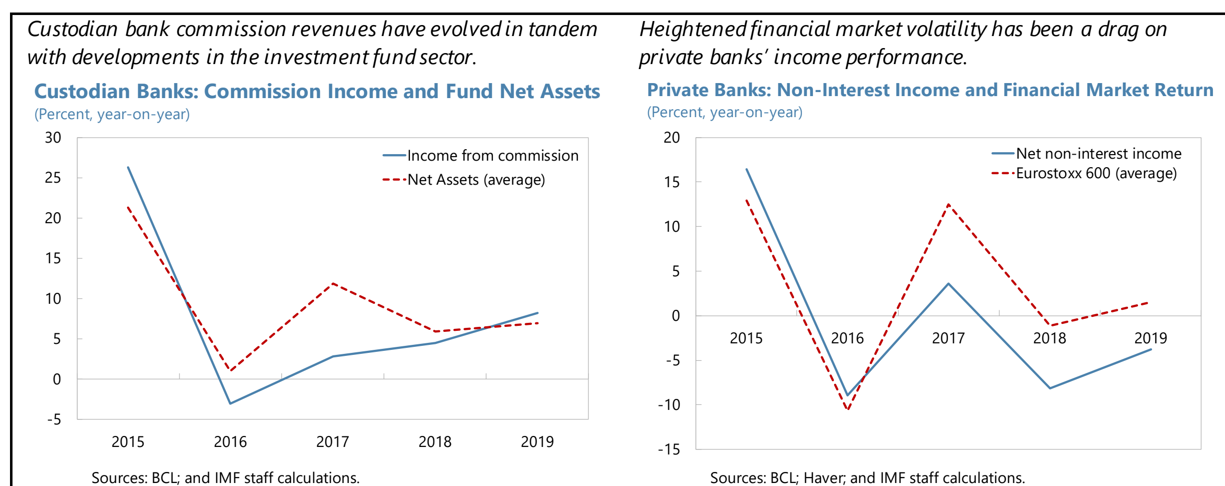


Note: CCB=capital conservation buffer, CET1=common equity Tier 1, MDA=maximum distributable amount (weighted average). The grey shaded area of the boxplots shows the inter-quartile range (25th to 75th percentile), with whiskers at the 5th and 95th percentile of the distribution. The sample includes 4 large Luxembourg banks accounting for 80 percent of the domestically active banks's assets. Euro area banks include only banks covered in the EBA Transparency Exercise. The analysis covers all three channels affecting the capital adequacy ratio under stress - profitability (net interest income and provisions), nominal assets (net lending and charge-offs after reserves), and risk exposure (changes in credit risk weights).
Sources: EBA; ECB; ESRB; FitchConnect; S&P Market Intelligence; and IMF staff estimates.

30. The structural vulnerabilities inherent to banks' other business lines should continue to be monitored and action taken in line with the 2017 FSAP recommendations (Annex VII)**.** Custodian and private banks have been highly dependent on capital market developments and can be vulnerable to market corrections. While intra-group lending may help mitigate profitability risks, the resulting maturity and currency transformation at the parent level should continue to be closely monitored. Also, efforts to strengthen the supervision of the banks' large cross-border exposures and the review of the waivers to large exposure limits for intra-group transactions should continue. Finally, in the runup to the crisis, corporate finance banks have benefited from growing higher-margin lending to non-financial corporations (NFCs), including in jurisdictions outside the euro area where the oversight by the Luxembourg authorities may be limited. Thus, the high level of

[13] See for details Jobst *et al* ("COVID 19: How Will European Banks Fare?", IMF Departmental Paper 21/08).

engagement with supervisors of parent groups of Luxembourg's Less Significant Institutions (LSI) located outside the euro area should be maintained.

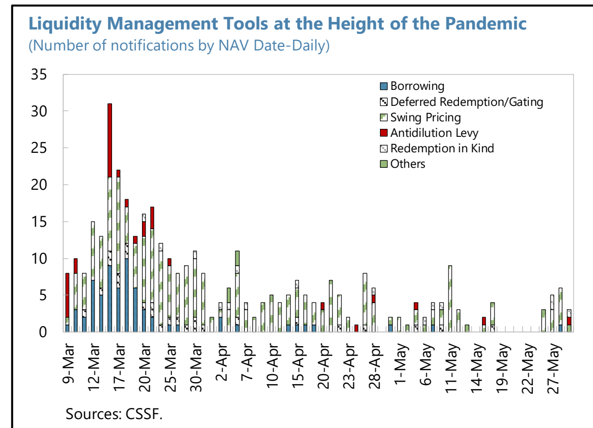


31. The pandemic illustrated the fund sector's growing vulnerabilities, warranting a deepening of the sector's macroprudential-based surveillance and regulation. The investment fund sector weathered the crisis well thanks to decisive global policy action and robust oversight. At the same time, faced with large price corrections and an increase, albeit limited, in redemptions during the March 2020 market turmoil, Luxembourg funds increased their holdings of cash and liquid assets, which led to a procyclical selling of assets. Later, as in other jurisdictions, they reverted to their pre-pandemic trend of increasing liquidity, maturity, and currency mismatches, underpinned by a renewed search for yield. As a result, investment funds—especially open-ended ones—remain prone to widespread outflows and procyclical selling of less liquid assets in a market downturn, warranting action in line with the 2017 FSAP recommendations.

- *Further enhancing the system-wide surveillance of the sector while coordinating at the EU and international levels*. The authorities appropriately stepped up the data-based system-wide oversight of the sector, introducing more granular and frequent reporting requirements for a large sample of asset managers. They made further progress on closing important data gaps for system-wide vulnerability indicators (including the CSSF's risk dashboard and the BCL's market-based indicators of funds' balance-sheet vulnerabilities). These efforts should continue, including for the introduction of a consistent measure of leverage in the context of ESMA's forthcoming AIFM and UCITS reviews. Given the renewed risk-taking behavior in the sector, the authorities should continue to improve their internal methodologies for system-wide liquidity stress testing, such as by incorporating second-round effects and expanding the coverage of asset classes. They should also maintain high-level engagement with regulators in jurisdictions where delegated portfolio and risk management are prominent.

- *Taking a lead role in relevant international fora for the design and calibration of a macroprudential toolkit for investment funds*. The authorities actively contributed to ESMA's recent guidelines on macroprudential leverage limits for alternative investment funds. Given the UCITS sector's importance and its strong connections with the rest of the domestic financial system, the authorities involved in macroprudential policy should continue to be proactive in international fora to push forward the macroprudential reform agenda. Their active engagement in ongoing assessments of the compliance of funds' liquidity management frameworks as well as policy options for money-market funds is welcome. These efforts should continue, especially to issue guidance to the industry on the effectiveness of liquidity management tools (LMTs) in mitigating systemic liquidity risk.[14]

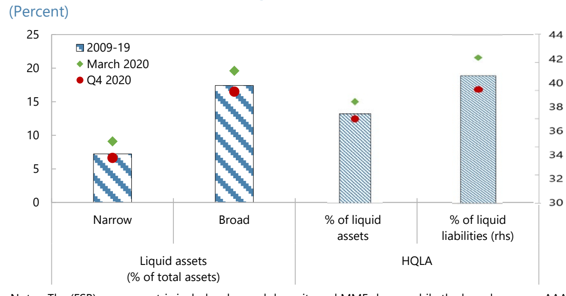
Liquidity Management Tools at the Height of the Pandemic
(Number of notifications by NAV Date-Daily)



Sources: CSSF.

Investment funds increased their holdings of high-quality liquid assets during the turmoil, but reverted back later in the year...

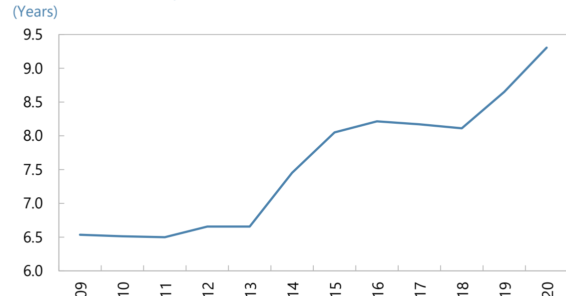
Investment Funds' Holdings of Liquid Assets
(Percent)



Notes: The (FSB) narrow metric includes demand deposits and MMF shares, while the broad measure AAA-AA government bonds and 85 percent of A rated government bonds. The ESRB's metric, used in the EU Non-bank Financial Intermediation Risk Monitor, includes demand deposits, MMF shares, investment grade government bonds, listed equity and short-term debt securities. Liquid liabilities include shares/units issued by open-ended funds and debt liabilities with less than 1-year original maturity.
Sources: BCL; and IMF staff calculations.

... and continued to increase their exposure to longer-duration assets in the lower-for-longer interest rate environment.

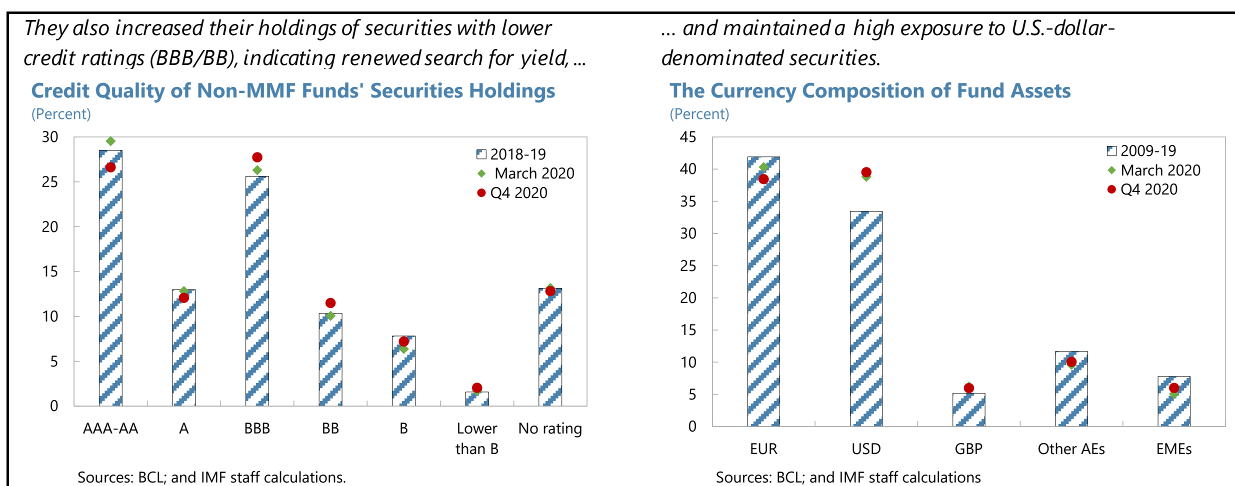
Residual Maturity of Non-MMF Funds' Debt Securities
(Years)



Notes: The chart shows annual average figures. Bond securities include perpetual bonds, which are assumed to have a residual maturity of 100 years.
Sources: BCL; and IMF staff calculations

32. Money laundering risks should continue to be monitored and mitigated and the Anti-Money Laundering/Combating the Financing of Terrorism (AML/CFT) framework should be strengthened further. Staff welcome the easy and free access to the information collected by the ultimate beneficial ownership (UBO) registries. Greater transparency of legal entities would facilitate more effective due diligence by Luxembourg's financial institutions and strengthen competent authorities' capacity to identify and address major proceeds of crime. The September 2020 update of the national risk assessment indicated persisting threats posed by cross-border proceeds of

[14] During the March 2020 market turmoil, Luxembourg funds benefited from CSSF's active guidance on LMTs and used a variety of tools, especially swing pricing and anti-dilution levy.



corruption and tax evasion. While AML/CFT supervision of banks is conducted on a risk-sensitive basis, ensuring greater ongoing monitoring of cross-border flows could further enhance the understanding of money laundering risks, and support effective mitigation measures. The UBO registries were launched relatively recently and include a process intended to improve the accuracy of information collected over time. To increase their usefulness, additional measures to ensure the accuracy of information, including at the stage of data collection, should be implemented.

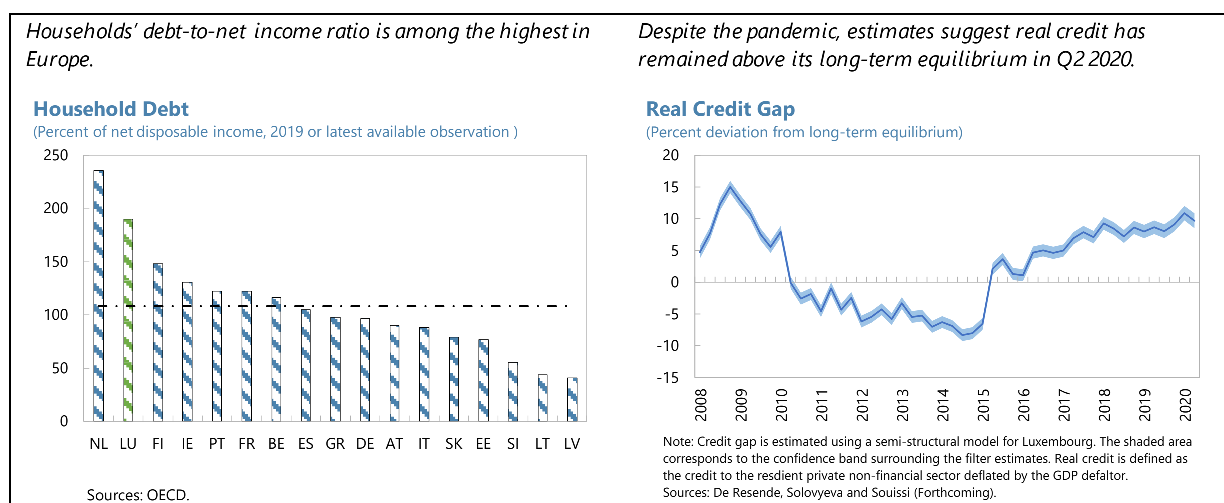
33. The macroprudential stance was rightly tightened amid rising risks in the real estate market, and further tightening may help aleviate credit pressures if they reemerge. Residential real estate (RRE) prices grew at a double-digit rate (16.7 percent yoy in nominal terms in Q4 2020), reflecting the impact of the supportive policies which successfully protected household debt servicing capacity. As a result, household indebtedness continued to increase rapidly, supported by fast-growing mortgages (11.6 percent in 2020, above its long-term trend), despite some tightening in lending standards.[15] In response to these developments, the authorities introduced LTV limits differentiated across various categories of borrowers starting early-2021, which is a step in the right direction.[16] While this measure should help reduce tail credit risk in the new mortgage portfolio, it remains to be seen how effective the LTV limits will be in reducing households' high indebtedness.[17] If household indebtedness continues to increase, the current LTV setup should be revisited and other tools provided in the legal framework for borrower-based measures explored. The authorities also appropriately kept the counter-cyclical buffer unchanged, given the current credit cycle

[15] According to OECD data, Luxembourg's household debt stood at about 190 percent of net disposable income in 2019, about 1.7 standard deviations above the euro area average (108 percent).

[16] The general rule is an 80 percent limit on LTVs, but higher LTV limits applies for first-time home buyers (100 percent) and primary residences (90 percent, with lenders allowed to issue 15 percent of the new mortgages with an LTV ratio up to 100 percent).

[17] The authorities estimate that 14 percent of current mortgage loans would have not been granted by the top RRE banks under the new LTV limits. About a third of these loans have LTVs above 100 percent.

position. As the recovery firms and should credit market pressures resume, partly due to the lower-for-longer interest rates, some tightening of the macroprudential stance may help alleviate these pressures (Box 2).



34. Leveraging its status as a global financial center, Luxembourg has taken welcome steps to consolidate its position as a sustainable finance hub. As for UCITS several decades ago, Luxembourg is gaining from the first-mover advantage in sustainable finance. It currently hosts the lion's share of Europe's environmental sustainability funds, as its stock exchange was the first to launch a green bond in 2007. In 2016, Luxembourg established the world's first platform exclusively dedicated to green securities, which lists half of the world's green bonds. To deepen the market for sustainable finance, the government adopted the first framework for sustainable bonds in Europe (in line with the EU Taxonomy Regulation) and issued its green bond under this framework (1.5 billion euro at a negative rate). More recently, the government launched Luxembourg Sustainable Finance Initiative, a public-private platform, to design and implement the country's strategy for sustainable finance. These steps will help to diversify Luxembourg's financial sector.

Authorities' Views

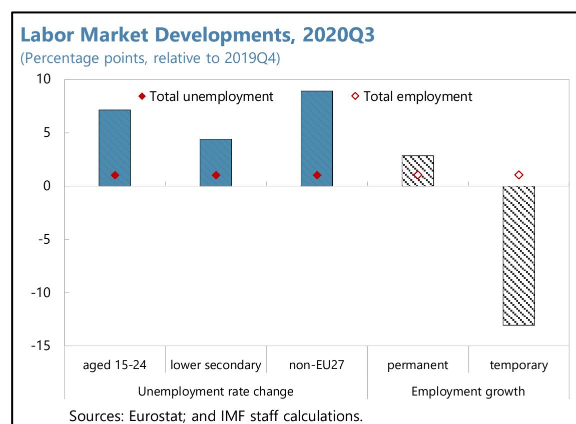
35. The authorities emphasized that the financial sector remains resilient and agreed with the need to remain vigilant, given increased risks and vulnerabilities. They highlighted that the significant take-up of loan moratoria boosted firms' liquidity and helped them to withstand the pandemic, and that slower growth in business credit is mainly attributable to weaker demand. They agreed that insolvency risks in the non-financial corporate sector will need to be closely monitored in light of the persistent uncertainty and the still large policy support measures in place. They concurred that the crisis weakened bank profitability due to higher provisioning, mainly on performing loans and stressed that the banking sector as a whole would remain resilient thanks to its large capital and liquidity buffers should credit risks deteriorate going forward. The authorities also shared staff's assessment that vulnerabilities in the investment fund sector have increased overall following the March 2020 market turmoil. Accordingly, the authorities noted that they will continue to strengthen the sector's oversight, including from a system-wide perspective. They

supported further work on the macroprudential framework for the investment fund sector, stressing that this should be done in collaboration with global securities regulators as well as international macro-prudential authorities. Finally, the authorities emphasized that Luxembourg complies with international regulations and transparency standards and were open to strengthening UBO registries further, following an EU approach.

36. The authorities are monitoring the build-up of risk in the real estate sector and stand ready to take further action as needed. The authorities reasoned that the introduction of differentiated LTV limits would reduce tail credit risks in new mortgages and, hence, enhance the resilience of both banks and households. They concurred with staff on the need to continue monitoring households' growing indebtedness and, depending on its evolution, to revisit current measures and explore other instruments provided in the legal framework for borrower-based measures. There was a broad agreement that the uncertainty on the current position in the credit cycle does not warrant releasing the countercyclical capital buffer. Its appropriateness will be continuously reevaluated, including based on the evolution of credit market conditions and more broadly the economy.

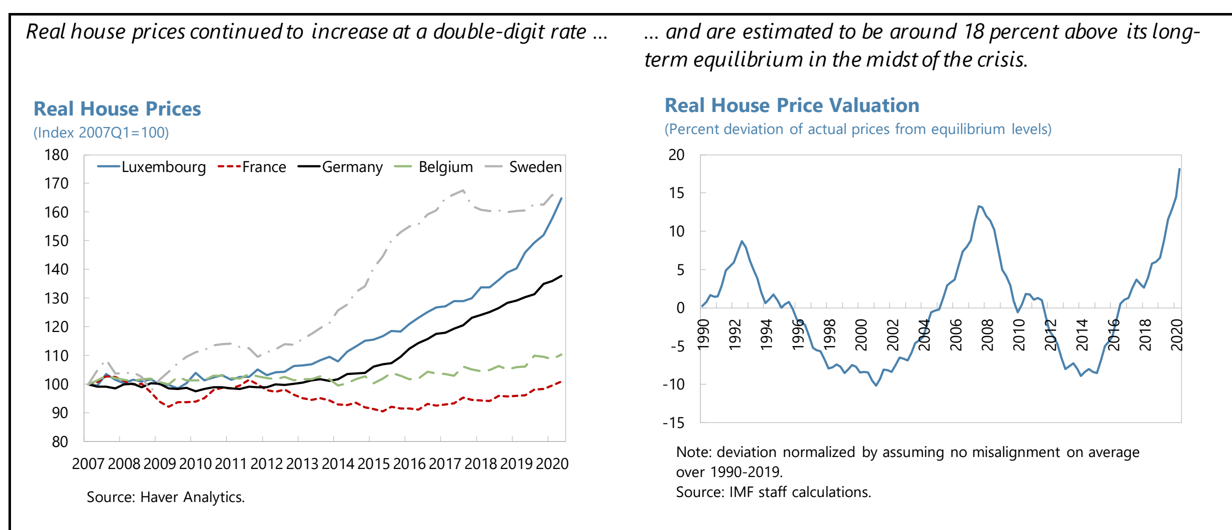
C. Structural Reforms: Mitigating Scarring Effects and Ensuring an Inclusive Recovery

37. The crisis has widened long-standing inequities in the labor market. Based on Eurostat data, the pandemic seems to have disproportionately affected workers in contact-intensive services sectors, comprised largely of temporary workers who are typically at the lower end of the income distribution and have less options for teleworking. It also appears to have led to rising unemployment among the youth, low-skilled and foreign born who were already facing challenges integrating into the labor market.



38. As the recovery firms up, policies should shift from preserving jobs to supporting workers, especially among the most vulnerable groups, and facilitate labor reallocation. The extension of the expanded short-time work scheme until mid-2021 is welcome and will partly address a possible increase in inequality. However, once the recovery is firm, labor mobility within and across sectors should be promoted through hiring subsidies for viable firms, such as subsidies for employer-sponsored apprenticeships, in order to facilitate the reallocation of workers from shrinking to expanding firms and sectors. Building on recent initiatives such as *Future Skills*, the authorities should continue to support training programs to upgrade skills and promote the reintegration of crisis-hit workers into the labor market.

39. Further action is needed to expand affordable housing to improve inclusiveness in the housing market which was aggravated by the pandemic. Real house prices in Luxembourg continued to increase rapidly, exacerbating already acute affordability issues, and are estimated to be overvalued (about 18 percent in Q2 2020)[18]. The disproportionate impact of the pandemic on vulnerable groups, in conjunction with rising house prices, make the issue of the availability of affordable housing even more pressing. In 2020, the government rightly took steps to improve the supply of affordable housing available for sale. For example, the *Pacte Logement 2.0* will link the provision of financial support to municipalities to the number of affordable housing units built, and raise the requirement for minimum built surface dedicated to affordable housing from 10 to up to 30 percent. In addition, the 2021 budget includes measures intended to discourage speculation in the real estate market and support rental supply (such as by lowering the depreciation rate for rented properties). More broadly, to increase housing supply, further efforts are needed, such as modernizing the rigid urban zoning, planning and administrative rules and amending communal development legislation to increase the supply of land (e.g. by increasing taxes on unused land, Annex IV).



Authorities' Views

40. The authorities agreed that efforts to address possible scarring in the labor market and boost housing supply should continue. While agreeing that the pandemic is worsening the already high long-term unemployment, the authorities cautioned that it was still too early to assess whether the most vulnerable groups, including younger and low-skilled employees, have been bearing a larger burden. They highlighted the role of the short-time work scheme in limiting job losses, especially in contact-intensive sectors, which have higher shares of these vulnerable groups. They also stressed that the crisis has sped up the pre-pandemic digital transformation trend, potentially exacerbating structural unemployment, and that existing active labor market instruments

[18] The assessment of the price misalignment draws on the model estimated in the 2018 Article IV Selected Issues "Housing market: Assessment and Policy Recommendations"

aimed at re-skilling workers would contribute to re-integrating affected groups into the labor market. An ongoing sectoral analysis is aimed at enhancing training programs. The authorities concurred that alleviating the stringent supply constraints, especially for social housing, remains a priority. They emphasized that there are several ongoing large social housing projects which would partly help address supply constraints over the medium term. They noted that work on modernizing the outdated property valuation process is underway, but it may take time as it would require the preparation of new general development plans for all local authorities.

STAFF APPRAISAL

41. **Luxembourg has managed the pandemic relatively well thanks to a vigorous domestic and global policy response, and the structure of the economy.** The economy, dominated by financial services, benefited from an unprecedented policy response, as well as its financial sector's rapid transition to teleworking. The government swiftly launched a broad-based stimulus package, such as short-time work scheme, loan moratoria/guarantees, and tax deferrals, to address the health and economic consequences of the pandemic, making good use of the large accumulated fiscal buffers. While actual spending has been lower than the initial envelope, the policy support helped limit the economic fallout from the pandemic, with a much milder contraction in GDP than initially expected. Luxembourg external position remains broadly consistent with fundamentals and desirable policies.

42. **The outlook is for a recovery with risks tilted to the downside.** The economy is projected to rebound in 2021, with GDP increasing around 4 percent amid continuing targeted policy support and accommodative global financial conditions. Over the medium term, output is forecast to remain below the pre-crisis trend, partly reflecting some impairment in corporate balance sheets and scarring in the labor market. Risks to the outlook are skewed to the downside and are dominated by the virus dynamics in the near term. On the downside, a prolongation of the health crisis into 2021 could delay the recovery. Broader risks, such as tightening of financial conditions, the acceleration of de-globalization, and potentially non-negligible revenue loss from changes in international taxation, could weigh on economic prospects. On the upside, quicker containment of the pandemic could bring back activity significantly faster.

43. **Fiscal policy should remain supportive until a sustained recovery is underway, and target the most vulnerable.** The government adequately extended key policy measures until mid-2021 while making them targeted towards the most affected. Because of unprecedentedly high uncertainty, fiscal normalization should be state contingent and start only when output has broadly recovered to its pre-COVID level. Subsequent support measures should continue to be targeted to the most impacted, such as lower-income households and firms in the sectors most exposed to the pandemic, while allowing automatic stabilizers to fully operate.

44. **Over the medium term, fiscal policy should aim at further greening the economy and closing infrastructure gaps, taking advantage of Luxembourg's ample fiscal space.** Recent

efforts to strengthen environmental taxation and incentivize green investment and sustainable finance are welcome. Building on these efforts, Luxembourg should pursue its transition to a data-driven economy, including by stepping up the digitalization of public services and further incentivizing business investment. It should also maintain high public investment spending to close physical infrastructure gaps, such as in transportation.

45. Given non-negligible fiscal risks, Luxembourg should preserve comfortable buffers, explore options to diversify revenues, and improve public investment efficiency. There is some evidence that Luxembourg's welcome steps to comply with international anti-tax-avoidance and transparency initiatives, along with the U.S. tax reform, are affecting large multinational enterprises in a way that may reduce tax revenues in Luxembourg. Efforts needed to meet climate change mitigation targets, especially for road transportation, may also imply potentially non-negligible revenue losses due to lower sales of fuel and complementary goods. Against this background, Luxembourg should continue to explore ways to diversify revenues. These include increasing environmental levies (such as the low transport taxes) and housing taxation (such as outdated property valuations). To safeguard public resources, efforts to enhance public investment management should continue, including the introduction of independent and systematic ex-post evaluation of major projects. Collecting and publishing information on beneficial ownership of winners of public tenders and subjecting COVID-related contracts to an independent ex-post audit would help further strengthen the effectiveness of the public procurement framework.

46. While firms and households were shielded by the unprecedented policy support in 2020, the pandemic could weigh on their balance sheets. Liquidity support—especially the short-time work scheme—together with favorable lending conditions helped alleviate potentially costly vulnerabilities concentrated in the most affected sectors (notably wholesale, retail, and hospitality). Going forward, liquidity pressures could intensify and may turn into insolvencies should state support be withdrawn prematurely or the recovery delayed. A sharp rise in unemployment due to a sustained economic slowdown could weigh on household debt repayment capacity, especially for lower-income households who would be more vulnerable to cliff-edge risks.

47. Rising risks and vulnerabilities in the financial sector, while manageable, should continue to be closely monitored and addressed in line with the 2017 FSAP recommendations. The banking sector entered the crisis with large capital and liquidity buffers, which would remain adequate even under severe stress scenarios. Nonetheless, continued vigilance is required as asset quality deterioration could weigh on DOBs already weak bank profitability, especially if the health crisis persists. Luxembourg's investment funds have also weathered the crisis well thanks to decisive global policy action and robust oversight. However, the pandemic illustrated its growing vulnerabilities, especially liquidity mismatches. Building on the welcome efforts to step up the oversight of the sector from a system-wide perspective, the authorities involved in macroprudential policy should continue to enhance internal methodologies for system-wide liquidity stress testing. They should also remain proactive in international fora to push forward the macroprudential reform agenda. A greater ongoing monitoring of cross-border flows would strengthen the AML/CFT

supervision of banks. Finally, additional measures to ensure the accuracy of information on beneficial ownership could increase the usefulness of UBO registries.

48. Notwithstanding the pandemic, the authorities rightly tightened the macroprudential stance as risks in the real estate market continued to rise. The introduction of differentiated loan-to-value (LTV) limits to curb the increasing household indebtedness, amid fast-growing house prices and mortgages, is a step in the right direction. If household indebtedness continues to increase, the current LTV setup should be revisited, and other tools provided in the legal framework for borrower-based measures explored. The authorities also appropriately maintained the counter-cyclical capital buffer unchanged, given the current credit cycle position. As the recovery gains momentum and if credit market pressures reemerge, some tightening of the macroprudential stance may help alleviate these pressures.

49. As the recovery firms up, policies should shift from preserving jobs to helping workers, especially among the most vulnerable groups, to facilitate labor reallocation. In the near term, labor market policies should remain protective, targeting the most affected firms and sectors. Accordingly, the extension of the short-time work scheme until mid-2021 is welcome as it will help prevent scarring and possible widening in inequalities. As the recovery firms, labor mobility within and across sectors should be promoted, including via hiring subsidies for viable firms which facilitate the reallocation of workers from shrinking to expanding firms and sectors. Building on recent initiatives such as *Future Skills*, Luxembourg should continue to support training programs to upgrade skills and promote the reintegration of crisis-hit workers into the labor market.

50. Steps taken in 2020 to improve housing supply are welcome and should be followed up with further actions to improve inclusiveness in the housing market. The continued rapid growth in housing prices, mainly due to significant supply constraints, has continued to weigh on affordability in this challenging economic environment. Building on the recent steps to improve the supply of affordable housing available for sale, such as the *Pacte Logement 2.0*, the authorities should take further action to alleviate the supply constraints, including by amending the law on communal development to discourage hoarding of land that can be used for development.

51. It is proposed that the next Article IV consultation with Luxembourg take place on the standard 12-month cycle.

Table 1. Luxembourg: Selected Economic Indicators, 2016–26

					Est.	Projections					
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Real economy (percent change)											
GDP	4.6	1.8	3.1	2.3	-1.3	4.1	3.6	3.0	2.7	2.5	2.5
Domestic demand	2.8	2.1	2.3	3.3	-4.4	4.4	3.5	2.9	2.6	2.5	2.5
Private consumption	3.4	2.1	3.3	2.8	-7.0	6.6	4.9	3.6	3.0	2.5	2.5
Public consumption	1.0	4.7	4.1	4.8	6.9	2.1	1.3	1.7	2.0	2.4	2.4
Gross investment	3.3	-0.2	-1.0	2.8	-11.0	3.9	3.2	2.8	2.7	2.6	2.6
Foreign balance 1/	2.6	0.4	1.5	0.2	1.3	1.9	1.3	1.2	1.0	0.9	0.9
Exports of goods and nonfactor services	2.6	0.7	0.5	0.8	2.5	6.5	4.4	3.6	3.0	2.9	2.9
Imports of goods and nonfactor services	1.6	0.6	-0.3	0.9	2.1	6.7	4.5	3.7	3.0	3.0	3.0
Labor market (thousands, unless noted otherwise)											
Resident labor force	267.4	273.9	280.3	287.8	295.7	302.2	308.3	314.4	320.4	326.6	333.2
Unemployed	16.9	16.2	15.3	15.4	18.7	20.1	19.7	19.1	18.9	18.8	19.2
(Percent of labor force)	6.2	5.8	5.1	5.4	6.3	6.7	6.4	6.1	5.9	5.8	5.7
Resident employment	250.4	257.7	265.0	272.4	277.0	282.1	288.6	295.3	301.5	307.8	314.1
(Percent change)	2.3	2.9	2.8	2.8	1.7	1.8	2.3	2.3	2.1	2.1	2.1
Cross border workers (net)	168.0	175.0	183.8	192.7	197.2	199.8	205.0	210.3	215.6	221.3	227.1
Total employment	418.4	432.7	448.8	465.1	474.3	481.8	493.6	505.5	517.2	529.1	541.2
(Percent change)	3.0	3.4	3.7	3.6	2.0	1.6	2.4	2.4	2.3	2.3	2.3
Prices and costs (percent change)											
GDP deflator	0.8	1.7	2.5	3.4	2.3	3.3	2.5	2.1	1.9	1.9	1.9
CPI (harmonized)	0.0	2.1	2.0	1.7	0.0	0.9	1.8	1.9	1.9	1.9	1.9
CPI core (harmonized)	1.0	1.4	0.9	1.8	1.2	1.6	1.8	1.9	1.9	1.9	1.9
CPI (national definition)	0.3	1.7	1.5	1.7	0.8	1.8	1.9	1.9	1.9	1.9	1.9
Wage growth 2/	0.7	3.0	3.2	1.7	-0.8	6.3	2.5	2.5	2.5	2.5	2.5
Nominal unit labor costs 2/	-0.8	4.6	3.8	3.1	2.6	3.8	1.4	1.9	2.1	2.3	2.2
Public finances (percent of GDP)											
General government revenues	43.0	43.6	45.4	44.7	43.7	43.2	42.8	42.6	42.5	42.5	42.5
General government expenditures	41.0	42.3	42.3	42.3	47.8	44.8	43.4	42.8	42.6	42.6	42.6
General government balance	1.9	1.3	3.0	2.4	-4.1	-1.6	-0.6	-0.2	-0.1	-0.1	-0.1
General government structural balance	1.2	0.7	2.4	2.1	-3.3	-1.3	-0.5	-0.1	-0.1	0.0	0.0
General government gross debt	20.1	22.3	21.0	22.0	24.9	26.7	27.3	27.4	27.3	27.3	27.3
Balance of payments (percent of GDP)											
Current account	4.9	4.9	4.8	4.6	4.3	4.9	4.9	4.8	4.7	4.7	4.6
Balance on goods	3.7	4.0	4.4	5.0	3.8	4.1	4.0	4.0	3.8	3.8	3.7
Balance on services	43.4	40.1	37.6	33.7	33.1	33.2	33.5	33.3	33.1	33.0	32.9
Net factor income	-43.8	-38.7	-37.3	-33.4	-31.1	-32.7	-32.9	-32.8	-32.5	-32.3	-32.3
Balance on current transfers	1.6	-0.5	0.0	-0.7	-1.5	0.3	0.3	0.2	0.2	0.2	0.2
Exchange rates, period averages											
U.S. dollars per euro	1.11	1.13	1.18	1.12	1.14	...	...	...	...	...	...
(Percent change)	-0.3	2.0	4.6	-5.2	1.9	...	...	...	...	...	...
Nominal effective rate (2010=100)	99.2	100.1	102.2	101.5	103.2	...	...	...	...	...	...
(Percent change)	1.7	0.9	2.0	-0.6	1.6	...	...	...	...	...	...
Real effective rate (CPI based; 2010=100)	98.1	98.9	100.3	99.5	100.8	...	...	...	...	...	...
(Percent change)	1.0	0.8	1.4	-0.8	1.3	...	...	...	...	...	...
Credit growth and interest rates											
Credit to nonfinancial private sector (percent change) 3/	8.7	9.2	8.5	7.2	5.0	11.3	9.4	6.7	6.7	6.5	6.5
Government bond yield, annual average (percent)	0.3	0.5	...	...	...	...	...	...	...		
Memorandum items: Land area = 2,586 sq. km; population in 2019 = 626,108; GDP per head = €101,446											
GDP (billions of euro)	54.9	56.8	60.1	63.5	64.1	69.0	73.3	77.0	80.6	84.2	88.0
Output gap (percent deviation from potential)	1.7	1.5	1.4	0.6	-1.7	-0.8	-0.2	-0.1	-0.1	-0.1	0.0
Potential output growth (percent)	3.3	2.0	3.2	3.2	1.0	3.1	3.0	2.9	2.7	2.5	2.5

Sources: Luxembourg authorities and IMF staff estimates.

1/ Percentage point contribution to GDP growth.

2/ Overall economy.

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

Table 2. Luxembourg: Balance of Payments, 2016–26
(In percent of GDP)

	2016	2017	2018	2019	2020	Projections 2021	2022	2023	2024	2025	2026
Current account	4.9	4.9	4.8	4.6	4.3	4.9	4.9	4.8	4.7	4.7	4.6
Balance on goods and services	47.1	44.1	42.0	38.7	36.9	37.3	37.5	37.3	36.9	36.8	36.6
Trade balance 1/	3.7	4.0	4.4	5.0	3.8	4.1	4.0	4.0	3.8	3.8	3.7
Goods exports	39.7	41.9	41.1	41.3	35.8	35.7	35.8	33.8	31.6	30.7	30.3
Goods imports	36.0	37.9	36.7	36.3	32.0	31.6	31.8	29.8	27.7	26.9	26.6
Balance on services	43.4	40.1	37.6	33.7	33.1	33.2	33.5	33.3	33.1	33.0	32.9
Services exports	154.5	158.1	156.8	159.4	151.2	150.8	152.8	156.1	158.4	159.8	160.5
Services imports	111.1	118.0	119.1	125.7	118.1	117.6	119.3	122.8	125.2	126.8	127.6
Net factor income	-43.8	-38.7	-37.3	-33.4	-31.1	-32.7	-32.9	-32.8	-32.5	-32.3	-32.3
Compensation of employees, net	-16.2	-16.6	-16.8	-16.3	-16.2	-16.3	-16.2	-16.2	-16.2	-16.4	-16.5
Compensation of employees, credit	2.8	2.9	2.9	2.8	2.8	2.7	2.7	2.7	2.7	2.7	2.7
Compensation of employees, debit	19.0	19.5	19.7	19.1	19.0	19.1	18.9	18.9	18.9	19.1	19.2
Investment income, net	-27.6	-22.1	-20.5	-17.1	-14.8	-16.4	-16.7	-16.6	-16.3	-15.9	-15.8
Investment income, credit	494.3	481.6	466.0	448.0	422.8	398.0	384.8	375.2	367.7	361.3	354.9
Investment income, debit	521.8	503.7	486.5	465.2	437.6	414.4	401.5	391.8	383.9	377.3	370.7
Balance on current transfers	1.6	-0.5	0.0	-0.7	-1.5	0.3	0.3	0.2	0.2	0.2	0.2
Capital and financial account	-4.9	-4.9	-4.8	-4.5	-7.2	-4.9	-4.9	-4.8	-4.7	-4.7	-4.6
Capital account	-0.3	-0.4	1.0	-0.1	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
Financial account	4.7	4.5	5.7	4.4	6.9	4.5	4.6	4.5	4.4	4.4	4.3
Direct investment, net	-68.1	218.6	10.2	-30.9	-28.6	-25.7	-23.2	-20.8	-18.8	-16.9	-15.2
Abroad	162.7	322.7	-756.7	-477.5	-269.9	-243.2	-218.9	-196.9	-177.2	-159.5	-143.5
In reporting economy	230.8	104.2	-766.9	-446.6	-241.3	-217.4	-195.7	-176.1	-158.4	-142.6	-128.3
Portfolio investment, net	-209.5	-115.4	-163.5	-88.1	66.9	66.9	66.9	66.9	66.9	66.9	66.9
Portfolio investment, assets	153.3	585.8	163.0	246.7	285.2	181.7	136.3	114.0	101.7	94.4	89.8
Portfolio investment, liabilities	362.7	701.2	326.5	334.8	218.2	114.7	69.4	47.0	34.8	27.5	22.9
Financial derivatives, net	33.3	-22.6	26.1	14.8	18.0	18.0	18.0	18.0	18.0	18.0	18.0
Other investment, net	248.6	-75.8	132.9	108.5	-49.5	-54.7	-57.2	-59.6	-61.8	-63.7	-65.5
Other investment, assets	288.3	-1.6	176.5	140.1	55.4	55.4	55.4	55.4	55.4	55.4	55.4
Other investment, liabilities	39.8	74.2	43.5	31.6	104.9	110.1	112.6	115.0	117.2	119.0	120.8
Reserve assets	0.4	-0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Errors and omissions	0.0	0.0	0.0	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0

Sources: STATEC and IMF staff estimates.

1/ Includes merchanting trade operations.

Table 3. Luxembourg: General Government Operations, 2016–26
(In percent of GDP)

					Est.	Projections					
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Revenue	43.0	43.6	45.4	44.7	43.7	43.2	42.8	42.6	42.5	42.5	42.5
Taxes	25.6	26.4	28.4	27.8	26.7	26.8	26.6	26.6	26.5	26.5	26.4
Social contributions	11.8	12.2	12.2	12.1	12.7	12.0	11.8	11.7	11.6	11.7	11.7
Grants	0.6	0.1	0.1	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Other revenue	4.9	4.9	4.7	4.7	4.2	4.2	4.2	4.2	4.2	4.2	4.2
Expenditure	41.0	42.3	42.3	42.3	47.8	44.8	43.4	42.8	42.6	42.6	42.6
Expense	39.3	40.4	40.6	40.9	45.3	42.9	41.4	40.9	40.7	40.7	40.7
Compensation of employees	9.4	9.8	9.9	10.0	10.8	10.4	10.2	10.2	10.2	10.2	10.2
Use of goods and services	4.2	4.1	4.1	4.2	4.5	4.3	4.1	4.0	4.0	4.0	4.0
Interest	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.2
Subsidies	1.1	1.1	1.1	1.1	1.2	1.4	1.3	1.3	1.3	1.3	1.3
Social benefits	17.8	18.3	18.2	18.2	20.9	19.3	18.3	18.1	18.1	18.1	18.1
Other expense	7.4	7.9	8.0	8.3	8.8	8.8	8.6	8.5	8.3	8.3	8.3
Net acquisition of nonfinancial assets	1.8	1.8	1.8	1.4	2.5	1.9	2.0	1.9	1.9	1.9	1.9
Gross operating balance	6.0	5.5	7.2	6.5	1.1	2.8	4.0	4.3	4.4	4.5	4.4
Net operating balance	3.7	3.2	4.8	3.8	-1.6	0.2	1.4	1.7	1.8	1.9	1.8
Net lending / borrowing	1.9	1.3	3.0	2.4	-4.1	-1.6	-0.6	-0.2	-0.1	-0.1	-0.1
Net acquisition of financial assets	0.6	4.7	3.8	5.0	...	...	...	...	...	...	...
Monetary gold and SDRs	0.0	0.0	0.0	0.0	...	...	...	...	...	...	...
Currency and deposits	-1.5	3.1	0.6	3.5	...	...	...	...	...	...	...
Securities other than shares	0.6	0.8	0.0	0.5	...	...	...	...	...	...	...
Loans	0.0	0.0	0.2	0.2	...	...	...	...	...	...	...
Shares and other equity	1.6	0.8	1.7	1.0	...	...	...	...	...	...	...
Insurance technical reserves	0.0	0.0	0.0	0.0	...	...	...	...	...	...	...
Financial derivatives	0.1	-0.4	0.3	0.3	...	...	...	...	...	...	...
Other accounts receivable	-0.2	-0.1	1.3	-0.2	...	...	...	...	...	...	...
Net incurrence of liabilities	-1.2	3.0	1.0	2.8	...	...	...	...	...	...	...
Special Drawing Rights (SDRs)	...	...	...	...	...	...	...	...	...	...	...
Currency and deposits	0.0	0.0	0.0	0.0	...	...	...	...	...	...	...
Securities other than shares	0.0	3.5	0.0	2.4	...	...	...	...	...	...	...
Loans	-0.8	-0.6	-0.2	-0.1	...	...	...	...	...	...	...
Shares and other equity	0.0	0.0	0.0	0.0	...	...	...	...	...	...	...
Insurance technical reserves	0.0	0.0	0.0	0.0	...	...	...	...	...	...	...
Financial derivatives	0.0	0.0	0.0	0.0	...	...	...	...	...	...	...
Other accounts payable	-0.4	0.1	1.1	0.5	...	...	...	...	...	...	...
Memorandum items:											
GDP (in billions of euro)	54.9	56.8	60.1	63.5	64.1	69.0	73.3	77.0	80.6	84.2	88.0
Structural balance	1.2	0.7	2.4	2.1	-3.3	-1.3	-0.5	-0.1	-0.1	0.0	0.0
Output gap	1.7	1.5	1.4	0.6	-1.7	-0.8	-0.2	-0.1	-0.1	-0.1	0.0
Public gross debt (Maastricht definition)	20.1	22.3	21.0	22.0	24.9	26.7	27.3	27.4	27.3	27.3	27.3

Sources: Luxembourg authorities and IMF staff estimates.

Table 4. Luxembourg: General Government Financial Balance Sheet, 2015–19
(Millions of euros unless noted otherwise)

	2015			2016			2017			2018			2019		
				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	649	23,888	25,730	1,047	760	27,486	770	66	28,299	1,034	313	29,688	1,638	2,322	33,687
Financial assets	1,318	38,407	41,595	338	842	42,775	2,494	-127	45,142	1,657	188	46,987	3,478	2,233	52,698
Currency and deposits	369	7,640	8,008	-798	-1	7,209	1,782	1	8,992	339	80	9,411	2,248	0	11,659
Debt securities	705	7,434	8,717	351	137	9,205	467	-380	9,292	20	-58	9,254	330	524	10,108
Loans	-61	1,355	1,295	-22	1	1,274	23	-1	1,296	97	-2	1,391	113	-1	1,503
Equity and inv. fund shares	-248	17,462	18,681	863	767	20,311	456	50	20,817	1,036	-454	21,399	604	1,955	23,958
Financial derivatives	242	-21	47	31	-61	17	0	17	34	0	-21	13	0	40	53
Other financial assets	311	4,537	4,847	-87	-1	4,759	-234	186	4,711	165	643	5,519	183	-285	5,417
Liabilities	644	14,519	15,865	-658	82	15,289	1,747	-193	16,843	581	-125	17,299	1,801	-89	19,011
Currency and deposits	11	262	272	10	0	282	9	0	291	11	-1	301	10	0	311
Debt securities	2	6,445	7,149	2	80	7,231	1,990	-193	9,028	4	-100	8,932	1,533	-40	10,425
Loans	109	4,829	4,938	-428	0	4,510	-333	0	4,177	-93	-24	4,060	-70	-50	3,940
Other liabilities	522	2,983	3,506	-242	2	3,266	81	0	3,347	659	0	4,006	328	1	4,335
Statistical discrepancy	25			-51			-23			42			39		
Memorandum items:															
Net financial worth (percent of GDP)			45.3			50.1			49.8			49.4			53.0
Financial assets (percent of GDP)			73.2			78.0			79.5			78.2			83.0
Liabilities (percent of GDP)			27.9			27.9			29.6			28.8			29.9
GDP			56,814			54,867			56,814			60,053			63,516

Sources: IFS and IMF staff estimates.

Table 5. Luxembourg: International Investment Position, 2015–19[1/]

	2015	2016	2017	2018	2019
Billions of Euros					
International investment position	34.6	31.7	40.0	33.1	35.7
Assets	10,481.3	10,961.0	11,048.6	10,645.3	11,171.3
Liabilities	10,446.7	10,929.4	11,008.6	10,612.2	11,135.6
Direct investment	740.4	735.6	717.7	738.6	769.7
Assets	5,718.7	5,868.4	5,613.9	5,220.1	5,052.3
Liabilities	4,978.3	5,132.7	4,896.2	4,481.6	4,282.6
Portfolio investment	-1,024.1	-1,077.2	-1,060.9	-1,120.0	-1,120.9
Assets	3,368.9	3,588.2	3,939.7	3,877.2	4,506.0
Liabilities	4,393.1	4,665.4	5,000.7	4,997.2	5,626.8
Financial derivatives	8.5	-1.2	2.9	3.1	10.4
Assets	137.8	157.8	146.1	132.8	145.0
Liabilities	129.3	159.0	143.2	129.7	134.6
Other investment	309.2	373.5	379.6	410.7	375.5
Assets	1,255.3	1,345.7	1,348.1	1,414.4	1,467.1
Liabilities	946.1	972.2	968.5	1,003.7	1,091.7
Reserve assets	0.7	0.9	0.7	0.8	0.9
Percent of GDP					
International investment position	66.5	57.7	70.4	55.2	56.2
Assets	20,130.9	19,977.4	19,446.8	17,726.5	17,588.1
Liabilities	20,064.4	19,919.6	19,376.5	17,671.3	17,531.9
Direct investment	1,422.0	1,340.8	1,263.2	1,229.8	1,211.8
Assets	10,983.6	10,695.6	9,881.1	8,692.5	7,954.3
Liabilities	9,561.6	9,354.8	8,618.0	7,462.7	6,742.5
Portfolio investment	-1,967.0	-1,963.3	-1,867.4	-1,865.1	-1,764.7
Assets	6,470.5	6,539.8	6,934.4	6,456.3	7,094.2
Liabilities	8,437.5	8,503.1	8,801.8	8,321.3	8,858.9
Financial derivatives	16.3	-2.1	5.1	5.1	16.4
Assets	264.6	287.7	257.1	221.1	228.3
Liabilities	248.3	289.8	252.0	216.0	211.8
Other investment	593.8	680.8	668.2	683.9	591.1
Assets	2,410.9	2,452.7	2,372.9	2,355.3	2,309.8
Liabilities	1,817.1	1,771.9	1,704.7	1,671.4	1,718.7
Reserve assets	1.4	1.7	1.3	1.4	1.5

Sources: STATEC and IMF Staff estimates.

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

Table 6. Luxembourg: Financial Soundness Indicators, 2015–20
(Percent)

	2015	2016	2017	2018	2019	2020 (Prelim.)
All Banks						
Capital adequacy						
Regulatory capital to risk weighted assets	22.0	25.0	25.9	25.0	22.0	24.3
Regulatory tier 1 capital to risk weighted assets	21.0	24.0	25.1	24.3	21.5	22.4
Capital to assets	7.0	7.0	8.4	8.0	7.4	8.6
Profitability and efficiency						
Return on assets	0.8	0.8	0.7	0.6	0.5	0.5
Return on equity	11.0	11.0	8.1	7.4	7.4	6.2
Interest margin to gross income	27.0	25.0	27.9	27.1	26.7	24.9
Trading income to total income	2.0	3.0	1.3	3.5	2.8	1.5
Noninterest expenses to gross income	67.0	69.0	73.6	77.5	77.7	79.5
Personnel expenses to noninterest expenses	29.0	25.0	25.9	24.9	25.1	24.2
Asset quality and structure						
Residential real estate loans to total loans	4.0	6.2	6.2	6.8	6.9	8.5
Household debt to GDP	57.0	60.0	59.5	59.8	64.3	69.7
Nonperforming loans to total gross loans	...	0.9 [1/]	0.8 [1/]	0.9 [1/]	0.8 [1/]	1.0
Sectoral distribution of loans (in percent of total loans)						
Residents	27.0	33.0	33.4	33.7	32.0	36.9
Nonresidents	73.0	67.0	66.6	66.3	68.0	63.1
Liquidity						
Liquid assets to total assets	58.0	21.2 [1/]	22.9 [1/]	24.9 [1/]	24.7 [1/]	29.8 [1/]
Liquid assets to short-term liabilities	67.0	31.8 [1/]	31.7 [1/]	34.6 [1/]	33.2 [1/]	38.8 [1/]
Customer deposits to total (non interbank) loans	129.0	106.0 [1/]	102.9 [1/]	106.2 [1/]	107.7 [1/]	109.0 [1, 3/]
Domestically Oriented Banks						
Capital adequacy						
Regulatory capital to risk weighted assets	22.6	23.0	23.0	22.9	22.5	22.9
Regulatory tier 1 capital to risk weighted assets	22.2	23.0	22.1	22.1	21.8	22.2
Capital to assets	8.4	9.0	8.2	8.8	8.7	8.9
Profitability and efficiency						
Return on assets	1.0	1.0	0.8	0.8	0.7	0.7
Return on equity	11.0	11.0	9.7	8.8	8.6	7.6
Interest margin to gross income	64.0	56.1 [1/]	54.8 [1/]	52.8 [1/]	51.5 [1/]	52.2 [1/]
Asset quality and structure						
Residential real estate loans to total loans	28.0	28.0	26.7	24.9	25.6	35.1
Household debt to GDP						
Nonperforming loans to total gross loans	...	2.4 [1/]	2.0 [1/]	1.8 [1/]	1.7 [1/]	1.9 [1/]
Sectoral distribution of loans (in percent of total loans)						
Residents	67.0	71.0	69.5	67.5	71.0	76.4
Nonresidents	33.0	29.0	30.5	32.5	29.0	23.6
Liquidity						
Liquid assets to total assets	44.0 [2/]	19.5 [1/]	20.3 [1/]	20.9 [1/]	23.4 [1/]	24.0 [1/]
Liquid assets to short-term liabilities	51.0 [2/]	26.0 [1/]	27.2 [1/]	28.0 [1/]	30.7 [1/]	32.3 [1/]
Customer deposits to total (non interbank) loans	137.6	124.0 [1/]	128.0 [1/]	112.0 [1/]	108.1 [1/]	101.0 [1, 3/]

Sources: BCL, and CSSF.

1/ Change in underlying data source and calculation methodology.

2/ Q3 2015.

3/ Q1 2020.

Table 7. Luxembourg: Risk Assessment Matrix[1]

Risks	Likelihood, and transmission channels	Expected Impact of Risk	Policy response
Business model risk:			
Changes in EU and international taxation rules and transparency standards for cross-border activities.	**High** • 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.	– Once the recovery is on firm ground, fiscal normalization would help maintain buffers to mitigate revenue loss. – Diversify fiscal revenue base, and develop contingency plans, and further pension reform.
Global Risks:			
Unexpected shifts in the Covid-19 pandemic. • **Downside**: Prolonged pandemic. The disease proves harder to eradicate (e.g., due to new virus strains, short effectiveness of vaccines, or widespread unwillingness to take them), requiring costly containment efforts and prompting persistent behavioral changes rendering many activities unviable. • **Upside**: Faster containment. Pandemic is contained faster than expected due to the rapid production and distribution of vaccines, boosting confidence and economic activity.	• **Downside**: **Medium** Prolonged pandemic in Europe would weaken the already fragile recovery of the economy and may lead markets to reassess real economy risks, with possible adverse repricing of risk assets. This could undermine the performance of the large financial sector, with adverse implications for fiscal revenues and the economy. These effects would be compounded by adverse domestic confidence effects and weaker consumption. • Upside: **Medium** Faster containment would restore confidence and boost activity in Europe, which help consolidate capital market performance. Domestically, confidence effects would boost both consumption and production in the most affected sectors.	• **High (Downside)** Weaker growth in Europe and heightened volatility in global financial markets would weigh on the performance of the large financial sector, with adverse implications for tax revenues and growth. Domestically, further impairment of corporate balance sheets, rising unemployment and the resulting adverse confidence effects would further weaken growth prospects. • **High (Upside)** Faster progress with vaccines would allow activity in Europe and, hence, in Luxembourg, to return more rapidly to pre-pandemic levels than currently projected.	• **Downside:** – Further increase the testing capacity to facilitate early detection of cases. Ensure hospitals are adequately resourced. – Provide fiscal support in a targeted manner. – Deepen further risk surveillance in the investment fund sector and spillovers to the rest of the financial system. – Introduce transparent, targeted, and temporary measures to alleviate long-lasting pressures on the capital and liquidity of banks affected. – Stand ready to provide liquidity support to banks in collaboration with the ECB.

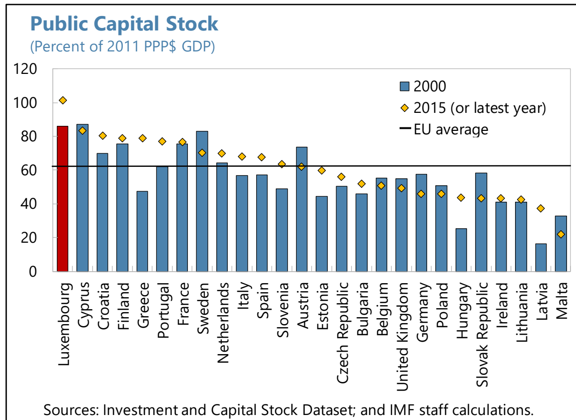
Table 7. Luxembourg: Risk Assessment Matrix (Concluded)

Risks	Likelihood, and transmission channels	Expected Impact of Risk	Policy response
Accelerating de-globalization. Despite renewed efforts to reach multilateral solutions to existing tensions, geopolitical competition leads to further fragmentation. Reshoring and less trade reduce potential growth.	**Medium** • Intra-Europe border closures and regional quarantines can become more frequent in response to a sporadic rise in cases. • Reshoring and less trade would weigh on growth in euro area, with adverse effects on Luxembourg's exports and FDI inflows. These effects would be compounded by the adverse impact of increased market volatility on the profitability of the financial sector.	**High** • Retaliatory cycles of trade restrictions could hurt Luxembourg's exports, financial sector profitability, tax revenues from multinational companies, and GDP growth.	– Continue support for the multilateral rules-based trading system, and advocate trade liberalization – Participate in a coordinated policy response at the European and global level. – Ensure robust contingency plans to diversify tax revenue base. – Advance structural reforms and infrastructure investments to boost competitiveness.
Sharp rise in global risk premia exposes financial and fiscal vulnerabilities. A reassessment of market fundamentals (e.g., in response to adverse Covid-19 developments) triggers a widespread risk-off event. Risk asset prices fall sharply and volatility spikes, leading to significant losses in major non-bank financial institutions. Higher risk premia generate financing difficulties for leveraged firms and households, and a wave of bankruptcies erode banks' capital buffers.	**Medium** • A widespread risk-off event and the resulting increase in financial markets' market volatility could hamper the financial sector performance. 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 • The likely extension of low policy rates would weigh further on the profits in the banking sector.	**High** • Weaker performance of the financial sector could adversely affect economic activity in Luxembourg and reduce tax revenues.	– Deepen the surveillance of systemic risks in the investment fund sector. Closely monitor the effectiveness of liquidity management tools and take actions as needed. – Take lead role in international discussion of the design macroprudential toolkit and regulation for the investment fund sector. – Ensure robust contingency planning for operational risks that may arise from market volatility.
Cyber-attacks Cyber attacks on critical infrastructure, institutions, and financial systems trigger systemic financial instability or widespread disruptions in socio-economic activities and remote work arrangements.	**Medium** • Cyber attacks targeting individual financial institutions in Luxembourg could pose reputation risk, possibly triggering confidence and contagion effects. • Widespread cyber attacks that would disrupt remote work arrangements could adversely affect the services-dominated economy which relies on teleworking.	**Medium** • Cyber attacks can lead to disruptions in financial services and more broadly the economy. However, the magnitude of the disruptions would depend, among other things, on the scale of the attack.	– Enhance 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.

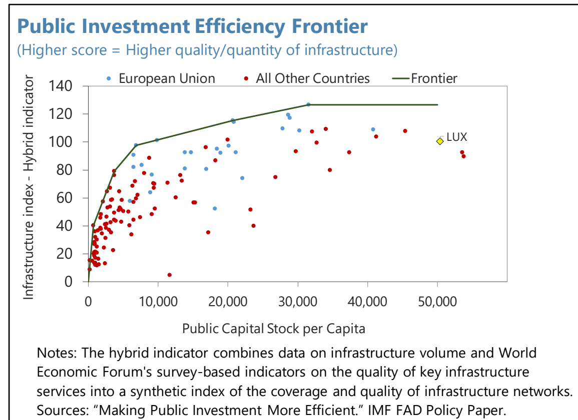
[1] The Risk Assessment Matrix (RAM) shows events that could materially alter the baseline path. The relative likelihood is the staff's subjective assessment of the risks surrounding the baseline ("low" is meant to indicate a probability below 10 percent, "medium" a probability between 10 and 30 percent, 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. The conjunctural shocks and scenario highlight risks that may materialize over a shorter horizon (between 12 to 18 months) given the current baseline. Structural risks are those that are likely to remain salient over a longer horizon.

Box 1. Improving Public Investment Management[1]

Luxembourg has built an impressive level of public capital stock, but efficiency gaps remain. Luxembourg achieved one of the highest public capital stock-to-GDP ratios among EU countries. When assessed against the global efficiency frontier, there appear efficiency gaps in terms of both quantity and quality of infrastructure.



Sources: Investment and Capital Stock Dataset; and IMF staff calculations.



Notes: The hybrid indicator combines data on infrastructure volume and World Economic Forum's survey-based indicators on the quality of key infrastructure services into a synthetic index of the coverage and quality of infrastructure networks.
Sources: "Making Public Investment More Efficient." IMF FAD Policy Paper.

Shortcomings in the public investment management (PIM) framework include:

- *Budget processing*. The budget framework does not currently include a medium-term expenditure plan (MTEF) and does not follow a performance-based approach. This can lead to a disconnect between budget planning and sectoral priorities, possibly resulting in variations between approved capital budgets and actual outturns. At present, the budget circular does not include firm overall ceilings for line ministries, which can be modified at the discretion of the government to allow for revisions in underlying macroeconomic assumptions or to respond to other unforeseen fallouts. There are no limits on such adjustments—provided they are justified—and no systematic sensitivity analysis of the fiscal impact of deviations from key variables.

- *Strategic planning in public investment projects*. The rapid growth in economy and working population has continued to drive infrastructure needs. In response, Luxembourg has adopted a fragmented project-by-project approach, possibly reflecting a rush in the execution of projects. Such an approach could result in insufficient planning and sequencing of investment projects, and lead to delays and cost overruns. The recent adoption of the national plan to accommodate mobility needs until 2035 is a step in the right direction to enhance intersectoral coordination, and ensure better prioritization and more efficient execution of infrastructure projects.

- *Public investment performance oversight*. In general, public investment projects are subject to ex-ante cost-benefit analysis during the preparation of the budget, which is reviewed by the General Inspection Directorate of the Ministry of Finance. Projects with capital value exceeding €40 million are subject to more in-depth analysis as they are authorized by a special law. However, the government does not currently publish a list of infrastructure projects along with important information such as cost estimates, implementation status and possible delays, and data on performance targets. This undermines lesson-learning and useful feedback and may raise general questions concerning transparency. Moreover, there are currently no systematic ex-post evaluations of large infrastructure projects, partly reflecting limited availability of information on cost overruns and delays.

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[1] Prepared by Padma Hurree-Gobin (STA) and Moez Souissi (ICD).

Box 1. Improving Public Investment Management (Continued)

Luxembourg should continue to enhance the budgetary framework in line with the 2012 OECD recommendations, which may require revisions in the existing legal framework.[2] Specifically:

- *Adopt a multiannual expenditure strategy*. Implementing of multi-year budgeting was a welcome step to anchor public spending levels and control their evolution, thereby improving the allocation of resources for projects. Looking forward, the budget process could be further strengthened by incorporating a MTEF to the multi-year budget framework to better align sectoral expenditures with government's priorities and long-term macroeconomic objectives. The authorities envisage implementing medium-term expenditure plans for individual expenditure items in the context of the 2022 budget, which is a step in the right direction. Moreover, capital expenditure ceilings should be based on medium-term forecasts reflecting, among others, maintenance cost profiles over the medium term to reduce the risk of resource over-commitments.

- *Implement a spending review into the budget process*. The Ministry of Finance conducted an ad-hoc spending review in 2014, which aimed mostly at informing on large-scale spending cuts and consolidation efforts. Going forward, a spending review mechanism should be embedded into the budgetary process, once a MTEF is introduced. Either continuous and selective reviews, or comprehensive reviews at regular intervals could be considered.

- *Review and assess existing carry-over rules for special funds*. The authorities abolished the "extra-budgetary" special funds converting them into budgetary ones, which will help strengthen the monitoring of budget execution and reduce the risk of over-commitment of resources. They should review and assess the carry-over rules in place to avoid inefficient building up of resources.

Furthermore, to fully benefit from the welcome move from a project-by-project to a more global approach, some measures could be taken to enhance planning and oversight of public investment. These include:

- *Strengthen governance arrangements for managing public investment in line with international good practices*. To ensure the robustness of cross-sectoral coordination frameworks, the government may consider establishing an entity with independent powers. This independent body can coordinate the assessment of infrastructure needs consistent with the national long-term mobility objectives, contribute to project prioritization and sequencing, help remove bottlenecks in delivering major projects, and monitor their performance. Examples of countries that established similar entities include France, the U.K., New Zealand, and South Korea (see Table below).

- *Enhance investment project oversight*. While proportionate application of sophisticated analytical tools is generally regarded as good practice, €40 million is a relatively high threshold by international standards. Some countries use lower values—such as Ireland, whose threshold is €20 million—and others, like the U.K. and the Netherlands, require cost-benefit analysis to be applied to all projects with a level of effort proportionate to project size. This threshold could be reviewed with a view to widening the coverage of projects subject to more in-depth analysis. In addition, the authorities should consider conducting systematic ex-post evaluations and audits of major infrastructure projects to review experience and draw lessons for future plans. The results of post-project reviews should be published for transparency purposes. The independent unit, when established, could be entitled to conduct such exercise.

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[2] See "Budgeting in Luxembourg - Analysis and recommendations".

Box 1. Improving Public Investment Management (Concluded)

Table. Examples of Public Investment Units in Advanced Countries

Country	Entity	Affiliation	Main responsibilities
France	General Commission for Investment (2010).	Reports to the Prime Minister	- Check project consistency with the Government's policies and strategy on future investment. - Coordinate the processing of investment project, the independent review process, and provides advice and recommendations. - Oversee ex-ante and ex post evaluations of investment.
United Kingdom	National Infrastructure Commission (2015)	Executive Agency reports to HM Treasury, but operates at arm's length	- Provide impartial, expert advice and makes independent recommendations to the government on economic infrastructure. - Take account of potential interactions between its infrastructure recommendations and housing supply. - Prepare a National Infrastructure Assessment once in every Parliament, setting out long-term infrastructure needs with recommendations for action by the government.
New Zealand	National Infrastructure Unit (2009)	Unit of the Treasury	- Formulate and monitor progress on the 20-year National Infrastructure Plan. - Establish robust and reliable cross-government frameworks for infrastructure project appraisal and capital asset management, and monitor their implementation and use.
South Korea	Public and Private Infrastructure Management Center (2005)	Independent think-tank	- Conduct preliminary feasibility studies for major projects based on general and sector-specific guidelines. - Examine the efficiency and appropriateness of projects by reviewing economic and policy feasibility

Source: Report on Public Investment Management Assessment for Ireland, IMF Country Report No. 17/333.

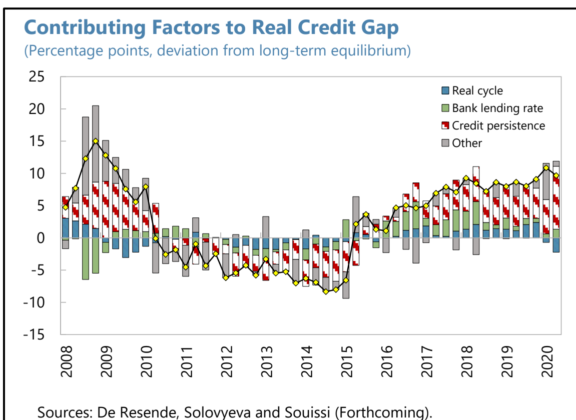
Box 2. A Semi-Structural Model to Assess Macroprudential Policy

We built a semi-structural model with financial accelerator to analyze the nexus between the financial and business cycles.[1] This work extends the "gap model" in Detragiache *et al* (2020), incorporating financial accelerator mechanisms—inspired by both Bernanke, Gertler and Gilchrist (1999) and Kiyotaki and Moore (1997)—and an active banking sector based on Dib (2010) and De Resende *et al* (2016). More specifically:

- *Financial accelerator*. The supply of bank credit is partly driven by the effect of borrowers' net worth on banks' credit risk perceptions, proxied by a measure of aggregate leverage. For example, real shocks which boost economic activity increase net worth (i.e., reduce aggregate leverage), lowering both aggregate credit risk and banks' marginal cost of lending. This, in turn, increases investment and consumption, hence amplifying the initial impact of the shock on the real cycle. In addition, procyclical asset prices—proxied by housing prices—determine the value of borrowers' collateral and alter both their borrowing costs as well as demand for credit, ultimately affecting aggregate demand.
- *Bank behavior*. Banks respond to changes in macroprudential policy stance by changing their capital buffers, which in turn affect the cost of credit supply. A tightening of the macroprudential stance (say, in response to a credit boom), leads to lower capital buffers, higher marginal costs of lending and higher lending rates, which in turn reduce demand for credit and attenuates the credit and real cycles.

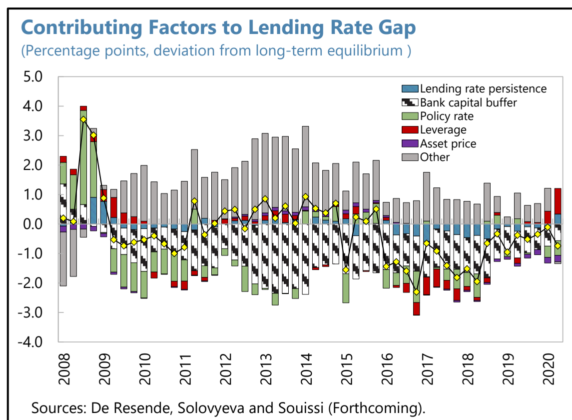
The model's key parameters were estimated using Bayesian inference methods using quarterly data over 2003-18, focusing on the DOBs. Key parameters governing the size of credit response to changes in the macroprudential stance were calibrated based on the empirical findings in Jimenez et al (2017).[2]

Contributing Factors to Real Credit Gap
(Percentage points, deviation from long-term equilibrium)



Sources: De Resende, Solovyeva and Souissi (Forthcoming).

Contributing Factors to Lending Rate Gap
(Percentage points, deviation from long-term equilibrium)



Sources: De Resende, Solovyeva and Souissi (Forthcoming).

At the onset of the pandemic, aggregate credit has continued to expand above its estimated long-term equilibrium trend amid continued favorable financial conditions. The model suggests that Luxembourg was still in the upward phase of the credit cycle by Q2 2020. Despite the negative impact of the COVID, real total credit is estimated to be 10 percent above its long-term equilibrium, driven by continuously low lending rates and credit's underlying persistence (left chart). The lending rate continued to evolve below its long-term equilibrium level, driven by the ECB's accommodative monetary policy stance, pre-existing large capital buffers—partly reflecting the domestic macroprudential stance—and, to a lesser extent, by the positive effect of increasing housing prices on borrowers' collateral (right chart). As the pandemic unfolded, increasing leverage ratios started to put upward pressures on lending rates, reflecting higher risk perceptions, but still not enough to lift the interest rates back to equilibrium.

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[1] Prepared by Carlos De Resende (ATI), Alexandra Solovyeva (EUR), and Moez Souissi (ICD).

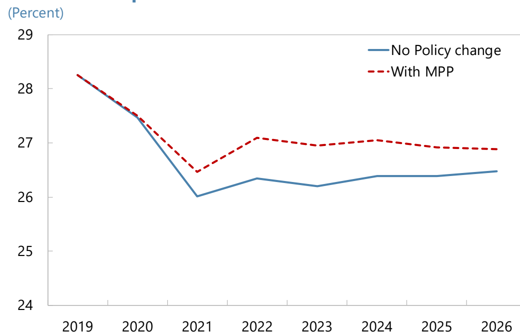
[2] The parameters governing the responses of the bank lending rate to changes in capital buffers and of credit demand to changes in the lending rate were set such that a 1 percentage point increase in the countercyclical capital buffer reduces the deviation of credit from its long-term equilibrium (credit gap) by about 0.5 percentage points over 5 quarters.

Box 2. A Semi-Structural Model to Assess Macroprudential Policy (Concluded)

Under the baseline scenario, tightening the macroprudential stance would help limit the ongoing credit pressures with marginal impact on the real economy. Staff's baseline scenario assumes no change in the macroprudential policy stance. Thanks to continued, albeit more targeted state support and effective vaccination strategy, the economic recovery would gain speed starting in 2021, with limited scarring effects over the medium term. In this environment, credit growth would remain above its long-term trend on the back of expectations of continued low interest rates amid improvement in economic conditions. As a result, housing prices would remain higher than their long-term equilibrium. In response to these developments, the authorities would tighten somewhat the macroprudential policy stance.[3] In turn, banks would lower their capital buffers which would increase their marginal lending costs and, hence, raise lending rates. Consequently, credit demand would soften, and credit growth would slow down. Given the relatively low sensitivity of output to interest rates—partly reflecting the structure of the economy which is dominated by financial services—real growth would only be marginally affected.

In response to a tightening of the macroprudential stance, banks reduce their capital buffers, …

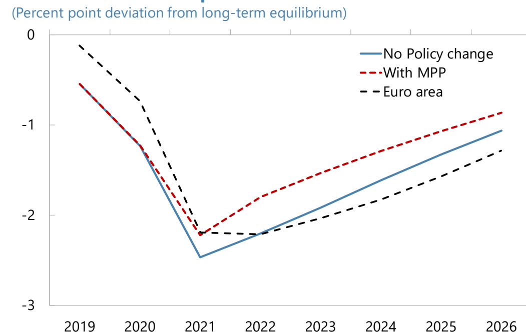
Bank Total Capital Ratio
(Percent)



Sources: De Resende, Solovyeva and Souissi (Forthcoming).

… which increase their marginal lending cost; hence rise their lending rates.

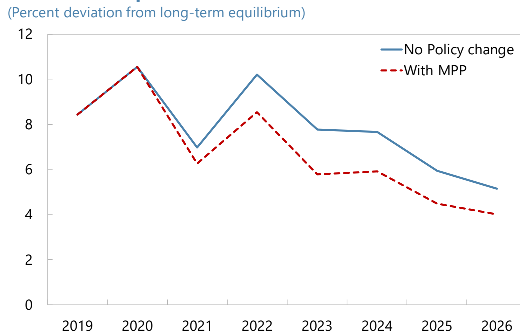
Real Interest Rate Gap
(Percent point deviation from long-term equilibrium)



Sources: De Resende, Solovyeva and Souissi (Forthcoming).

As a result, credit grows less strongly and credit gap closer faster than under the baseline, …

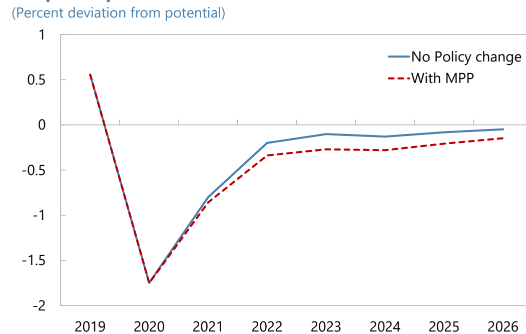
Real Credit Gap
(Percent deviation from long-term equilibrium)



Sources: De Resende, Solovyeva and Souissi (Forthcoming).

…with limited impact on the real economy, reflecting weak sensitivity of the output to changes in interest rates.

Output Gap
(Percent deviation from potential)



Sources: De Resende, Solovyeva and Souissi (Forthcoming).

[3] In staff's best understanding, developments in credit and housing markets are the main factors underpinning the setting of the macroprudential policy stance. Assuming that the currently (relatively) low capital buffer requirements (at about 4 percent) are brought close to the EU average (6.9 percent), banks would still preserve a large lending capacity without breaching minimum capital requirements.

Annex I. Key Policy Measures in Response to COVID-19

Measure	Description	Objective
Health-related	- Spending on medical equipment and infrastructure, and accommodation costs for eligible cross-border health-care workers. - Establishing four regional centers specifically for COVID-19 patients. - Providing support for COVID-19 related R&D and investment aid to produce articles relevant to the fight against COVID-19 (e.g. protective masks).	Strengthen the response of the health sector
Social	- Covering employees' leave for family reasons and sick leave, and extending leave for family reasons to take care of adults with disabilities and the elderly. - Doubling of the cost-of-living allowance for low-income households. - Widening of eligibility criteria and increasing financial support under means-tested housing subsidies for rent. - Suspending the forced execution of evictions ordered for residential leases.	Preserve solidarity and protect households
Short-time work scheme	- Until end-June 2021: Sectors affected by the crisis, in particular hospitality, tourism, and events organizing, keep access to the short-time work scheme. - Since July 2020: the simplified short-time work scheme due to structural economic problems was extended to businesses from sectors mostly hit by the pandemic (such as tourism and hospitality) or still not allowed to resume their activity (such as event businesses). Layoffs up to 25 percent of staff are allowed. In case the planned layoffs exceed 25 percent, a restructuring plan is required.	Preserve employer-employee relationships, address unemployment and mitigate firms' liquidity problems.
Public guarantees	- Extending credit guarantees for new bank loans (€2.5 billion), SMEs (€200 million), anti-crisis financing (€400 million) and other guarantees (€290 million), including a new reinsurance scheme by the Office du Ducroire. - Injecting capital into the Office du Ducroire (€20 million) and temporarily increasing its maximum commitment level to beef up its guarantee capacity to exporters.	Channel liquidity to firms, including exporters, and avoid any disruptions to credit supply.
Grants for self-employed, micro and SMEs	- Providing non-repayable financial aid. - Establishing a Recovery and Solidarity Fund (€20 million) to provide, among others, temporary grants based on businesses' turnover loss to cover fixed costs.	Mitigate liquidity and solvency problems.
Other liquidity measures	- Deferring direct and indirect tax and social security contribution payments. - Cancelling quarterly advances of CIT and local business tax for 2020 and 1st and 2nd quarter of 2021. - Providing repayable capital advances to cover firms' operating costs.	Mitigate liquidity problems for firms.
Sectoral support plans	- Financial support measures for independent professional artists and intermittent workers in the entertainment and cultural sector. - Various support measures for tourism, hospitality, sports, and agriculture. - Flat-rate aid to support the non-food retail stores and personal care providers (less than 250 employees).	Ensure support for vulnerable sectors and support their recovery.
Green transition	- Fiscal incentives to support private investment and green recovery, including aid for development and energy efficiency projects.	Support the green recovery.

Prudential measures	- Allowing 6-month moratorium on principle and interest payments for SMEs, self-employed and liberal professionals by Luxembourg banks. - Recommending banks and insurance undertakings to temporarily refrain from dividend distribution. - Intensifying off-site oversight of key risks in the banking and insurance sectors and stepping up surveillance of investment funds, including new reporting requirements, notifications on significant events and large redemptions. - Issuing a guidance on COVID19-related financial crime and AML/CT issues, and released Q&As clarifying, among others, reporting requirements for investment funds, and the prudential treatment of Covid-19 industry-wide private moratoria as well supervisory flexibility to avoid IFSR9-related procyclical effects for banks.	Ensure smooth functioning of the financial system.

Annex II. Short-Time Work Scheme in Selected Countries

	Luxembourg											
	Pre-COVID		March - June 2020	July - December 2020			January - April 2021			May - June 2021		
Name of program	Chômage partiel structurel	Chômage partiel conjoncturel	Chômage partiel pour cas de force majeure	Chômage partiel conjoncturel	Chômage partiel structurel		Chômage partiel conjoncturel	Chômage partiel "lockdown partiel"	Chômage partiel structurel	Chômage partiel conjoncturel	Chômage partiel "lockdown partiel"	Chômage partiel structurel
Replacement rate for worker	80% of the usual gross wage		80% of the usual gross wage, with floor at min wage									
Cap on worker compensation	250% of min wage											
Replacement rate for firms (share of cost covered by State)	None Employers' social security contributions remain at the employer's expense											
Cap on firm compensation	N/A											
Max duration	Full-time: 1022 hour/year. Part-time: pro-rated. The hours of STW used during the period from 1 January 2020 to 31 July 2020 shall not be counted against the reduction in the maximum working time of 1,022 hours.											
Sectors / firms eligible	Industry		All sectors but the finance and insurance sector (and the Early Childhood Education and Care (ECEC) sector)	Industry	Vulnerable sectors such as hospitality, tourism, and events	Other affected sectors	Industry	Vulnerable sectors such as hospitality, tourism, and events	Other affected sectors	Industry	Vulnerable sectors such as hospitality, tourism, and events	Other affected sectors
Work contracts eligible	Permanent or fixed-term contract		Permanent or fixed-term contract Apprentices (March - June 2020; as of November 2020 for apprentices in sectors shut down due to a governement decision (i.e. hospitality and retail)									
Other conditions and additional support	Layoffs up to the regulatory limit (conditional on the submission of a recovery plan/job protection plan)	No layoffs for economic reasons	Accelerated procedure for businesses that completely/partially ceased activities. No layoffs for economic reasons	No layoffs for economic reasons	Simplified procedure. Layoffs up to 25% of workforce (with priority to rehire previously laid off when they start hiring again). Layoffs of more than 25% of workforce conditional on the submission of a recovery plan/job protection plan	Simplified procedure. STW shall be limited to 25% of the workforce (Jul-Aug), 20% (Sep-Oct) and 15% (Nov-Dec). Any layoffs for economic reasons are conditional on the submission of a recovery plan/job protection plan.	Any layoffs are conditional on the submission of a recovery plan/job protection plan.	Accelerated procedure. Layoffs possible up to 25% of the workforce (baseline: 30 June 2020). Layoffs of more than 25% of workforce conditional on the submission of a recovery plan/job protection plan.	Accelerated procedure. Max. 15% of the usual working hours. Any layoffs are conditional on the submission of a recovery plan/job protection plan.	Any layoffs are conditional on the submission of a recovery plan/job protection plan.	Accelerated procedure. Max. 50% of the usual working hours. Any layoffs are conditional on the submission of a recovery plan/job protection plan.	Accelerated procedure. Max. 10% of the usual working hours. Any layoffs are conditional on the submission of a recovery plan/job protection plan.

	Germany		France			
	Pre-COVID	COVID	Pre-COVID	COVID		
				March - December 2020	From July 2020	From January 2021
Name of program	Kurzarbeit		Activité partielle	Activité partielle	Activité partielle (longue durée)	Activité partielle (droit commun)
Replacement rate for worker	60% net (67% with children)	Increase to 70% (67%) from 4th month; 80% (87%) from 7th month (if 50%+ cut in hours)	70% of gross (84% net), with floor at min wage	70% of gross (84% net), with floor at min wage	70% of gross (84% net), with floor at 90% of min wage	60% of gross (71% net), with floor at 90% of min wage
Cap on worker compensation	No		No		€4,606 (net)	No
Replacement rate for firms (share of cost covered by State)	100% but employers pay 80% of SSC (about 27% of comp at avg. salary)	100%	Fixed amount per hour (about 90% of min wage)	100% before June and 85% since June; 100% for selected sectors until Jan 2021	85%	60%; 100% for selected sectors
Cap on firm compensation	No		N/A	€30.3/hour or €4,608 at monthly basis (84% of net wage at 4½ times the minimum wage)		
Max duration	6 months	Exceptional until end 2021	6 months	12 months	24 months (within 36 months)	6 months
Sectors / firms eligible	All		All			
Work contracts eligible	Permanent or fixed- term contracts and paying SSC	Expanded to temporary workers	No condition on type of contract, part or full time, seniority			
Other conditions and additional support	Min 1/3 of workforce subject to reduced hours of 10% or more; draw down working time account balances and exhaust leave balances before applying	Min 1/3 of workforce subject to reduced hours of 10% or more; requirement to draw down balances waived. Employer SSC waived until June 30, only 50% SSC until end 2021	N/A	State covers 100% training cost	Collective agreement needed; reduction in hours cannot exceed 40% of regular hours. State covers 80% training cost	State covers 70% training cost. SSC waived

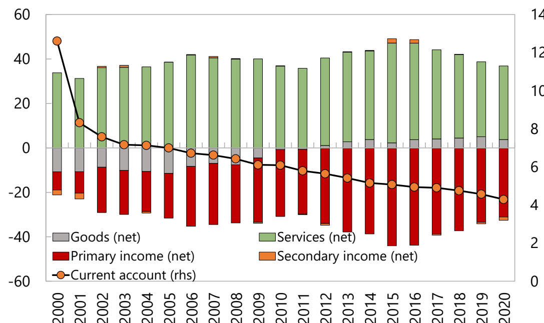
Sources: Luxembourg authorities; and IMF Country Report No. 21/15.

Annex III. External Sector Assessment

1. Staff's bottom line assessment is that Luxembourg's external position is broadly in line 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.

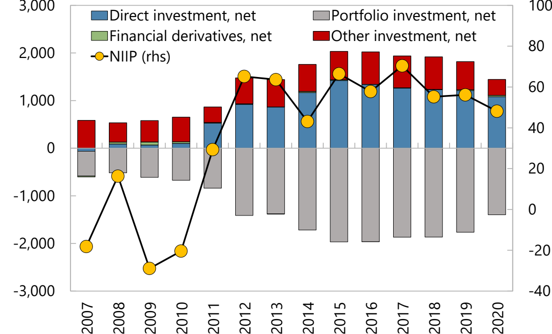
Figure 1. External Sector

The current account has broadly unchanged around 5 percent of GDP since 2016.



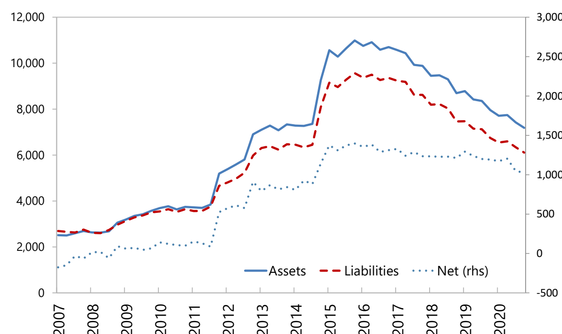
Sources: Haver Analytics; and IMF staff calculations.

Luxembourg's NIIP deteriorated but stayed positive, driven by net direct and net other investment.



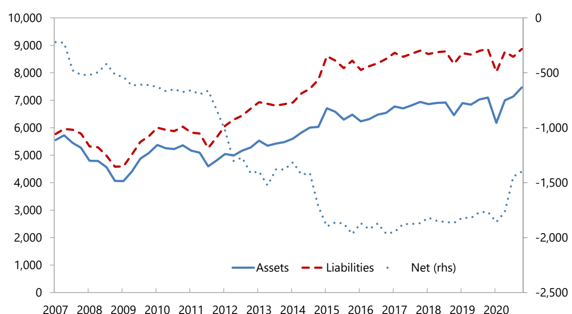
Sources: Haver Analytics; and IMF staff calculations.

Since 2017, both outward and inward FDI have been on a downward trend.



Sources: BCL; and IMF staff calculations.

Net portfolio investment position improved in 2020, driven largely by weaker inward portfolio investment flows.



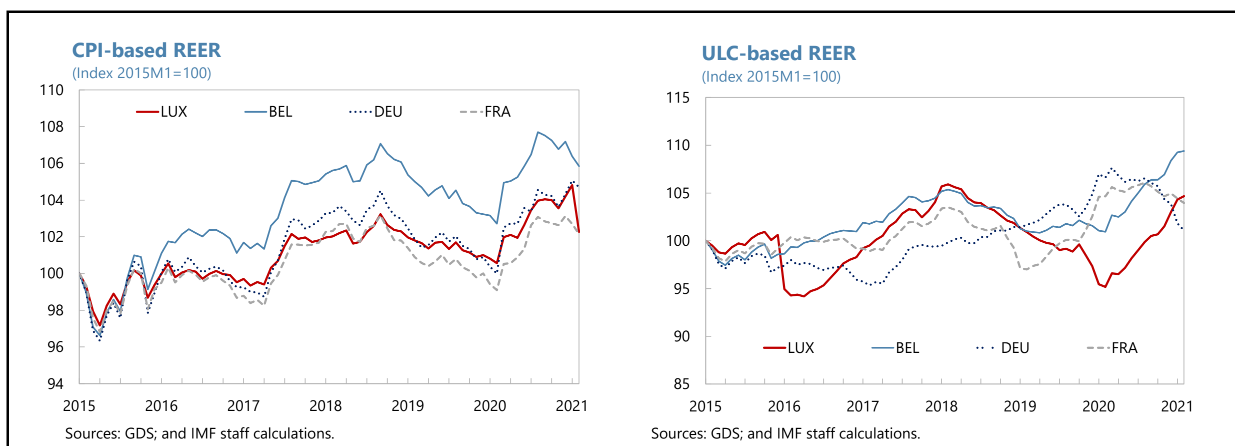
Sources: BCL; and IMF staff calculations.

2. The current account surplus declined moderately to about 4¼ percent of GDP in 2020, driven by lower net goods exports and net transfers (Table 1)**.** 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 33 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 somewhat equally shared between investment income and compensation of employees.

3. Luxembourg's net international investment position continued to weaken in 2020, largely driven by net other investment. The net international investment position (NIIP) fell to 48 percent of GDP in 2020 from 56 percent of GDP at end-2019, mainly due to the decline in net other investment (256 percent of GDP) and net direct investment (133 percent of GDP). It was only partially offset by the improvement in net portfolio position (367 percent of GDP), driven by larger outward investment flows. Since 2017, gross positions in direct investment assets and liabilities have been trending downwards, partly reflecting the U.S. CIT reform, so has been the net direct investment position. While it is uncertain how FDI would evolve due to global CIT reforms, the baseline assumes a gradual decline of net FDI as a share of GDP.

4. Measures of real effective exchange rates (REER) indicate moderate appreciation in 2020. Luxembourg's CPI-based REER appreciated by about 3 percent yoy compared to December 2019. Over the same period, the ULC-based REER appreciated by 5.8 percent. Compared to neighboring countries, the appreciation of the CPI-based REER has been of the same magnitude as in France and Germany but smaller than in Belgium. The ULC-based REER appreciated in Belgium and France (by 6.7 and 2.4 percent respectively), while in Germany it depreciated (by 0.9 percent) compared to end-2019.



5. Staff's bottom line assessment is that Luxembourg's external position is broadly in line with fundamentals and desirable policy settings. This assessment is based on the quantitative External Balance Assessment (EBA-lite) supplemented with staff judgement. The EBA-lite models can only partially capture some important specificities of Luxembourg, such as being a financial center with a large investment fund industry and a very small open economy with a large share of non-resident workers. Exports and imports of financial services which drive Luxembourg's current account are less sensitive to relative price changes, and the large number of non-resident workers affects net factor income and population-based variables in the models. In this sense, as in previous years, staff has adjusted the EBA-lite explanatory variable "output per worker" to reflect that almost

half of Luxembourg's labor force is non-resident. Based on this adjustment, the current account norm for 2020 is now estimated at 4.6 percent of GDP.

- **The EBA-lite current account (CA) model suggests that the external position of Luxembourg is broadly in line with fundamentals and desirable policies.** In comparison with the norm, the current account gap is estimated at 0.5 percent of GDP and the corresponding REER undervaluation at 0.4 percent. The current account gap includes a policy gap of 3.6 percent of GDP, mostly reflecting a looser world average fiscal stance.

- **The Real Effective Exchange Rate (REER) index model suggests some undervaluation**. The policy gap is estimated at 2.8 percent, reflecting mainly a positive domestic private credit to GDP gap.

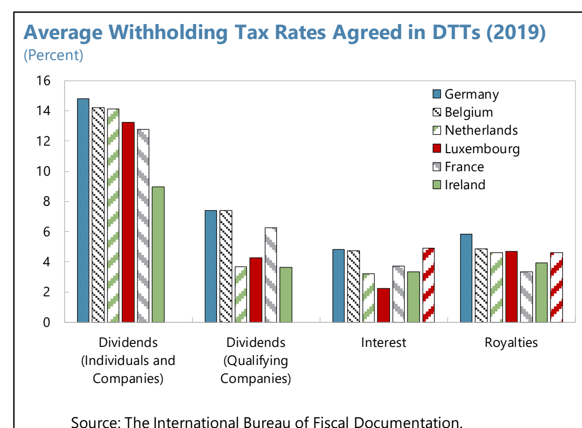
Model Estimates for 2020 (in percent of GDP)

	CA model	REER model
CA-Actual	**4.3**	
Cyclical contributions (from model) (-)	-0.5	
COVID-19 adjustor (+) 1/	0.2	
Additional temporary/statistical factors (+)	0.0	
Natural disasters and conflicts (-)	-0.1	
Adjusted CA	**5.2**	
CA Norm (from model) 2/	**10.6**	
Adjustments to the norm (+)	-6.0	
Adjusted CA Norm	**4.6**	
CA Gap	**0.5**	**1.1**
o/w Relative policy gap	3.6	
Elasticity	-1.37	
REER Gap (in percent)	**-0.4**	**-0.8**

1/ Additional cyclical adjustment to account for the temporary impact of the pandemic on oil trade balances (-0.7 percent of GDP) and on tourism (0.9 percent of GDP).
2/ Cyclically adjusted, including multilateral consistency adjustments.

Annex IV. Impact of International Taxation Reforms on Luxembourg[1]

1. Despite a comparatively high corporate income tax (CIT) rate, Luxembourg is an investment hub—attracting significant foreign direct investment from multinational corporations. The corporate income tax rate of 24.9 percent is higher than the average in the EU (21.6 percent) and OECD (23.7 percent). Moreover, an unusual and complicated corporate net wealth tax adds to the tax burden for companies and magnifies distortions to investment and debt bias. Yet, Luxembourg is the third largest global recipient of foreign direct investment (FDI). This is partly due to some attractive features of its international tax rules, such as a generous participation exemption regime, low withholding tax rates on dividends, interest and royalties, and a wide network of bilateral tax treaties.[2] These features attract little productive investment in tangible assets but rather flow-through FDI that is channeled internationally via special purpose entities (SPEs). Luxembourg hosts around 45,000 SPEs, including holding companies and intragroup lending vehicles. While having minimal employment in Luxembourg, they feature very large balance sheets and income flows, and account for the bulk of the sizeable stock of inbound and outbound FDI. The SPEs' contribution to the economy remains relatively low compared to the FDI flows, with spending on salaries and business services representing only 3 percent of GDP. SPEs pay around 2¾ percent of GDP in tax revenue.

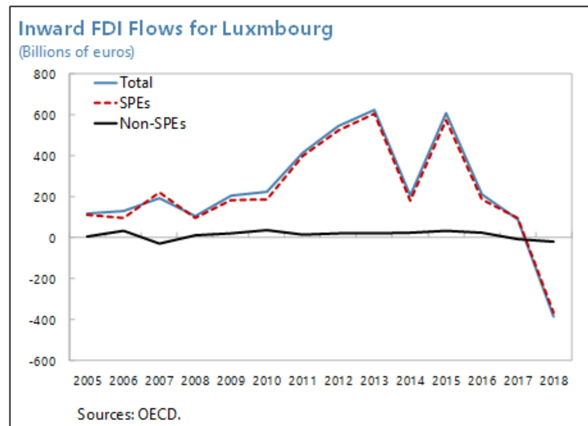


2. Recent changes in the international tax system provide both risks and opportunities for Luxembourg's corporate revenue base. In 2018, CIT revenue was 5.8 percent of GDP, almost twice the European average. The corporate net wealth tax and dividend withholding tax added another 2 percent of GDP. Recently, Luxembourg has implemented rules to strengthen the corporate tax base and potentially increase revenue by limiting opportunities for tax avoidance by multinationals. It currently complies with the minimum standards of the OECD's Base Erosion and Profit Shifting (BEPS) as well as the EU's ATAD I and II. However, international tax developments might also put Luxembourg's corporate tax revenue at risk. For instance, the Tax Cuts and Jobs Act

[1] Prepared by Antje Pflugbeil, Dinar Prihardini, and Ruud De Mooij (all FAD), drawing on "International Taxation and Luxembourg's Economy" (IMF WP/20/264).

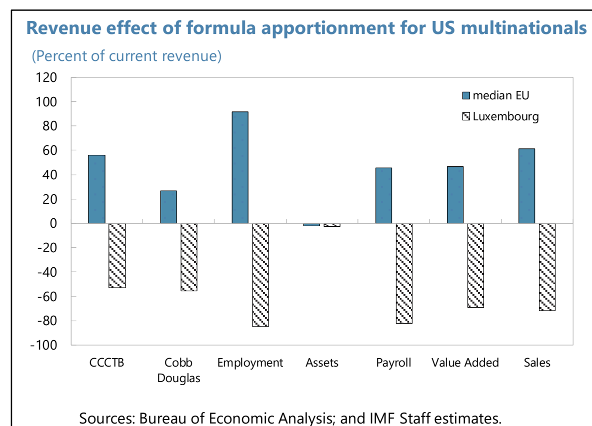
[2] This is a common way to exempt qualifying dividends and capital gains from taxation. The relatively lenient conditions for qualification make Luxembourg attractive for headquarters of Multinational enterprises (MNEs) and holding companies because a large part of their income are dividends from subsidiaries.

in the United States will likely have important spillover effects on Luxembourg (see Box 1 in the 2019 Article IV consultation report). Indeed, inbound FDI flowing through SPEs has dropped from positive flows during 2005-2017 to a negative flow of EUR 400 billion in 2018.[3] The balance sheet of SPEs also dropped from EUR 9.6 to 8.6 trillion during 2016-18, which reflects especially US-held assets. Further drops in FDI can be expected, and this may put downward pressure on activities and tax payments by SPEs.



3. Further international tax reform is underway and will likely reduce tax revenue from multinationals. Fundamental change is currently being discussed in the OECD's Inclusive Framework; and a new corporate tax system for the EU has been proposed by the European Commission. Reforms under discussion go in three broad directions:

- *Supplementing the prevailing arm's-length pricing method by a system of formula apportionment*. Thereby, the global consolidated profit of an MNE is allocated to countries using a simple formula based on labor, capital, and sales. Luxembourg would likely lose significant tax revenues from such reforms. For instance, simulations (based on data for US MNEs) suggest it will incur a loss in revenue from U.S. multinationals as large as 1 percent of GDP, especially when the apportionment is based on labor or sales. For an asset-based allocation, results depend on the treatment of financial assets, an important factor for Luxembourg: losses are smaller, for instance, if financial assets play a bigger role. Formula apportionment will especially jeopardize revenue from SPEs, as MNE profits will be attributed to where physical production factors are located or where the final sales take place.



- *A new taxing right for profits in destination countries*. This is mainly a response to digitalization. Luxembourg would most likely lose revenue from such a shift, in part due to a loss by SPEs and because Luxembourg has a large surplus on the current account. A simulation of the revenue effect (using data from country-by-country reports) of

[3] Foreign dividends have no longer been taxed in the US since 2018, eliminating incentives for US MNEs to defer dividend payments to their US parent. Accordingly, dividend repatriations increased significantly in 2018.

implementing the OECD's unified approach (which attributes a portion of the tax base to destination countries) suggests a 6-11 percent revenue loss from large multinationals.

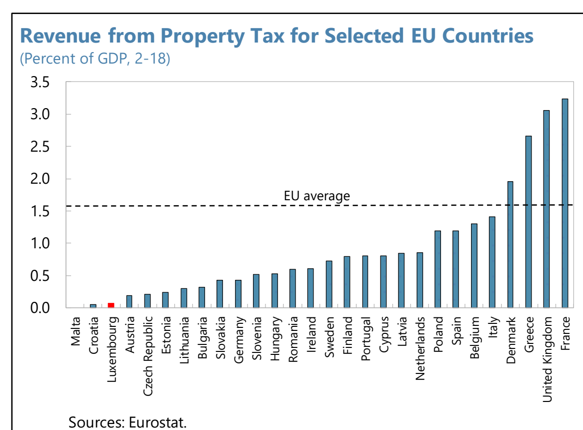
- *Introduction of a minimum effective corporate income tax.* It aims to address residual BEPS concerns and limit the impact of tax competition. A global minimum effective tax would have ambiguous revenue implications for Luxembourg. On the one hand, there will be direct revenue gains for Luxembourg if low-tax jurisdictions and multinationals do not change their policies. For instance, country-by-country reports suggest that each percentage point of "topping-up" tax rate until the minimum rate charged by Luxembourg on foreign earnings of its headquartered multinationals could raise between US$ 100 and 160 million. However, these gains might be more than offset if low-tax jurisdictions raised their tax rates and MNEs re-routed their international capital flows, both of which are highly likely to occur.

4. Luxembourg should be prepared to find compensation for possible revenue losses, preferably through tax measures that support growth or are least harmful to it. Options include:

- *Corporate taxation.* Reform of the corporate net wealth tax should feature on the policy agenda, as this tax is complex and imposes relatively large distortions to real investment and corporate debt finance. Repealing this tax could stimulate economic growth, enhance corporate resilience, and reduce corporate indebtedness. However, it currently raises 1.2 percent of GDP in revenue. To mitigate such a revenue loss, one option might be to maintain the minimum asset tax on SPEs, perhaps by transforming it into a registration fee. Alternatively, a modest financial activities tax on the value added of financial companies could be considered.

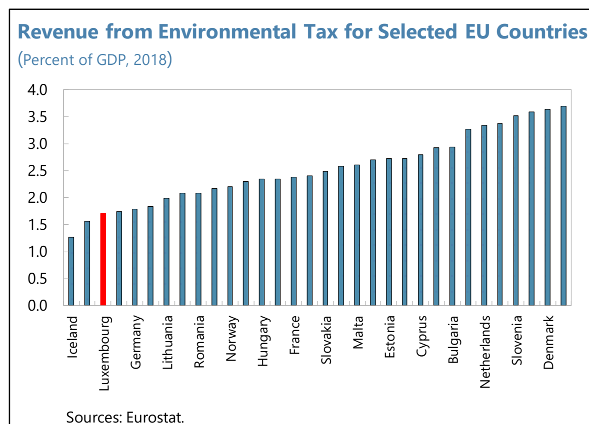
- *Reforming housing taxation.* Another promising and untapped revenue source in Luxembourg is the recurrent property tax, which generates much less revenue than elsewhere in the EU. This is partly because the underlying valuation of immovable properties stems from 1941 and is thus considerably lower than market values. Broad-based property taxes are an efficient way of raising revenue, but they can lead to a reduction in housing supply in the long term. The increase in property taxes can be combined with a targeted measure to impose higher taxes on unused land to encourage greater supply. Since the property tax is the responsibility of municipalities, the national government might encourage them to use such a tax or otherwise impose such a tax at the central level.

Revenue from Property Tax for Selected EU Countries
(Percent of GDP, 2-18)



Sources: Eurostat.

- *Environmental taxation.* Environmental taxes provide an attractive revenue source for Luxembourg. Currently, their revenue is among the lowest in the EU. The government has recently announced a €20 carbon tax in 2021 on emissions not covered by the European emission trading scheme. This is welcome and expected by the authorities to raise €150 million per year. The tax will help reduce CO2 emissions, local air pollution and congestion. The scope for increasing fuel taxes is limited, however, by the high elasticity of fuel demand, related to the price-sensitive sales to commuters and transit traffic. Alternative environmental levies can be exploited more, such as vehicle taxes, congestion charges, and taxes on electricity.



- *Personal income tax.* Luxembourg's personal income tax (PIT) follows a traditional family-based model, as in France, Germany, and Portugal. However, this system induces a gender bias against females and discourages women from participating in the labor market. Therefore, since the 1970s most EU countries have transformed their PIT into an individualized system (Table 1). To smooth a transition, family-based elements (such as a transferable tax deduction from the non-working spouse to the breadwinner, or family-based deductions) could be phased out more gradually to compensate families. The higher tax burden on couples might also provide room for lower PIT rates as part of a revenue-neutral reform.

Table 1. Personal Income Tax Systems in Selected EU Countries

Country	Tax Unit	Family deduction/credit	Dependent spouse deduction/credit	Transferable deduction/credit
Austria	Individual		x	
Belgium	Individual, partial split			
Denmark	Individual			x
Finland	Individual			
Germany	Family, individual option			
Ireland	Family, individual option			
Italy	Individual	x	x	
Luxembourg	Family, individual option			
Netherlands	Individual	x	x	x
Spain	Individual, family option			
Sweden	Individual			
United Kingdom	Individual	x		x

Source: Kalyva et al (2018)

Annex V. Debt Sustainability Analysis

Table 1. Luxembourg: Public Sector Debt Sustainability Analysis (DSA)—Baseline Scenario

(In percent of GDP unless otherwise indicated)

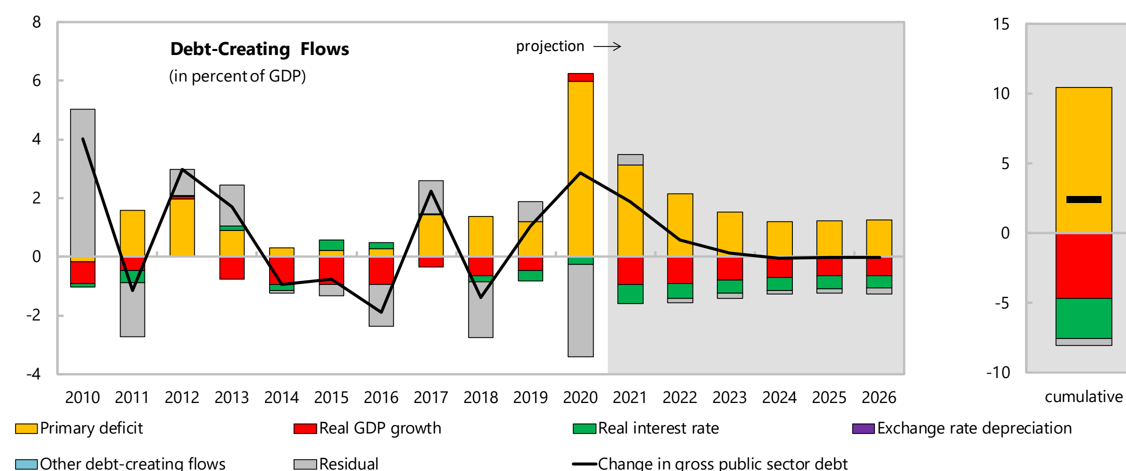
Debt, Economic and Market Indicators [1/]

	Actual			Projections					
	2010-2018 [2/]	2019	2020	2021	2022	2023	2024	2025	2026
Nominal gross public debt	21.4	22.0	24.9	26.7	27.3	27.4	27.3	27.3	27.3
Public gross financing needs	1.0	1.3	6.0	3.4	4.0	4.7	2.8	4.1	4.6
Real GDP growth (in percent)	3.2	2.3	-1.3	4.1	3.6	3.0	2.7	2.5	2.5
Inflation (GDP deflator, in percent)	2.3	3.4	2.3	3.3	2.5	2.1	1.9	1.9	1.9
Nominal GDP growth (in percent)	5.6	5.8	1.0	7.6	6.2	5.2	4.7	4.4	4.5
Effective interest rate (in percent) [4/]	2.2	1.7	1.1	0.6	0.6	0.4	0.2	0.3	0.4

As of March 31, 2021		
Sovereign Spreads		
EMBIG (bp) 3/	-4	
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			Projections							
	2010-2018	2019	2020	2021	2022	2023	2024	2025	2026	cumulative	debt-stabilizing
Change in gross public sector debt	0.5	1.1	2.8	1.9	0.6	0.1	-0.1	0.0	0.0	2.4	primary
Identified debt-creating flows	0.2	0.4	6.0	1.5	0.7	0.3	0.1	0.1	0.2	2.9	balance [9/]
Primary deficit	0.9	1.2	6.0	3.1	2.1	1.5	1.2	1.2	1.2	10.5	-1.1
Primary (noninterest) revenue and grants	28.8	28.5	28.9	28.9	28.8	28.8	28.8	28.7	28.7	172.6	
Primary (noninterest) expenditure	29.7	29.7	34.9	32.0	30.9	30.3	30.0	29.9	29.9	183.1	
Automatic debt dynamics [5/]	-0.7	-0.8	0.0	-1.6	-1.4	-1.2	-1.2	-1.1	-1.1	-7.6	
Interest rate/growth differential [6/]	-0.7	-0.8	0.0	-1.6	-1.4	-1.2	-1.2	-1.1	-1.1	-7.6	
Of which: real interest rate	0.0	-0.4	-0.3	-0.7	-0.5	-0.4	-0.4	-0.4	-0.4	-2.9	
Of which: real GDP growth	-0.6	-0.5	0.3	-0.9	-0.9	-0.8	-0.7	-0.7	-0.7	-4.7	
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	
Privatization/Drawdown of Deposits (negative)	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	
Please specify (2) (e.g., ESM and Euroarea loans)	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/]	0.3	0.7	-3.1	0.3	-0.2	-0.2	-0.1	-0.2	-0.2	-0.5	



Source: IMF staff.

1/ Public sector is defined as central government.

2/ Based on available data.

3/ Long-term bond spread over German bonds.

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

5/ Derived as $[(r - \pi(1+g) - g + ae(1+r)]/(1+g+\pi+g\pi))$ times previous period debt ratio, with r = 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 $r - \pi(1+g)$ and the real growth contribution as $-g$.

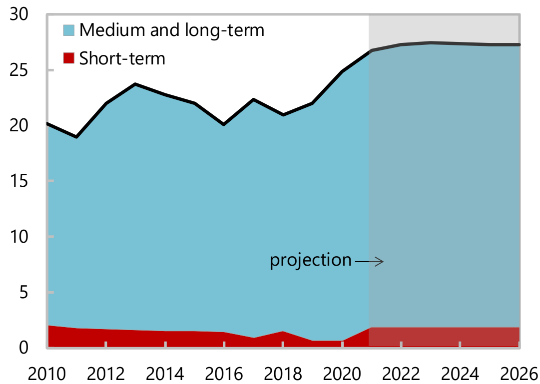
7/ The exchange rate contribution is derived from the numerator in footnote 5 as $ae(1+r)$.

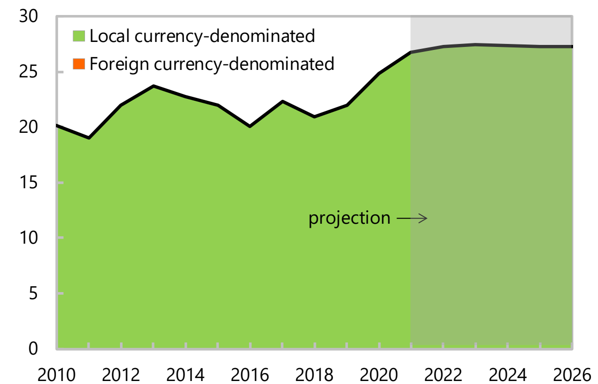
8/ Includes asset changes and interest revenues (if any). For projections, includes exchange rate changes during the projection period.

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

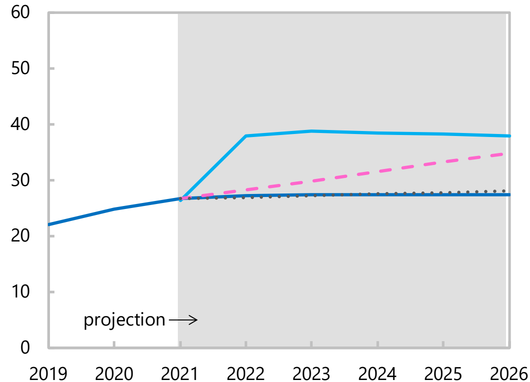
Composition of Public Debt

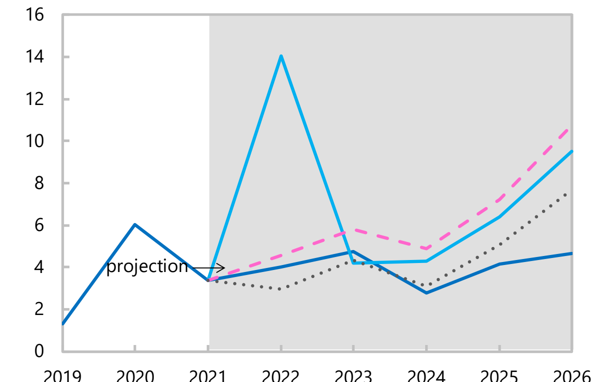




Alternative Scenarios

Baseline
Historical
Constant Primary Balance
Contingent Liability Shock





Underlying Assumptions

(in percent)

Baseline Scenario	2021	2022	2023	2024	2025	2026
Real GDP growth	4.1	3.6	3.0	2.7	2.5	2.5
Inflation	3.3	2.5	2.1	1.9	1.9	1.9
Primary Balance	-3.1	-2.1	-1.5	-1.2	-1.2	-1.2
Effective interest rate	0.6	0.6	0.4	0.2	0.3	0.4
Constant Primary Balance Scenario						
Real GDP growth	4.1	3.6	3.0	2.7	2.5	2.5
Inflation	3.3	2.5	2.1	1.9	1.9	1.9
Primary Balance	-3.1	-3.1	-3.1	-3.1	-3.1	-3.1
Effective interest rate	0.6	0.6	0.4	0.2	0.3	0.4

Historical Scenario	2021	2022	2023	2024	2025	2026
Real GDP growth	4.1	2.5	2.5	2.5	2.5	2.5
Inflation	3.3	2.5	2.1	1.9	1.9	1.9
Primary Balance	-3.1	-1.5	-1.5	-1.5	-1.5	-1.5
Effective interest rate	0.6	0.6	0.6	0.7	0.8	1.1
Contingent Liability Shock						
Real GDP growth	4.1	1.6	1.1	2.7	2.5	2.5
Inflation	3.3	2.0	1.6	1.9	1.9	1.9
Primary Balance	-3.1	-12.5	-1.5	-1.2	-1.2	-1.2
Effective interest rate	0.6	0.7	1.3	1.2	1.1	1.0

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.

Annex VI. Implementation of BEPS Actions/ATAD 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, members of the OECD/G20 Inclusive Framework on BEPS 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 digitalization for taxation.

  On May 31, 2019 the international community has agreed on a road map for resolving the tax challenges arising from the digitalization of the economy and committed to continue working toward a consensus-based long-term solution by the end of 2020. This working program has been adopted by 129 members of the OECD/G20 Inclusive Framework on BEPS, laying out a process for reaching a new global agreement for taxing multinational enterprises.

  In January 2019, the Inclusive Framework agreed to examine proposals in two pillars, which could form the basis for a consensus solution to the tax challenges arising from digitalization. Pillar One is focused on nexus and profit allocation and Pillar Two is focused on a global minimum tax intended to address remaining BEPS issues. In October 2020, the Inclusive Framework of the OECD published Blueprints for Pillar One and Pillar Two for public consultation with a view to a successful conclusion of the project by mid-2021. Luxembourg actively participates in all the related working groups both in the EU and in the OECD.

- **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 December 18, 2015 that has amended articles 147 and 166 of the Luxembourg Income Tax Law (LITL).

  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 involving third countries, was transposed by the law of December 20, 2019 and is applicable since 1st of January 2020.

- **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.

- **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 advanced cross-border tax rulings (to be considered as counterpart of Action 5 of the BEPS action plan). Furthermore, on April 17, 2018 Luxembourg adopted a law introducing the new IP regime, which comprises 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 are being implemented via the Multilateral Convention to Implement Tax Treaty Related Measures to Prevent Base Erosion and Profit Shifting ("Multilateral Instrument" or "MLI"). The MLI entered into force in August 2019, following the adoption by the Parliament of the ratification MLI bill in February 2019 (and the deposit of the instrument of ratification with the OECD in April 2019). The MLI covers all Luxembourg's tax treaties at the time of signature. All bilateral tax treaties of Luxembourg with countries that have ratified the MLI will be modified in due course according to the provisions accepted by both contracting states.

  The MLI provisions will apply to taxes withheld at source on amounts paid or credited where the event giving rise to such taxes occurs on or after the first day of the next calendar year that begins on or after the latest of the dates on which the MLI enters into force for the two parties to the covered tax treaty. These provisions entered into effect on January 1st, 2020.

  In 2016, Luxembourg updated its model tax treaty by the minimum standards set out in Action 6. Further adaptations have been made with Luxembourg's final position in the framework of the MLI aimed at curbing tax treaty abuse.

- **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**.

  Although Action 12 is not an OECD minimum standard, on May 25, 2018, the Economic and Financial Affairs Council (ECOFIN) formally adopted Council Directive (EU) 2018/822, introducing mandatory automatic exchange of information in the field of taxation in relation to reportable cross-border arrangements (commonly referred as "DAC6").

  Luxembourg transposed the Directive into national legislation by the law dated 25 March 2020.

- **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. The Directive was transposed into Luxembourg national legislation by the law of 20 December 2019. Several provisions of Action 14 are being implemented into Luxembourg's tax treaties via the MLI. Moreover, Luxembourg's model tax treaty contains the minimum standard recommendation on resolution of disputes in the framework of tax treaties.

- **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. Luxembourg Parliament has adopted the ratification bill of the MLI on February 14, 2019 and the instrument of ratification has been deposited with the OECD

on April 9, 2019. The MLI entered into force on August 1st, 2019 and has covered all Luxembourg's tax treaties at the moment of the signature. All bilateral tax treaties with countries that have ratified the MLI will be modified in due course according to the provisions that have been accepted by both contracting states.

The MLI provisions will become applicable for taxes withheld at source on amounts paid or credited where the event giving rise to such taxes occurs on or after the first day of the next calendar year that begins on or after the latest of the dates on which the MLI enters into force for the two parties to the covered tax treaty. In Luxembourg, these provisions entered into effect on January 1st, 2020.

Annex VII. Implementation Status—FSAP Update 2017 Recommendations

Table 1. Luxembourg: FSAP Update 2017: Key Recommendations

Recommendations	Timeframe	Status
General/Cross-Cutting		
1. Continue resource allocation toward risk-based supervision at BCL, CSSF and CAA.	NT	• The CSSF assesses the correspondence between resources and needs from a risk-based perspective on an ongoing basis. • The CAA regularly hires new staff—all will be involved in risk-based supervision. • The 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's participation in joint supervisory teams and colleges and the establishment of annual meetings covers 85 percent of bank assets. For the rest, memoranda of understandings have been concluded. • Resolution: The CSSF has bilateral contacts and participates in resolution colleges, either as group level resolution authority or resolution authority of a subsidiary. • Investment funds: The CSSF has regular bilateral meetings, including regarding the delegation of activities, with EU/third-party supervisory authorities (such as, France, Ireland, Germany, Switzerland, and other Asian jurisdictions) as well as the U.S. securities regulator. These bilateral exchanges have noticeably increased since March 2020, leading to frequent information exchanges on certain market/fund developments (e.g. in MMFs). Since 2020, the CSSF requests standardized information from regulators of the jurisdictions where Luxembourg fund managers mostly delegate portfolio management activities. In 2021, these also cover distribution activities performed by delegates abroad.
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. • CAA's board's internal rules will be formally updated by mid-2021 including a "conflict of interest" policy.
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 (ESRB/2017/6) have been addressed to the European Commission to take legislative action on liquidity risk management, including making more LMTs available in Europe, but also thereafter to provide ESMA guidance on the enhanced scope. The CSSF supports guidance on a European Level. Recommendations addressed to ESMA also cover guidance on liquidity stress testing by asset managers.

Table 1. Luxembourg: FSAP Update 2017: Key Recommendations (Continued)

		• The CSSF actively contributed to ESMA's guidelines on liquidity stress testing in UCITS and AIFs published in September 2019, which became applicable at end-September 2020, and which the CSSF has implemented into the local regulatory framework via Circular 20/752; the CSSF also actively contributed to ESMA's development of stress testing guidelines under the MMF Regulation as well as related MMF reporting guidelines. • Internally, the CSSF implemented an LST framework, and continues to improve it based on experience with ongoing CSA, ESRB work as well as experience from the COVID-19 crisis. The study on the effectiveness of LMTs in collaboration with the BIS has been delayed in 2020 to integrate the Covid-19 experience.
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 has been finalised with the final report published in December 2019. These recommendations will likely be implemented in EU rules in the context of the forthcoming AIFM/ UCITS review which has also been highlighted in ESMA's letter to the EU Commission. IOSCO discussions on the global collection/ publication of consistent measures of leverage (Recommendation 4) are being finalized, with the approach/reporting template submitted for approval to the Board. • ESRB Recommendation (Feb. 2018) requested ESMA to develop a guidance on the design, calibration and implementation of macroprudential leverage limits in the context of the AIFMD (Art. 25) for NCAs. ESMA finalized these guidelines in December 2020 with active contribution by the CSSF. The CSSF is in the process of implementing those guidelines locally.
Macroprudential Policy		
7. Expand the macroprudential policy toolkit to include borrower-based lending limits.	I	• The BBMs law was adopted by Parliament in December 2019, expanding the existing macroprudential policy toolkit with a comprehensive set of BBMs. • Based on this law, the systemic risk committee (CdRS) has acted to set LTV caps on mortgage loans and recommended to the CSSF to enact them (see CdRS Recommendation CRS/2020/005). Accordingly, the CSSF issued Regulation N°20-08 (December, 2020) introducing differentiated LTV limits for mortgage loans as follows: (1) For first-time buyers (FTBs), the LTV limit is set at 100 percent; (2) For non-FTBs acquiring their primary residence, the LTV limit is 90 percent. Some flexibility is introduced as banks may provide up to 15 percent of their annual mortgage credit portfolio loans with an LTV ranging from 90 to 100 percent; (3) For the borrowers buying a property to be rented out (buy-to-let property), the maximum LTV limit is 80 percent.

Table 1. Luxembourg: FSAP Update 2017: Key Recommendations (Continued)		
8. Continue to strengthen risk-based monitoring of the residential real estate market and bank-investment fund interlinkages, and close remaining related data gaps.	I	• Risk-based monitoring: The CSSF conducts a regular biannual liquidity stress test of fund deposits for all depositary banks. It also performs an annual assessment of maturity transformation between liabilities and intragroup assets at all banks. • Investment funds-related data gaps: Discussions with BCL/ECB are ongoing on the access to the centralized securities data base CSDB), possibly via an MoU between CSSF and BCL. • Bank-investment fund interlinkages: 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. • Monitoring of risks in the real estate market: The CSSF conducts an annual stress test of banks' exposures to residential real estate and regular analyses of the lending standards based on its bi-annual bank level survey (CSSF Circular N°18/703 (amended by CSSF circular N°20/737)., and the BCL continued to strengthen its analysis of related macro-financial risks. Both participate in SSM and ECB working groups on residential real estate. • Real estate-related data gaps: CSSF Circular N°18/703 (amended by CSSF circular N°20/737) 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 are collected on a bi-annual basis. Since June 2020, new data on residential real estate loans is available on a quarterly basis in the FINREP, including LTV distributions.
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	• Monitoring of systemic risk: The CSSF has further increased surveillance of systemic risks in the fund sector, including by continuing to close data gaps via use of multiple data sources (such as UCITS risk reporting, AIFMD reporting, EMIR, external data providers), building a risk dashboard for the sector, and conducting regular liquidity stress testing. With the onset of the COVID-19 crisis, the CSSF has installed further ad-hoc (IT based) reporting on a large sample of asset managers, allowing for a very close monitoring of liquidity, governance, market and other risks in the context of the Covid-19 developments. This monitoring is still ongoing in March 2021. The CSSF actively participates in relevant working groups both at the European and international level. • A common supervisory action has been conducted in Europe to check for compliance with the UCITS liquidity risk management rules. The CSSF has reported to ESMA at the end-2020 and the final report is currently being developed by ESMA. • The CSSF contributed to an ESRB liquidity risk exercise for funds with significant exposures to corporate debt and real estate assets (ESRB/2020/4 recommendation, as part of a set of actions to address the COVID-19 emergency from a macro prudential perspective) to assess the preparedness of these two segments to potential adverse shocks. ESMA's report to ESRB has been published (see ESMA34-39-1119).

Table 1. Luxembourg: FSAP Update 2017: Key Recommendations (Continued)

		• The CSSF conducted a dedicated survey of a sample of AIFMs on their RE investment funds (REIFs) in June/July 2020 and gathered data as well as analyzed the risks (esp. liquidity) within such funds, with a focus on the impact of the COVID-19 crisis. • Preemptive measures: The operationalization of ESRB-Recommendations (2018) is ongoing at ESMA-Level (including the finalized implementation of liquidity stress testing guidelines, while Art. 25 AIFMD is in final stages).
10. Strengthen the institutional framework to increase the willingness to act, including by enshrining in the law the *de facto* leading role of the BCL.	MT	• The authorities consider the current institutional framework to be adequate.
11. Publish the risk dashboard and a note assessing systemic risk.	MT	• The CdRS has published the substance of the macro-financial risk analysis in 2019.
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. Beginning 2019 an additional resource dedicated to reviewing existing waivers has been recruited. • 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.
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 and are also discussed with the supervisors in charge. • 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. • The CSSF was requested to participate in a survey on the targeted engagement level from Central On-Site of the SSM (specifically, for significant subsidiaries of SSM banks) to be conducted in the course of 2020.
15. Harmonize data reporting standards for loan-to-value and debt-to-income ratios.	I	• Harmonized definitions for the LTV and DSTI ratios as well additional relevant indicators are included in CSSF circular N°18/703, following the ESRB's recommendation ESRB/2016/14. The data requested under the CSSF circular is bi-annual.

Table 1. Luxembourg: FSAP Update 2017: Key Recommendations (Continued)

		• Data reporting has been further harmonized through the issuance of CSSF circular N°20/737 (18/703 amended). The first data under the new reporting requirements was received in April 2019, covering the period from the beginning of July to end-December 2018. The results of data collection are used to assess potential risks linked to the real estate market.
Investment Fund Regulation and Supervision		
16. Strengthen guidance on substance in the context of delegated activities and actively engage with regulators in jurisdictions where such activities are prominent.	NT	• The CSSF issued specific guidance on substance requirements in the context of delegated activities in CSSF Circular 18/698. • The CSSF has regular bilateral meetings, including regarding the delegation of activities, with EU/third-party supervisory authorities (such as, France, Ireland, Germany, Switzerland, and Asian jurisdictions) as well as the U.S. securities regulator. • The CSSF initiated standardized information requests to regulators of jurisdictions where Luxembourg fund managers mostly delegate collective portfolio management activities.
17. Issue guidance on the holdings of directorships of funds and their managers.	NT	• The CSSF has issued specific guidance on the holdings of directorships of funds and their managers in CSSF Circular 18/698 (published on August 23, 2018).
18. Assess whether safeguards to ensure depositary 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. The CSSF concluded that it is neither necessary nor appropriate to implement depositary independence requirements beyond the requirements outlined in the EU Directive 2014/91/EU relating to undertakings for collective investment in transferable securities as regards depositary functions, remuneration policies and sanctions (the UCITS V Directive).
Insurance Regulation and Supervision		
19. Implement revised early warning system under Solvency II regime.	NT	• The CAA has designed a risk-based early warning system based on a risk appetite level chosen by insurance and reinsurance undertakings. The early warning system is based on the risk appetite which every insurance and reinsurance undertaking must define internally (as a part of its Own Risk and Solvency Assessment (ORSA) process).
Contingency Planning and Financial Safety Nets		
20. Develop policies on intragroup exposures and the transfer of custodian functions in recovery and resolution.	I	• Recovery: – 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, the transfer may be time consuming due to legal and contractual constraints, and the volume of assets to be transferred. Major custodian banks have qualified their custodian functions as critical for the local economy within their recovery plans; hence, their continuity should be ensured in recovery (and resolution).

Table 1. Luxembourg: FSAP Update 2017: Key Recommendations (Continued)

		– In terms of recovery planning and the potential transfer of the custodian function, the CSSF verifies whether the list of recovery options includes the option of selling/transferring the custodian functions to another institution. The impact and credibility of each recovery option are assessed pursuant to provisions set forth in the EBA Single Supervisory Handbook's module on the supervisory assessment of recovery plans. – The assessment of the recovery plans includes an assessment of the overall credibility, completeness and quality including both the intra-group exposures and the transfer of the custodian function, if applicable. • Resolution: – In the absence of an SRB formal policy regarding depositary banks—particularly for collective investment schemes, the CSSF has not put in place its own policy regarding the use of transfer tools for the purpose of transferring the depositary function. Nonetheless, the SRB has elaborated a set of guidance notes, including on the sale of business tool, and a resolution planning manual requiring IRTs to assess whether the preconditions for the effective use of a transfer strategy, e.g. the sale of business tool can be met. – However, resolution plans have been drafted and approved by the CSSF, both for banks with a specialized business model and for banks providing the custodian function next to other functions (such as private banks), covering all LSIs with the exception of a few ones (recent establishment or change of status). The drafting of these plans and notably the identification of the preferred resolution strategy, including any assessment of the use of transfer tools, other resolution tools, or winding up under normal insolvency proceedings, has been undertaken on a case-by-case basis taking into consideration notably the volume of net assets from CIS, any potential contagion effects (e.g. funds of funds). Consistency throughout resolution plans has nevertheless been ensured. In line with legal and operational requirements, the draft plans have been submitted to the SRB in order to enable the latter to ensure its oversight function. – For intragroup exposures, the new point (h) of article 44(2) BRRD (as added by article 1, point (15)(a)(ii) of Directive (EU) 2019/879 (BRRD2)) provides the mandatory exclusion from bail-in of certain intragroup exposures, i.e. liabilities to institutions that are part of the same resolution group without being themselves resolution entities. This provision was transposed into national law in April 2021.
Financial Market Infrastructure Oversight		
21. Reduce CBL's exposure to commercial banks vis-à-vis CSDs and central banks.	NT	• CBL's dependencies on commercial banks have been reduced for most of the relevant currencies (i.e. EUR, GBP, USD) by having multiple CCBs, at least three, to reduce the concentration risk on a particular CCB. Additional CCBs will still have to be appointed for CHF and JPY. • In addition to this, Clearstream has defined contingency measures aiming at executing switchover from an appointed CCB to another defined CCB, in case of unavailability of services of the first one.

Table 1. Luxembourg: FSAP Update 2017: Key Recommendations (Continued)		
		Robust testing and communication plans have already been defined for the USD currency. Similar contingency measures are planned to be implemented and tested for the other major currencies during the course of the coming year in order to ensure that in case of unavailability of services, CBL can switchover all payments flows of a CCB to another CCB within Clearstream RTO of 2 hours.
22. Require establishment of third data center and conduct a full failover test.	NT	• Establishment of a third data centre: CBL has analysed the likelihood of an unavailability of both data centres, as extremely low. CBL is currently in the process to re-evaluate its data-centre strategy. No final decisions have been made yet, and a proposal (including the proposed way forward as regards the third data centre) will be made to the CSSF in the coming months. • Conduct of a full failover test: CBL has successfully performed a failover test on 29 January 2019, which covered all critical
		Clearstream functions based in Luxembourg. Full failover tests are conducted every year as part of the Business Continuity testing framework, via simulating the loss of CBL primary facilities in Luxembourg and/or its staff according to a yearly test plan. Test parameters and simulated scenarios change from year to year to allow validation of different dimensions of CBL recovery ability (e.g. duration of the test, announced/unannounced, full/scope or reduced scope).
AML/CFT		
23. Ensure the 2016/2017 national risk assessment focus adequately on TCSP risks.	I	• Luxembourg finalized its first National Risk Assessment (NRA) in September 2018 based on data available as end 2017. The NRA covered, among others, TCSPs, and analyzed both the inherent risk as well as mitigating actions. From an AML/CFT perspective, risks inherent in TCSPs' activities were assessed as "High". • The update of the current NRA, covering 2018–19, adopted in September 2020 and was published in 2020, confirms the inherent risk linked to TCSP activity by financial and non-financial sectors as "High". In addition, the NRA assesses the specific topic of "legal entities and arrangements" and the inherent risk allocated to this category is "High". As a follow-up, the national coordination committee decided to perform a vertical (more granular) risk assessment on this subject. This is currently being drafted. • Following up on the 2018 NRA recommendations, the 2004 AML/CFT Law has been adapted in 2020 and requires every professional providing TCSP activity to register with their respective authority/SRB, thereby improving supervision of these professionals from a national point of view. • The CSSF is supervising the professionals offering TCSP services in the financial sector which fall under its remit. Considering the risk exposure highlighted in the NRAs, CSSF has undertaken and published a sub-sectoral risk assessment in July 2020 to raise awareness and to provide guidance/supervisory expectations to professionals supervised by it and performing TCSP activity. CSSF AML/CFT questionnaires that are submitted annually by professionals include up-dated information on inherent risks and mitigation measures linked to TCSP activity which is taken into account for the entity level risk assessment.

Table 1. Luxembourg: FSAP Update 2017: Key Recommendations (Concluded)

		• More broadly, the legal framework and institutional set-up have been regularly updated in line with higher international standards, including the latest modifications to the AML/CFT legal framework. • As a result, all Luxembourg TCSPs will need a new obligatory authorization/registration process for their activity with the relevant authority or SRB in the country (for example, notaries or lawyers) in charge of the supervision for AML/CFT purposes. • More broadly, the legal framework and institutional set-up have been regularly upgraded in line with higher international standards, including the draft bill of law 7467, fully transposing the AMLD V into the 2004 Law.
24. Agree on the roles and responsibilities in dealing with a system-wide crisis.	NT	• This recommendation is being considered by the Ministry of Finance.
25. Finalize the operational modalities of emergency liquidity assistance provision.	MT	• 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 29, 2021

STAFF REPORT FOR THE 2021 ARTICLE IV CONSULTATION—INFORMATIONAL ANNEX

Prepared By | European Department

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FUND RELATIONS

(As of March 31, 2021)

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	1,020.26	77.19
Reserve Tranche Position	301.62	22.82
Lending to the Fund		
New Arrangements to Borrow	14.09	

SDR Department:

	SDR million	Percent of allocation
Net cumulative allocation	246.62	100.00
Holdings	250.64	101.63

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				
	2021	2022	2023	2024	2025
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 May 08, 2019. The associated Executive Board assessment is available at https://www.imf.org/en/News/Articles/2019/05/10/pr19158-luxembourg-imf-executive-board-concludes-2019-article-iv-consultation and the staff report (IMF Country Report No. 19/130) at https://www.imf.org/~/media/Files/Publications/CR/2019/1LUXEA2019001.ashx. Luxembourg is on the standard 12-month consultation cycle.

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

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

STATISTICAL ISSUES

A. Assessment of Data Adequacy for Surveillance

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

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

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

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

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

B. Data Standards and Quality

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

No data ROSC is available.

Luxembourg: Table of Common Indicators Required for Surveillance					
(As of March 31, 2021)	Date of Latest Observation	Date Received	Frequency of Data[7]	Frequency of Reporting[7]	Frequency of Publication[7]
Exchange Rates	03/31/21	03/31/21	D	D	D
International Reserve Assets and Reserve Liabilities of the Monetary Authorities[1]	02/28/21	02/28/21	M	M	M
Reserve/Base Money	02/28/21	02/28/21	M	M	M
Broad Money	02/28/21	02/28/21	M	M	M
Central Bank Balance Sheet	02/28/21	02/28/21	M	M	M
Consolidated Balance Sheet of the Banking System	02/28/21	02/28/21	M	M	M
Interest Rates[2]	02/28/21	02/28/21	D	D	D
Consumer Price Index	M3 2021	4/13/21	M	M	M
Revenue, Expenditure, Balance and Composition of Financing[3]—General Government[4]	2020	03/16/21	A	A	A
Revenue, Expenditure, Balance and Composition of Financing[3]—Central Government	2020:Q4	03/16/21	Q	Q	Q
Stocks of Central Government and Central Government-Guaranteed Debt[5]	2021	03/11/21	A	A	A
External Current Account Balance	2020:Q4	03/16/21	Q	Q	Q
Exports and Imports of Goods	12/31/20	03/16/21	M	M	M
GDP/GNP	2020:Q4	03/16/21	Q	Q	Q
Gross External Debt	2020:Q4	03/16/21	Q	Q	Q
International Investment Position[6]	2020:Q4	03/16/21	Q	Q	Q

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

Statement by Mr. Dresse and Mr. Scholer on Luxembourg
May 14, 2021

The Luxembourg authorities thank Mr. Stavrev and his team for constructive discussions and a successful 2021 Article IV consultation, which put the impact of the COVID-19 pandemic on the Luxembourg economy at the center of its mission. They broadly agree with staff's appraisal and will carefully consider their advice, as they have in previous years.

Luxembourg has weathered the COVID-19 crisis better than initially foreseen. The authorities' rapid, comprehensive, and targeted crisis response, unlocking a total of 18.6% of GDP, has decisively contributed to the containment of the human, economic and social toll of the crisis. Thanks to the early implementation of large-scale testing and its low share of contact-intensive sectors, the economy quickly adapted to teleworking. The first policy package – consisting inter alia of an extended short-time work scheme, household support measures, as well as a wide range of direct aid schemes, loan moratoria, and tax/social security deferrals – succeeded at mitigating the negative consequences of the crisis.

Following this first package, the authorities implemented a second set of measures aimed at kickstarting a green and digital recovery. Throughout the crisis response, policy measures evolved in line with health developments to provide targeted and effective support to both businesses and citizens. Going forward, the authorities stand ready to provide continued support, if and where necessary, and to use this crisis as an opportunity to advance the green and digital transition.

Macroeconomic outlook

After a comparatively mild economic downturn in 2020 (-1.3%), the authorities expect a V-shaped recovery, underpinned by sound economic fundamentals. The economy is thus forecast to exceed pre-crisis output levels in 2021 (+4.0%), supported by a recovery in domestic demand due to a vaccination campaign that is picking up speed. Over the medium-term, output is forecast to remain slightly below pre-crisis trends. The authorities broadly agree with staff's assessment of risks, which are mostly external, dependent on crisis-related developments, and subject to a high degree of uncertainty. They further welcome staff's judgment that the government's support measures are suitable and efficient. Hence, they are encouraged to continue on the path to recovery on which they have embarked.

The labor market is set to recover at a slightly slower, albeit promising, pace. Employment, which continued to grow during the crisis months, is projected to increase at an average annual rate of about 2% over the medium-term. While unemployment has returned to pre-crisis levels in early 2021, the authorities continue to closely monitor potential scarring effects that may materialize with a lag.

Fiscal policy

The fiscal situation reflects the improved economic outlook. Thanks to years of prudent financial management creating comfortable fiscal buffers, Luxembourg was and continues to be in a position to implement a sizable and multi-pronged response to the exogenous COVID-19 shock. While the general government deficit is forecast to reach an unprecedented -4.1% of GDP in 2020, it is only half as deep as anticipated a year ago and is expected to dissipate gradually before returning to a balanced position by 2024. Against the backdrop of continued uncertainty, and in line with IMF advice, the authorities stand ready to deploy additional targeted support measures if needed, including to avoid potential cliff-edge effects.

To foster a lasting green and digital recovery, Luxembourg has maintained public investment at around 4.0% of GDP in recent years and will continue to prioritize public investments, including by making full and swift use of *Next Generation EU* funds. Luxembourg's Recovery and Resilience Plan – which encompasses a coherent package of reform and investment projects with an envelope of EUR 183 million – illustrates the government's ambitions in this regard. With 61% of investments supporting a green transition and 32% targeting the digital transformation, the plan exceeds the European Commission's targets of 37% and 20%, respectively.

Despite its ambitious investment policy and the comprehensive COVID-19 policy response, Luxembourg has experienced the smallest increase in public debt in the EU in 2020. The latest projections point to comparatively low public debt levels in the medium-term (27.6% by 2025), thereby continuously respecting the government's self-imposed debt-to-GDP ceiling of 30%**.** In addition to the country's AAA rating granted by all major rating agencies, negative yields on recent debt issuances further underscore strong investor confidence in the authorities' policy stance. In line with their commitment to sustainable public finances, the authorities fully share staff's advice to preserve comfortable buffers once the recovery firms.

Tax policy

As noted in Annex VI of the staff report, Luxembourg has taken several steps to fully align its tax framework with international and EU standards (including the BEPS Action Plan and EU Anti-Tax Avoidance Directives) and is assessed to be compliant by both the OECD and the European Commission. The authorities continue to constructively engage in all international fora and stand ready to address potential revenue risks, should they materialize in the future. They are convinced that a global level playing field will bring to the fore Luxembourg's many comparative advantages, such as its well-integrated financial ecosystem, its skilled multilingual workforce, and its political and social stability.

Financial sector

Luxembourg's financial sector has proven resilient to the COVID-19 crisis, thanks to solid capital and liquidity positions, domestic and global policy support, as well as effective

supervisory action. CET1 ratios have remained far above regulatory requirements, while the share of NPLs remains low, both in absolute levels and compared to peers. Private sector loan moratoria, which peaked at about EUR 3.6 billion in June 2020, as well as a public guarantee loan scheme worth EUR 2.5 billion, significantly contributed to mitigating the impact of the crisis on Luxembourg banks and, as staff notes, prevented a much higher proportion of illiquid firms.

While investment funds experienced the effects of global volatility in March 2020, the sector has been able to recoup losses and end the year with positive net inflows, supported by active supervisory guidance. Acknowledging potential vulnerabilities in the sector, the authorities are continuously monitoring developments and implementing measures to further improve the oversight framework. The design of a macroprudential framework for the investment fund sector should be coordinated at the international level to ensure the application of uniform standards.

Looking ahead, domestically-oriented banks are expected to remain resilient and financial stability risks are anticipated to remain manageable, even under severe stress test scenarios. While overall profitability has declined due to loan loss provisioning, low-for-long interest rates, and costs of regulatory compliance, the authorities agree with staff that the ability of domestically-oriented banks to extend credit to the real economy and thereby support the recovery will remain strong. Potential risks arising from household indebtedness are mitigated by recently introduced LTV limits.

Furthermore, the authorities have taken many steps to further strengthen the AML/CFT framework and fully align it with international best practices, including FATF recommendations. Luxembourg fully transposed the 5th EU AML Directive in 2020, updated its National Risk Assessment, and has gone beyond EU requirements by establishing an open and freely accessible Ultimate Beneficial Owners Registry.

The authorities remain committed to implement robust financial policies, in line with 2017 FSAP recommendations, and to support the sector's continued development. This includes continuous adjustments of the national regulatory and supervisory framework to evolving international standards and best practices. Combined with forward-looking diversification efforts pre-dating the crisis in favor of sustainable finance and Fintech, Luxembourg is thus well-positioned to remain a leading financial center.

Structural policies

The broadened COVID-19 short-time work scheme has limited job losses, especially in contact-intensive sectors. While potential long-term effects may materialize going forward, they are closely monitored and addressed through investments in the skills of tomorrow. Based on pre-crisis success in reducing unemployment through targeted active labor market policies, the authorities focus on tackling skills mismatches through re- and upskilling. For example, the *Future Skills* initiative proactively encourages jobseekers to develop cross-disciplinary and ever more important digital skills.

Rising real estate prices are a reflection of current market dynamics, characterized by insufficient supply as well as a low-interest rate environment. Due to structural features of Luxembourg's housing market, supply has been unable to meet increasing demand resulting from dynamic economic and population growth. As acknowledged by staff, the government is seeking to alleviate pressures through the *Pacte Logement 2.0*, large-scale affordable housing projects, and targeted tax measures.

Green and digital transition

Ever since 2013, the government has put the twin transition at the heart of its economic policy agenda of qualitative growth, as reflected in its national Resilience and Recovery Plan. It has set itself ambitious emission reduction targets of 55% compared to 2005 by 2030, has committed to seek energy efficiency gains of 40%, and raised the share of renewable energy sources to 23%. To that end, the authorities have adopted a comprehensive set of policy measures. Public investment in sustainable infrastructure, especially the rail and tramway network, has been at historic highs for years. Since 2020, Luxembourg is the first country to have made public transport free-of-charge nationwide. The switch to electric vehicles is encouraged through a mix of tax incentives and subsidies, including a new carbon tax.

Leveraging its position as a global financial center, the country has made considerable strides to become an international leader in sustainable finance, as noted by staff. The establishment of the world's first stock exchange platform exclusively dedicated to green securities, which today lists half of the world's green bonds, was an important step. In 2020, the government has underlined its commitment by becoming the first European and first AAA-rated country to launch a sustainability bond framework that is fully in line with the EU's taxonomy and by issuing a sustainability bond of 1.5bn EUR under the framework.

Luxembourg has also consistently pursued its ambition to become a digital nation. Measures include inter alia: (i) developing high-quality digital infrastructure; (ii) fostering digital skills of pupils and jobseekers; (iii) digitalizing public services; and (iv) spearheading European initiatives, such as *EuroHPC*. In the financial sector, the *Luxembourg House for Financial Technology* has created a digital innovation hub to develop cutting-edge solutions in many different areas, such as payments and regulatory technology.