Creditreform Sovereign Rating

Creditreform Rating

Rating Object	Rating Information	
GRAND DUCHY OF LUXEMBOURG	Assigned Ratings/Outlook: **AAA /stable**	Type: Monitoring, Unsolicited with participation
Long-term sovereign rating Foreign currency senior unsecured long-term debt Local currency senior unsecured long-term debt	Initial Rating Publication Date: Rating Renewal: Rating Methodologies:	29-07-2016 21-04-2023 "Sovereign Ratings" "Rating Criteria and Definitions"

Rating Action

Neuss, 21 April 2023

Creditreform Rating has affirmed the unsolicited long-term sovereign rating of "AAA" for the Grand Duchy of Luxembourg. Creditreform Rating has also affirmed Luxembourg's unsolicited ratings for foreign and local currency senior unsecured long-term debt of "AAA". The outlook is stable.

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Key Rating Drivers

1. Luxembourg's economy has hitherto weathered the economic consequences from the Russian invasion and the energy crisis well; while the adverse effects are being felt, as reflected by significantly slower economic growth, we expect real GDP growth to expand at a faster rate than in the euro area overall in 2023-24, buttressed by public investment as well as resilient private consumption aided by wage indexation and ample government support

2. Exceptionally wealthy economy as well as resilient and credit-positive labor market conditions; a modest degree of overall economic diversification makes Luxembourg's economy vulnerable to macro-financial shocks; further weaknesses emanate from very high private debt levels amid stretched house price valuations and stretched housing affordability, whereas anemic productivity growth poses risks to Luxembourg's underlying growth

3. Luxembourg remains among the sovereigns with the highest perceived institutional quality worldwide, as reflected by its persistently strong performance in the Worldwide Governance Indicators; extensive benefits from membership in the EU and EMU; we anticipate policy-making to remain future-oriented and coherent against the backdrop of Luxembourg's track record of high political and social stability

4. Despite the succession of extraordinary events, fiscal metrics have remained sound so far; since the outbreak of the energy crisis, deficit-increasing discretionary measures included in Energiedesch and Solidariteitspak packages have been enacted, which leads us to expect a further deteriorating headline balance, particularly in 2023, following a broadly balanced budget last year; although economic activity should pick up gradually, we thus project the sovereign's public debt ratio to rise over the medium term; we think that neither the current level nor the expected path entail fiscal sustainability risks, and prevailing risks related to the financial sector and the international tax reform remain manageable at the current

juncture, reflecting high debt affordability, prudent debt management, and strong fiscal commitment to currently low debt levels

5. External risks stem from Luxembourg's extraordinarily open economy, which is mainly due to its role as a global financial center and the large investment fund industry, but we see these mitigated by a track record of high and sustained current account surpluses

Reasons for the Rating Decision and Latest Developments[1]

Macroeconomic Performance

Our credit assessment of the sovereign is guided by a very strong macroeconomic profile. Featuring the highest per capita income in the world and a track record of strong economic growth, Luxembourg has weathered the recent accumulation of crises well. Its labor market has so far remained resilient, with relatively stable unemployment figures and buoyant employment growth. Nevertheless, structural challenges persist, as signaled by high levels of labor shortages and decoupling unemployment and vacancy data. While Luxembourg's economy benefits from substantial financial inflows, and its financial center ecosystem builds on several pillars, the pivotal role of Luxembourg's financial sector leaves the economy vulnerable to shocks and at times raises macro-financial volatility. Private sector indebtedness adds to shock-related risks. Whilst Luxembourg performs well in terms of international competitiveness and is implementing vital reforms in the context of NextGenerationEU (NGEU), which should prove conducive for its medium-term growth perspectives, we will vigilantly monitor labor productivity, which has proven anemic in a context of weak business fixed investment and administrative barriers.

Luxembourg's economic growth slowed down markedly in 2022, posting at 1.5% (2021: 5.1%). Output expansion thus posted well below the euro area (EA) reading (2022: 3.5%), which is partly due to the pandemic's milder impact on Luxembourg's economy and the following economic recovery. To be sure, the Grand Duchy significantly outperforms the euro area as regards the five-year average (2018-22: 1.9% vs. 1.2%).

Last year's economic expansion was driven largely by private consumption (+0.9 p.p.), thanks to strong labor market performance, the easing of pandemic-related restrictions and to energy support measures. The government's aid measures have led to a strong rise in public consumption (+3.8%), which also contributed positively to economic activity (+0.7 p.p.), while net external trade supported real GDP growth (+0.2 p.p.) as imports contracted more strongly than exports. Gross fixed capital formation receded by 0.5% due to soaring energy as well as commodity prices, deteriorating financing conditions and elevated uncertainty emanating from the geopolitical context.

While a recession has been avoided so far, last year's annual growth profile masks a significant decline in real GDP in the fourth quarter (-3.8% q-o-q, EA: 0.0%), mainly dragged down by net exports (-2.7 p.p.) given weak financial sector performance. Moreover, the contribution of household spending turned negative in the final stretch of the year (-0.7 p.p.), having decreased by 2.2% q-o-q, following seven quarters of unabated, robust growth.

[1] This rating update takes into account information available until 14 April 2023.

Despite decelerating economic growth, we expect Luxembourg's per capita income to remain exceptionally high, representing one of the sovereign's key strengths. Drawing on most recent IMF data, the Grand Duchy's already very high GDP per capita is estimated to have increased by another 6.9% in 2022, totaling USD 138,193 (PPP terms, current prices). As a result, Luxembourg retained its status as the world's leading economy in terms of per capita income, with the latter being roughly twice as large as that of AAA-peers such as Germany (USD 63,816) and the Netherlands (USD 69,963).

Growth prospects for the current year are for continued moderate growth, with major factors affecting economic activity last year remaining largely in place, namely tightening monetary policy to address still high though receding inflation, bouts of financial sector volatility, as well as the Russian war against Ukraine and concurrent repercussions on trade in terms of geo-economic fragmentation.

At this stage, we expect real GDP to expand by 1.3% in 2023 and 2.1% in 2024. While public investment and private consumption should support this year's economic growth, declining commodity prices and waning inflationary pressures will increasingly bolster household spending and cater for a better investment outlook going forward. Also, we assume gradually recovering external demand reflecting strengthening economic growth elsewhere. We have to stress, however, that uncertainty surrounding these forecasts remains very high in light of recent financial market turbulence and the ongoing geopolitical crisis.

We believe that household spending will remain supportive of economic growth, mainly due to falling, albeit still high HICP inflation, the raft of government support measures, wage indexations, and robust employment growth. Latest available data show that the annual rate of change dropped sharply to 3.0% in Mar-23, down from its peak at 10.3% in Jun-22 and the lowest reading since Mar-21 (2.5%). Furthermore, core inflation stabilized in Luxembourg, hovering around 4.0% over the last couple of months. By contrast, core inflation continued to rise in the euro area as a whole, and although headline inflation in the euro area declined as well, it stood well above Luxembourg's level, partly reflecting the higher weight of transport fuels in Luxembourg's basket of goods and services. Against this backdrop, we also note that the announcement of several of the OPEC+ countries to cut oil production by around 1.16mn barrels per day could potentially add disproportionally to price pressure in Luxembourg going forward.

Apart from the gradual normalization of energy markets more generally, fiscal measures, in particular the Tripartite agreements on the Solidaritéitspak 2.0 and 3.0 in October 2022 and March 2023, respectively, are likely to support household disposable income, keeping a lid on energy prices during 2023 and 2024, inter alia comprising a VAT reduction, the introduction of a cap on gas prices, and the subsidization of heating oil. The recently greenlighted Spring Tripartite will extend some of the 2.0 measures until the end of 2024. Also, the decrease in energy price inflation should be contained via energy efficiency gains and savings in energy consumption.

In addition, private consumption will be fostered by wage indexation. On the whole, 2023 should see three automatic wage indexations: the indexation triggered in February, the index tranche triggered in June 2022 and postponed to April 2023, and the wage indexation expected for Q4 2023 (Statec intelligence). Favorable labor market developments, as illustrated by persistently robust employment growth (see below), should in our view continue to act as a supporting pillar to private consumption, whilst consumer confidence seemingly bottomed out in September last year, reaching its highest level since the outbreak of the Russian war against Ukraine.

We assume overall investment to decline this year before picking up beyond 2023. Public investment is envisaged to edge up to 4.6% of GDP this year (Ministry of Finance, MoF), but business investment activity will be held back by deteriorating funding conditions and labor shortages (see below). Manufacturing has experienced strong headwinds due to soaring energy prices and will recover only slowly in view of still elevated prices and soft external demand in the near term. While falling capacity utilization hints at a decreasing need for expansion investment, annual growth in industrial production has been weak until recently and should gain traction only gradually as e.g. reflected by plunging new orders and still downbeat, though brightening, sentiment in the industrial sector.

Construction investment suffers from higher producer prices as well as rising interest rates, which translate into higher financing costs and reduced mortgage demand. Additionally, the construction sector faces very high labor shortages (Mar-23: 61.3% of surveyed businesses) and increasingly insufficient demand. We think that fixed investment performance will be dragged down by housing investment, which should continue on its downward trajectory, having fallen in y-o-y terms over the last six quarters.

Export growth will in our view remain moderate, being adversely impacted by easing economic activity in Luxembourg's main trading partners as well as tightening global financial conditions and depressed confidence. As the Grand Duchy's exports tend to align with the economic performance of the euro area as a whole, prospectively decelerating euro area GDP growth seems to bode ill for Luxembourg's export prospects. We forecast the euro area's real GDP to rise by 0.8% in 2023 and to expand by 1.4% next year, with moderate growth impulses from domestic demand and net exports alike.

Moreover, tightening financial conditions are likely to entail lower lending and financial services activity in the near term. Alongside financial market volatility in the context of Russia's invasion of Ukraine, the synchronous sharp interest rate hikes of major central banks and, more recently, the failure of two medium-sized regional US banks and the loss of market confidence in Credit Suisse, have contributed to deteriorating financial conditions.

Luxembourg's country-level index of financial stress (CLIFS) climbed to a new historical high last September, exceeding levels last seen during the global financial crisis, and remains elevated as of late, although moderating at the turn of the year. Confidence in and the expected demand for financial services (Eurostat data) recovered during this year's first quarter, hinting at the broad resilience of the Grand Duchy's financial center ecosystem. At this stage, we expect a moderately positive growth contribution by net exports this year before it likely turns broadly neutral in 2024, given our assumption that import growth will pick up more significantly from next year.

Luxembourg's medium-term growth perspectives remain, in our view, constructive, with real GDP likely to converge towards its potential growth rate, which the European Commission (EC) estimates to amount to 2.3% this year and 2.4% in 2024, well above the estimated level of the euro area as a whole (1.1% and 1.3% respectively).

We anticipate labor market conditions to stay strong, with solid employment growth supportive of medium-term growth. Luxembourg's labor market has hitherto remained robust, as suggested by the annual LFS-adjusted unemployment rate, which came in at 4.6% in 2022, below the pre-pandemic level (2019: 5.6%) and corresponding to its lowest reading since 2010. On a

monthly basis, the unemployment rate inched up to a still low 4.8% in February 2023 from 4.5% a year before, as compared to 6.6% in the euro area overall.

At the same time, employment has grown rapidly over recent years, even posting positive — albeit softer — growth during the pandemic, partly as a result of Luxembourg's economic structure and telework capacities. Employment expanded by 3.5% in 2022 (national account, domestic concept, EA: 2.2%), showing few signs of weakness throughout the year, easing only slightly to 3.3% y-o-y in Q4-22. According to STATEC data, employment of cross-border workers rose more strongly than employment of residents on average. Employees from the Greater Region continue to play a key role, with workers from Germany, France and Belgium displaying stronger growth than that of Luxembourgish residents. Employment of non-EU residents registered double-digit annual growth throughout 2022 (Q4: +17.9% vs. 1.8% Luxembourgish citizens). Our expectation of solid employment growth is underscored by job vacancy rates, which stood at 2.4% as of Q4-22 (2.2% in Q4-21). In addition, Luxembourg performs well on the EC's Social Scoreboard, most notably in terms of social protection and inclusion.

Notwithstanding this, challenges pertain to labor market mismatches as indicated by misaligned unemployment and job vacancy rates, which have become more significant as of late, pointing to an ongoing need for foreign labor. STATEC estimates the influx of labor to move at roughly 10,000 per year over the medium term, bolstering labor supply to some degree. On a positive note, the share of long-term unemployment in total unemployment edged down vis-à-vis the previous year, although remaining elevated as compared to the pre-pandemic level (28.7% vs. 22.8%). We monitor envisaged NGEU reforms and investment targeted towards labor market policies as elaborated in our last reviews.

Tying in with the Recovery and Resilience Plan (RRP), Luxembourg submitted its first payment request to the tune of EUR 24.86mn at the end of last year, which is founded on the fulfillment of milestones and targets in areas related to skills, climate, anti-money laundering and health. We note that Luxembourg's RRP was amended earlier this year, but this did not affect the positive assessment of Luxembourg's plan.

Non-cost competitiveness metrics bode well for the Grand Duchy's medium-term performance. In the IMD 2022 global competitiveness yearbook, Luxembourg reached the 13th rank out of 63 economies, with an outstanding 1st place in the category economic performance. Moreover, Luxembourg was ranked at 19 out of 132 economies in the UN's Global Innovation Index 2022, with the pillars institutions, business sophistication and creative outputs standing out in particular. Luxembourg is a strong innovator and achieved above-average outcomes relative to the strong innovator peer group (European Innovation Scoreboard 2022).

In a similar vein, Luxembourg ranged in the upper third among the EU member states concerning the Digital Economy and Society Index (DESI) 2022. That being said, room to improve emanates from the shortage of ICT specialists, which could obstruct a swift digital transition. Concurrently, Luxembourg's R&D expenditure was among the lowest in the EU as a percentage of GDP, posting at 1.02% in 2021, essentially boding ill for lifting Luxembourg's productivity growth. By the same token, private investment remained sluggish, at 12.6% of GDP in 2022, standing among the lowest readings in the euro area (EA: 19.4% of GDP).

Risks that could cloud the otherwise bright medium-term outlook arise from Luxembourg's tremendously high private debt levels. According to ECB data, NFC debt was the highest among the EU-27 countries as of Q4-22 by a wide margin, amounting to 269.5% of GDP. While this figure is

inflated by extensive MNE activities, the corporate sector appears to be in a sound condition, with insolvencies having fallen sharply by 9.5% in 2022 and remaining well below the pre-pandemic levels (Statec, 1,050 vs 1,232 in 2019). Arguably more importantly in light of overvalued housing prices and rising interest rates, households displayed a debt-to-disposable income ratio of 180.5% as of Q4-21, according to latest available ECB Data, corresponding to one of the highest readings in the euro area.

We would also flag risks to cost competitiveness going forward, following a repeated decline in real labor productivity per person, while acknowledging that Luxembourg ultimately exhibits very high productivity levels from a European perspective. Still, real labor productivity has declined over an extended period, having fallen by an annual average 0.5% p.a. in 2013-22, causing real unit labor costs to rise, generally comparing unfavorably against its main European trading partners. However, these developments have not been mirrored in the global export market share of goods and services until 2021 (0.64%), largely driven by financial services.

Institutional Structure

We continue to assess the Grand Duchy's extraordinarily high institutional quality as one of the sovereign's key credit strengths. Against the backdrop of heavy reliance on the free movement of labor and capital as a major financial hub, Luxembourg draws significant benefits from its EU/EMU membership. In addition, HICP inflation and MFI interest rates were broadly synchronized with the euro area over the last decade. A track record of cohesive policy-making adds to the sovereign's overall exceptionally high institutional quality.

As signaled by the four pillars of the WGI we deem most relevant for our credit assessment, Luxembourg ranks persistently amongst the world's best-performing countries in terms of institutional quality. According to the latest vintage relating to 2021 as base year, Luxembourg is attested outstandingly high quality when it comes to the perceived quality of the public administration's capacities in effectively formulating and implementing policies, as reflected by rank 8 out of 209 economies worldwide, well above the euro area median (rank 37). The sovereign also ranks significantly above the euro area median as regards freedom of speech and media ('voice and accountability', rank 6 vs. rank 29). Top ten rankings concerning the WGIs 'rule of law' (rank 8, EA median: 33) and 'control of corruption' (rank 9, EA median: 44) pay testament to the very high degree of efficiency and independence of Luxembourg's judicial system. We note that the sovereign improved two places in the relative ranking as regards 'voice and accountability' and 'rule of law', while remaining broadly unchanged on the other two WGIs.

Luxembourg continues to stand out among the EU member states when it comes to the perception of the likelihood of political instability, having advanced by one place as regards the WGI 'political stability', ranking at 13 out of 213 economies. Tying in with political stability, general elections will be held in October this year. We anticipate Luxembourg's consensus-based policy-making to remain forward-looking and coherent, reflecting its history of political stability, although current polls point to equally tight results as seen five years ago, with the Christian Social People's Party (CSV) slightly ahead in terms of public voting intention (23%, 2018 general election. 29%), followed by the governing coalition parties of Luxembourg Socialist Workers' Party (LSAP/21% vs. 17%), the Democratic Party (DP/18% vs. 18%) and the Greens (12% vs. 15%).

After years of discussion, the Grand Duchy's constitutional reform will finally enter into force on 1 July 2023. The reform contains the installation of a national judicial council, empowered to

suggest the appointment of magistrates. Moreover, the principle of presumption of innocence and the conclusion of court proceedings within reasonable time limits will be codified in the constitution.

We note that legislation on whistleblower protection is still pending after a draft law had been tabled in January 2022. While the deadline for transposing the respective EU directive was 17 December 2021, discussions were still ongoing throughout 2022. In February 2023, the EC referred Luxembourg (as well as several other member states) to the European Court of Justice for failing to implement the Whistleblowing Directive into its national legal framework.

This notwithstanding, we continue to view the authorities' responsiveness and government effectiveness as high, inter alia corroborated by GRECO's second compliance report of the fifth evaluation round published in December 2022, which deals with the prevention of corruption and the promotion of integrity in the central government and law enforcement agencies. Thus, 18 out of 21 recommendations have been satisfactorily dealt with, whereas two of the remaining three recommendations have been partially implemented and only one has not been implemented yet.

In addition, a reform of the bankruptcy law, which had stalled over a longer period, eventually passed parliament, introducing procedures to dissolve companies that do not have assets or employees without the administrative burden of undergoing liquidation proceedings. The bill, which was adopted in October 2022, could prove an important building block regarding the control of corruption, providing a legislative basis to prevent so-called empty shell companies from being used for money-laundering purposes.

With a view to greening the economy, Luxembourg has set up a comprehensive, though ambitious, strategy to become carbon neutral, and is a global frontrunner in terms of sustainable finance. As elaborated during our past reviews, authorities have implemented a raft of measures aiming at achieving its climate goals, with the National Mobility Plan (Apr-22) being one of the more recent initiatives. The EC's eco-innovation index (2022) continues to underline the government's forward-looking approach to policy-making, with Luxembourg leading the EU27 in this respect.

We take note of the adoption of the Partnership Agreement between the Grand Duchy and the EC (Dec-22) which governs the strategy and details on investments under the EU's cohesion policy funding. In light of Luxembourg's net zero targets, it is thus set to receive EUR 23mn under the European Regional and Development Fund and the Just Transition Fund, which will promote energy efficiency, the achievement of lower levels of carbon dioxide emissions and the utilization of renewable energy in 2021-27.

Partly reflecting the Grand Duchy's challenges as a transit country and its dependency on commuting workers from the Greater Region, transport plays a key role in explaining the sovereign's still high greenhouse gas (GHG) emissions. To be sure, GHG emissions per capita dropped to 17.0 tons per capita in 2020 (2019: 20.2 tons p.c.). However, Luxembourg continues to display the highest level among the EU27 (EU average: 7.5 tons), and it has to be seen whether the marked decline in GHG emissions (2010-19 average: 22.2 tons) was largely driven by the pandemic. Room for improvement also exists when it comes to the overall share of energy from renewable sources, which stagnated at 11.7% in 2021, representing the lowest reading among the EU-27 countries.

Fiscal Sustainability

Although public debt is set to rise moderately over the medium term, we continue to assess fiscal sustainability as one of Luxembourg's key credit strengths. Prudent debt management and strong commitment to fiscal sustainability add to the sovereign's credibility of respecting the fiscal rule of keeping the debt-to-GDP ratio below the threshold of 30%. Energy support packages that were adopted to shield consumers and businesses from the negative repercussions of the Russian war against Ukraine and the energy crisis will prospectively lead to higher headline deficits this year and next. At the same time, highly affordable debt and substantial financial scope mitigate risks related to financial stability and contingent liabilities more generally. We would also flag the international tax reform, housing market dynamics and demographics, with the latter presumably weighing heavily on the state budget over the long term due to a sharp rise in pension expenditure.

While awaiting the spring notification for Eurostat's government financial statistics, we expect the headline balance to have shifted into a minor deficit of -0.2% of GDP in 2022, down from a surplus of 0.8% of GDP a year before. Dynamic tax revenue growth helped to limit the impact of the various aid measures adopted throughout 2022. Thus, Luxembourg's tax intake grew briskly, having risen by 7.4% on the central government level last year (MoF), also boosted by the inflationary impact on VAT revenues, household taxes and social security contributions. Strong wage and employment growth as well as the April 2022 wage indexation were additional factors that have contributed to tax revenue growth. On the other hand, falling receipts from excise duties weighed on revenue growth, largely owing to excise duties from oil products given the government's energy support measures.

Following the "Energiedesch" (Feb-22) and the "Solidariteitspak 1.0" (Mar-22) packages, the government adopted another raft of measures in September. The so-called "Solidariteitspak 2.0", enacted in September last year, is geared towards providing aid for households and businesses, containing energy prices, and accelerating the country's energy transition. According to the MoF, the budgetary impact of the second Solidariteitspak totals approx. EUR 1.162bn (2022-2023), with the introduction of a ceiling on the gas price increase, the temporary one percentage point reduction in the VAT rate, and a newly formulated energy support scheme for certain businesses accounting for the lion's share (80.6%) of the financial envelope. Together with the "Energiedesch" (EUR 0.065bn) and the "Solidariteitspak 1.0" (EUR 0.847bn) packages, budgetary costs are expected to amount to roughly EUR 2.074bn, or 2.7% of 2022 GDP, excluding guarantees (~EUR 0.5bn).

The sovereign's headline balance will continue to be adversely affected by the authorities' support measures. Drawing on MoF estimates, the "Solidariteitspak 2.0" should have a revenue-reducing impact of roughly 0.4% of our projected 2023 GDP, whereas it is likely to lead to higher outlays of close to 1.0% of GDP. These will be complemented by other deficit-increasing measures not linked to the energy crisis, e.g. additional social benefits for parental care, rising subsides for school transport and disabled people, and higher spending pertaining to the green and digital transition.

Furthermore, another Tripartite agreement was reached this March, the "Solidariteitspak 3.0". The measures included in the new package will cost approx. EUR 0.5bn in 2023 and EUR 0.85bn in 2024, essentially comprising an extension of large parts of the measures under Solidariteitspak 2.0. Among others, measures to cap gas and electricity prices, as well as several subsidies to reduce household energy bills, will be extended until the end of 2024. Moreover, the energy allowance for cost-of-living allowance recipients will be paid until the end of 2024, the

tax credit on the bëllegen act will be raised, and tax allowances granted, e.g. on rental income as well as on interest payments for residential property purchased for own use.

Expenditure should also increase due to the rising public wage bill given the aforementioned wage indexations and the government's plans to ramp up public investment. In addition, we note that Luxembourg's parliament reportedly approved the financing law for public rail transport over the period 2025-2039 to the tune of over EUR 7bn.

On the whole, also taking into account the latest Tripartite agreement, we believe that the budget balance should record a marked deficit this year and next, before the negative position should shrink gradually further out. At this stage, we would pencil in a headline deficit of -2.7% of GDP in 2023, which should narrow to -2.2% of GDP in 2024. In light of the geopolitical context and the current turmoil on the financial markets, we highlight that our forecasts are subject to an unusually high degree of uncertainty.

In our view, the introduced discretionary measures will be reflected in a rising public debt ratio. Luxembourg's debt-to-GDP ratio has remained virtually unchanged over the last three years, according to our forecast, which assumes general government debt to have come in at 24.6% of GDP in 2022, following 24.5% of GDP in 2020 and 2021, respectively. Against the backdrop of easing economic activity and recurrent headline deficits, we expect the sovereign's public debt ratio to increase to 27.3% in 2023 and further to 29.6% in 2024, by then still corresponding to one of the lowest debt levels in Europe.

That being said, we believe that neither the current level nor the expected path entail fiscal sustainability risks over the near to medium term, and we assess the sovereign's firm commitment to adhere to self-imposed fiscal rules, i.e. the 30% debt threshold, as positive. In our view, the sovereign's track record of fiscal prudence in the years leading up to the pandemic lends confidence that authorities will engage in fiscal consolidation as soon as uncertainty and inflationary pressure linked to the geopolitical crisis have subsided.

Debt should also remain affordable, with interest expenditure projected to decrease to 0.1% as set against GDP in the current year from an estimated 0.2% in 2022 and the interest-to-revenue ratio posting at a very low 0.4% as of Q3-22 (Eurostat, four-quarter moving average). Furthermore, Luxembourg boasts ample financial assets, totaling approximately 47% of GDP, contributing to its overall positive public financial position (DBP23). What is more, we assess the diversity in the Grand Duchy's investor base in terms of type of investor and location as positive, as well as the fact that the sovereign is not exposed to foreign-exchange risks.

Tying in with affordability, bond yields have risen materially since our last review, mirroring the monetary policy tightening and concerns that the global economy may face a recession. Luxembourg's yield on long-term government bonds rose from 0.55% in March last year to 2.99% in Feb-23. At the same time, the Bund spread stood at a moderate 58bp.

From its current level of 3.50%, we still expect the ECB to raise its policy rates by an additional 50bp, presumably in two 25bp steps, by the end of the current year. However, uncertainty around these expectations has arguably become more pronounced in view of the most recent market tensions. The data-dependent approach remains key. For the time being, the ECB's Governing Council intends to continue reinvesting the principal payments from maturing securities purchased under the Pandemic Emergency Purchase Program (PEPP) until at least the end of 2024, whereas the Asset Purchase Program portfolio will be wound down gradually from March

2023, with an initial monthly portfolio reduction of EUR 15bn until June 2023. The subsequent pace of the reduction will be determined over time

We continue to follow closely the implementation of the OECD's international tax reform and its related impact. Technical guidance ensuring a smooth implementation of the Pillar Two GloBE Rules was released in February this year. Following a delay of one year, MNEs are envisaged to be levied with an effective minimum tax rate of 15% from 2024 onwards. All else being equal, the reform could ultimately result in higher fiscal revenues, while posing risks to the attractiveness of investing in Luxembourg, with the net effects difficult to gauge at present.

We also monitor Luxembourg's financial sector vigilantly, not only since financial sector turbulence could have sizable adverse effects on credit conditions and the gross value added of financial services, but also for the financial industry's impact on revenue growth in terms of subscription taxes. In addition, contingent liability risks continue to remain in place, entailed by the huge scale of the Grand Duchy's financial sector.

Given the cross-border and EU internal market-oriented nature of its business activities, Luxembourg's banking sector remains by far the largest among the EU27 peers in terms of GDP, standing at 1261.19% (ECB, Q3-22). Statec recorded a total of 121 banks operating in the Grand Duchy as of the end of 2022 (2021: 124 banks). According to MoF data published in Oct-22, the estimated take-up of public guarantees accounted for 5.7% of GDP, of which 3.5 p.p. were linked to the financial sector and 0.5% to the government's Covid-19 response. The maximum amount of public guarantees equals 12.0% of GDP (3.6% pandemic-related).

Financial stability metrics capturing asset quality, capitalization and profitability hint at an overall healthy banking sector. The NPL ratio remained unchanged vis-à-vis last year, posting at 1.3% as of Q4-22 (EBA data), which compares favorably against the average EU reading of 1.8%. Judging by a CET1-ratio of 21.6% as of Q4-22 (Q4-21: 20.2%), the banking sector's capital buffers have increased, exceeding the average EU capitalization by a substantial margin (EU: 15.5% in Q4-22). Profitability remained relatively stable, as illustrated by return on assets amounting to 0.6% (0.5% as of Q4-21), roughly in line with the EU average (of Q4-22: 0.5%). In a similar vein, Luxembourg's banks can draw on sufficient liquidity. The liquidity coverage ratio stood at 154.5% at the end of 2022, broadly in line with the EU average (164.7%), having edged down from 166.4% a year before.

In addition, vulnerabilities with regard to the housing market are still prevalent and imply risks to economic activity and financial stability amidst high levels of household indebtedness (see above) in connection with persistent house price overvaluation, as also echoed by the European Systemic Risk Board. Drawing on Eurostat data, y-o-y growth of house prices has decelerated notably to 5.6% in Q4-22 (Q3-22: 11.1%), but the 3-year rate of change in house prices amounted to a still exceptionally high 38.2%. In the same vein, the OECD's price-to-income ratio points towards significant misalignments between prices and fundamentals, standing roughly 43% above its long-term average since 2007.

The share of mortgage loans in total outstanding private credit posted at a high 55.0% as of February 2023. With the majority of mortgages having been granted at variable rates, the tightening credit conditions pose risks to lenders and borrowers, in particular low-income households. As housing loans are largely concentrated in only a few banking institutions (BCL intelligence), sudden mortgage delinquencies on a broader scale could pose significant risks to

banking sector stability. This notwithstanding, households have built up significant, albeit rather illiquid, stocks of financial assets, thus balancing these risks somewhat.

Foreign Exposure

The pivotal role of Luxembourg's financial sector and the very high degree of trade and financial openness continue to leave the economy vulnerable to external shocks. Thanks to its track record of high current account surpluses, the sovereign has built up substantial external buffers, as underlined by its high positive net international investment position (NIIP), mitigating external risks somewhat. While forecasting and interpreting Luxembourg's current account balance and NIIP appears challenging due to frequent and notable revisions to balance of payment data, we believe that Luxembourg will remain in a comfortable net creditor position over the medium term.

According to latest Eurostat data, Luxembourg's current account surplus widened to 5.0% of GDP in 2022, expanding by 0.4 p.p. vis-à-vis the preceding year, thus returning to its pre-pandemic long-term average (2010-19: 4.8% of GDP). The shrinking primary income deficit, which fell from 31.0% of GDP to 24.2% of GDP in 2021-22, more than compensated for the weakening goods and services balances.

The significant deterioration in the services surplus (-5.2 p.p.) was mainly driven by the decline in financial services exports accompanied by increasing financial services imports, mainly due to valuation effects regarding investment fund assets. Meanwhile, declining net exports in general merchandise were somewhat buffered by rising merchanting trade. As indicated by quarterly current account data, the weakness in financial and insurance services essentially observed in Q4 dragged down last year's annual outturn to some extent.

Looking ahead, risks from the external front appear remote, as we expect Luxembourg's current account surplus to decrease only moderately in the near term, since a higher net primary income deficit should offset a slightly improving trade balance due to import weaknesses. Uncertainty ultimately remains high, due to the evolving geopolitical situation, possible further bouts of financial volatility and balance of payment data revisions.

We project Luxembourg to remain a pronounced net international creditor, noting a marked decline in its NIIP over the last two years, with the positive position decreasing from 40.4% of GDP in 2021 to 28.2% of GDP last year. Compared to 2021, net portfolio investments and other investments declined significantly, somewhat compensated by the increasing net position in foreign direct investment. At the current level, Luxembourg's NIIP is still among the highest in the EU, pointing to limited external risks. Awaiting the application of the OECD's international tax rules for multinational enterprises from 2024 onward, we would expect the Grand Duchy's NIIP to experience some volatility related to these developments, with the net effects of the reforms on foreign direct investment not entirely clear-cut at the current juncture.

Rating Outlook and Sensitivity

Our rating outlook on the Grand Duchy of Luxembourg's long-term credit ratings is stable, as we believe that the risks stemming from the evolving geopolitical background and tighter global financial conditions are contained by its fundamental economic strength, very high institutional quality and forward-looking policy-making, as well as significant fiscal and external buffers. That

said, we note that the assessment and interpretation of economic developments remains more challenging, as is the case for other indicators from the fiscal and external realm.

We could consider a negative rating action if medium-term growth falls substantially short of our current expectations. Downside risks which could lead to such a scenario include stronger-than-expected adverse effects from the synchronized monetary policy tightening of major central banks, more persistent inflation than assumed in our baseline scenario, renewed significant spikes in commodity prices, and a stronger-than-expected tightening in financial conditions emanating from turbulences in the banking sector. The aforementioned factors could also entail the slight upward-sloping trajectory in the sovereign's debt trend becoming more entrenched, as well as a significantly and sustainably increasing public debt ratio.

Analysts

Primary Analyst
Fabienne Riefer
Sovereign Credit Analyst
f.riefer@creditreform-rating.de
+49 2131 109 1462

Chairperson
Dr Benjamin Mohr
Head of Sovereign Ratings
b.mohr@creditreform-rating.de
+49 2131 109 5172

Ratings*

Long-term sovereign rating	AAA /stable
Foreign currency senior unsecured long-term debt	AAA /stable
Local currency senior unsecured long-term debt	AAA /stable

*) Unsolicited

ESG Factors

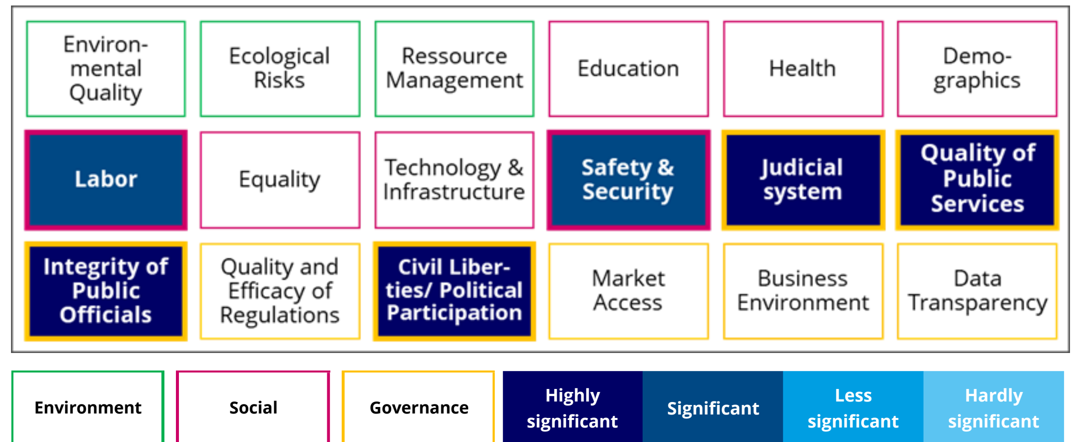
Creditreform Rating has signed the ESG in credit risk and ratings statement formulated within the framework of the UN Principles for Responsible Investment (UN PRI). The rating agency is thus committed to taking environmental and social factors as well as aspects of corporate governance into account in a targeted manner when assessing creditworthiness.

While there is no universal and commonly agreed typology or definition of environment, social, and governance (ESG) criteria, Creditreform Rating views ESG factors as an essential yardstick for assessing the sustainability of a state. Creditreform Rating thus takes account of ESG factors in its decision-making process before arriving at a sovereign credit rating. In the following, we explain how and to what degree any of the key drivers behind the credit rating or the related

outlook is associated with what we understand to be an ESG factor, and outline why these ESG factors were material to the credit rating or rating outlook.

For further information on the conceptual approach pertaining to ESG factors in public finance and the relevance of ESG factors to sovereign credit ratings and to Creditreform Rating credit ratings more generally, we refer to the basic documentation, which lays down key principles of the impact of ESG factors on credit ratings.

ESG Factor Box



The governance dimension plays a pivotal role in forming our opinion on the creditworthiness of the sovereign. As the World Bank's Worldwide Governance Indicators Rule of Law, Government Effectiveness, Voice and Accountability, and Control of corruption have a material impact on Creditreform Rating's assessment of the sovereign's institutional set-up, which we regard as a key rating driver, we consider the ESG factors 'Judicial System and Property Rights', 'Quality of Public Services and Policies', 'Civil Liberties and Political Participation', and 'Integrity of Public Officials' as highly significant to the credit rating.

The social dimension plays an important role in forming our opinion on the creditworthiness of the sovereign. Labor market metrics constitute crucial goalposts in Creditreform Rating's considerations on macroeconomic performance of the sovereign, and we regard the ESG factor 'Labor' as significant to the credit rating or adjustments thereof. What is more, exceptionally high perceived political stability would also touch upon the social dimension, which is reflected among other things by the respective WGI, and would ultimately affect the sovereign's institutional performance, so that we regard the ESG factor 'Safety and Security' as significant.

While Covid-19 may exert adverse effects on several components in our ESG factor framework in the medium to long term, it has not been visible in the relevant metrics we consider in the context of ESG factors – though it has a significant bearing on public finances. To be sure, we will follow ESG dynamics closely in this regard.

Economic Data

[in %, otherwise noted]	2017	2018	2019	2020	2021	2022e	2023e
Macroeconomic Performance							
Real GDP growth	1.3	1.2	2.3	-0.8	5.1	1.5	1.3
GDP per capita (PPP, USD)	116,621	118,604	121,141	119,368	129,313	138,193	142,490
Credit to the private sector/GDP	159.9	162.6	167.5	161.3	155.0	150.9	n/a
Unemployment rate	5.5	5.6	5.6	6.8	5.3	4.6	n/a
Real unit labor costs (index 2015=100)	103.0	106.6	108.3	107.4	105.1	106.1	107.9
World Competitiveness Ranking (rank)	8	11	12	15	12	13	n/a
Life expectancy at birth (years)	82.1	82.3	82.7	82.2	82.7	n/a	n/a
Institutional Structure							
WGI Rule of Law (score)	1.7	1.8	1.8	1.8	1.8	n/a	n/a
WGI Control of Corruption (score)	2.0	2.1	2.1	2.1	1.9	n/a	n/a
WGI Voice and Accountability (score)	1.5	1.5	1.5	1.5	1.5	n/a	n/a
WGI Government Effectiveness (score)	1.7	1.8	1.7	1.8	1.7	n/a	n/a
HICP inflation rate, y-o-y change	2.1	2.0	1.6	0.0	3.5	8.2	3.0
GHG emissions (tons of CO2 equivalent p.c.)	20.1	20.4	20.2	17.0	n/a	n/a	n/a
Default history (years since default)	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Fiscal Sustainability							
Fiscal balance/GDP	1.4	3.0	2.2	-3.4	0.8	-0.2	-2.7
General government gross debt/GDP	21.8	20.9	22.4	24.5	24.5	24.6	27.3
Interest/revenue	0.9	0.8	0.7	0.5	0.4	n/a	n/a
Debt/revenue	51.1	46.2	49.3	56.6	56.1	n/a	n/a
Total residual maturity of debt securities (years)	6.9	6.0	5.1	5.7	6.3	6.6	n/a
Foreign exposure							
Current account balance/GDP	4.7	3.7	3.4	3.2	4.6	5.0	n/a
International reserves/imports	0.0	0.0	0.0	0.1	0.1	n/a	n/a
NIIP/GDP	80.6	61.1	67.8	63.9	40.4	28.2	n/a
External debt/GDP	6545.7	6303.1	5859.5	5193.0	4953.6	4474.0	n/a

Sources: IMF, World Bank, Eurostat, AMECO, ECB, Statec, IMD Business School, own estimates

Appendix

Rating History

Event	Publication Date	Rating /Outlook
Initial Rating	29.07.2016	AAA /stable
Monitoring	30.06.2017	AAA /stable
Monitoring	01.06.2018	AAA /stable
Monitoring	31.05.2019	AAA /stable
Monitoring	29.05.2020	AAA /stable
Monitoring	21.05.2021	AAA/ stable
Monitoring	20.05.2022	AAA/ stable
Monitoring	21.04.2023	AAA /stable

Regulatory Requirements

In 2011 Creditreform Rating AG (CRAG) was registered within the European Union according to EU Regulation 1060/2009 (CRA-Regulation). Based on the registration Creditreform Rating AG is allowed to issue credit ratings within the EU and is bound to comply with the provisions of the CRA-Regulation. The rating was not endorsed by Creditreform Rating AG from a third country as defined in Article 4 (3) of the CRA-Regulation.

This sovereign rating is an unsolicited credit rating. The Ministry of Finance (MOF) participated in the credit rating process as it provided additional information and commented on a draft version of the report. Thus, this report represents an updated version, which was augmented in response to the factual remarks of MOF during their review. However, the rating outcome as well as the related outlook remained unchanged.

Unsolicited Credit Rating	
With Rated Entity or Related Third Party Participation	YES
With Access to Internal Documents	NO
With Access to Management	NO

The rating was conducted on the basis of CRAG's "Sovereign Ratings" methodology (v1.2, July 2016) in conjunction with its basic document "Rating Criteria and Definitions" (v1.3, January 2018). CRAG ensures that methodologies, models and key rating assumptions for determining sovereign credit ratings are properly maintained, up-to-date, and subject to a comprehensive review on a periodic basis. A complete description of CRAG´s rating methodologies and basic document "Rating Criteria and Definitions" is published on our website.

To prepare this credit rating, CRAG has used the following substantially material sources: International Monetary Fund, World Bank, Organization for Economic Co-operation and Development, Eurostat, European Commission, European Banking Authority, European Central Bank, World Economic Forum, IMD Business School, Banque Centrale du Luxembourg (BCL), Institute national de la statistique et des étude économiques (STATEC), Grand Duchy of Luxembourg – Ministry of Finance, Commission de Surveillance du Secteur Financier (CSSF).

A Rating Committee was called consisting of highly qualified analysts of CRAG. The quality and extent of information available on the rated entity was considered satisfactory. The analysts and committee members declared that the rules of the Code of Conduct were complied with. No conflicts of interest were identified during the rating process that might influence the analyses and judgements of the rating analysts involved or any other natural person whose services are placed at the disposal or under the control of Creditreform Rating AG and who are directly involved in credit rating activities or approving credit ratings and rating outlooks. The analysts presented the results of the quantitative and qualitative analyses and provided the Committee with a recommendation for the rating decision. After the discussion of the relevant quantitative and qualitative risk factors, the Rating Committee arrived at a unanimous rating decision. The weighting of all risk factors is described in CRAG´s "Sovereign Ratings" methodology. The main arguments that were raised in the discussion are summarized in the "Reasons for the Rating Decision".

As regards the rating outlook, the time horizon is provided during which a change in the credit rating is expected. This information is available within the credit rating report. There are no other attributes and limitations of the credit rating or rating outlook other than displayed on the CRAG website. In the event of providing ancillary services to the rated entity, CRAG will disclose all ancillary services in the credit rating report.

The date at which the credit rating was released for distribution for the first time and when it was last updated including any rating outlooks is indicated clearly and prominently in the rating report; the first release is indicated as "initial rating"; other updates are indicated as an "update", "upgrade or downgrade", "not rated", "affirmed", "selective default" or "default".

In accordance with Article 11 (2) EU-Regulation (EC) No 1060/2009 registered or certified credit rating agency shall make available in a central repository established by ESMA information on its historical performance data, including the ratings transition frequency, and information about credit ratings issued in the past and on their changes. Requested data are available on the ESMA website: https://cerep.esma.europa.eu/cerep-web/statistics/defaults.xhtml.

An explanatory statement of the meaning of each rating category and the definition of default are available in the credit rating methodologies disclosed on the website.

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Creditreform Rating AG

Creditreform Rating AG
Europadamm 2-6
D - 41460 Neuss

Phone +49 (0) 2131 / 109-626
Fax +49 (0) 2131 / 109-627
E-Mail info@creditreform-rating.de
Internet www.creditreform-rating.de

CEO: Dr. Michael Munsch
Chairman of the Board: Michael Bruns
HRB 10522, Amtsgericht Neuss