

Grand Duchy of Luxembourg Rating Report



Credit strengths

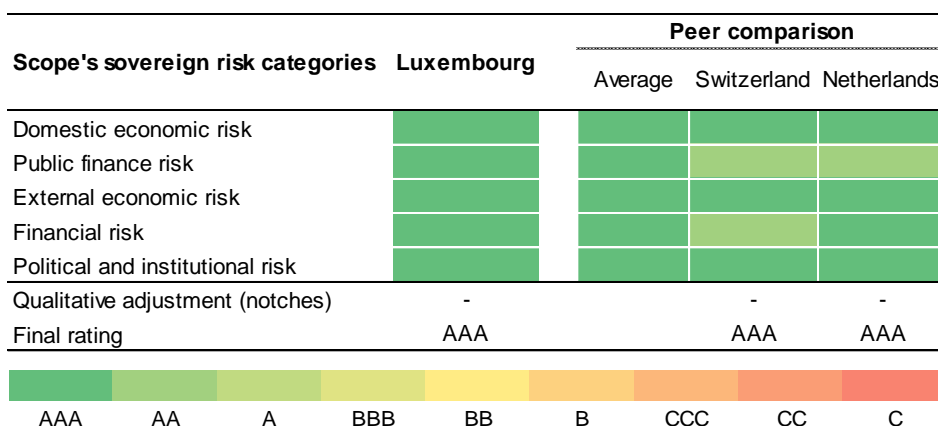
- Wealthy economy; robust growth
- Sound public finances
- Euro area membership
- Strong external position

Credit weaknesses

- Adverse demographics
- Strong reliance on financial sector
- Housing market imbalances

Rating rationale and Outlook: Luxembourg's AAA rating reflects its wealthy economy and robust economic growth, sound public finances, euro area membership and effective institutional framework as well as its strong external position. However, unfavourable demographics, exposure to developments in the external environment, and imbalances in the housing market remain challenges. The Stable Outlook reflects our assessment that the risks faced by Luxembourg are balanced.

Figure 1: Sovereign scorecard results



Source: Scope Ratings GmbH

Note: The comparison is based on Scope's Core Variable Scorecard (CVS), which is determined by the relative rankings of key sovereign credit fundamentals. The CVS peer group average is shown together with two selected countries chosen from the entire CVS peer group. The CVS rating can be adjusted by up to three notches depending on the size of relative credit strengths or weaknesses.

Positive rating-change drivers

- Not applicable

Negative rating-change drivers

- Changes in international tax environment adversely impacting growth and fiscal outlook
- Build-up of vulnerabilities in housing market reaching unsustainable level

Ratings and Outlook

Foreign currency

Long-term issuer rating	AAA/Stable
Senior unsecured debt	AAA/Stable
Short-term issuer rating	S-1+/Stable

Local currency

Long-term issuer rating	AAA/Stable
Senior unsecured debt	AAA/Stable
Short-term issuer rating	S-1+/Stable

Lead analysts

Levon Kameryan
+49 69 6677389-21
l.kameryan@scoperatings.com

Team leader

Dr Giacomo Barisone
+49 69 6677389-22
g.barisone@scoperatings.com

Scope Ratings GmbH

Neue Mainzer Straße 66-68
60311 Frankfurt am Main
Phone +49 69 6677389 0

Headquarters

Lennéstraße 5
10785 Berlin
Phone +49 30 27891 0
Fax +49 30 27891 100
info@scoperatings.com
www.scoperatings.com

Bloomberg: SCOP

**Strong economic growth
compared to euro area peers****Domestic economic risk**

Luxembourg benefits from an exceptionally wealthy economy, with GDP per capita estimated at around EUR 96,000 in 2018, the highest among the sovereigns we rate, and high labour productivity¹, which exceeds the euro area average by more than 50%.

Over the past five years Luxembourg's economy has been growing considerably faster than the euro area average (3.5% compared to 1.5% for the euro area in 2013-17) supported by strong trade surpluses in the services balance, reflecting Luxembourg's importance as a global financial centre. In line with the IMF's forecast, we expect growth to remain strong at 4% in 2018 and 3.5% in 2019 due to a sturdy performance in both domestic and external demand, before converging to its medium-term potential of 3%. Private consumption will benefit from the favourable labour market trends, the 2017 tax reform aimed at increasing the progressivity of personal income tax, and ongoing wage indexation. In addition, steady growth in the financial sector and moderate euro area economic growth will ensure the current account balance remains at around 5% of GDP.

While job creation has been strong across all industries in the three quarters of 2018, with unemployment rate falling to 5.5% in September, driven by favourable economic trends and government policies, important rigidities remain in the labour market as captured by low activity rates among workers aged above 50 (42% at end-2017), partly due to financial disincentives to work. The somewhat elevated youth unemployment rate (13.5% in September 2018 for those aged under 25) can be explained by the high enrolment ratio of this age group in education or training.

After more than two years of subdued consumer price growth owing to weak wage growth and oil prices, inflation rose to 2.1% in 2017, reflecting higher commodity prices and the wage indexation in 2017. Going forward, we expect the robust oil price outlook and the continued indexation of wages to be partly offset by one-off effects, including child- and healthcare subsidies, driving inflation to its target of below but close to 2% over 2018-19.

**Heavy reliance on the financial
sector; exposure to external
developments**

The main risks to the medium-term growth outlook stem from the financial sector's exposure to developments in the external environment. The sector generates around 27% of gross value-added in the economy and the direct tax contribution of the funds industry amounts to about 2% of GDP². Against this backdrop, international tax transparency initiatives, including the European anti-tax avoidance agenda and the US tax reform, which incentivise the repatriation of funds held overseas, could affect growth and fiscal revenues. This risk, however, is mitigated by proactive government policies and Luxembourg's favourable business environment. In addition, while Brexit adds to medium-term uncertainties given the UK's important role in the trade of financial services (the UK share of assets under management is around 18%), it could, on the other hand, also result in financial institutions moving business to Luxembourg.

Luxembourg's AAA rating is supported by the country's euro area membership, affording the advantages of a large common market, a strong reserve currency, the independent European Central Bank (ECB) effectively acting as a lender of last resort, and an economic governance and macroprudential framework sustaining credible macroeconomic policies.

¹ Labour productivity per hour worked is calculated as real output per unit of labour input (measured by the total number of hours worked). Measuring labour productivity per hour worked better reflects productivity developments in the economy than labour productivity per person employed, as it eliminates differences in the full-time/part-time composition of the workforce across countries and year: European Commission, Eurostat.

² IMF Article IV, Luxembourg 2018 April.

Improved fiscal framework
supporting budgetary performance

Favourable debt structure; highly
liquid capital markets

Strong debt dynamics, but long-
term challenges remain

Public finance risk

Luxembourg has adequate fiscal space thanks to balanced public finances and a low debt burden. This position is further bolstered by favourable financing costs.

Moderate general government deficits³ at the beginning of the European debt crisis (0.7% for 2009-10) as a result of large deficits in the central government's budget have now been largely absorbed, supported by the authorities' fiscal consolidation. In addition, the government has strengthened the fiscal framework, complying with the medium-term objective of the Stability and Growth Pact in its budgetary strategy and keeping debt as a share of GDP below 30%. As a result, during 2011-16 the budgetary surplus averaged 1% of GDP.

Positive fiscal performance continued into 2017, with the general government surplus at 1.5% of GDP, a slight decline from 2016, driven by a combination of increased compensation of employees following public-wage indexation and social benefits. Going forward, we expect higher spending for infrastructure and the tax reform to reduce the headline surplus to 1% of GDP over 2018-19, partly offset by a rise in revenues led by a strong economic performance.

Luxembourg benefits from highly liquid capital markets, and a favourable debt profile, reflected in low refinancing risks with the share of debt requiring refinancing in the next 12 months having stood at 3.7% at end-2017. Securities accounted for 65% of the total debt stock, around an 8pp increase from 2016. Given the low interest rate environment, the average yield of 10-year government bonds stood at 0.6% for the three quarters of 2018, almost unchanged when compared to 2017. Luxembourg's debt is issued entirely in euro, which eliminates exchange-rate risks.

Debt sustainability analysis

We view positively Luxembourg's medium-term public debt dynamics, owing to the relative robustness across several scenarios over the projection horizon to 2023, including a stressed scenario which incorporates a combined growth, interest-rate, primary-balance and foreign-currency shock.

Luxembourg's debt amounted to around 23% of GDP at end-2017, one of the lowest in the euro area. Debt sustainability risks are further mitigated by sizable government assets exceeding liabilities, including pension fund reserves, about 33% of GDP, and government shares in companies worth around 10% of GDP. Luxembourg's intergenerational sovereign fund, established in 2015, holds assets equivalent to 0.4% of GDP as of end-April 2018.

Despite the primary surplus in 2017, the debt-to-GDP ratio increased by around 2 pp in the same year. This is because the surplus in the social security fund is earmarked for the pension fund, while the deficit in the central government budget is financed through new debt issuance.

Our baseline scenario, in line with the IMF forecast, foresees a moderate decline in the debt-to-GDP ratio over 2018-23 to around 20%. The contribution of strong GDP growth and low/negative financing costs will be partly offset by moderate primary deficits.

However, long-term challenges remain. The European Commission estimates that Luxembourg's old-age dependency ratio, despite being the lowest in the EU at 20.6% in 2016, will increase considerably faster than the EU average of 22 pp (by circa 28 pp from 2016 to 2070). As a result, the rise in both pension and healthcare expenditure until 2070

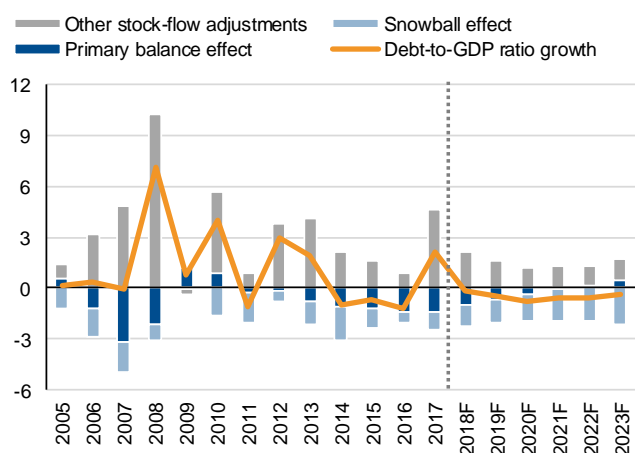
³ The general government budget is the sum of the budgets of central and local governments and the social security fund.

is projected to be among the highest in the EU, by respectively 8.9 pp to 17.9% of GDP and 1.4 pp to 5.2% of GDP.

In addition, measured by net present value of future pension and healthcare obligation changes, Luxembourg ranks fourth among the 30 advanced economies, with a ratio of 128% of GDP, above that of the Netherlands (109%), Belgium (95%) and Germany (88%), but below the USA (154%) and Switzerland (132%)⁴.

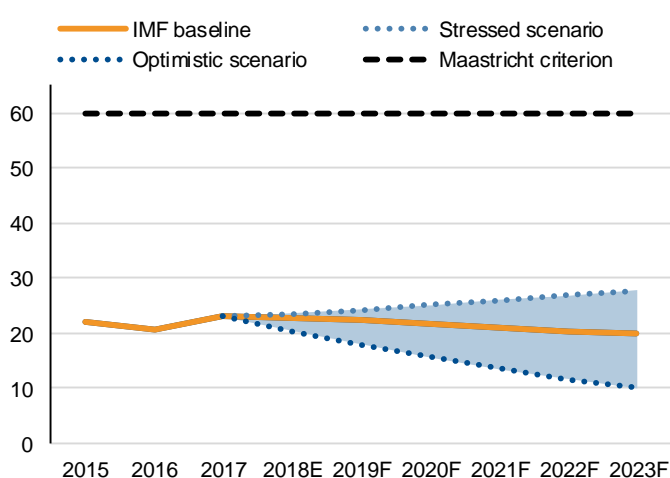
Against this backdrop, we note that despite the pension reform adopted in 2012, the low activity rate of older people and their early exit from the labour market improved only marginally and pension fund reserves will maintain the viability of the system until 2043⁵.

Figure 2: Contribution to gov't debt changes, % of GDP



Source: IMF, Scope Ratings GmbH

Figure 3: General government debt, % of GDP



Source: IMF, Scope Ratings GmbH

Scenario	Period	Real GDP growth (%)	Primary bal. (% of GDP)	Real eff. int. rate (%)	Debt, end period (% of GDP)
History	2013-17	3.5	1.2	-1.9	23.0
IMF baseline		3.3	0.2	-4.3	20.0
Optimistic scenario	2018-23	3.8	0.5	-5.3	10.0
Stressed scenario		1.8	-1.3	0.1	27.8

External economic risk

Sound external position supported by the large financial sector

Luxembourg's rating is supported by favourable external surpluses which reflect its key role in global capital flows, underpinned by its favourable business environment, effective institutional framework and economic stability.

The large financial sector has consistently generated strong surpluses in services trade, at 35% of GDP on average in 2010-17, in part counterbalanced by net outflows of primary income, reflecting the large number of foreign companies and employees in the country. As a result, Luxembourg has posted sizeable current account surpluses relative to GDP, albeit at half of pre-financial crisis levels (5.1% in 2014-17 compared to 9.9% in 2000-07). Over the medium-term we expect a current account balance at around 5% of GDP, mostly reflecting the large sustained surpluses in financial and business services.

⁴ IMF Fiscal Monitor, October 2018, calculations Scope Ratings GmbH.

⁵ Ministère de la Sécurité sociale, Rapport du groupe de travail pensions – 2018

Compared to end-2016 Luxembourg's net international investment position remained almost unchanged at a high 47% of GDP at end-2017. This results from large net balances of direct and other investment assets and portfolio investment liabilities, each at almost 20 times the country's GDP.

Financial stability risk

The financial sector remains the central pillar of Luxembourg's economy. Net assets under management in Luxembourg funds amounted to EUR 4.28trn as of July 2018, the second largest in the world after the US. Growth in the fund industry has been steady, averaging 10% since 2001. Liquidity provided by the ECB's accommodative monetary policy has also fuelled the financial sector's expansion in recent years.

While Luxembourg's heavy economic reliance on the financial sector remains a major long-term challenge, the risks are largely contained. Credit quality is high, reflected in the continuously low levels of non-performing loans (below 1% of total loans). Overall, bank profitability has remained stable during the low interest rate environment, slightly above the euro area average.

On the other hand, rising household debt, at 65% of GDP in Q1 2018, and strong growth in house prices, 5.7% each year since 2015, are sources of financial imbalances. Mortgages account for more than 80% of total household debt. The Central Bank of Luxembourg estimates the average overvaluation in house prices between Q1 2012 and Q1 2017 at 6.85%⁶. Rising real estate prices are due to a mismatch in housing supply and demand. Demand is driven by demographics, tax incentives and favourable lending conditions; supply by structural constraints on housing availability.

On a positive note, the government has submitted to parliament a bill on regulatory measures aimed at strengthening the macroprudential framework by capping several ratios (loan to value, loan to income, debt to income, and debt-service to income) and a loan's initial maturity. In addition, risks are mitigated by households' sizable net asset position, which amounted to 105% of GDP at end-2017.

Institutional and political risk

Luxembourg is a parliamentary democracy in the form of a constitutional monarchy. The political system is characterised by strong democratic institutions and stability and broad consensus on key issues, including European integration. Legislative power is implemented by the Chamber of Deputies, made up of 60 members elected for a five-year term. Executive power is officially held by the Grand Duke, according to the constitution; in practice, however, this is exercised by the government, led by the prime minister. In the general elections on 14 October 2018, the current coalition government comprising the centre-right Democratic Party, the centre-left Socialist Workers' Party, and the Greens together won 31 seats, one seat less compared to the outgoing parliament. The centre-right Christian Social Party (CSV) remained the single largest party in the parliament with 21 seats, despite losing 2 seats. However, even in case the government were to change, we do not expect a shift in policy priorities.

The new government will focus on enhancing Luxembourg's importance as a global financial centre, implementing international tax transparency initiatives, committing to prudent fiscal policies, improving demographics and labour market outcomes, and strengthening financial supervision and regulation.

Steady growth in the financial sector driving economic growth

Imbalances in the housing market

Effective institutional framework underpinned by political stability

⁶ Central Bank of Luxembourg, Sara Ferreira Filipe, Housing prices and mortgage credit in Luxembourg, February 2018.

Methodology

The methodology applicable for this rating and/or rating outlook 'Public Finance Sovereign Ratings' is available on www.scooperatings.com.

Historical default rates of the entities rated by Scope Ratings can be viewed in the rating performance report at <https://www.scooperatings.com/#governance-and-policies/regulatory-ESMA>. Please also refer to the central platform (CEREP) of the European Securities and Markets Authority (ESMA): <http://cerrep.esma.europa.eu/cerrep-web/statistics/defaults.xhtml>.

A comprehensive clarification of Scope's definition of default as well as definitions of rating notations can be found in Scope's public credit rating methodologies on www.scooperatings.com.

The rating outlook indicates the most likely direction of the rating if the rating were to change within the next 12 to 18 months.

Rating history

	Rating action	Outlook
19 October 2018	First-time rating: AAA	Stable

Source: Scope Ratings GmbH

Outlook and rating-change drivers

The Stable Outlook reflects our assessment that the risks faced by Luxembourg are balanced.

The Outlook could be changed if: i) the changing international tax environment adversely impacts growth and fiscal revenues; and/or ii) a build-up of vulnerabilities in the housing market becomes unsustainable, weighing on financial stability.

Foreign- versus local-currency ratings

Luxembourg's debt is issued in local currency. Because of the country's history of openness to trade and capital flows, and the euro's reserve-currency status, we see no evidence that Luxembourg would differentiate between any contractual debt obligations based on currency denomination.

Rating committee

The main points discussed were: i) Luxembourg's growth outlook; ii) recent developments in the financial sector and its exposure to changes in the international tax environment; iii) debt dynamics and sustainability; iv) current account performance; v) the housing market; vi) the financial sector's macro-prudential framework; vii) recent political developments; and viii) peer considerations.

I. Appendix: Environmental, social and governance factors

We consider sustainability issues (ESG) during the rating process, as reflected in our sovereign methodology. Governance-related factors are explicitly captured in our assessment of 'Institutional and Political Risk', for which Luxembourg has one of the highest scores as measured by the World Bank's Worldwide Governance Indicators.

The socially related factors captured in our Core Variable Scorecard (CVS) are Luxembourg's very high per capita income, somewhat elevated unemployment rate, and low, albeit increasing, old-age dependency ratio. Furthermore, income inequality as calculated by the Gini coefficient is moderately lower than the average for OECD economies.

According to the global Green Finance Index⁷, which measures sustainable development in the world's financial systems, Luxembourg ranks among the top international financial centres. The Luxembourg Stock Exchange (LuxSE) listed the world's first green bond in 2007, issued by the European Investment Bank. Furthermore, in 2016 Luxembourg launched the Luxembourg Green Exchange (LGX), the first worldwide platform to list sustainable financial instruments. Currently it is the world's leading exchange of its kind, listing over USD 100bn bonds. More than 50% of the world's green bonds are listed in Luxembourg. In addition, Luxembourg accounts for around 40% of all assets managed by European responsible-investment funds. The LuxSE has been a partner in the Climate Bonds Initiative since 2016, promoting a green bond issuance target of USD 1trn by 2020.

In addition to the CVS, we account for strengths and weaknesses in social and environmental areas via our Quantitative Scorecard (QS) to evaluate Luxembourg's 'growth potential', 'macro-economic stability and sustainability' and 'market access and funding sources'.

⁷ <https://www.longfinance.net/publications/long-finance-reports/global-green-finance-index-2/>

II. Appendix: CVS and QS results

Scope's Core Variable Scorecard (CVS), which is based on the relative rankings of key sovereign credit fundamentals, signals an indicative 'AAA' ('aaa') rating range for Luxembourg. This indicative rating range can be adjusted by up to three notches on the Qualitative Scorecard (QS) depending on the size of relative credit strengths or weaknesses versus peers based on analysts' qualitative findings. For Luxembourg, the QS signalled relative credit strengths for the following analytical categories: i) growth potential of the economy; ii) market access and funding sources; and iii) banking-sector oversight and governance. Relative credit weaknesses were signalled for: i) macro-economic stability and sustainability; ii) vulnerability to short-term external shocks; and iii) financial imbalances and financial fragility. The combined relative credit strengths and weaknesses generate no adjustment and signal a sovereign rating of AAA for Luxembourg. A rating committee has discussed and confirmed these results.

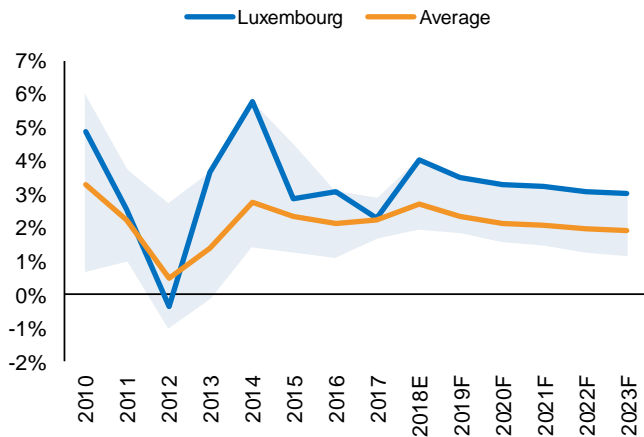
CVS		QS					
Rating indicator	Category weight	<i>Maximum adjustment = 3 notches</i>					
		+2 notch	+1 notch	0 notch	-1 notch	-2 notch	
Domestic economic risk	35%	Growth potential of the economy	Excellent outlook, strong growth potential	Strong outlook, good growth potential	Neutral	Weak outlook, growth potential under trend	Very weak outlook, growth potential well under trend or negative
		Economic policy framework	Excellent	Good	Neutral	Poor	Inadequate
		Macro-economic stability and sustainability	Excellent	Good	Neutral	Poor	Inadequate
		Real GDP growth					
		Real GDP volatility					
		GDP per capita					
Public finance risk	30%	Fiscal policy framework	Exceptionally strong performance	Strong performance	Neutral	Weak performance	Problematic performance
		Debt sustainability	Exceptionally strong sustainability	Strong sustainability	Neutral	Weak sustainability	Not sustainable
		Market access and funding sources	Excellent access	Very good access	Neutral	Poor access	Very weak access
		Primary balance					
External economic risk	15%	Current account vulnerability	Excellent	Good	Neutral	Poor	Inadequate
		External debt sustainability	Excellent	Good	Neutral	Poor	Inadequate
		Vulnerability to short-term external shocks	Excellent resilience	Good resilience	Neutral	Vulnerable to shock	Strongly vulnerable to shocks
Institutional and political risk	10%	Perceived willingness to pay	Excellent	Good	Neutral	Poor	Inadequate
		Recent events and policy decisions	Excellent	Good	Neutral	Poor	Inadequate
		Geopolitical risk	Excellent	Good	Neutral	Poor	Inadequate
Financial risk	10%	Banking sector performance	Excellent	Good	Neutral	Poor	Inadequate
		Banking sector oversight and governance	Excellent	Good	Neutral	Poor	Inadequate
		Financial imbalances and financial fragility	Excellent	Good	Neutral	Poor	Inadequate
		Non-performing loans (NPLs)					
Indicative rating range		aaa					
QS adjustment		AAA					
Final rating		AAA					

* Implied QS notch adjustment = (QS notch adjustment for domestic economic risk)*0.35 + (QS notch adjustment for public finance risk)*0.30 + (QS notch adjustment for external economic risk)*0.15 + (QS notch adjustment for institutional and political risk)*0.10 + (QS notch adjustment for financial stability risk)*0.10

Source: Scope Ratings GmbH

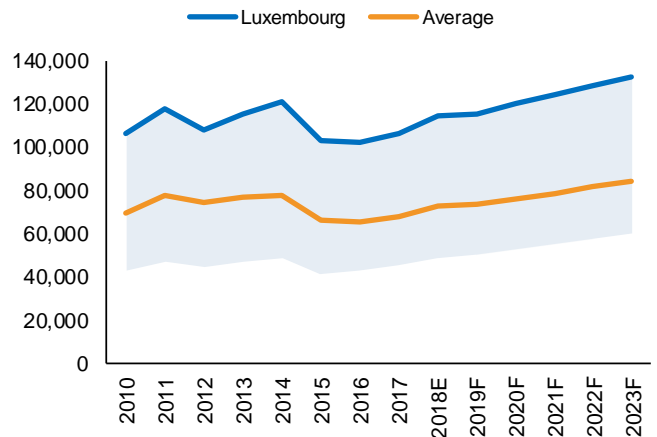
III. Appendix: Peer comparison

Figure 4: Real GDP growth, %



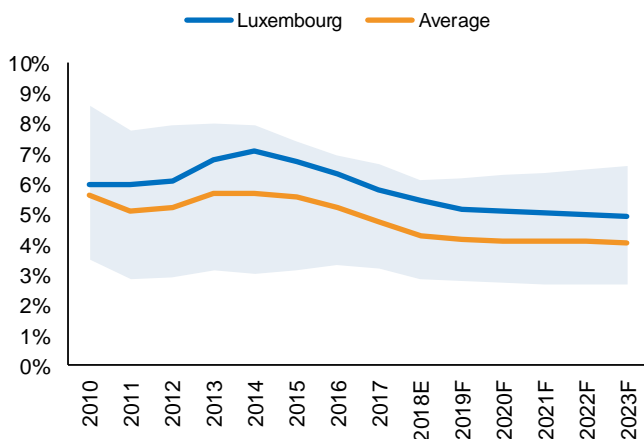
Source: IMF, calculations Scope Ratings GmbH

Figure 5: GDP per capita, USD



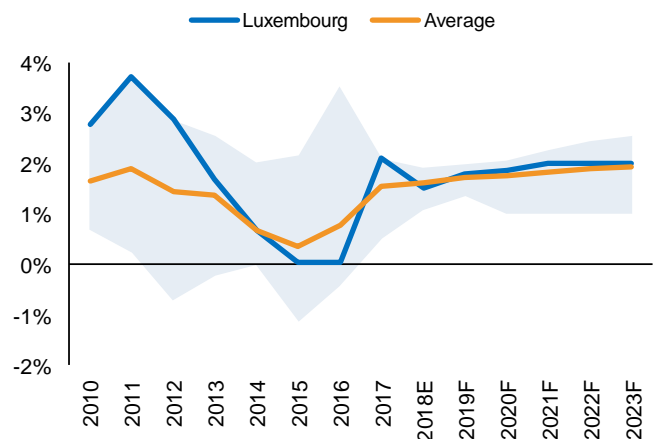
Source: IMF, calculations Scope Ratings GmbH

Figure 6: Unemployment rate, %



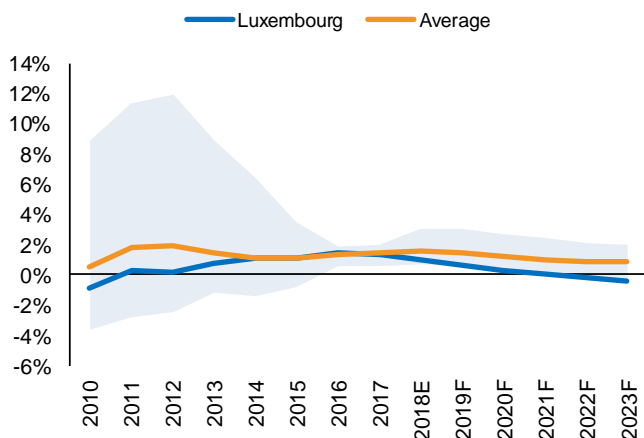
Source: IMF, Calculations Scope Ratings GmbH

Figure 7: Headline inflation, %



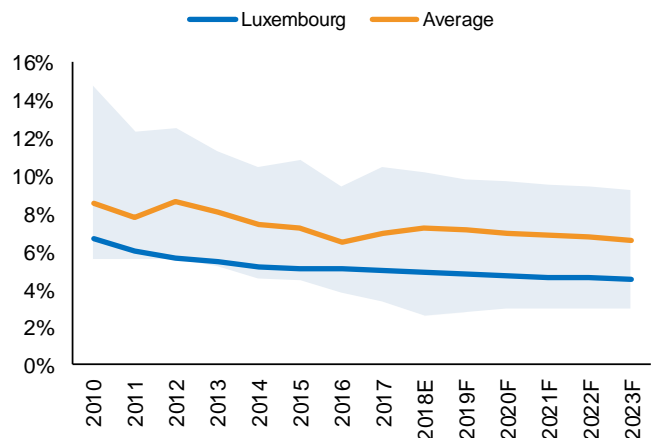
Source: IMF, Calculations Scope Ratings GmbH

Figure 8: General government primary balance, % of GDP



Source: IMF, Calculation Scope Ratings GmbH

Figure 9: Current account balance, % of GDP



Source: IMF, Calculation Scope Ratings GmbH

IV. Appendix: Statistical tables

	2013	2014	2015	2016	2017	2018E	2019F
Economic performance							
Nominal GDP (EUR bn)	46.5	50.0	52.1	53.0	55.4	58.2	61.1
Population ('000s)	537.0	550.0	563.0	576.0	591.0	605.0	621.0
GDP per capita PPP (USD)	95,590.5	101,640.1	102,517.1	102,389.4	103,744.8	-	-
GDP per capita (EUR)	86,585.0	90,949.1	92,550.2	91,982.5	93,754.7	96,080.2	98,442.1
Real GDP, % change	3.7	5.8	2.9	3.1	2.3	4.0	3.5
GDP growth volatility (10-year rolling SD)	3.6	3.8	3.8	3.7	3.1	2.9	1.6
CPI, % change	1.7	0.7	0.1	0.0	2.1	1.5	1.8
Unemployment rate (%)	6.8	7.1	6.8	6.3	5.8	5.4	5.2
Investment (% of GDP)	19.0	18.8	18.1	17.9	17.3	17.4	17.3
Gross national savings (% of GDP)	24.5	24.0	23.2	23.0	22.3	22.3	22.1
Public finances							
Net lending/borrowing (% of GDP)	1.0	1.3	1.4	1.6	1.5	1.1	0.9
Primary net lending/borrowing (% of GDP)	0.8	1.1	1.2	1.4	1.4	1.0	0.7
Revenue (% of GDP)	44.3	43.1	42.9	43.7	44.4	43.8	43.7
Expenditure (% of GDP)	43.3	41.8	41.5	42.1	42.9	42.7	42.8
Net interest payments (% of GDP)	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-0.2
Net interest payments (% of revenue)	-0.4	-0.6	-0.5	-0.4	-0.3	-0.3	-0.5
Gross debt (% of GDP)	23.7	22.7	22.0	20.8	23.0	22.8	22.4
Net debt (% of GDP)	-8.8	-10.8	-12.1	-11.9	-11.4	-9.9	-8.8
Gross debt (% of revenue)	53.5	52.5	51.2	47.5	51.7	52.0	51.1
External vulnerability							
Gross external debt (% of GDP)	5,592.2	6,913.4	7,275.5	7,355.7	6,524.1	-	-
Net external debt (% of GDP)	-2,167.3	-1,789.5	-1,784.4	-1,829.1	-1,938.6	-	-
Current account balance (% of GDP)	5.5	5.2	5.1	5.1	5.0	4.9	4.8
Trade balance (% of GDP)	-	1.6	-0.5	-1.4	-0.7	-0.9	-0.7
Net direct investment (% of GDP)	-244.0	39.0	152.7	-38.0	-45.6	-	-
Official forex reserves (EOP, EUR m)	134.0	155.2	174.0	181.7	144.6	-	-
REER, % change	1.5	0.6	-2.6	0.8	1.1	-	-
Nominal exchange rate (AVG, USD/EUR)	1.3	1.3	1.1	1.1	1.1	-	-
Financial stability							
Non-performing loans (% of total loans)	0.2	-	-	0.9	0.8	-	-
Tier 1 ratio (%)	21.3	18.5	20.2	23.6	21.8	-	-
Private debt (% of GDP)	437.1	446.9	483.2	482.7	472.1	-	-
Credit-to-GDP gap (%)	-28.9	-30.5	-14.9	-28.1	-51.1	-	-

Source: IMF, European Commission, European Central Bank, Central Bank of Luxembourg, STATEC, World Bank, Haver Analytics, Scope Ratings GmbH



Grand Duchy of Luxembourg

Rating Report

Scope Ratings GmbH

Headquarters Berlin

Lennéstraße 5
D-10785 Berlin

Phone +49 30 27891-0

London

Suite 301
2 Angel Square
London EC1V 1NY

Phone +44 203-457 0 4444

Oslo

Haakon VII's gate 6
N-0161 Oslo

Phone + 47 21 623142

Frankfurt am Main

Neue Mainzer Straße 66-68
D-60311 Frankfurt am Main

Phone +49 69 66 77 389-0

Madrid

Paseo de la Castellana 95
Edificio Torre Europa
E-28046 Madrid

Phone +34 914 186 973

Paris

33 rue La Fayette
F-75009 Paris

Phone +33 1 8288 5557

Milan

Via Paleocapa 7
IT-20121 Milan

Phone +39 02 30315 814

info@scoperatings.com
www.scoperatings.com

Disclaimer

© 2018 Scope SE & Co. KGaA and all its subsidiaries including Scope Ratings GmbH, Scope Analysis, Scope Investor Services GmbH (collectively, Scope). All rights reserved. The information and data supporting Scope's ratings, rating reports, rating opinions and related research and credit opinions originate from sources Scope considers to be reliable and accurate. Scope cannot, however, independently verify the reliability and accuracy of the information and data. Scope's ratings, rating reports, rating opinions, or related research and credit opinions are provided "as is" without any representation or warranty of any kind. In no circumstance shall Scope or its directors, officers, employees and other representatives be liable to any party for any direct, indirect, incidental or otherwise damages, expenses of any kind, or losses arising from any use of Scope's ratings, rating reports, rating opinions, related research or credit opinions. Ratings and other related credit opinions issued by Scope are, and have to be viewed by any party, as opinions on relative credit risk and not as a statement of fact or recommendation to purchase, hold or sell securities. Past performance does not necessarily predict future results. Any report issued by Scope is not a prospectus or similar document related to a debt security or issuing entity. Scope issues credit ratings and related research and opinions with the understanding and expectation that parties using them will assess independently the suitability of each security for investment or transaction purposes. Scope's credit ratings address relative credit risk, they do not address other risks such as market, liquidity, legal, or volatility. The information and data included herein is protected by copyright and other laws. To reproduce, transmit, transfer, disseminate, translate, resell, or store for subsequent use for any such purpose the information and data contained herein, contact Scope Ratings GmbH at Lennéstraße 5, D-10785 Berlin.

Scope Ratings GmbH, Lennéstraße 5, 10785 Berlin, District Court for Berlin (Charlottenburg) HRB 192993 B, Managing Director: Torsten Hinrichs.