2 2022

NOTE DE CONJONCTURE

The economic situation in Luxembourg
Recent developments and outlook

STATEC

Contents

Preface

Russia's war of aggression against Ukraine has hastened a serious energy crisis in Europe. Each country is trying to mitigate this severe shock on consumer prices, which is affecting the purchasing power of households and the competitiveness of businesses. In March 2022, a tripartite meeting resulted in an agreement with the social partners, protecting purchasing power and reducing the impact of automatic wage indexation on production costs.

However, in August this year, STATEC announced a sharper rise in inflation for 2022 and 2023, mainly due to the rise in gas prices, which have become a weapon in the war led by the Kremlin. This alert was confirmed in mid-September, which prompted the Prime Minister to convene a second round of the tripartite at Senningen Castle. This time, the consensus was made to shield consumers and businesses from surging energy prices, in this case gas and electricity. Thanks to the simulations that STATEC carried out during the negotiations, the tripartite coordination committee decided to cap the rise in gas and electricity prices as well as to reduce VAT by one percentage point (from January 2023). A series of additional support for households and businesses have been decided, which have been detailed and assessed in this Note de conjoncture.

For the sake of transparency, the analyses and simulations submitted to the tripartite negotiators were all presented to the Chamber of Deputies (special tripartite committee) and published immediately on the STATEC website. A special chapter of the Note de conjoncture examines the effect of tripartite measures according to income classes (quintiles) and source of energy, documenting the socially targeted nature of the measures.

This Note de conjoncture explains the basis of these important economic policy decisions and their estimated impact for this year and next year on inflation, economic growth, employment, public finances and CO_2 emissions.

Inflation lower than in the euro area 6.4% this year, 3.4% next year

This Note de conjoncture provides a detailed analysis of inflation forecasts according to three scenarios which depend on the price of oil, but also on a possible rationing of gas. A special chapter assesses the negative effect of gas volume rationing on economic activity (a 30% drop in gas would reduce value added by about 1% in the absence of adequate alternative energy).

State aid for households in order to support purchasing power as well as aid for companies with a view to bring down the costs of energy, raw materials and the workforce, has supported the economy. Economic growth, however, would be rather moderate (1.7% this year and 1.5% next year) without excluding a recession, for example in the event of energy rationing or a new surge in the cost of raw materials.

The Note de conjoncture remains hopeful that a fair peace in Ukraine and a recovery in world trade would sustain activity.

The importance of the financial sector in the Luxembourg economy justifies a specific study analysing the (positive) impact of successive interest rate hikes, initiated by the ECB, on the interest margin and net commissions of a sample of banking institutions.

Dr Serge Allegrezza, director

Summary and main facts

Table 1
Macroeconomic forecasts

		Baseline scenario			Gas rationing scenario[1]		Slower policy tightening scenario[2]	
	1995-2021	2021	2022	2023	2022	2023	2022	2023
	Change in % unless otherwise specified							
Real GDP	3.2	5.1	1.7	1.5	0.7	-2.9	1.9	2.7
Total domestic paid employment	3.1	3.0	3.4	2.3	3.0	0.3	3.5	2.9
Unemployment rate (% of labour force)	4.6	5.7	4.8	5.1	5.0	6.2	4.8	4.9
Consumer price index (NICP)	1.8	2.5	6.4	3.4	6.5	3.8	6.4	3.1
Average wage costs	2.9	6.0	6.3	5.6	6.2	5.4	6.3	5.2
Public balance (% of GDP)	1.7	0.8	-0.4	-2.8	-0.8	-5.1	-0.3	-2.2
Greenhouse gas emissions[3]	-1.7	2.8	-9.9	0.2	-10.2	-0.9	-9.9	0.8

Source: STATEC (2022-2023: forecasts)
[1] The negative scenario with gas rationing is based on assumptions made by Oxford Economics in August. It mainly consists of a complete halt of Russian gas deliveries in Q4 2022 and a 10% rationing in European industry until spring 2023. Inflationary pressures would intensify, which would trigger a tighter monetary policy than in the baseline scenario.
[2] In the upper scenario, production prices would ease against a backdrop of more fluid supply chains. Inflationary pressures should therefore fade more quickly than expected, prompting an slower policy tightening scenario. On financial markets, equity prices would rise sharply and government bond yields would fall, while most currencies including the EUR would rise against the USD.
[3] Change 2005-2021.

Towards a stagnation in activity in the euro area in 2023

This year, the international economic climate has been characterised by historically high inflation. It continues to rise across Europe, mainly driven by the impact of the war in Ukraine on energy costs.

This energy crisis follows in the wake of the pandemic and poses many challenges. In Europe, measures have been taken to limit the increase in household energy bills and gas supply disruptions. Monetary policies in most developed economies have been tightened in order to reduce inflation, which will restrict financing for economic actors and increase the risks related to high levels of debt.

Activity in the euro area remained solid in the first half of 2022, however the third quarter was marked by a clear slowdown. Business and household confidence continues to deteriorate as winter approaches, thus pointing towards an even more challenging end of year and start of 2023. In the euro area, GDP is expected to stagnate in 2023, after growing by 3% this year.

Nevertheless, there are many uncertainties surrounding this scenario: the evolution of the conflict in Ukraine, the impact of energy prices on the markets, future monetary policy decisions as well as the temperatures during the upcoming winter.

Annual growth below 2% in Luxembourg this year and next

Business in Luxembourg fell back in the second quarter of 2022, affected in particular by the negative performance of manufacturing and construction.

These two branches experienced supply-chain issues in 2021 and witness a drop in demand this year. The financial sector held up better in the second quarter, but its value added in the first half of the year was lower than in the first half of 2021, with the results of financial auxiliaries affected by the deteriorating stock market environment. While the current rise in interest rates may represent an opportunity for banks to increase earnings, it has been accompanied by a fall in demand for loans, combined with stricter lending conditions.

The outlook for the second half of the year is bleak, with surveys pointing towards a further deterioration in the business climate coupled with highly negative signals for household consumption, in particular concerns about high inflation. The measures to counter the effects of rising energy prices, negotiated under the tripartite agreements, will be a major benefit in terms of the purchasing power of households and businesses affected by the energy crisis. Economic activity should therefore continue to rise, but on a very modest growth trajectory, with real GDP growth expected at 1.7% this year, then 1.5% in 2023.

Surge in inflation, less pronounced in Luxembourg

2022 has been marked by historically high levels of inflation, although it is less pronounced in Luxembourg than elsewhere in the EU. This surge in inflation is the result of a combination of factors ranging from global supply bottlenecks, increased demand resulting from a "return to normal" after two years of health restrictions, tensions on the energy market amplified by the war in Ukraine and the appreciation of the dollar, which automatically raises the price of several imported goods.

The delayed impact of soaring energy prices on all other prices, especially food prices, is putting strong upward pressure on inflation in Luxembourg. This effect is reinforced by the depreciation of the euro, which looks set to last longer than previously anticipated. These developments have led STATEC to revise its inflation forecasts upwards.

In line with high inflation, the compensation per employee showed strong growth in Q2 2022 in the euro area and Luxembourg. Over the year as a whole, the compensation per employee is expected to increase by 6.3% in Luxembourg, and by 5.6% in 2023, under the major effect of successive index brackets. Real household disposable income per capita - i.e. purchasing power - is expected to stagnate in 2022 and to increase by about 2% in 2023, with the purchasing power of low-income households being significantly supported by the measures agreed in the tripartite negotiations.

Slowdown in employment, moderate rise in unemployment

While job creations remain relatively high in the euro area and in Luxembourg in autumn 2022, they have clearly entered a period of slowdown. The unemployment rate, even if it remains low, has recently resumed an upward trend in Luxembourg (as well as in several countries of the euro area). Business employment prospects, as well as other leading indicators of employment, have worsened during 2022, leaving little doubt that unemployment will continue to rise. However, this increase should be moderate, with the proportion of vacancies still at a historically high level.

During 2022, the labour market was still buoyed by the post-pandemic recovery, however the outlook for 2023 is gloomier. The near-stagnation in activity forecast for the euro area will also be accompanied by a sluggish employment market. In Luxembourg, the slowdown in activity would be less marked but would still lead to a slowdown in employment (from +3.4% to +2.3% in 2023) as well as a slight rise in unemployment (to 5.1% of the labour force, compared to 4.8% in 2022).

Public deficit may reach 3% of GDP in 2023

In 2022, tax revenues in Luxembourg were boosted by the effects of high inflation on VAT revenues, household taxes and social contributions. However, there has been a slowdown in revenue growth since the second quarter, due to weaker fuel sales and the stock market pullback. The slowdown should be accentuated in 2023 with the reduction in VAT rates, a less buoyant property market and, in general, a more subdued economic climate.

Government spending has increased strongly in 2022, driven by growth in employment, wages, pensions and operating costs. Spending growth is expected to be even stronger in 2023, partly as a result of measures introduced to curb high inflation and to help households and businesses particularly affected by rising energy prices.

The nominal balance will then deteriorate from -0.4% of GDP in 2022 to -2.8% in 2023. This is a sharp downward revision from previous forecasts however it reflects the weaker economic climate and the measures taken as a result of this situation.

A marked drop in energy consumption in 2022

Energy markets are in turmoil, generating high price volatility. Largely due to the war in Ukraine, gas and electricity prices reached historically high levels this summer, while oil prices returned to levels not seen since 2014. These developments have threatened the purchasing power of households and raised costs for companies. On the other hand, this fossil fuel crisis could accelerate the energy transition.

Two tripartite negotiations were held in Luxembourg within six months to implement measures to mitigate rising energy bills and inflation in general. Anticipating a potential shortage of gas, and even electricity, the EU has issued recommendations to member states to guarantee supply, with targets for storage and consumption reductions. A mild start to winter has also helped to lessen the risk of shortages. Luxembourg consumed much less gas over the first nine months compared to the average of the previous five years (-19%, against -7% in the EU). The surge in energy prices in 2022 has therefore had a resounding impact on consumption. On the other hand, the aid measures taken in neighbouring countries have temporarily removed the competitive advantage of Luxembourg's petrol prices, leading to a fall in fuel sales. Greenhouse gas (GHG) emissions have thus decreased by 10% in 2022, to below the level witnessed in the crisis year 2020.

1 International situation

This year, the international economic climate has been characterised by historically high inflation. It continues to rise across Europe, mainly driven by the impact of the war in Ukraine on energy costs.

This energy crisis follows in the wake of the pandemic and poses many challenges. In Europe, measures have been taken to limit the increase in household energy bills and gas supply disruptions. Monetary policies in most developed economies have been tightened in order to reduce inflation, which will restrict financing for economic stakeholders and increase the risks related to high levels of debt.

Activity in the euro area remained solid in the first half of 2022, however the third quarter was marked by a clear slowdown. Business and household confidence continues to deteriorate as winter approaches, thus pointing towards an even more challenging end of year and start of 2023. In the euro area, GDP is expected to stagnate in 2023, after growing by 3% this year.

Nevertheless, there are many uncertainties surrounding this scenario: the evolution of the conflict in Ukraine, the impact of energy prices on the markets, future monetary policy decisions as well as the temperatures during the upcoming winter.

Table 1.1
European Commission forecasts

	Real GDP			Implicit price of private consumption			Number of job seekers			Budget balance		
	2022	2023	2024	2022	2023	2024	2022	2023	2024	2022	2023	2024
	Percentage change						As a percentage of the labour force			As a percentage of GDP		
Belgium	2.8	0.2	1.5	8.3	5.4	2.8	5.8	6.4	6.3	-5.2	-5.8	-5.1
Germany	1.6	-0.6	1.4	7.1	6.9	2.8	3.1	3.5	3.5	-2.3	-3.1	-2.6
Ireland	7.9	3.2	3.1	6.1	5.8	2.8	4.4	4.8	5.0	0.2	0.8	1.2
Greece	6.0	1.0	2.0	9.1	6.6	2.7	12.6	12.6	12.1	-4.1	-1.8	-0.8
Spain	4.5	1.0	2.0	8.5	4.8	2.1	12.7	12.7	12.6	-4.6	-4.3	-3.6
France	2.6	0.4	1.5	5.3	4.6	2.2	7.7	8.1	7.7	-5.0	-5.3	-5.1
Italy	3.8	0.3	1.1	7.4	5.6	2.3	8.3	8.7	8.5	-5.1	-3.6	-4.2
Luxembourg[1]	**1.5**	**1.0**	**2.4**	**6.8**	**3.7**	**2.4**	**4.7**	**5.1**	**4.9**	**-0.1**	**-1.7**	**-0.5**
Netherlands	4.6	0.6	1.3	7.0	6.7	3.4	3.7	4.3	4.3	-1.1	-4.0	-3.1
Austria	4.6	0.3	1.1	8.7	6.7	3.3	5.0	5.2	5.3	-3.4	-2.8	-1.9
Portugal	6.6	0.7	1.7	6.0	3.9	2.1	5.9	5.9	5.7	-1.9	-1.1	-0.8
Finland	2.3	0.2	1.4	6.8	4.0	1.7	7.0	7.2	6.9	-1.4	-2.3	-2.3
Denmark	3.0	0.0	1.3	9.9	4.7	2.4	4.5	5.5	5.6	1.8	0.5	0.4
Sweden	2.9	-0.6	0.8	8.3	6.9	1.6	7.2	7.6	7.8	0.2	0.2	0.0
EU	**3.3**	**0.3**	**1.6**	**8.0**	**6.4**	**2.8**	**6.2**	**6.5**	**6.4**	**-3.4**	**-3.6**	**-3.2**
Euro area	**3.2**	**0.3**	**1.5**	**7.2**	**5.8**	**2.5**	**6.8**	**7.2**	**7.0**	**-3.5**	**-3.7**	**-3.3**
United Kingdom	4.2	-0.9	0.9	9.3	10.3	2.2	3.8	4.4	4.8	-6.4	-4.4	-3.7
United States	1.8	0.7	1.7	6.2	3.5	2.4	3.7	4.1	4.4	-5.9	-6.7	-7.1
Japan	1.7	1.6	1.2	2.4	3.1	1.8	2.7	2.5	2.5	-6.9	-4.7	-3.4

[1] The European Commission forecasts for Luxembourg may differ from those of STATEC.
Source: European Commission (11.11.2022)

Stronger headwinds on the global economy

After recovering by around 6% in 2021 under the effect of the easing of restrictions caused by the coronavirus pandemic, global activity should record growth slightly above 3% for 2022 as a whole (+2.4% for developed economies and +3.7% for emerging economies according to IMF forecasts[1]).

However, many headwinds are affecting global economic dynamics, starting with the extremely high level of inflation (at its highest level for forty years). Inflation is much higher this year than predicted by all forecasters. The sharp rise in energy prices in particular, largely fuelled by the consequences of the war in Ukraine, coupled with the rise in the price of basic foodstuffs, is weighing on household disposable income and consumption prospects. The high cost of energy is also increasing the costs of many companies. This energy crisis has mainly affected the European Union, forcing it – at great expense – to completely overhaul its supply strategy, which was heavily dependent on Russian gas and oil imports.

The pandemic, the effects of which have been felt much less this year in developed economies, continues to pose risks to the performance of developing economies (where the vaccination rate is relatively low) and in particular China, which continues to stick to its "zero-Covid" policy in conjunction with systematic lockdown measures.

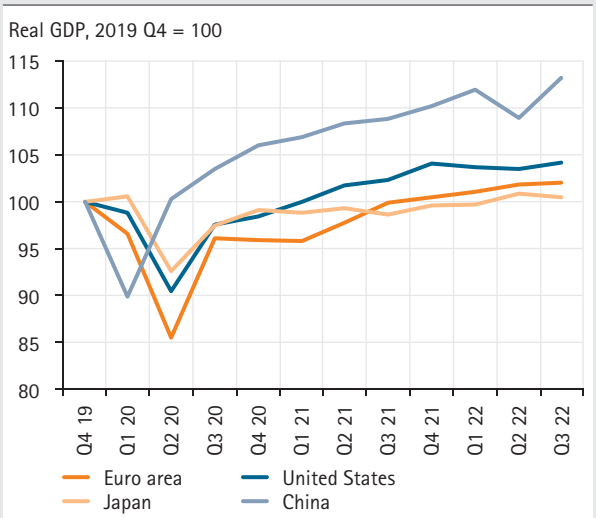
Faced with the feverish surge of inflation, and the fact that it is spreading through a ever-increasing share of goods and services, monetary policies have tightened significantly (see below). The financing capacities of households, businesses and States are thereby reduced, with risks in terms of debt sustainability and financial stability.

For 2023, global growth should slow to 2.7% according to the IMF[2], with a particularly marked slowdown in developed economies, with only +1.1% (the expansion in the emerging countries should continue, with growth forecast at +3.7%, identical to rate for 2022).

[1] World Economic Outlook, October 2022.

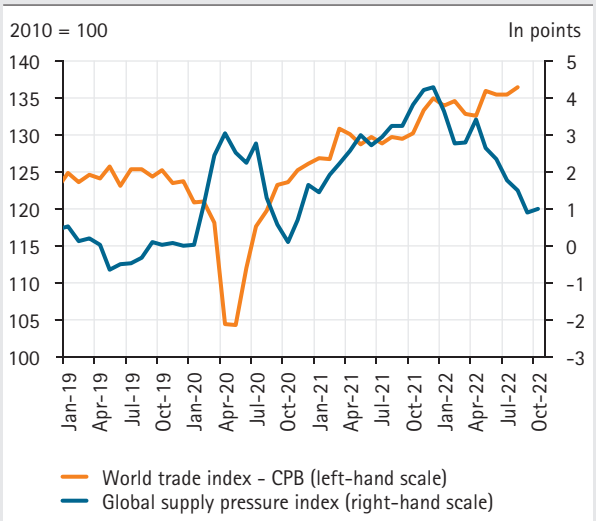
[2] The European Commission is counting on a slightly lower figure of +2.5% (forecast of 11 November 2022).

Graph 1.1
Slow growth in activity in 2022



Sources: Eurostat, World Bank

Graph 1.2
Reduced pressures on global supply



Sources: Federal Reserve Bank of New York (Global Supply Chain Pressure Index)

Caught between a slowdown and recession

The unfavourable economic climate is having an impact on the evolution in GDP, the profile of which is tending to flatten out this year in several regions of the world. The United States has already experienced a phase of technical recession (two consecutive quarters of decline in GDP) in the first half-year of 2022. However, this has been essentially driven by a strong recovery in imports, propelled in part by sustained consumer spending (itself stimulated by the highly positive performance of the labour market). US GDP recovered in the third quarter (+0.6% over one quarter), with data for household spending and business investment remaining encouraging, while data for residential investment was negative. This is likely to continue a downward trend, in reaction to the rise in interest rates[3]. After an expansion of close to 2% in 2022, the United States should thus record growth of 1% at best next year.

In China, GDP fell in the second quarter, significantly impacted by orchestrated lockdowns in several large cities. With coronavirus infections having clearly subsided in third quarter, GDP recovered by almost 4% over one quarter. However, the PMI survey indices show that Chinese activity contracted again in September and October in industry and services. Moreover, infections rose sharply again in November, followed by new lockdowns. The Chinese real estate sector remains in structural difficulties and the prices of new homes recorded a decline in October for the first time since 2015. The forecasts of the IMF and the European Commission point towards an expansion in China slightly above 3% for this year (that is well below an estimated potential between 5% and 6%).

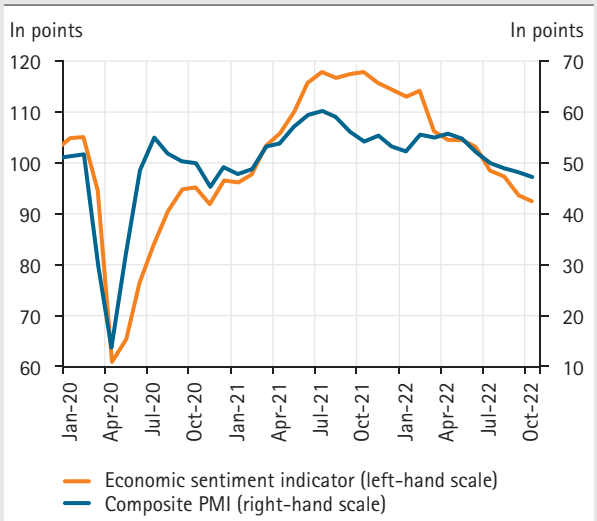
In Japan, growth had been sustained in the second quarter by a recovery in domestic demand after the lifting of health restrictions, but activity recorded a slight decline in the third quarter, under the effect of weak consumption and a negative external contribution (imports having increased more than exports).

If supply pressures ease globally[4] (see graph 1.2), international trade in goods is likely to slow in the short term due to the downturn in demand.

[3] US real estate market data indicates that new home sales, mortgage applications and sales prices of homes have tended to decline over the past few months.

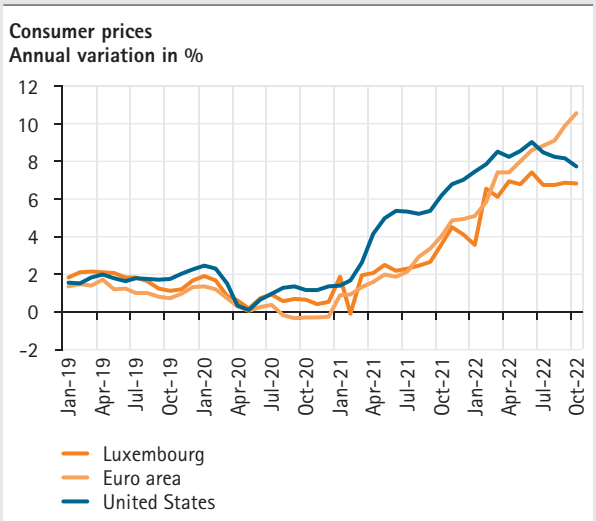
[4] This trend has occurred in connection with the slightest supply difficulties and the shortening of delivery times (these elements are taken from the PMI surveys) as well as with the fall in the price of maritime freight (in bulk and in containers).

Graph 1.3
Marked deterioration in business surveys in the euro area...



Sources: European Commission, S&P Global

Graph 1.4
... with inflation not yet showing signs of slowing down



Sources: Eurostat, STATEC (NCPI for Luxembourg)

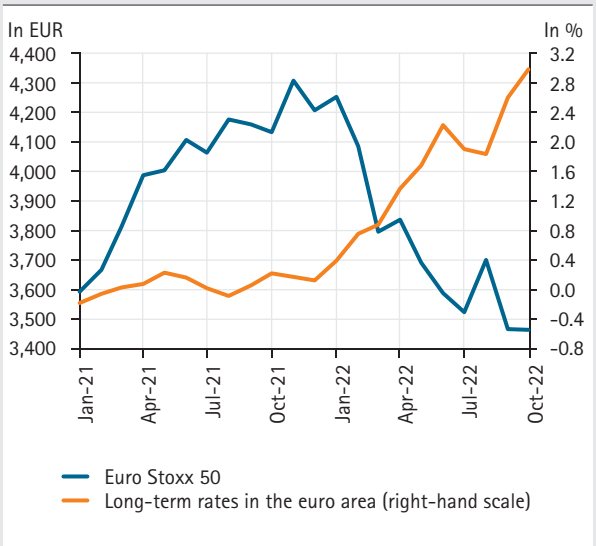
Euro area: activity held up well in 2022, but the slowdown endures

Business performance was better than expected in the euro area over the first three quarters of the year (especially in the Q2 and Q3). The lifting of health-related restrictions has freed up some demand, particularly for spending on leisure activities. The strong recovery in international travel has boosted transport and tourism-related activities, particularly benefiting countries such as France, Italy and Spain. Household consumption was thus able to post a relatively dynamic increase in second quarter (+1.0% over one quarter), while consumer sentiment had fallen very heavily from March, just after the start of the Russian invasion of Ukraine.

Activity continued to expand in the third quarter, while the business surveys had deteriorated sharply during the summer period and instead pointed to a very slight decline. Nevertheless, the 0.2% increase in GDP over one quarter posted in Q3 shows a serious slowdown (after +0.6% in Q1, then +0.8% in Q2). As business surveys continued to deteriorate in October, it is very likely that the results for Q4 will reveal that GDP shrank in the euro area. This year, the decline in confidence among economic actors is largely broad-based: industry, construction, retail trade and other non-financial services, financial sector and households are no exception to this trend. But it is among consumers, who are extremely worried about the evolution of their financial situation in the face of the rise in consumer prices (despite the measures to support purchasing power put in place in the various Member States), that morale fell most sharply. With inflation continuing to accelerate at the start of the last quarter of 2022, it is difficult to anticipate an improvement in the short term.

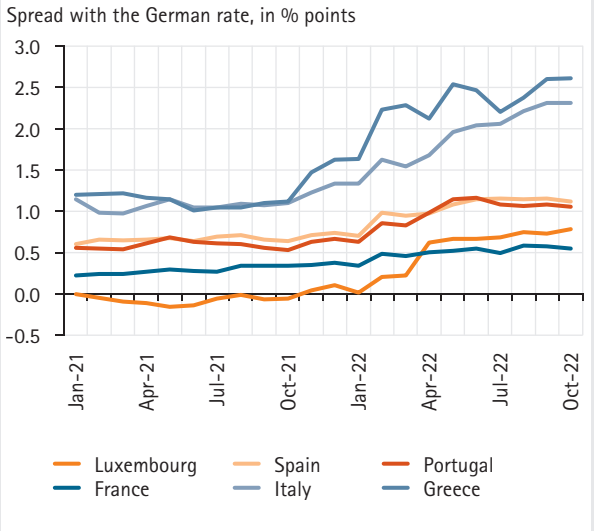
The rise in key interest rates, relatively recent in the euro area, will also begin to have its effects, impacting household demand (consumption, residential investment) and business investment (see below).

Graph 1.5
Economic and monetary uncertainties weigh on stock market valuations and push up long rates in the euro area



Source: Macrobond

Graph 1.6
Spreads are widening between government borrowing rates



Source: Macrobond

Financial conditions are tightening

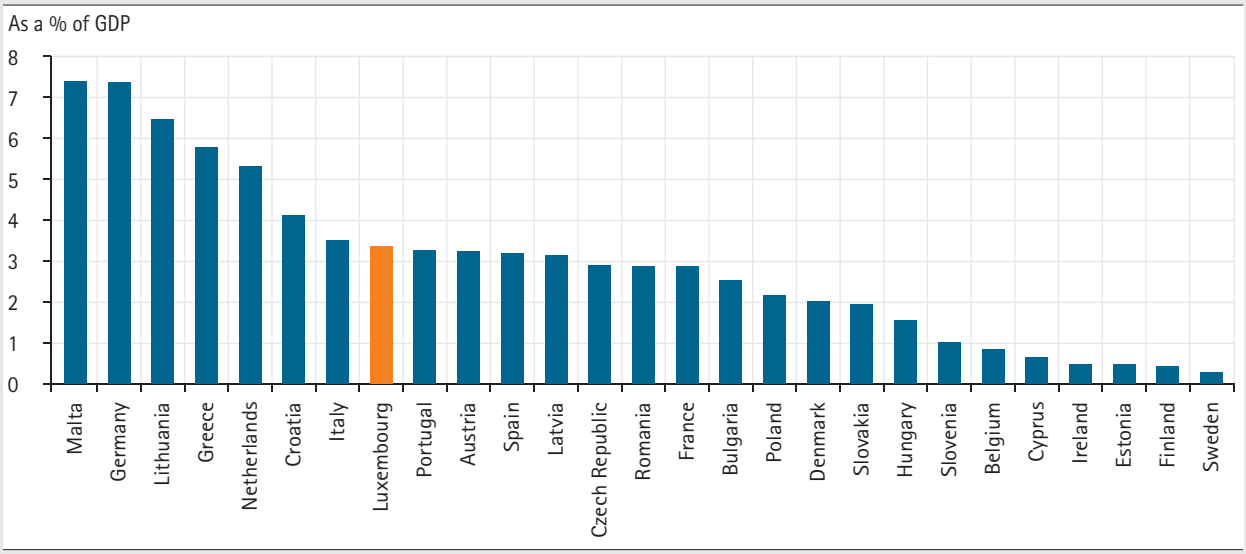
Inflationary pressures prompted central banks to raise their key rates quickly and sharply. Rates were raised six times in the United States (from 0.25% at the start of 2022 to 4.0% in November) and three times in the euro area (from 0% to 2%). These rate hikes are intended to contain inflation by dampening demand, consumption and investment, but this is weighing on growth prospects. Although the peak of inflation seems to have been reached in June in the United States (with the rate having fallen by 1.3 percentage point between June and October) and points towards less significant increases in key rates over the coming months, this is not yet the case in the euro area. Euro area inflation rate continued to climb in October, reaching 10.6%, a 40-year high.

The deterioration in the economic outlook and uncertainties about the pace of monetary tightening weighed on stock market asset valuations and pushed up government borrowing rates. The spreads have widened between the rates of the countries of the South and the North of the euro area (see graph 1.6). In October, the 10-year borrowing rate was above 3% in Spain and Portugal, and even above 4% in Italy and Greece, while it remained contained between 2% and 3% for the others euro area countries. On the stock markets, the trend was clearly downward over the first ten months of the year (-16% over one year in October on the Euro Stoxx 50 and the S&P 500), with all sectors being affected by the declines, except for the oil and gas industry which has benefited from the rise in prices. Between mid-October and mid-November, all sectors (excluding oil and gas) recovered strongly under the effect of the slowdown in inflation in the United States, allowing the Euro Stoxx 50 to return to its level of April 2022.

Several factors could affect global financial stability in the short term[5]. The deterioration of the economic outlook combined with the tightening of financial conditions is weighing on the ability to repay the debt accumulated by households, businesses and governments, which could lead to significant debt restructuring and a deterioration in the quality of banks' assets.

[5] See European Systemic Risk Board (September 2022), "Warning of the European systemic risk board of 22 September 2022 on vulnerabilities in the Union financial system", and IMF (October 2022) "Global financial stability report".

Graph 1.7
Support plans for the energy crisis in Europe



Sources: Eurostat, Bruegel
Note: these amounts do not include liquidity support for energy companies (in the form of loans, bailouts or nationalisations).

Falling real household incomes and tighter credit conditions are also putting downward pressure on house prices and exacerbating challenges in the commercial real estate sector (rising financing costs and construction prices, material supply shortages and reduced demand). These developments could render certain investment projects unviable, increase the risk of default and the volume of non-performing loans. Furthermore, stock market volatility could lead to liquidity shortages for investors and the collapse of several cryptocurrency platforms is impacting many retail investors. Finally, the war in Ukraine has increased the likelihood of large-scale cyberattacks that could disrupt critical economic and financial infrastructure and trade. These risks to financial stability could materialise simultaneously, interacting with each other and amplifying the impact of each event.

European Union increases sanctions against Russia

Russia's continued military aggression against Ukraine has led the European Union to toughen existing economic sanctions against Russia. The individual and economic sanctions (listed in the Note de conjoncture 1-2022) have been renewed for another six months and new sanctions have been added affecting trade with Russia, including a price cap on the maritime transport of Russian oil[6].

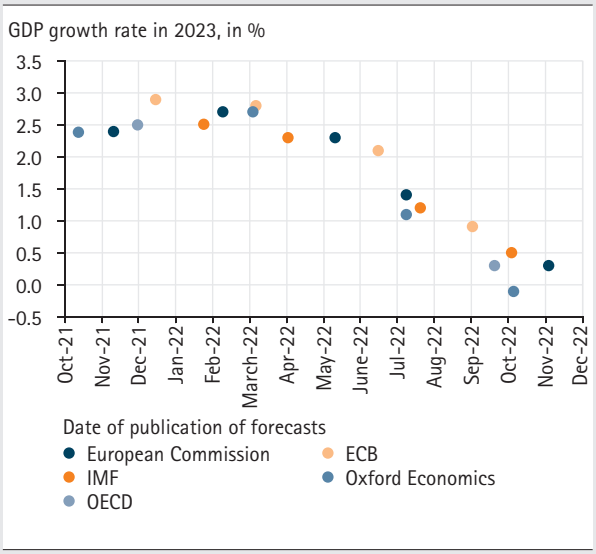
Major support measures in Europe in the face of the energy crisis

The energy crisis caused by the war in Ukraine has prompted European governments to take measures to protect households and businesses from rising prices. From September 2021 to October 2022, the amounts committed at national level in EU countries amount to approximately EUR 570 billion. The most widespread measures are transfers to vulnerable groups, business support and reductions in energy taxes. In Luxembourg, the measures taken represent 3.3% of GDP[7], slightly more than the average for EU countries (see graph 1.7). Germany commits the highest amount in the EU, in particular with the "defensive shield" of EUR 200 billion. This action has provoked criticism in certain other countries, who criticised a lack of coordination and a risk of distortion of competition, while Germany defended the amount it has committed as justified by specifying that the amount also covers the winter of 2023/2024.

[6] For more information, see https://www.consilium.europa.eu/fr/policies/sanctions/restrictive-measures-against-russia-over-ukraine/history-restrictive-measures-against-russia-over-ukraine/

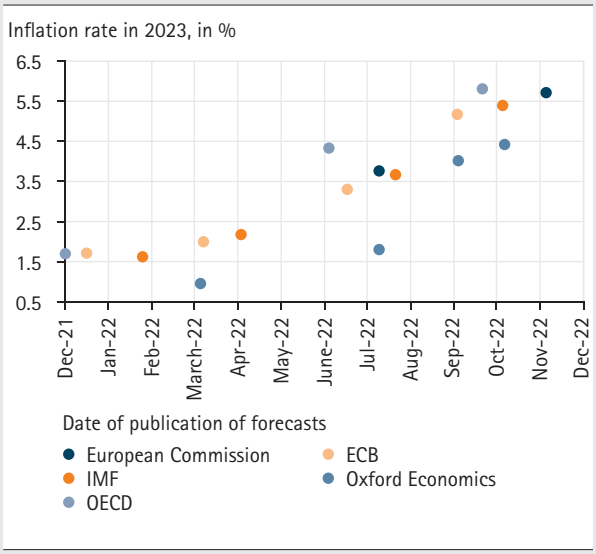
[7] The amount of the support measures given here differs from that mentioned in the following chapters of this Note, which excludes the aid scheme in the form of guarantees (Solidaritéit-spak), and which takes into account recourse to aid to companies less than that provided for in the budget.

Graph 1.8
Growth prospects for the euro area revised significantly downwards for 2023...



Sources: European Commission, IMF, OECD, ECB, Oxford Economics

Graph 1.9
... and a significant upward revision of inflation forecasts



Sources: European Commission, IMF, OECD, ECB, Oxford Economics

Stagnation forecast for the euro area in 2023

The data from Oxford Economics (which provides STATEC with very detailed sets of hypotheses and forecasts concerning the international environment and accompanied by alternative scenarios) point towards a stagnation of euro area activity in 2023 (with GDP falling by -0.1% over the whole year).

This is a marked downward revision compared to the previous Note de conjoncture published last June, which forecast +2.7% in 2023 (based on the central scenario adopted by Oxford Economics on 8 March). In general, growth forecasts for 2023 have been continuously revised downwards by forecasters from the spring of 2022. At the same time, inflation forecasts were systematically revised upwards (see graphs 1.8 and 1.9). In fact, this stagnation projected in the euro area for next year corresponds quite well to the alternative scenario of a protracted war presented in the previous Note (which forecast an increase in GDP in the euro area of only 0.3% in 2023[8]).

This stronger-than-expected rise in inflation naturally leads to fairly strong revisions to the interest rate assumptions (the corresponding data can be found in table 1.2), notably due to the accelerated tightening of monetary policies. Interest rates (short and long) have thus been revised upwards by approximately one percentage point in 2022 and even more in 2023 (+2.5 points for short rates, an additional point and a half for long rates). The earlier tightening in the United States also significantly affected the EUR/USD exchange rate, with a marked appreciation of the American currency (the two currencies are now close to parity in 2023, as compared to EUR 1 for USD 1.17 previously).

The stock market climate, characterised by the evolution of the Euro Stoxx 50 index, shows a deterioration greater than what was forecast for 2022 (-9% compared to -2% previously, the revisions for 2023 are less significant).

[8] This scenario, on the other hand, provided for an expansion of only 1.0% in 2022, far from the 3% currently envisaged.

Table 1.2
Main international assumptions

			Baseline scenario		Gas rationing scenario[1]		Slower policy tightening scenario[2]	
	1995-2021	2021	2022	2023	2022	2023	2022	2023
					Change in percent unless otherwise specified			
Real GDP in the euro area	1.4	5.2	3.0	-0.1	2.5	-1.4	3.0	1.0
Global demand (goods, volume)	4.4	9.2	4.7	0.3	3.7	-1.8	4.7	1.9
Global demand (services, volume)	3.4	6.5	9.9	7.0	9.7	6.2	9.9	7.6
Euro Stoxx 50 European stock index	4.2	22.8	-8.9	-2.6	-12.7	-21.4	-8.8	1.4
GDP prices, euro area	1.6	2.1	4.3	3.0	4.1	3.3	4.3	2.8
Oil prices (USD/barrel)	55.2	70.7	102.5	96.1	104.5	107.9	102.0	90.7
Exchange rate (EUR/USD)	1.20	1.18	1.04	0.99	1.03	0.96	1.04	1.01
Unemployment rate, Greater Region (percentage of labour force)	8.6	6.6	6.2	6.5	6.2	6.8	6.1	6.3
Short-term interest rates (euro area)	2.1	-0.5	0.3	2.3	0.3	2.8	0.3	2.0
Long-term interest rates (euro area)	3.6	0.1	1.9	2.7	1.9	3.5	1.8	2.4

Source: Oxford Economics (2022-2023: forecasts)
[1] The negative scenario with gas rationing is based on assumptions made by Oxford Economics in August. It mainly consistsof a complete halt of Russian gas deliveries in Q4 2022 and a 10% rationing in European industry until spring 2023. Inflationary pressures would intensify, which would trigger a tighter monetary policy than in the central scenario.
[2] In the upper scenario, production prices would ease in a climate of more fluid supply chains. Inflationary pressures should therefore fade more quickly than expected, prompting an easing of monetary policy. On financial markets, equity prices would rise sharply and government bond yields would fall, while most currencies including the EUR would appreciate against the USD.

"Balanced" risks

In the previous Note de conjoncture, the risks surrounding the forecasts of the central scenario were considered to be mainly of a downward nature, i.e. that the probability of weaker-than-expected growth in the euro area was greater than that of stronger growth. This had led STATEC to propose two alternative scenarios that were more unfavourable than the baseline scenario.

The risks are now considered by Oxford Economics as "balanced" i.e. with equal probability of bullish and bearish nature. STATEC has therefore selected two alternative scenarios for this forecasting exercise – one more unfavourable than the central scenario ("gas rationing"), the other more favourable ("slower policy tightening") – whose main characteristics are described under table 1.2.

The first scenario would lead to a marked recession in the euro area in 2023 (-1.4%), even if the occurrence of real gas rationing seems partially ruled out for the winter of 2022-23 (in particular due to the current filling of storage capacities). The second scenario, which instead of stagnation would see activity increase by one percent in 2023, assumes a more marked decline in inflation than previously expected. However, it must be admitted that inflation forecasts have in fact tended to underestimate its trend this year.

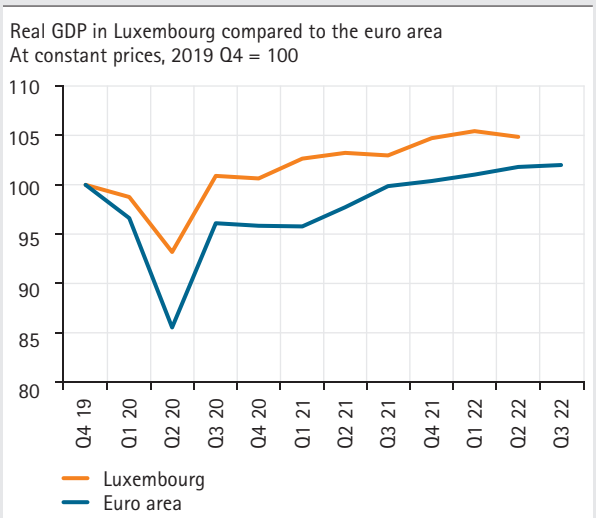
These two scenarios are a way to quantify some of the uncertainties surrounding the baseline forecast. However, there are many uncertainties surrounding this scenario. Starting with the developments of the war in Ukraine and their potential consequences, particularly on the European and global geopolitical chessboard, which can go far beyond the framework of economists' thinking. Temperatures in Europe will also be a determining factor in energy and gas consumption in particular. The evolution of the coronavirus pandemic may also hold surprises. The direction of monetary policies also involves many elements of uncertainty. Will they be able to curb inflation? Will they prove too restrictive and affect activity?

Economic activity 2

Activity in Luxembourg fell in the second quarter of 2022, affected in particular by the negative performance of manufacturing and construction. These two branches experienced supply-chain issues in 2021 and will witness a drop in demand this year. The financial sector held up better in the second quarter, but its value added in the first half of the year was lower than in the first half of 2021, with the results of financial auxiliaries affected by the deteriorating stock market environment. While the current rise in interest rates may represent an opportunity for banks to increase earnings, it has been accompanied by a fall in demand for loans, combined with stricter lending conditions.

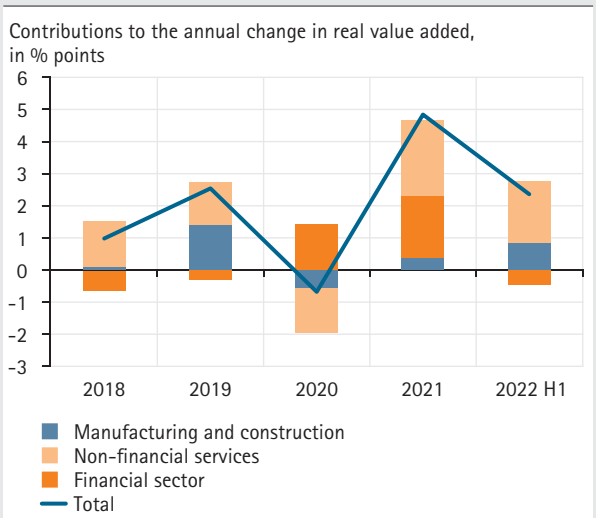
The outlook for the second half of the year is bleak, with surveys pointing towards a further deterioration in the business climate coupled with highly negative signals for household consumption, in particular concerns about high inflation. The measures to counter the effects of rising energy prices, negotiated under the tripartite agreements, will be a major support for the purchasing power of households and the businesses affected by the energy crisis. Economic activity should therefore continue to rise, but on a very modest growth trajectory, with real GDP growth expected at 1.7% this year, then 1.5% in 2023.

Graph 2.1
Lacklustre activity in Luxembourg in the first half of the year



Sources: Eurostat, STATEC

Graph 2.2
The financial sector lags behind in 2022



Source: STATEC

Activity undermined in 2022

Luxembourg's GDP quickly returned to its pre-pandemic level, from Q3 2020, i.e. one year ahead of the euro area as a whole. Luxembourg also escaped the (slight) recession experienced by the euro area at the crossroads of 2020 and 2021. Since then, Luxembourg's dynamic has experienced a less favourable trend compared to the euro area. Moreover, in Q2 2022, Luxembourg is one of the few countries (with Cyprus and Estonia) to experience a decline in GDP (-0.5% over one quarter).

There is undoubtedly a mechanical aspect to this drop in momentum. As Luxembourg's activity was much less affected by the consequences of the pandemic (owing, in particular, to its structure, which is heavily focused on services, and especially services where the possibilities of teleworking were relatively important), it did not benefit from catching-up effects as much as the other Member States in 2021 and early 2022.

But there is also the fact that certain branches have shown a downward trend in recent quarters, especially the financial sector, information and communication services and those linked to transport. (see below). In Q2, we also begin to feel the effects of the consequences of the war in Ukraine. These are mostly indirect in nature[1] and essentially via the channels of rising prices (energy and other raw materials), supply difficulties for certain materials and components, falling demand and deterioration of the stock market environment. These effects seem to have impacted activity in industry, construction and the financial sector during the spring of 2022 and some of them are likely to be even stronger in Q3. The results of the economic surveys carried out among companies and households continued to deteriorate during Q3 (as well as in October).

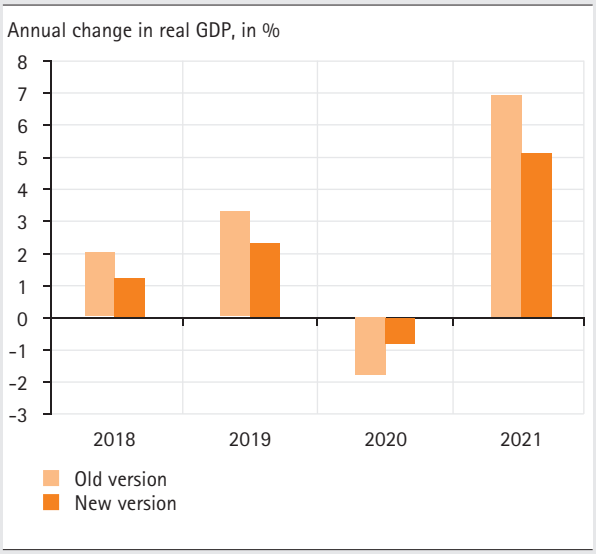
At the end of Q2, the growth carry-over for 2022 amounts to 1.6%[2], well below the 3.3%[3] posted for the euro area.

[1] The direct effects, for example a decline in Luxembourg exports to Russia or Ukraine are - a priori - weak because these countries are marginal trading partners for Luxembourg, see Note de conjoncture 1-2022, p. 19.

[2] This is the result obtained assuming that real GDP stabilises at its level of Q2 over the rest of the year.

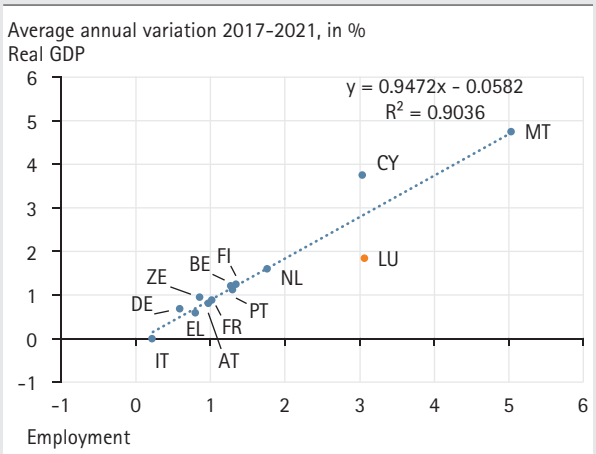
[3] This concerns the growth carry-over at the end of Q3 (for which euro area GDP has already been subject to a flash estimate).

Graph 2.3
Growth revised downward over recent years...



Source: STATEC (National Accounts)

Graph 2.4
... and much less dynamic than employment



Sources: Eurostat, STATEC

Downward revision of growth in recent years

Annual national accounts data have been revised for the years 2018 to 2021[4]. The results of this "annual campaign" were released at the beginning of October, at the same time as the accounts for Q2. As in each of these campaigns, the revisions have multiple origins: new data or available sources, reclassifications of businesses due to changes in the nature of their activity, changes in accounting methods, adjustments to errors detected since the previous year, etc.

Without going into the details of these revisions, we can summarise their main impact on the evolution of GDP over these four years. Overall, GDP growth has been revised down for every year except 2020 (where the decline in GDP now appears less pronounced, see graph 2.3). The main revisions - in terms of contribution to GDP growth - are in information and communication services (downwards) and financial activities (downwards in 2018-19, up in 2020-2021[5]) trade (with a strong downward revision in 2021) and business services (again mainly in 2021 and downwards).

In the "expenditure" approach to GDP, based on volume data, the balance of trade in goods and services has been revised downwards overall (less exports of goods, more imports of financial services), as has investment expenditure[6]. Private and public consumption expenditure, on the other hand, has been revised upwards, but to a lesser extent.

All in all, the change in real GDP over these years seems relatively weak compared to that of other economic indicators such as the European cycle or the results of the business surveys. This is also particularly evident in relation to employment, which grew much faster over this period than GDP (see graph 2.4). In this respect, Luxembourg stands out from most European countries, where these two variables tend to evolve at the same rate. With regard to Luxembourg, this divergence indicates a downward trend in labour productivity, but it could just as well reflect an underestimation of economic growth.

[4] For 2021, this is in fact a first estimate based on annual data.

[5] For the financial sector, real value added has been revised upwards for financial intermediation and insurance over all of these four years, but downwards for financial auxiliaries.

[6] This downward revision of investment mainly covers 2021 and in particular construction expenditure. It coincides with a clear revision of value added in this sector (+3.2% in 2021, compared to almost +10% in the previous estimate derived from the quarterly accounts).

Table 2.1
GDP and demand components

	Year					Quarter			
	2017	2018	2019	2020	2021	Q3 21	Q4 21	Q1 22	Q2 22
	Annual variation in %					Quarterly variation[1] in %			
Final household consumption expenditure	3.0	2.6	2.3	-7.3	9.5	1.3	1.0	0.9	-0.4
Final consumption expenditure for public services	4.0	5.4	2.6	7.8	5.4	-0.4	2.0	0.3	0.5
Gross fixed capital formation	5.3	-7.3	9.1	-3.6	6.7	-5.4	10.5	-2.4	-5.4
Exports of goods and services	-0.2	3.6	4.5	0.2	9.7	-1.8	4.0	-2.1	0.3
Exports of goods	5.7	0.5	0.7	-11.2	7.4	9.2	1.5	-2.7	-6.7
Exports of services	-1.9	4.6	5.9	4.1	10.1	-1.4	4.6	-3.5	0.5
Exports of financial services	0.1	-0.1	-1.5	1.6	6.6	0.8	0.3	-1.5	0.0
Exports of non-financial services	-5.3	13.3	18.0	7.6	14.7	-4.1	10.2	-5.9	1.2
Imports of goods and services	0.8	3.7	5.7	-0.4	11.8	-3.2	5.9	-3.1	-0.2
Imports of goods	5.6	-0.9	2.1	-9.9	10.1	-3.1	6.3	-5.0	-4.5
Imports of services	-0.9	5.4	7.4	3.4	11.8	-2.8	5.4	-3.1	1.2
Imports of financial services	-0.1	-0.2	-3.1	2.4	9.0	0.3	-0.3	-0.4	-0.7
Imports of non-financial services	-1.7	11.4	17.8	4.2	14.0	-5.1	10.1	-5.0	2.7
GDP	**1.3**	**1.2**	**2.3**	**-0.8**	**5.1**	**-0.3**	**1.7**	**0.7**	**-0.5**

Source: STATEC (national accounts – data at constant prices)
[1] Seasonally adjusted figures

Decline in private consumption, investment and exports of goods in Q2 2022

Household consumption showed signs of weakness in Q2 (-0.4% over one quarter). It is true that consumer sentiment had fallen sharply over this period, but not more markedly in Luxembourg than in the other countries of the euro area (where consumer spending increased by 1.0% over one quarter). Consumption, on the other hand, had been much more dynamic in Luxembourg over the two previous quarters. This drop in consumption in Luxembourg in the spring is mainly due to lower fuel sales (for which the split between residents and non-residents is currently estimated[7]) and cars (the situation should improve in Q3 under the effect of the recovery in registrations, see below). As for public consumption, which experienced a significant boost in 2020 and 2021 from the consequences of the health crisis, we have witnessed a return to normal (with an annual growth rate of around 3% in the first half of the year).

The volume of capital expenditure fell for the second consecutive quarter. The drop of in Q2 stems both from lower investments in non-residential construction (and reflects the fall in value added in construction over this period) as well as in aircraft and satellites. Excluding aircraft and satellites (which generate a lot of short-term volatility), the underlying investment trend remains buoyant in the first half of 2022.[8].

Exports of goods, already down in Q1, continued to decline, particularly in the areas of metal products, fuels and wood, cardboard and paper products. Exports of financial services stagnated overall, while those of non-financial services benefited from the positive performance of trade intermediaries and passenger air transport. For the air transport of goods, on the other hand (based on the statistics recorded at Findel airport, see below), exports fell in Q2. Exports of ICT services (especially telecommunications and computer consultancy) are also down.

[7] However, fuel sales have apparently decreased as a result of pump price differentials with neighbouring countries that are less favourable to Luxembourg (see in particular chapters 5 and 6), the decline attributed to residents may therefore be overestimated.

[8] On the other hand, the investment rate (investment expenditure in relation to GDP) remains low, at around 16% (it reached more than 20% at the start of the 2000s and has since shown a downward trend).

Table 2.2
Value added per sector

	Weighting				Year					Quarter
NACE Revision 2	2021	2017	2018	2019	2020	2021	Q3 21	Q4 21	Q1 22	Q2 22
	In %				Annual variation in %			Quarterly variation[1] in percent		
Value added in real terms										
Agriculture, forestry and fisheries	0.2	-6.9	12.3	-4.4	-3.6	0.0	-1.9	-0.5	5.8	4.0
Manufacturing	6.9	-11.6	0.1	10.9	-0.2	2.6	4.0	5.3	3.8	-8.6
Construction	5.1	-1.6	1.3	12.9	-9.1	3.2	0.0	-1.9	12.2	-8.7
Trade, transport, hospitality	14.3	4.5	-3.0	-0.6	-5.7	5.4	-0.7	0.7	5.1	-1.2
Information and communication	4.6	4.6	-2.5	-8.4	-10.9	-3.4	-8.8	6.2	6.3	-5.0
Financial and insurance activities	27.9	-0.2	-2.3	-1.1	5.5	7.1	0.8	0.2	-3.7	2.4
Real estate activities	8.4	3.2	1.5	3.0	-1.6	4.3	0.4	2.4	-2.6	1.6
Business services and rental	13.9	1.4	7.6	9.4	-2.1	0.2	-0.3	1.3	1.6	0.8
Public administration, defence, education and health	16.9	3.6	6.2	2.3	3.3	8.3	0.2	0.5	2.3	0.1
Other services[2]	1.7	1.7	0.1	5.1	-6.1	13.3	-0.4	2.0	-2.4	0.5
Total	**100.0**	**0.9**	**1.0**	**2.6**	**-0.7**	**4.8**	**-0.2**	**1.8**	**0.7**	**-0.4**

Source: STATEC (National Accounts)
[1] Seasonally adjusted data.
[2] Arts, entertainment and recreation, personal services, household activities, extra-territorial activities.

Industry and construction dampen value added

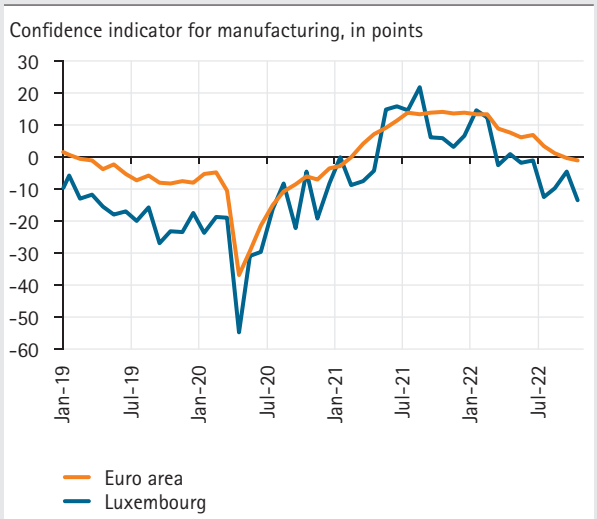
In Q2, the branches that contributed the most to the decline in GDP (and value added) were industry and construction. Rather facing supply difficulties in 2021, they have to deal with lower demand in 2022.

Information and communication services also made a significant contribution to the fall in GDP over this period, but this came after two good quarters. For this branch, it should be noted that the data for recent years has been subject to significant revisions. While in the previous version of the annual accounts it showed a positive and high contribution to the evolution of GDP, its value added is now showing a downward trend since 2018, which contrasts with the growing evolution of its workforce (employment in this branch has grown by about 3% per year from 2018 to 2021). Determining the added value of these services continues to pose difficulties of a methodological nature (and therefore of short-term interpretation), several case studies are still in progress, and it is likely that new revisions will take place at a later date.

Transport services also recorded a decline in Q2 mainly related to the evolution of air freight.

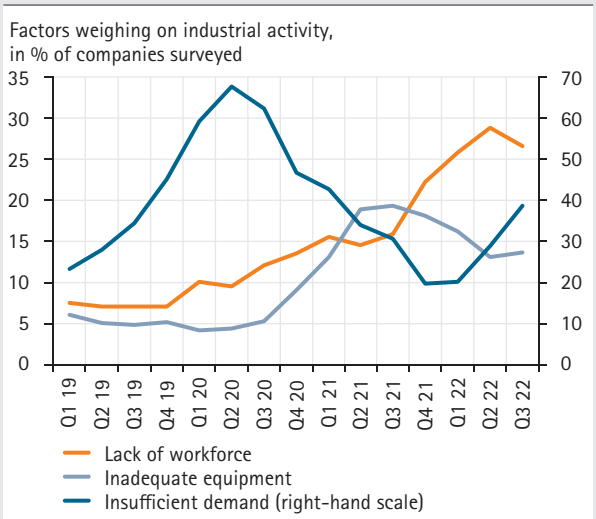
The financial sector held up better (+2.4% quarter-on-quarter compared with a drop of almost 4% in Q1), but the sector's value added in real terms remains below the levels reached at the end of 2021, which reflects in particular the deterioration of the stock market environment since then. Business services, accommodation and food service activities and trade (in particular wholesale trade, which is strongly internationally-oriented) also made a slight positive contribution to the change in GDP over this quarter.

Graph 2.5
Industrial confidence continues to decline...



Sources: Eurostat, STATEC (last point: October 2022)

Graph 2.6
...with more demand issues



Source: STATEC (economic surveys – data smoothed over three quarters)

Industry: the decline in production should continue

From January to August 2022, production per working day in industry in Luxembourg fell by 0.7% year-on-year (compared to +0.1% in the euro area over the same period[9]). At the root of this decline, we find mainly the negative contributions of metallurgy, rubber products, plastics, textiles, glass and ceramics[10]. This year, few areas stand out from a positively, apart from the manufacture of machinery and equipment (+8% year-on-year), beverages and tobacco (+8%, after having been fairly negatively impacted in 2020-21 by the consequences of the pandemic) and the production and distribution of electricity and gas (+5%).

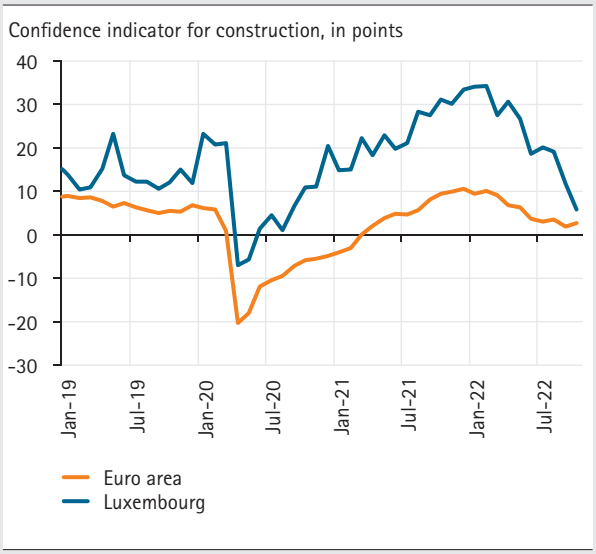
Despite a slight recovery during the summer, industrial confidence remains on a downward trend, in particular due to the deterioration of order books. While 2021 was marked by growing problems with supply (supply difficulties, staff recruitment, lack of equipment), concerns are now more focused on demand (the proportion of companies considering demand insufficient has in fact tended to rise since Q2 2022). The sharp rise in energy prices could also push certain industries to voluntarily limit part of their production (for the most energy-intensive industries). However, it is difficult to estimate the extent to which the production cuts observed are the result of a desire to optimise energy spending or are a reaction to a fall in demand. In any case, the production trend is down this year - without showing a sudden drop - for the industries identified as the most energy intensive (metallurgy, glass, wood see chapter 6).

Industrial product prices rose 22% year-on-year in September, after peaking at 33% in May, reflecting in particular the recent easing in commodity prices (see chapter 3), notably metals. In fact, the most marked slowdowns concern the prices of steel products (+25% year-on-year in September compared to +80% in May), non-ferrous metals (+26% compared to +56% in May) and metal products (+13% compared to +22% in May). The proportion of manufacturers anticipating a rise in their producer price remains historically high, but has gradually tended to decrease since May, until the last economic survey of October 2022.

[9] In the euro area, strong divergences are noted over this period, with notably very positive figures for Spain, Finland and the Netherlands (with increases of 3 to 4%). Luxembourg is further back in the field, alongside Germany and Belgium.

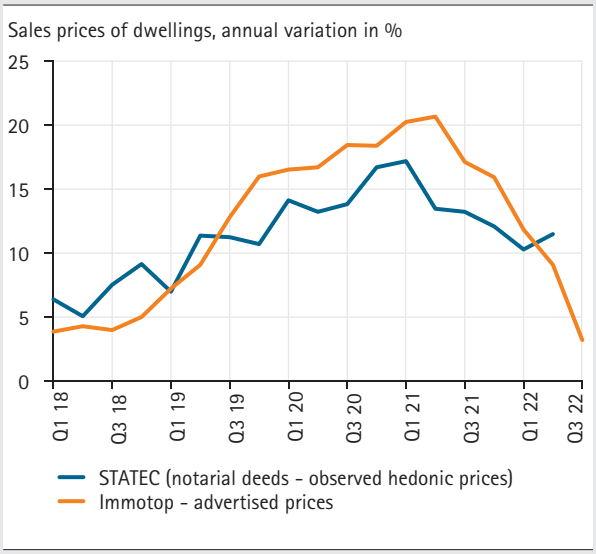
[10] Sharp drops (around 10% over this period), but with a lesser impact on the overall result, were also noted for the extractive industries and the timber industry.

Graph 2.7
A very marked drop in morale in construction in Luxembourg



Sources: Eurostat, STATEC

Graph 2.8
The slowdown in house prices is expected to deepen significantly



Sources: STATEC, Immotop

Construction: less demand, a sharp cooling of housing prices

Over the first eight months of 2022, construction production per working day fell by 0.3% year-on-year in Luxembourg, a result well below that recorded in the euro area (+3.5% over the same period). Although the year started well, with activity still expanding significantly in the first quarter, the figures deteriorated considerably thereafter, particularly for building and civil engineering companies.

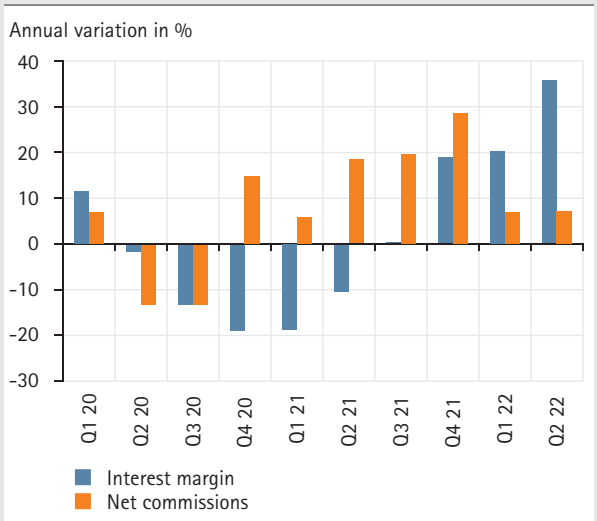
The morale of construction contractors, which had held up well until the spring by remaining at historically high levels, then took a heavy hit, mainly due to the deterioration in order books (and to a lesser extent the employment outlook). The share of companies considering demand as insufficient reached around 20% in September and October, against only 10% at the start of the year. Recruitment difficulties affect around two-thirds of businesses as they enter the autumn, which is still substantial, but this proportion reached three-quarters at the beginning of the summer.

Producer prices in construction rose almost 15% year-on-year in Luxembourg in the second quarter of 2022 (a record high replicated across many euro-area countries over the same period). This increase in the price of construction services may well act as a brake on consumer and business demand, already experiencing a sharp rise in general inflation and energy bills. The rise in interest rates has also weighed on their ability to borrow, and in Luxembourg as in the euro area there has been a fall in demand for mortgages (although this had already begun before the rise in key rates).

In the economic surveys, the outlook for producer prices peaked in Q2 and have since subsided slightly. However, their evolution should remain higher than that of real estate prices over the next few quarters. The latter have tended to slow down since mid-2021 and, according to the trajectories noted with private actors (see graph 2.8), the trend should clearly strengthen in Q2. These various factors – rising interest rates, higher construction costs than sales prices – are likely to weigh on real estate investments[11].

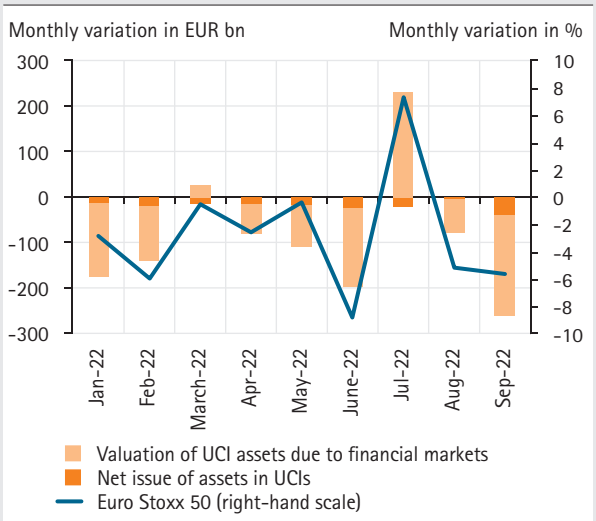
[11] On the other hand, the volume of new building permits reached its lowest level since 2009 in the first half of 2022 (with a 35% drop over one year for residential construction projects). STATEC expects declines of 6.5% in residential investment in real terms for 2022, followed by 5.3% in 2023.

Graph 2.9
Bank interest margins are on the rise again



Source: CSSF (decumulated quarterly data)

Graph 2.10
Undertakings for Collective Investment (UCIs) have suffered from the stock market decline since the beginning of 2022



Sources: CSSF, Macrobond

Financial sector torn between the decline of the stock markets and the rise in rates

Developments diverge between the different activities of the financial sector. On the one hand, rising interest rates are boosting banks' revenues, while on the other, stock market volatility and asset write-downs are weighing on the activities of undertakings for collective investment and related ancillary activities. The real value added of the financial sector thus fell by 2% year-on-year in the first half of 2022, dragged down by activities ancillary to financial services (-9% year-on-year), but supported by growth in the activity of insurance companies (+10%) and banks (+2%).

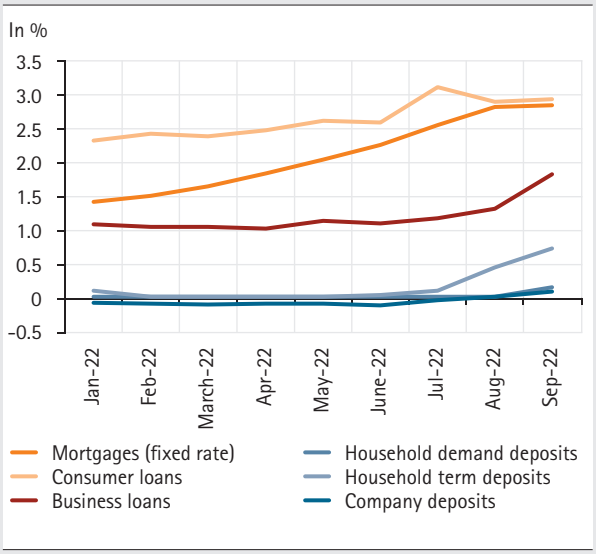
Banking revenues and fees both increased by 9.5% in the first half of the year. Interest margins increased sharply (+28% year-on-year), with the growth in activity (balance sheets up 9% year-on-year in June) and thanks to the rise in interest rates in the United States. Net commissions also increased (+7% year-on-year). The sustained increase in operating costs (+11%) is mainly the result of investment expenditure in information technology according to the Financial Sector Supervisory Commission[12]. Operating expenses are increasing for nearly 80% of banks, and are even higher than personnel expenses at a third of the institutions. Provisions made to cover risks related to the war in Ukraine, however, weighed heavily on the net result (-28% year-on-year)[13]. The results of Q3 disclosed by major European banks indicate an increase in interest margins and fees on retail and investment activities. On the other hand, profits are reduced by the devaluations on the stock markets which weigh on asset management and by the increase in the cost of credit risk and the provisions made to cover the risks of credit default.

Affected by turbulence on global stock markets since the start of 2022, assets under management of undertakings for collective investment shrank in the first three quarters of 2022 (-10% year-on-year in September). Asset depreciation explains 80% of the decline in investment fund assets in 2022, with the remaining 20% due to net outflows. Bond funds are the most affected (-11% year-on-year in August) followed by equity funds (-3%), while real estate funds, which represent 5% of non-monetary assets under management, are still progressing strongly (+30%).

[12] Commission de surveillance du secteur financier (2022), Comptes de profits et pertes des établissements de crédit au 30 juin 2022, Press release 22/22.

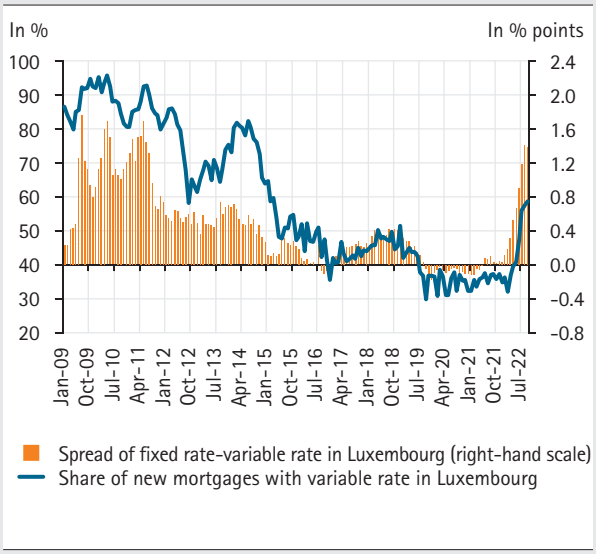
[13] These provisions are not taken into account in the calculation of the added value of banks in the national accounts.

Graph 2.11
Increase in rates applied to loans and deposits



Source: BCL
Notes: rate of outstanding deposits and new loan contracts.
Seasonally adjusted consumer credit rates.

Graph 2.12
Renewed interest in variable rate mortgages



Source: BCL

The decline in assets managed by these organisations automatically reduces income from ancillary activities related to fund management, which account for a third of the added value of the financial sector in Luxembourg.

As for insurance companies, premiums on non-life insurance products increased sharply again in the first half of 2022 (+17% year-on-year), while life insurance premiums fell (-5%), in particular for non-unit-linked products (-10%) against a backdrop of rising rates and volatility of stock markets.

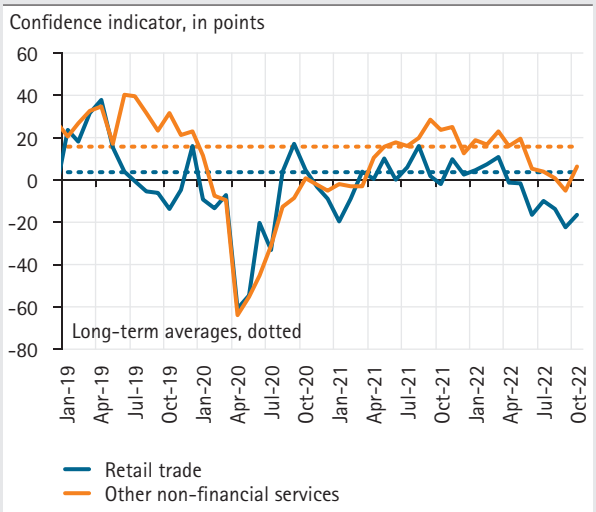
Rising interest rates impact demand for credit

Lending criteria and conditions for businesses and households have been tightening since the beginning of 2022, as long-term interest rates have risen and the economic outlook has deteriorated. The hardening was much stronger following the first rise in the ECB's short-term key rates in July (and the two others that followed in September and October).

Rates for new household consumer loans increased by 0.5% point year-on-year in September (from 2.6% to 3.1%) and corporate credit rates by 0.8 percentage points (from 1.0% to 1.8%). Fixed rates at 10 years or more for mortgages have risen sharply and reached 3% on average in September (+1.4 percentage points year-on-year), while variable rates were 1.4% on average, half the fixed rate. With such a wide gap between the two types of rates, variable rate loans have become more attractive. Their share in total new mortgages granted increased from 34% at the end of 2021 to almost 60% in September 2022 (see graph 2.12). The amount of new variable-rate loans thus increased by nearly 50% year-on-year, while it decreased by 38% for fixed-rate loans. Consumer loans granted in Q3 are up 2.8% year-on-year, while new business loans contracted 3.1%.

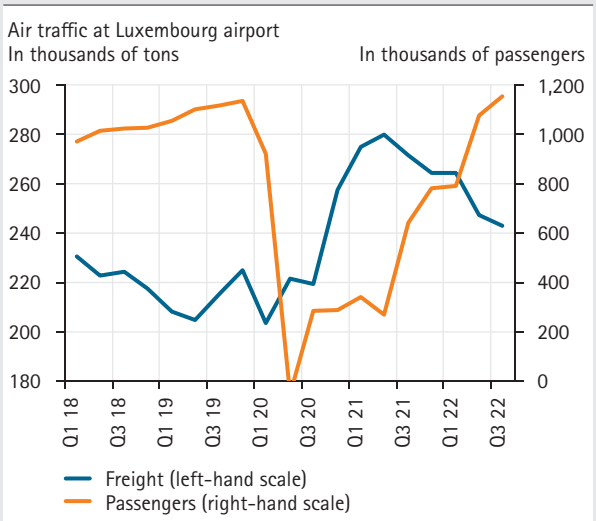
On the other hand, deposit rates were also raised, by +0.7 percentage points for household term deposits and +0.8 percentage points for business term deposits (which had been subject to a negative interest rate since the end of 2015).

Graph 2.13
Confidence in non-financial services has fallen sharply since the summer



Sources: European Commission, STATEC

Graph 2.14
Air transport: more passengers, less freight



Sources: ANA, STATEC (seasonally adjusted data)

Non-financial services in turn affected by a drop in confidence

Trust[14] of most non-financial service companies had held up rather well in the first few months after the start of the war in Ukraine (much better than that of industrials or retail trade actors). But since June, these services have taken a hit to morale. This is particularly true for transport actors (land and air) and several categories of business services (legal and accounting activities, head office activities, management consultancy, architecture, engineering, employment-related activities, investigation and security). The confidence indicator recovered slightly in October – owing in particular to legal and accounting activities and warehousing services – but it would be bold to anticipate a trend reversal. In fact, in most countries of the euro area, the results of the economic surveys in October show a continued deterioration in opinions in service activities.

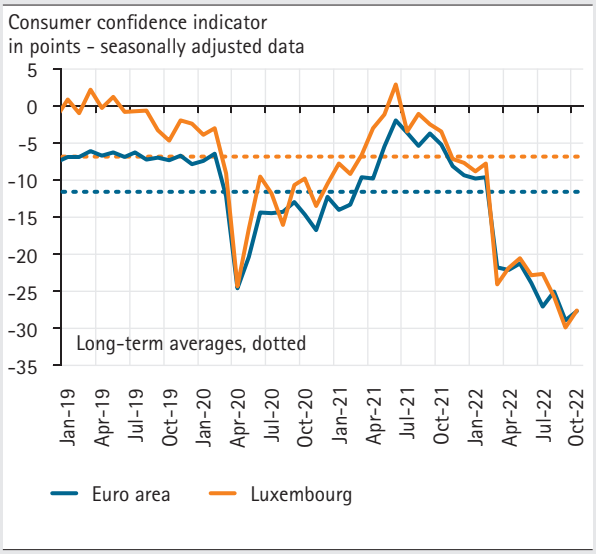
Catch-up effects are still in play this year for certain activities

In several areas of activity, we can see the disappearance of constraints that had weighed on results due to the COVID pandemic. This is particularly the case for air passenger transport, with traffic at Luxembourg airport which has recently reached its pre-crisis level (and even slightly exceeded this level in Q3). The situation is different for air freight, which had on the contrary benefited from effects linked to the pandemic, in particular from the fact that part of the freight transport could no longer be provided by regular passenger companies. Freight volumes have tended to decline since mid-2021, but still remain high (about 10% above pre-pandemic levels).

Accommodation and food service activities also continue to expand in 2022. For restaurants and cafés, turnover in real terms (in Q3) now clearly exceeds its pre-crisis level; while for hotels and canteens/caterers, it is just beginning to catch up with this level. The upturn in tourist numbers has certainly contributed to this trend: the number of arrivals in accommodation establishments returned to 2019 levels in the second quarter and even exceeded these levels significantly in the third quarter (the same is true in terms of overnight stays).

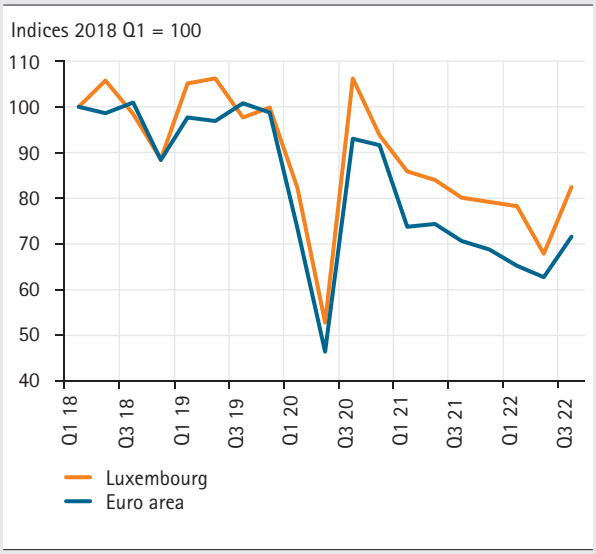
[14] The confidence indicator is calculated on the basis of three questions from the business survey: evolution of the company's situation over the last three months, evolution of demand over the last three months and outlook for demand over the next three months.

Graph 2.15
Lower morale for consumers



Sources: BCL, European Commission

Graph 2.16
Slight boost to new car registrations in Q3



Source: STATEC (seasonally adjusted data)

Increasingly negative signals for household spending

Morale in retail trade began to slump at the start of Q2 2022 (see graph 2.13). The volume of retail sales, after an increase of 0.6% over a quarter in Q1, fell 0.4% in Q2. This movement was due to marked declines in general retailers (-2.7%), petrol stations (-5.5%), specialised retailers of information and communication equipment (-5.9%) and other household equipment (-3.6%). However, the decline was offset by the positive performance of distance sales. Retail sales rebounded in Q3 (+1.4%), owing to better results from non-specialised shops and food, beverage and tobacco retailers, as well as a less pronounced decline in petrol outlets. The decline in sales is still quite pronounced in shops specialising in household goods.

Over the first three quarters of 2022 as a whole, retail sales thus show an increase of 2.4% year-on-year in real terms, close to the figure in the euro area (+2.1%). This result may seem significant given the collapse of consumer confidence this year. (see graph 2.15). However, it should be noted that the start of 2021 was still largely marked by health restrictions and weak commercial activity[15] and on the other hand – more specifically, concerning Luxembourg – that distance sales largely supported the figure in the Grand Duchy[16].

Indeed, consumer sentiment in Luxembourg and the euro area fell sharply after the start of the war in Ukraine, and it seems to have continued to decline since then (it has never reached such a low level). Households are particularly worried about the general economic outlook and that of their financial situation. Their intentions in terms of purchasing cars, housing, capital goods and major installation expenses for housing are currently at an all-time low. Sales of new passenger cars, however, recovered somewhat in Q3 (see graph 2.16), but – given the longer delivery times at this level – they may reflect earlier purchasing decisions.

[15] The euro area thus saw its retail sales increase by 6.1% year-on-year in Q1, only 1.0% in Q2 and fell by 0.8% in Q3.

[16] Excluding fuel and distance sales, retail sales thus show a decline of 1.5% in real terms this year (over the first nine months of the year).

Table 2.3
Main macroeconomic developments

			Baseline scenario		Gas rationing scenario[1]		Slower policy tightening scenario[2]	
	1995-2021	2021	2022	2023	2022	2023	2022	2023
Main aggregates							*Change in percent unless otherwise specified*	
Nominal GDP (EUR billion)	.	72.30	78.73	83.30	77.92	78.52	78.88	84.26
Idem, percent change	6.2	11.6	8.9	5.8	7.8	0.8	9.1	6.8
GNI (EUR billion)	.	50.5	54.86	57.72	54.37	54.73	54.98	58.39
Idem, change in %	5.1	12.8	8.7	5.2	7.7	0.7	8.9	6.2
Potential (real) GDP[3]	3.0	2.2	2.6	2.1	2.6	2.1	2.6	2.1
Output gap (% of pot. GDP)[3]	-0.4	-0.8	-1.7	-2.2	-2.6	-7.3	-1.5	-0.9
Real GDP	3.2	5.1	1.7	1.5	0.7	-2.9	1.9	2.7
Total domestic employment	3.1	3.0	3.4	2.3	3.0	0.3	3.5	2.9
Unemployment rate (% of labour force)	4.6	5.7	4.8	5.1	5.0	6.2	4.8	4.9
Consumer price index (NICP)	1.8	2.5	6.4	3.4	6.5	3.8	6.4	3.1
Sliding wage scale	1.8	0.6	3.8	5.5	3.8	6.0	3.8	5.1
Compensation per employee	2.9	6.0	6.3	5.6	6.2	5.4	6.3	5.2
Greenhouse gas emissions[4]	-1.7	2.8	-9.9	0.2	-10.2	-0.9	-9.9	0.8
Public finances								
Total revenues	6.1	12.6	6.0	5.8	5.2	2.2	6.2	6.4
Of which: taxes	6.4	12.7	6.1	5.6	5.2	1.8	6.3	6.4
Expenditure	6.3	2.4	9.0	11.5	9.1	12.3	9.0	11.1
Public balance (% of GDP)	1.7	0.8	-0.4	-2.8	-0.8	-5.1	-0.3	-2.2

Source: STATEC (2022-2023: forecasts)[1] The negative scenario with gas rationing is based on assumptions made by Oxford Economics in August. It mainly consists of a complete halt of Russian gas deliveries from Q4 2022 onwards and a 10% rationing in European industry until spring 2023. Inflationary pressures would intensify, which would trigger a tighter monetary policy than in the baseline scenario. [2] In the upper scenario, production prices would ease in a climate of more fluid supply chains. Inflationary pressures should therefore fade more quickly than expected, prompting a slower policy tightening. On financial markets, equity prices would rise sharply and government bond yields would fall, while most currencies including the EUR would appreciate against the USD. [3] No difference between the various scenarios for potential growth. [4] Average annual change 2005-2021; greenhouse gas emissions (GHG) attributed to Luxembourg, i.e. excluding emissions from companies subject to the European Emissions Trading Scheme (EU-ETS).

Two years of weak activity growth

After the recovery in 2021, the following two years will be marked by the energy crisis. The increase in activity will peak at around 1.5% per year and employment will begin to slow. Thanks to renewed major fiscal intervention, the non-market sector should support demand, thus avoiding a more marked downturn (especially in 2023).

STATEC has decided to represent the main upside and downside risks annexed to its baseline forecast scenario by using the following simulations from Oxford Economics (see table 2.3):

- Gas rationing (lower scenario);
- Slower policy tightening (upper scenario).

The gas rationing scenario is discussed in detail in the study 7.1. At present, the danger of natural gas rationing seems limited, thus the consequences drawn up by Oxford Economics in this scenario appear too severe.

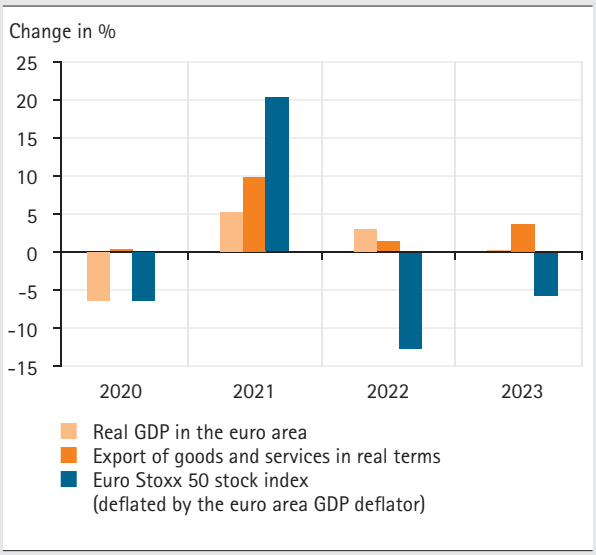
A less restrictive monetary policy could be a key factor in preventing the stagnation phase from extending beyond 2023.

Sluggish external demand

Following 2021, marked by the post-COVID recovery, external demand weakened in the course of 2022 and should remain largely sluggish in 2023 (see graph 2.17). Luxembourg's exports of goods and services will suffer as a consequence and, at +2.5% on average per year, their growth will remain well below the historical average (+6.2% since 1990).

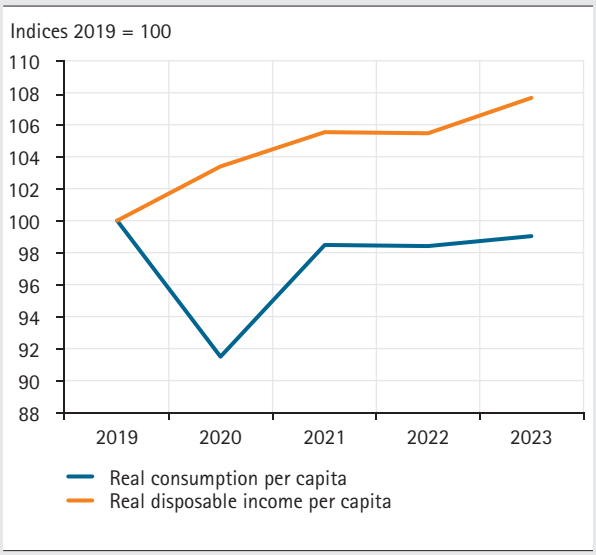
The main source of growth is non-financial services exports (+3.7% in 2022, +7.3% in 2023): these are estimated to have slowed down in 2022 (which could be a backlash to the strong increase of +15% in 2021) and are expected to grow in 2023 at more or less the same rate as foreign demand.

Graph 2.17
After the recovery in 2021, few external growth impulses in 2022 and 2023



Sources: STATEC, Oxford Economics (2022-2023: forecasts)

Graph 2.18
Per capita consumption falling behind disposable income



Source: STATEC (2022-2023: forecasts)

Exports of goods, which have been detached from imports from client countries since 2010, are already falling in 2022 (-10% in cumulative terms over the first half of the year). The minor recovery expected in 2023 should be observed in the context of the weak growth of 2022, when demand was still evident. In total, the increase of only +0.3% in 2022/2023 reflects the recession of industry in Europe against the backdrop of the energy crisis.

Exports of financial services were buoyant in 2020 and even more so in 2021, after a subdued period that began in 2015. In the past, they have often withstood weak stock market declines (2016, 2018/2019 and especially 2020) and the same could be true in 2022/2023 (total increase expected: +2.5%).

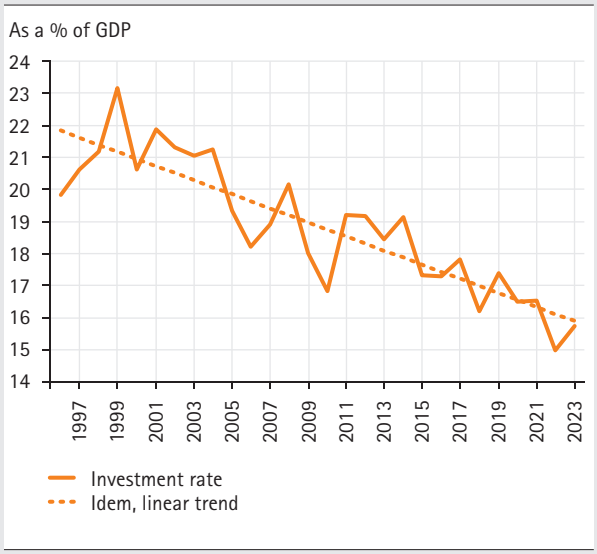
Consumption and investment lack energy

Final consumption per capita has stagnated overall since 2019: the level forecast for 2023 remains 1% below the 2019 level (see graph 2.18), while per capita disposable income (purchasing power) is progressing well. This divergence leads to an increase in the savings rate between 2022 and 2023, which is undoubtedly partly of precautionary nature (related to the energy crisis).

On the other hand, the government has supported purchasing power (via tripartite measures). While some of the measures benefit the upper quintiles, who have a lower marginal propensity to consume and are not a priori financially constrained, STATEC has integrated the measures in such a way as not to increase the savings rate, which translates into an almost complete spending of the injected funds.

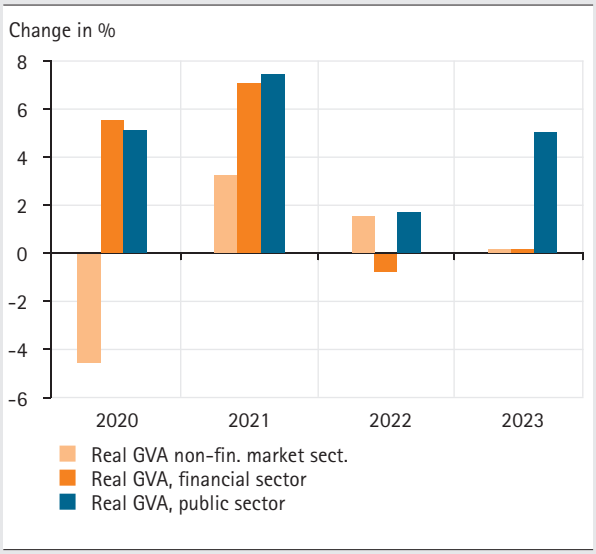
The investment rate should hold up in 2022/2023, although it would fall well below its long-term average. This fall is mainly due to machinery and equipment (-15% in 2022 and +5% in 2023 respectively), but this is a very volatile aggregate, heavily revised (and subject to the irregular impact of purchases of aircraft and satellites).

Graph 2.19
Investment rate at historic low



Source: STATEC (2022-2023: forecasts)

Graph 2.20
The market sector in need of a boost



Source: STATEC (2022-2023: forecasts)

Residential investment, although falling, should also hold up, as the fall is linked to a declining migration rate (halved between 2015 and 2023) and the rise in mortgage rates. The four years of decline (2020-2023) should be linked to the end of the cycle, which is also illustrated by the stagnation predicted by STATEC in real estate sales prices (old and new) in 2023.

Public investment would provide welcome support (+10% cumulatively in 2022/2023) to construction companies, which have been battered by cyclical headwinds.

The public sector is growing – the public deficit is growing

Over the four years under review (2020-2023, see graph 2.20), only the non-market sector would not have experienced any decline. This is linked to an expansive fiscal policy associated with the successive crises and leads to a continuous deterioration of the budget balance (see chapter 5).

In 2022/2023, the financial and non-financial market sectors would see their activity increase by a meagre cumulative percentage only, in line with the weak external and internal demand.

The public measures taken since autumn 2021 provide essential support[17]

STATEC simulated the macroeconomic impact of all measures acting on the economy in 2022 and 2023 ("Energiedësch", tripartite meetings of March and September 2022 and CO tax_2). The starting point is a synoptic table drawn up by the Ministry of Finance which details the measures per year and per type of revenue/expenditure (excluding CO_2 tax). These figures are expressed "ex ante", i.e. without feedback effects on the main variables, including public finances[18]. In addition, the postponement of the index bracket of July 2022 and the limitation of the number of brackets by means of the energy price cap have an impact in 2023 in particular. The added value of STATEC's analysis consists in assessing the multiplier effects of all these measures from a macroeconomic perspective.

[17] This part mainly deals with the macroeconomic impact of the measures; additional insight on the "public finances" aspect features in the related part (see chapter 5).

[18] And do not include changes made by STATEC to these figures (see notes no. 2 and 3 of table 2.4).

Table 2.4
Measures taken to counter the effects of the energy crisis[1]

	2022	2023	Total	% of total	Explanations
			In EUR million		
Subsidies to be paid	290	485	776	46	Especially limitation of energy prices (expenditure in favour of distribution companies)
Welfare benefits	20	12	32	2	Various household allowances
Current transfers	14	7	21	1	Various household allowances
Capital transfers[2]	58	45	103	6	Direct aid to businesses
Total expenditure measures	382	549	931	55	
Taxes on production and imports[3]	0	268	268	16	VAT reduction
Taxes on income and wealth	330	165	495	29	Household tax credit
Total revenue measures	330	433	763	45	
Overall total	**712**	**982**	**1,694**	100	
Idem, as a percentage of nominal GDP	**0.9**	**1.2**	**2.1**		

Sources: Ministry of Finance, STATEC
[1] Without the aid scheme in the form of guarantees from the "Solidaritéitspak".
[2] Capital transfers to companies suffering from the energy crisis have been reduced by EUR 220 and 25 million respectively due to the fact that fewer companies than expected took advantage of the aid in 2022. The applied discount is of 80% in 2022 and a prophylactic discount of 20% has been applied to the amounts budgeted for 2023.
[3] The cost of the VAT cut was reduced by EUR 50 million by STATEC based on its own simulations.

The inflation forecast from early September, with high rates of around 6.5% for 2022 and 2023, fuelled the tripartite discussions. It was used as a counterfactual to measure the effects of the tripartite on the NICP and the sliding wage scale (EMS) caused by the energy price cap.

In descending order, according to their total ex ante budgetary cost (2022 and 2023), the following main measures[19] have been simulated:
- Energy tax credit (EUR 495 million);
- The cap on the increase in gas prices to +15% for households from October 2022 (EUR 470 million);
- Temporary reduction of one percentage point in VAT rates (normal, intermediate and reduced rates: EUR 270 million[20]);
- Transfers to companies affected by the energy crisis (EUR 185 million[21]);
- Electricity price cap for households (EUR 110 million);
- Reduction of 7.5 cents per litre on petrol and heating fuel (EUR 77 million).

In Modux – the model used for forecasting – the main transmission channels are as follows:
- The direct and indirect limitation of the number of index brackets via a cap on energy prices (in addition to the more limited impact of the VAT cut);
- The increase in transfers in favour of households and the reduction of taxes;
- Investment aid for companies affected by rising energy prices.

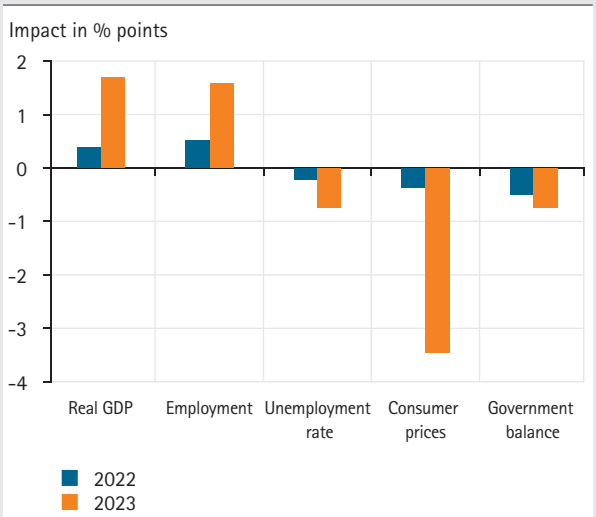
Thus, compared to the inflation forecast excluding the measures, the EMS would be reduced by 1.4% in 2022 and 4% in 2023. This curb on inflation and the number of index brackets thus constitutes a flagship measure of the tripartite agreements. It directly benefits employers (public and private) and has a positive impact on employment (compared to the counterfactual without measures) of almost 2% in 2023. This has a positive impact on private consumption, business surpluses and government revenues. Of all the measures taken, the inflation/moving scale lever is the one measure which will boost activity the most and would thus help to avoid a recession in 2023.

[19] Greater than EUR 50 million, summing to almost 90% of the total related expenses (excluding CO_2 tax).

[20] Amount retained by STATEC, to be compared with the EUR 317 million entered in the draft budget.

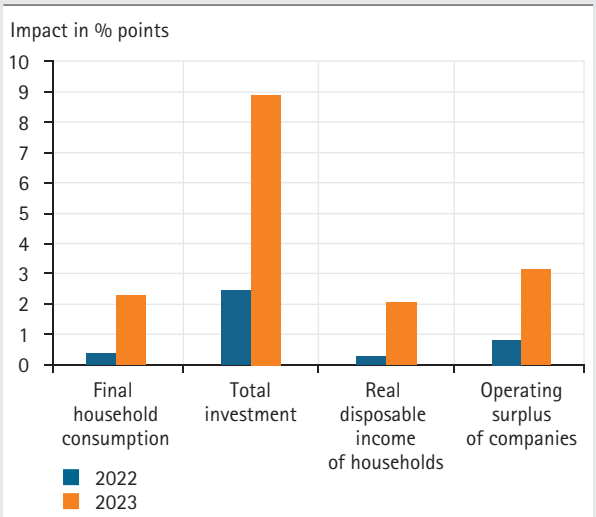
[21] Instead of the planned EUR 430 million. The measures are aimed at companies suffering from the energy crisis and include EUR 30 million to support self-consumption. The discount expresses a reduced use of measures, which is already noticeable in 2022 and which has been extrapolated to 2023.

Graph 2.21
Major impact of anti-crisis measures on activity, employment...



Sources: Ministry of Finance, STATEC

Graph 2.22
... and domestic demand



Sources: Ministry of Finance, STATEC

The measures that directly support purchasing power (tax credit, cash transfers, limitation of energy prices resulting from the first tripartite meeting) would particularly benefit low-income households while supporting private consumption (by just under 1.5%). However, the impact on GDP would be limited (+0.4%).

Measures for companies whose profitability is affected by the energy crisis (and which meet the criteria in the legislation) would give a substantial boost to investment in machinery and equipment (+4%).

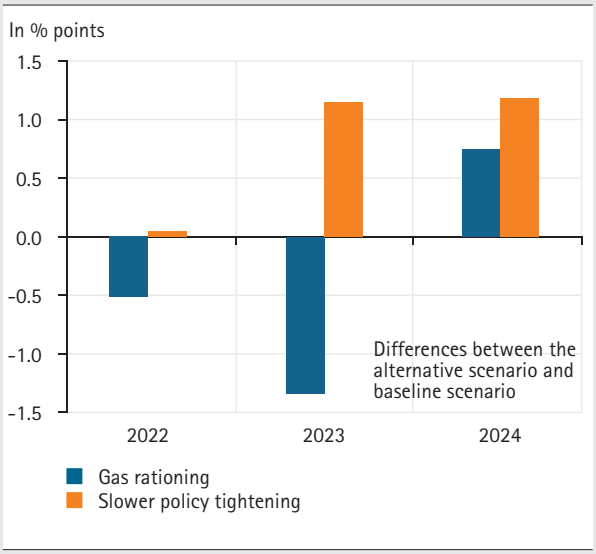
In total, real GDP growth would be positively impacted by a little less than half a percentage point in 2022 and by about 1.5 percentage points in 2023. The measures would keep domestic demand afloat in 2023, a year of crisis. Thanks to the favourable effects on other variables, mainly employment and unemployment, it can be estimated that the direct measures in favour of businesses and households[22] could be self-financing by up to around 30%: one third of the ex-ante budgetary cost would be compensated for by an increase in public revenue as a result of the expansion of activity following the public spending.

It should also be noted that the static analysis of the measures by quintile (see study 7.3) – which ignores the multiplier effects highlighted here, particularly on employment - highlights the redistributive nature of the whole tripartite package. Thus, this modulation of the wage indexation mechanism, accompanied by measures aimed at protecting the lowest wages, makes it possible to produce generally positive economic effects.

In any case, the package of measures limits (for 2022 and 2023) the impact of the energy crisis. The budgetary cost is limited by the direct and indirect action on the sliding scale and multiplier effects, but uncertainties remain on future energy prices, for which the State has committed to cover the acquisition costs by the distributors beyond 31 December 2023.

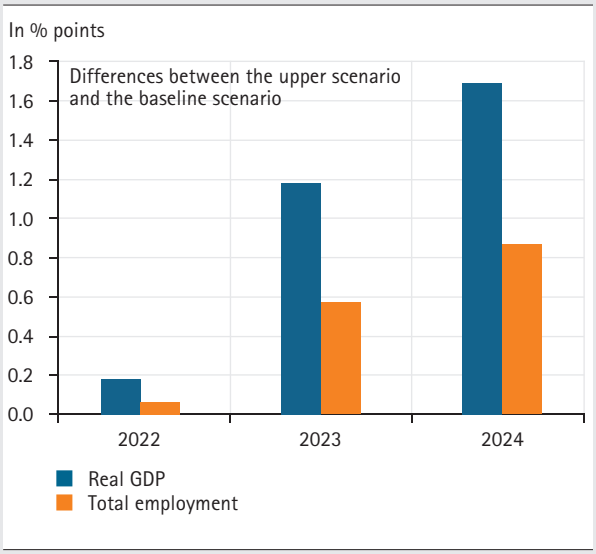
[22] Public expenditure or revenue shortfalls.

Graph 2.23
A broad range of risks in 2023 on euro area GDP



Source: Oxford Economics

Graph 2.24
A slower policy tightening would have lasting beneficial effects on the Luxembourgish economy



Sources: Oxford Economics, STATEC

A slower policy tightening could raise growth in 2023 to almost 3%

In the upper scenario, production prices would ease in a climate of smoother supply chains. Inflationary pressures should therefore fade more quickly than expected, prompting a slower policy tightening (-40 basis points in the euro area compared to the baseline scenario). On financial markets, equity prices would rise again (+15 percentage points in 2023 and 2024) and government bond yields would fall, while most currencies including the EUR would appreciate against the USD.

Growth in the euro area would therefore be 2.5 points higher in total in 2023 and 2024, which would stimulate growth in Luxembourg by around +3.5 points. The positive differential in favour of Luxembourg comes from the rise in equity markets.

In the favourable scenario, employment growth would remain high in 2023 (at +3%) and unemployment would not increase (up 0.3 points in the baseline scenario). Part of the favourable impetus on employment would come from lower inflation (-1 percentage point) resulting in a less dynamic sliding scale (-0.8 percentage point). At the end of the period, the public balance would be almost 2 points of GDP more favourable than in a scenario without slower policy tightening. In 2023, it would thus reach -2.2% instead of -2.8%.

Inflation and wages

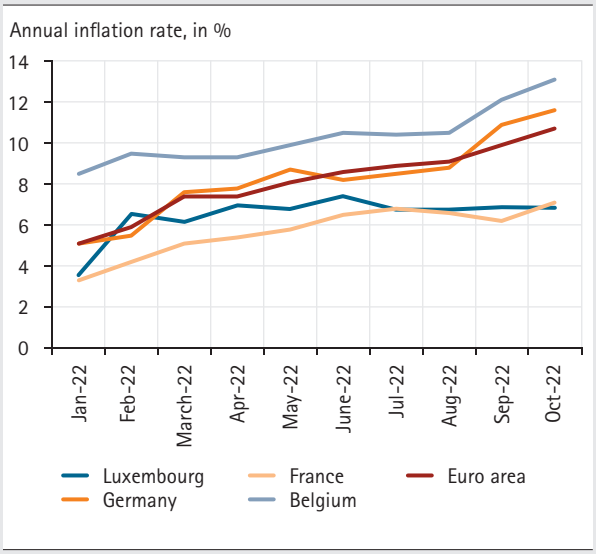
3

2022 has been marked by historically high levels of inflation, although it is less pronounced in Luxembourg than elsewhere in the EU. This surge in inflation is the result of a combination of factors ranging from global supply bottlenecks, increased demand resulting from a "return to normal" after two years of health restrictions, tensions on the energy market amplified by the war in Ukraine and the appreciation of the dollar, which automatically raises the price of several imported goods.

The delayed impact of soaring energy prices on all other prices, especially food prices, is putting strong upward pressure on inflation in Luxembourg. This effect is reinforced by the depreciation of the euro, which looks set to last longer than previously anticipated. These developments have led STATEC to revise its inflation forecasts upwards.

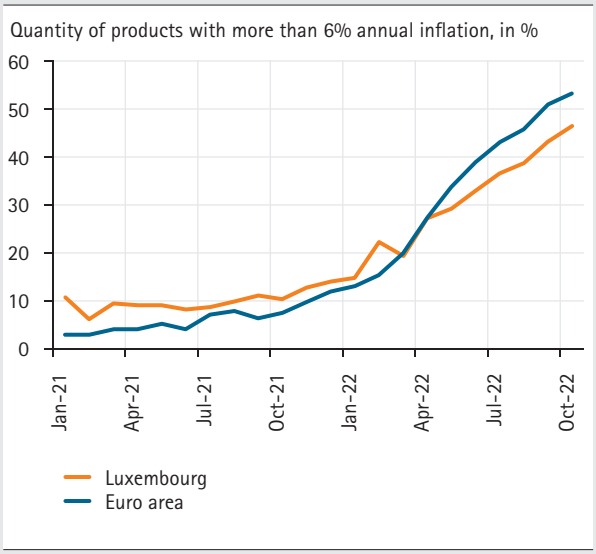
In line with high inflation, compensation per employee showed strong growth in Q2 2022 in the euro area and Luxembourg. Over the year as a whole, compensation per employee is expected to increase by 6.3% in Luxembourg, and by 5.6% in 2023, under the major effect of successive index brackets. Real household disposable income per capita - i.e. purchasing power - is expected to stagnate in 2022 and to increase by about 2% in 2023, with the purchasing power of low-income households being significantly supported by the measures agreed in the tripartite negotiations.

Graph 3.1
High inflation in Luxembourg, but somewhat contained compared to other European countries



Sources: STATEC, Eurostat

Graph 3.2
More and more products display inflation above 6%



Sources: STATEC, Eurostat

Inflation in Luxembourg is lower than in the euro area

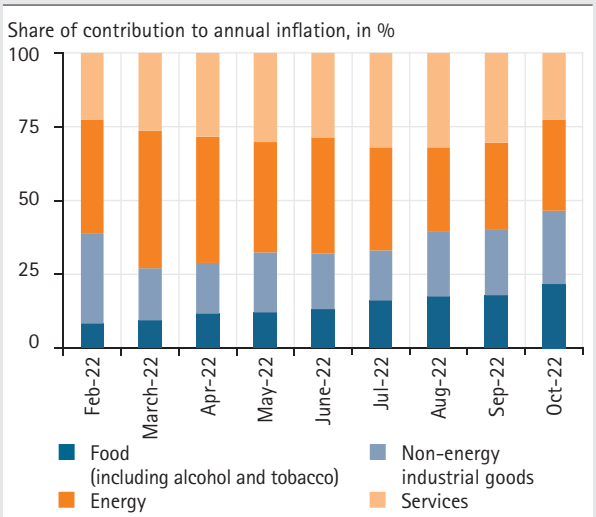
Even though it is historically high this year, the inflation rate in Luxembourg is one of the lowest among EU countries. This is mainly due to gas and electricity prices which, in the Grand Duchy, are adjusted less frequently than in other countries. In the euro area, electricity and gas prices have followed rising trends since the summer of 2021, reflecting tensions over gas supply that have been intensified by the war in Ukraine. Between January and October, on average, gas and electricity prices recorded annual inflation rates of 55% and 36% respectively in 2022, compared to 8% each in 2021. Similar trends have been observed in neighbouring countries where the price of electricity in October 2022 reached levels much higher than the average for 2021: +103% in Belgium, +27% in Germany and +9% in France.

In Luxembourg, on the other hand, the price of electricity only increased by 2.6% over the same period. The outcome is similar for gas, in October 2022 its price is 53% higher than the average for 2021, while in the euro area this increase is +94%. In Belgium +184%, in Germany +81% and in France, where a price cap has been put in place, it has risen by +57%. The new package of measures resulting from the second tripartite agreement provides for specific measures aimed at limiting the increase in energy bills, such as limiting the increase in the price of gas to 15% compared to the level of September 2022, freezing electricity prices in 2023 and a reduction of EUR cents 15 per litre of heating oil from 1 November. As a result, all things being equal, the hike in energy prices in Luxembourg should remain lower, at the end of 2022 and in 2023, than the levels observed in neighbouring countries.

More and more expenditure items affected by inflationary fever

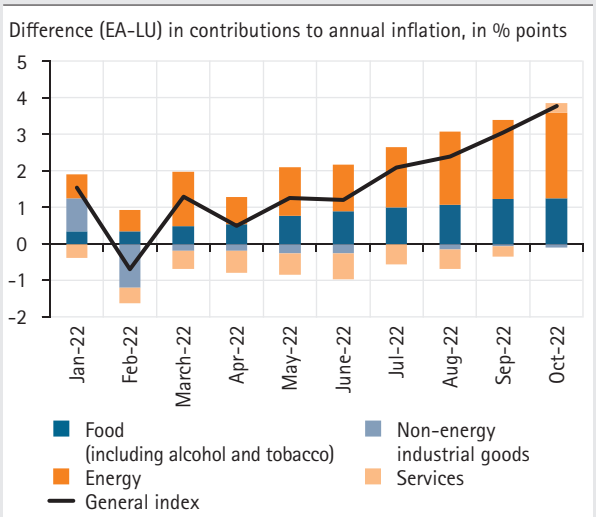
In January 2022, almost 10% of products in Luxembourg recorded annual inflation above 6%. This figure is close to 50% in October 2022. This inflationary fever is also affecting other countries in the euro area, which are seeing an exponential increase in the number of products in the consumer basket displaying more than 6% annual variation. (see graph 3.2).

Graph 3.3
Energy contributes relatively less to inflation in Luxembourg



Source: STATEC

Graph 3.4
More sustained energy and food prices in the euro area



Sources: STATEC, Eurostat

This generalised inflation is the result of the delayed impact of soaring energy prices on all other prices, notably food prices. This effect is amplified by the depreciation of the euro, which increases certain import prices.

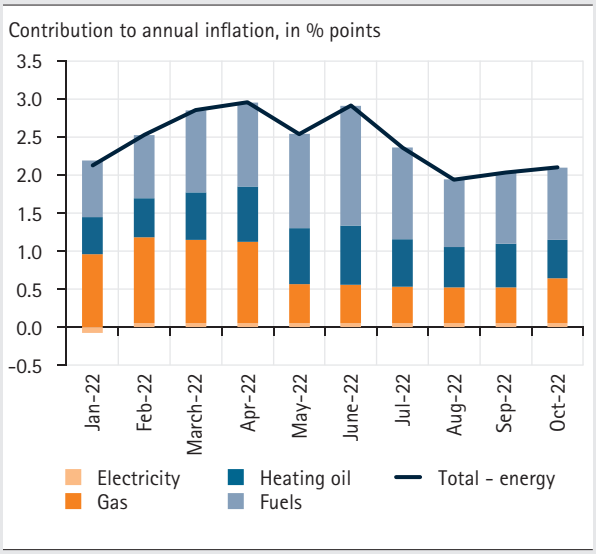
Inflation remains stable in Luxembourg while it intensifies in the euro area

In Luxembourg, the inflation rate has been relatively constant since April 2022, rising by close to (but below) 7%. This apparent stability, however, hides significant changes in the main contributors to inflation. The inflationary surge observed in February 2022 (6.6% year-on-year) was explained by the dynamics of energy prices (2.5 percentage points) as well as by the increase in the prices of non-energy industrial goods (2 percentage points) and services (1.5 percentage points). This structure of contributions has evolved significantly since then. The dynamics of food prices is increasingly contributing to inflation, while the contribution of energy is decreasing. In October 2022, food generated about 20% of inflation, compared to only 7% in February 2022. At the start of the war in Ukraine, energy price increases accounted for almost half of the contributions to inflation, whereas since August this share has fallen to only 30%.

In the euro area, the persistence of inflation is still due to soaring energy prices (which the national measures taken by the various Member States have only partially mitigated) as well as a sharp increase in food products, non-energy industrial goods and services. These broad-based increases reflect the (delayed) pass-through of both energy price increases and supply chain disruptions. In the euro area and Luxembourg, these effects are reinforced by the depreciation of the single currency, which looks set to last longer than previously anticipated.[1].

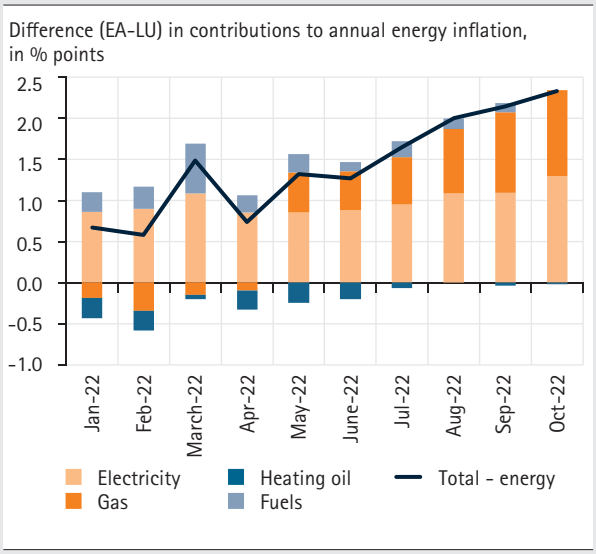
[1] In September 2022, the nominal effective exchange rate of the euro is devalued by 6% from its average value in 2021.

Graph 3.5
Energy inflation slows down in Luxembourg



Source: STATEC

Graph 3.6
A stronger contribution of gas and electricity in the euro area



Sources: STATEC, Eurostat

Slowdown of energy prices in Luxembourg but not in the euro area

Commodity prices have surged since the start of the war in Ukraine. Between March 2022 and October 2022, the average contribution of energy to annual inflation was around 2 percentage points in Luxembourg and 4 percentage points in the euro area (compared to 1 percentage point each over the same period in 2021). However, unlike the euro area, annual energy inflation is slowing down in Luxembourg.

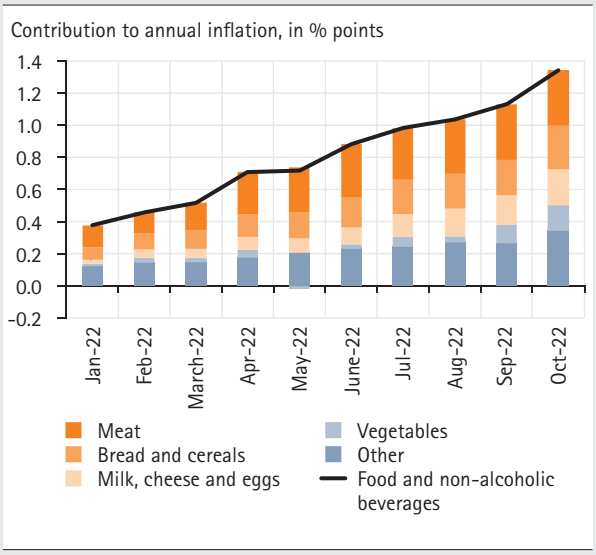
Indeed, in the euro area, the decline in fuel prices since the summer has been largely offset by the increase in gas and electricity prices, thus intensifying energy-related inflation. This phenomenon has not been observed in the Grand Duchy: the price of electricity has not witnessed an increase, while the price of gas, which has been constant since May, increased by nearly 15% in October compared to September, in accordance with the measures provided for in the tripartite agreement. In terms of annual variation, the price of gas in Luxembourg displayed an increase of nearly 40% in October, against almost 80% in the euro area.

Rising food prices

Foodstuffs have also suffered from the inflationary fever. Between March 2022 (at the start of the war in Ukraine) and October 2022, the average contribution of food products to annual inflation was around 1 percentage point in Luxembourg and 2 percentage points in the euro area (compared to 0.2 and 0.3 percentage points respectively over the same period in 2021). In October 2022, food and non-alcoholic beverages recorded an annual inflation rate of 11%, contributing 1.3 percentage points to annual inflation in Luxembourg. A similar observation is made for the euro area. At more than 15%, the annual inflation of food and non-alcoholic beverages broke a historic record in the euro area in October 2022. At 2.6 percentage points, it has contributed to a quarter of total inflation.

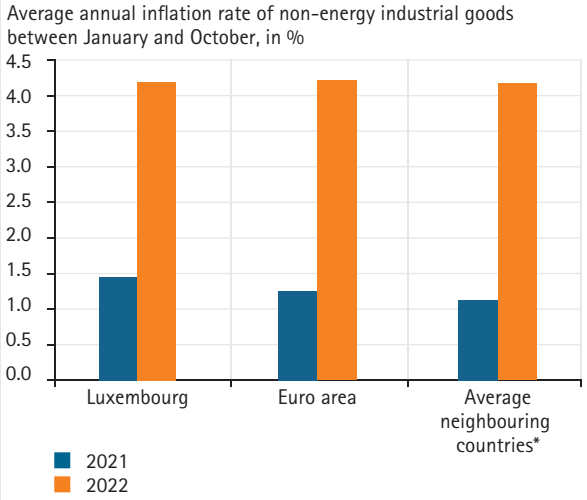
In the Grand Duchy, the food products that contributed the most to total inflation in October were meat (+11.9% year-on-year), breads and cereals (+12.4%), dairy products and eggs (+13.3%) as well as vegetables (13.0%). In the euro area, the strongest contributions to inflation from food products came from meat (+14.6% year-on-year), dairy products and eggs (+21.2%), breads and cereals (+16.2%) and vegetables (+20.0%).

Graph 3.7
Food inflation soars



Source: STATEC

Graph 3.8
The increase also concerns non-energy industrial goods



Sources: STATEC, Eurostat
* Germany, Belgium, France.

Pressures on the supply of fertilisers, the vagaries of the weather and the delayed impact of soaring energy and metal prices in the first half-year contributed to more expensive baskets of food. The dissipation of these impacts over the coming months and negative base effects should dampen food inflation in 2023.

Inflation of non-energy industrial goods is accelerating

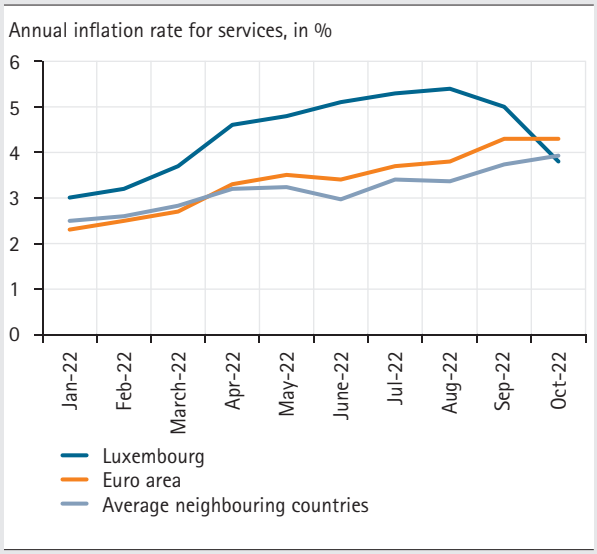
Reflecting continued disruptions in supply chains and imbalances between supply and demand, prices of non-energy industrial goods are rising in Luxembourg and elsewhere[2]. In October 2022, annual inflation for industrial goods excluding energy reached 5.4% in Luxembourg. This historically high rate is nevertheless lower than that recorded in the euro area (6.1%) and in neighbouring countries (5.9% on average). In the Grand Duchy, furniture (+11.4% year-on-year in October) and cars (+3.9%) are the goods that contribute the most to inflation, with 0.26 and 0.24 percentage points respectively. In the euro area, car prices displayed an even stronger annual increase, of +8.8% (0.3 percentage points) in October.

Service prices stall in Luxembourg

After a year of increases, inflation in services has slowed in Luxembourg since September 2022. The price of services thus increased by 3.8% year-on-year in October 2022, after peaking at +5.4% in August. On the one hand, this slowdown stems from a base effect linked to the wage indexation in October 2021. On the other hand, the fact that canteens and daycare centres have been free since the start of the new school year has contributed to this decrease, with a total contribution of -0.12 percentage points in October. In neighbouring countries (and in the euro area), services have shown a marked rise since June (+4% year-on-year in October). This can be explained by the repercussion of two effects impacting service providers: (i) an increase in labour costs linked to historically low unemployment rates and (ii) the increase in the energy bill.

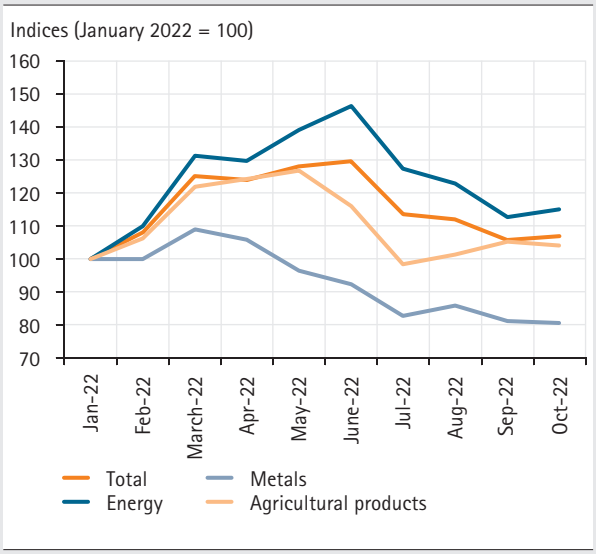
[2] Non-Energy Industrial Goods (NEIG) contains three sub-components: (i) non-durable goods (e.g. electronic products for personal care, pharmaceuticals, newspapers), representing 58% of NEIGs in Luxembourg, (ii) semi-durable goods (e.g. clothes and shoes, books, leisure equipment), representing 21% and (iii) durable goods (e.g. cars, furniture, appliances, computers), representing 22%.

Graph 3.9
Services inflation slows down in Luxembourg



Sources: STATEC, Eurostat

Graph 3.10
Decline in commodity prices



Source: Macrobond
Note: "Metals" corresponds to the weighted average of the precious and non-precious metal price indices based on the weights published by S&P.

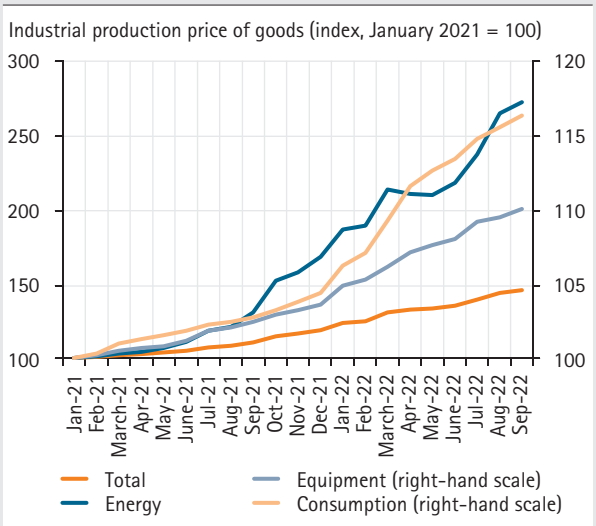
Commodity prices falling...

After rising at the start of the war in Ukraine, commodity prices have all started falling again. The only exception to this downward trend is observed in August and can be explained by an increase in uncertainties around the energy market which has rubbed off on the prices of metals and other energy-intensive raw materials.

The general downward trend is related to a combination of factors. In particular, the appreciation of the dollar, and, more generally, a decline in demand reflecting expectations of an economic recession. The magnitude of the price decline is not uniform across the different commodities.

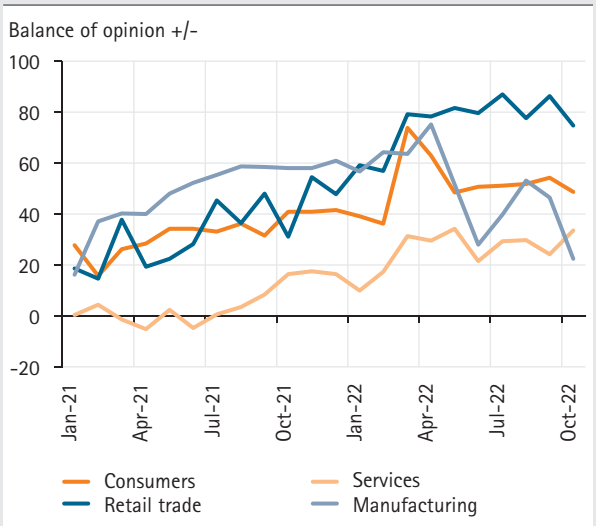
Energy prices have fallen back but remain above their pre-war levels, reflecting energy supply uncertainties in Europe. Agricultural commodity prices have risen slightly since summer due to high fertiliser costs, with production impacted by the war, bad weather and a delayed effect of rising energy costs. The price of metals, on the other hand, have followed a downward trend and have reached a level below that witnessed before the war. This is due to the strength of the dollar and the slowdown in global economic growth. This trend is nevertheless dependent on the evolution of health restrictions in China. In fact, the prices of raw materials are strongly influenced by Chinese demand.

Graph 3.11
Producer prices continue to rise in the euro area



Sources: Eurostat, STATEC calculations

Graph 3.12
Variable trends on price expectations



Sources: Macrobond, European Commission

... but producer prices continue to rise in the euro area

On the one hand, a rise in the price of agricultural commodities should cause further hikes in inflation via food prices. On the other hand, the fall in the price of metals and energy should translate into a reduction in producer prices and, ultimately, a reduction in consumer prices. These effects begin to be observed in Luxembourg in September (see chapter 2), but in the euro area producer prices are still on an upward trend. This trend is the result of increases in energy prices and the effect of order books which implies a lag in the effects of changes in commodity prices. The declines in commodity prices observed in recent months have therefore not yet been passed on to producer prices. Another element contributing to the rise in producer prices is found in the depreciation of the euro, which considerably moderates the impact of the fall in the price of raw materials.

Lower inflation expectations following the new tripartite agreement

In October, consumers in Luxembourg slightly lowered their inflation expectations over the next 12 months compared to September 2022. This decline echoes the drop in April, which also took place following a tripartite agreement.

On the supply side, industry and retail also significantly lowered their outlook for future prices compared to September. On the other hand, service providers expect further price increase on the horizon. For the euro area, both consumers and producers (of goods and services) have increased their price expectations over the next 12 months.

Table 3.1
Inflation forecasts

	Baseline scenario			Gas rationing scenario[1]		Slower policy tightening scenario[2]	
	2021	2022	2023	2022	2023	2022	2023
						Annual variation in % unless otherwise stated	
Inflation (NICP)	2.5	6.4	3.4	6.5	3.8	6.4	3.1
Core inflation	1.5	4.4	3.7	4.4	3.7	4.4	3.6
Oil products	27.6	43.4	0.7	44.0	6.4	43.2	-2.1
Application value	0.6	3.8	5.5	3.8	5.9	3.8	5.1
Application value (1/1/1948 = 100)	840.0	871.7	919.6	871.7	923.5	871.7	915.8
Brent crude oil price (USD/barrel)	70.7	102.5	96.1	103.8	107.9	102.2	90.7
Gas price (TTF[4], in EUR/MWh)	47.2	154.7	213.6	168.8	182.5	150.7	184.8
EUR/USD exchange rate	1.18	1.04	0.99	1.04	0.96	1.0	1.0
Wage indexation	Oct-21	Apr-22	Q1 2023 Apr-2023[3] Q4 2023	Apr-22	Q1 2023 Apr-2023[3] Q3 2023	Apr-22	Q1 2023 Apr-2023[3]

Sources: STATEC (forecast 01/11/2022), Oxford Economics

[1] The negative scenario with gas rationing is based on assumptions made by Oxford Economics in August. They mainly consist of a complete halt of Russian gas deliveries in Q4 2022 and a 10% rationing in European industry until spring 2023. Inflationary pressures would intensify, which would trigger a tighter monetary policy than in the baseline scenario.

[2] The monetary policy easing scenario assumes that producer prices would ease in a context of more fluid supply chains. Inflationary pressures should therefore fade more quickly than expected, prompting an easing of monetary policy. On financial markets, equity prices would rise sharply and government bond yields would fall, while most currencies including the EUR would appreciate against the USD. Inflation in this second scenario would be lower in 2023. [3] Payment of the index bracket scheduled for April 2023 in accordance with the Law of 29 June 2022. [4] Virtual trading point for natural gas in the Netherlands, the European benchmark.

Inflation forecasts revised upwards

Since the inflation forecasts for May 2022, presented in the Note de conjoncture 1-2022, several upside risks have materialised. In particular, the impact of the surge in the prices of metals and raw materials (particularly wheat) on end prices, the depreciation of the euro against the dollar and the price of a barrel of oil which hovered close to USD 100. Added to this were additional tensions on the energy market in Europe. Consequently, the latest forecasts from international institutions have been revised upwards. In its forecasts published in September 2022, the International Monetary Fund revised the euro area inflation rate by +1.2 percentage points in 2022 and +2.2 percentage points in 2023. Similar revisions have been observed in the latest forecasts from the OECD, the ECB and the European Commission. On average, these institutions expect inflation in the euro area to be 8.3% in 2022 and 5.9% in 2023[3].

In Luxembourg, the measures decided upon at the end of the tripartite negotiations in September temporarily lifted the uncertainties around energy prices and helped to slow down the dynamics of consumer prices[4]. Integrating the impact of these measures, STATEC expects inflation to be 6.4% for this year (compared to 5.8% in the NDC 1-2022 published in June) and 3.4% for 2023 (compared to 2.8% previously)[5]. Core inflation should slow from 4.4% in 2022 to 3.7% in 2023 (against 4.0% and 3.1% respectively in the NDC 1-2022). According to these forecasts, an index bracket would be paid in Q1 2023, followed by the deferred payment from July 2022 to April 2023. An additional instalment could be paid in Q4 2023 if the assumptions of the forecast, such as the continued depreciation of the exchange rate, actually materialise.

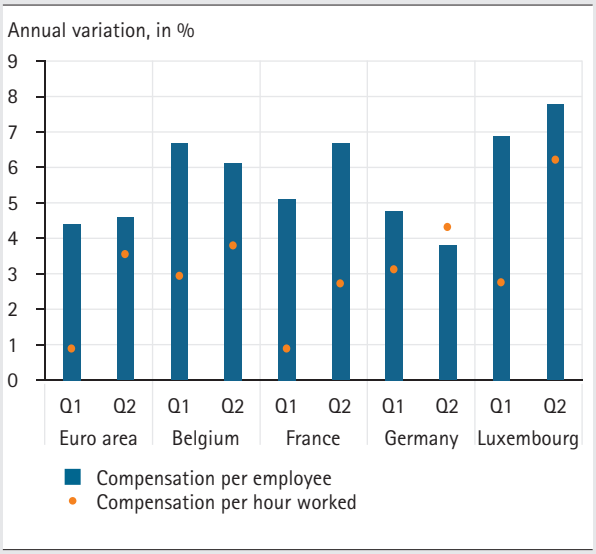
This note also assesses two alternative scenarios: gas rationing scenario and monetary policy easing scenario (see table 3.1). These alternative scenarios foresee, as in the baseline scenario, the payment of an index bracket in Q1 2023, followed by the deferred payment from July 2022 to April 2023. For the gas rationing scenario, a third index bracket would be paid in Q3 2023. These scenarios highlight the uncertainty around a third indexation in 2023, which might not take place if, for example, the assumptions of the monetary policy easing scenario materialise.

[3] Average of inflation forecasts published between September 2022 and November 2022 according to the institution.

[4] This makes it difficult if not impossible to compare with the forecasts published in NDC 1-2022.

[5] In the absence of the tripartite measures, inflation would be 6.8% in 2022 and 8.0% in 2023.

Graph 3.13
A relatively sharp rise in labour costs in Luxembourg



Source: Eurostat - National Accounts

Table 3.2
Increase in the compensation per employee and per hour worked by sector in Q2 2022

	CPE	CPHW
Total	7.8	6.2
Agriculture	6.2	6.1
Manufacturing	4.2	3.7
Construction	5.5	6.4
Wholesale and retail trade	6.8	5.3
Transport	21.0	19.2
Accommodation and food service activities	36.6	-0.6
ICT	3.7	3.2
Financial activities	8.5	8.9
Real estate activities	9.8	9.2
Business services	5.3	4.4
Public admin., health, education	5.3	5.6
Other services	8.4	6.3

Source: STATEC – National Accounts

The rise in labour costs is accelerating in the European Union

Compensation per employee (CPE) increased by 7.8% year-on-year in Luxembourg in Q2 2022, after an increase of 6.9% in Q1. This increase is stronger than in the euro area, where compensation per employee increased by 4.4% and 4.6% year-on-year in the first two quarters of 2022, despite lower inflation in the Grand Duchy than in the euro area. However, the annual variation of the CPE at the beginning of 2022 remains affected by the measures put in place during the COVID crisis. Indeed, the compensation per hour worked and the compensation per employee evolved differently in 2020 and 2021[6] (see NDC 1-2022). Even if in Luxembourg the effects of the pandemic on the CPE are less important in Q2 2022[7], it is advisable to consider, for an international comparison, the compensation per hour worked (CPHW).

In the euro area, the largest increases in the CPHW in Q2 2022 are observed in the three Baltic countries, followed by Portugal and Luxembourg. The growth rates generally differ between European countries, and the CPHW increases on average more in Eastern European countries (notably in the Baltic countries) following a convergence of wage levels between European countries[8]. Comparing the rises in Q2 2022 with the average annual growth over the five years preceding the COVID crisis, the gap is largest in Portugal, Finland and Luxembourg. Wages have thus accelerated more in Luxembourg than in most other European countries, also in connection with the index brackets of October 2021 and April 2022. It is especially in Q2 2022 that the growth of the CPHW is higher in Luxembourg than in its neighbouring countries (while it was still similar to that of Belgium or Germany in Q1).

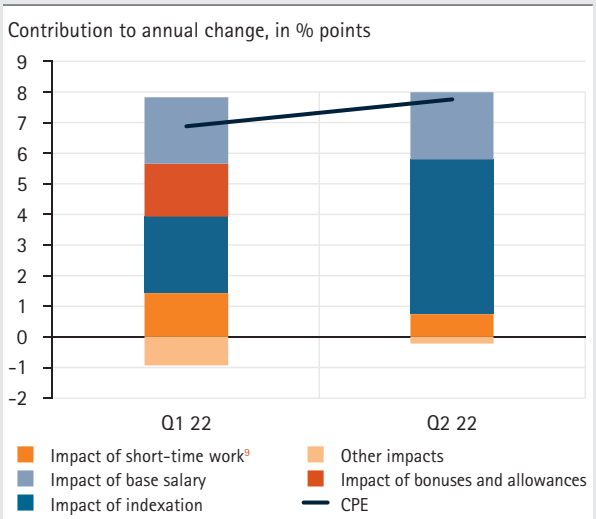
The sector contributing the most to the increase in the CPHW in Q2 is financial activities. It is followed by transport (whose strong growth is mainly due to an increase in bonuses and gratuities) and non-market sectors (public administration, health, education). Together, these sectors contribute around 70% to the increase in the compensation per hour worked. The strongest annual increases in the CPHW concern the sectors of transport, real estate activities and financial activities, while accommodation and food service activities, information and communication services and industry have experienced the weakest increases (see table 3.2).

[6] CPE fell sharply in 2020 before registering a recovery in 2021, while the opposite happened for the compensation per hour worked. This is largely due to a different evolution of the hours worked and the number of employees following the restrictions and support measures in place, such as short-time work (replacement income, paid for by the State, is not included in the calculation of the CPE). In addition, composition effects have to be taken into account due to an uneven impact of the restrictions on the different sectors and wage levels.

[7] If in general the situation is returning to normal, this is not yet the case for all branches of the economy, in particular not in accommodation and food service activities which were still highly affected by the restrictions in the first half of 2022.

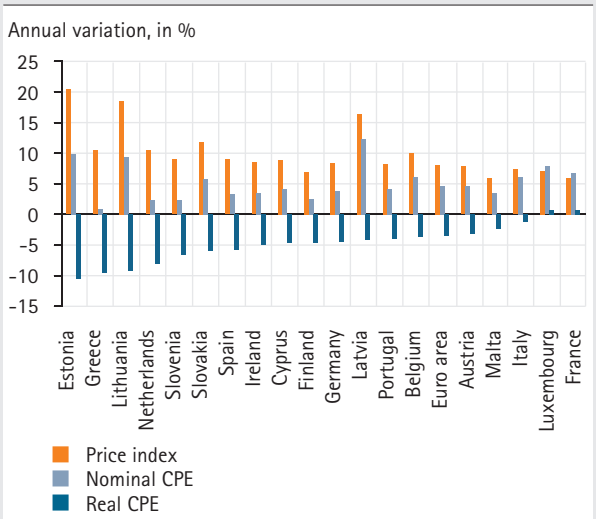
[8] For example, the average year-on-year CPHW growth from 2015 to 2019 was 8.5% in Latvia compared to 2.5% in Austria.

Graph 3.14
Indexation contributes a lot to the growth of the compensation per employee in the first half of 2022



Sources: STATEC, IGSS
Note: the category "Other" includes overtime, employer contributions, leave for family reasons and sickness

Graph 3.15
The real compensation per employee falls in the EU in Q2 2022



Sources: Eurostat, STATEC
Note: the HICP is used as the price index for all euro area countries except Luxembourg, for which the NICP is used[10].

Indexation boosts nominal wages, but inflation weighs on real wages

In Luxembourg, rising inflation has a direct impact on salaries via the indexation mechanism. Thus, the October 2021 and April 2022 index brackets contribute around two-thirds to the increase in the compensation per employee in Q2 2022 (see graph 3.14).

On the other hand, inflation weighs on the evolution of the real CPE. In Luxembourg, the real CPE (using the NICP as a deflator) shows an increase of 1.5% in Q1 2022, but a slowdown to +0.7% in Q2 (in line with higher inflation in this quarter). In the euro area, the real CPE fell in the first half of 2022, with -1.8% year-on-year in Q1 and -3.5% in Q2. Luxembourg is one of the countries with the strongest evolution of the real CPE (see chart 3.15). Alongside Luxembourg, France is also an exception at this level, with a real CPE posting an increase in the first two quarters of 2022[11] (which comes from the fact that France recorded the lowest inflation over this period, in particular due to the implementation of a price cap on gas and electricity prices).

Household disposable income to stagnate in 2022 and to increase again in 2023

Disposable household income, in addition to wages, also takes into account income from other sources, taxes paid and social benefits received. This distinction between wage and disposable income is particularly important in the current configuration. Indeed, many countries (including Luxembourg) have put in place measures to support household income in the face of soaring prices. In 2022, despite an increase in nominal disposable income, due to high inflation, real disposable income per capita should stagnate before increasing again in 2023 (+2.1%), under the effect of a slowdown in inflation. An in-depth analysis of the impact of tripartite measures on purchasing power by income quintile is presented in the study 7.3[12].

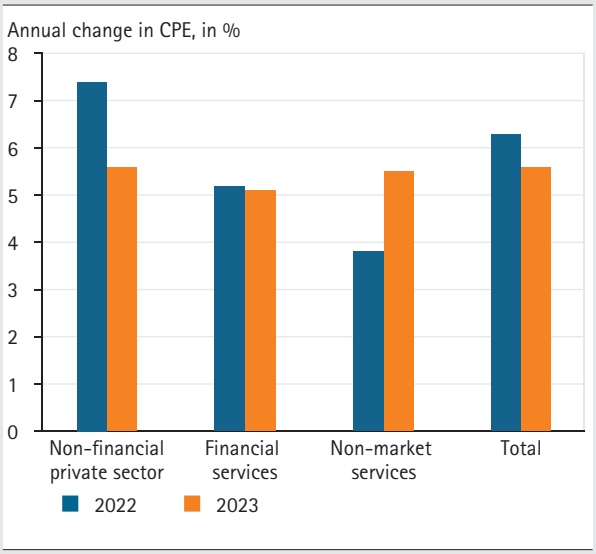
[9] The impact of short-time work is positive, as the associated income is not part of the CPE since it is paid by the State. Thus, a drop in the recourse to short-time work causes an increase in the CPE because more remuneration is again payable by the employer.

[10] The NICP considers the consumption of residents and the HICP the one on the national territory (the latter thus overweights fuels in the case of Luxembourg).

[11] The real CPHW displayed negative annual growth in all euro area countries in Q2 2022, also in France.

[12] The study uses a different methodology than the macroeconomic forecasts presented here, however the results on the evolution of purchasing power in 2022 and 2023 are similar.

Graph 3.16
The compensation per employee increases the most in the non-financial private sector



Source: STATEC (2022-2023: forecasts)

Table 3.3
Growth in the compensation per employee slows more in Luxembourg than in its neighbouring countries

	International forecasts	
	2022	2023
Euro area	4.3	4.8
Belgium	7.4	8.4
France	4.9	4.5
Germany	4.4	5.2
Luxembourg	5.9	4.4
Luxembourg - STATEC forecasts	6.3	5.6

Sources: AMECO, OECD, Oxford Economics, STATEC
Note: arithmetic mean of growth forecasts (in %) of CPE from the OECD, the European Commission and Oxford Economics, unless otherwise stated (STATEC forecasts)

A slowdown in the compensation per employee expected for next year

For the whole of 2022, an increase in the CPE of 6.3% is expected, implying a slight slowdown at the end of the year. In 2023, CPE continues to increase, but more slowly (+5.6%). The biggest contribution to growth in 2022 would come from the non-financial private sector. Inflation will continue to drive wages via the index brackets expected in Q1 2023 and Q4 2023 and the payment deferred from July 2022 to April 2023. Thus indexation should contribute more to the growth of CPE in 2023 than in 2022, despite a weaker increase in CPE next year linked to a slowdown in wage growth in the non-financial private sector (which will be affected by lower activity growth).

Luxembourg is one of the few European countries in which automatic wage indexation exists, alongside Belgium, Cyprus and Malta. Unlike in Luxembourg, wage indexation provisions in Belgium are set out in collective agreements and there is a distinction between indexation on a periodic basis and on a pivot basis. International forecasts (AMECO, OECD, Oxford Economics) indicate that Belgium will see a stronger increase in CPE than Luxembourg in 2022 and 2023[13] (see table 3.3).

With the cost of living rising due to current inflation, wage pressures are mounting in countries without automatic wage increases[14]. For 2022, international forecasts indicate a higher increase in CPE in Luxembourg than in France and Germany. According to STATEC's forecasts for Luxembourg (which foresee higher growth in CPE in Luxembourg than the average of international institutions), this will still be the case in 2023, with however a less marked difference, especially compared to Germany[15].

The current levels of inflation, the highest for forty years, raise fears of the risk of an inflationary spiral in Europe. The IMF notes, however, that historical episodes similar to the current situation (notably with stagnating or falling real wages) have generally not been followed by a wage-price spiral. Moreover, analyses indicate that supply shocks – responsible at least in part for current inflation – are unlikely to lead to an inflationary spiral.[16]. It should be noted, however, that these analyses are largely based on countries without automatic indexation.

[13] Belgium has not put in place an energy price cap to date, which contributes to higher inflation, which in turn would drive up wages.

[14] This is notably the case in Germany and France, with strikes linked to wage negotiations in certain sectors.

[15] The minimum hourly wage in Germany has increased strongly recently, from EUR 9.60 in 2021 to EUR 12 following increases in January, July and October 2022. The minimum hourly wage also increased in Luxembourg and its other neighbouring countries, but the scale of these increases was less important than in Germany.

[16] See IMF (World Economic Outlook October 2022) and ECB (Working paper no. 2235).

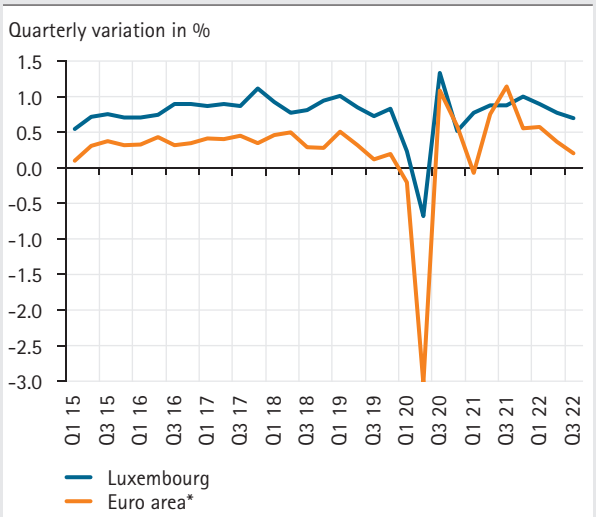
Labour market

4

While job creations remain relatively high in the euro area and in Luxembourg in autumn 2022, they have clearly entered a period of slowdown. The unemployment rate, even if it remains low, has recently resumed an upward trend in Luxembourg (as well as in several countries of the euro area). Business' employment prospects, as well as other leading indicators of employment, have worsened during 2022, leaving little doubt that unemployment will continue to rise. However, this increase should be moderate, with the proportion of vacancies still at a historically high level.

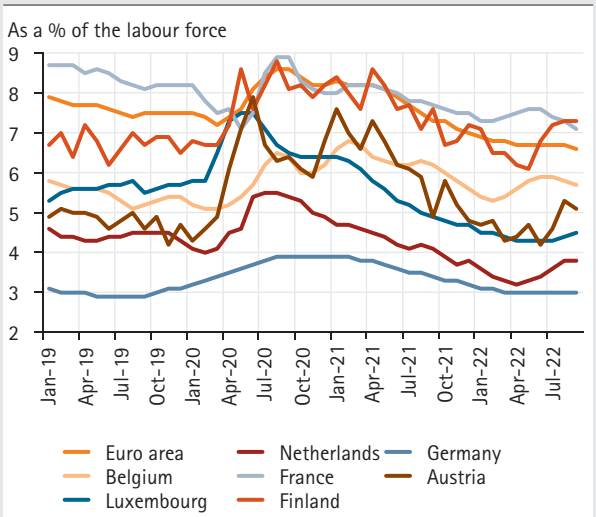
During 2022, the labour market was still buoyed by the post-pandemic recovery, however the outlook for 2023 is gloomier. The near-stagnation in activity forecast for the euro area will also be accompanied by a sluggish employment market. In Luxembourg, the slowdown in activity is expected to be less marked but would still lead to a slowdown in employment (from +3.4% to +2.3% in 2023) as well as a slight rise in unemployment (to 5.1% of the labour force, compared to 4.8% in 2022).

Graph 4.1
Employment slows down in Europe...



Sources: STATEC, Eurostat (*Flash estimate for Q3 22)

Graph 4.2
... and unemployment is on the rise again in some euro area countries



Sources: Eurostat, Macrobond

Signs of a slowdown in the labour market in the euro area

In Europe, employment growth continues, unemployment remains low and the number of vacancies high. However, the worsening economic climate is beginning to impact labour market indicators.

Employment in the euro area thus rose by 0.4% over one quarter in Q2 2022 (+2.7% year on year), a slower pace than in previous quarters but still very dynamic from a historical perspective. Nevertheless, the flash estimate for Q3 confirms an additional slowdown (+0.2% over one quarter, see graph 4.1). It is mainly Italy that contributed to the boom in employment in Q2 (with +300,000 people over one quarter). Ireland and Malta posted a relatively higher growth rate (+1.6% over one quarter), followed by Italy (+1.2%), Luxembourg and the Netherlands (+0.8% each). As in previous quarters, employment in the euro area grew more strongly in the ICT sectors (information and communication technologies, with +1.2% over one quarter) and in construction (+0.7%).

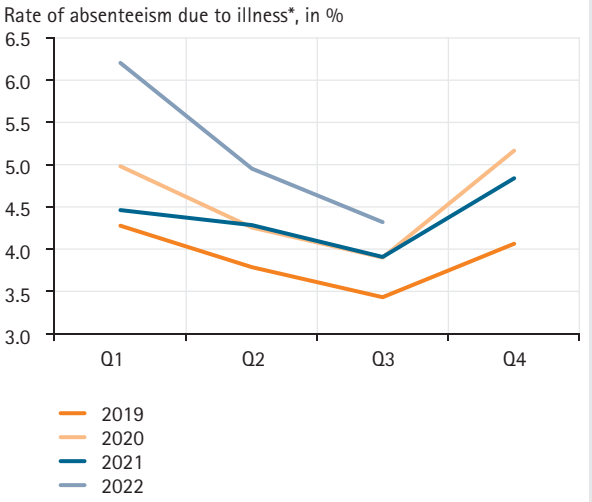
Overall, unemployment in the euro area continues to fall, dropping to 6.6% of the labour force in September 2022 (see graph 4.2), the lowest rate ever recorded. However, the rate is rising again in some euro area countries, including Luxembourg. This rebound in unemployment is particularly high in Finland and Austria (+1 percentage point since their last low point), as well as in the Netherlands and Belgium (+0.5 percentage points). It is mostly the positive performance of the "heavyweights" (Spain, Italy, France and Germany), partly benefiting from the good post-COVID tourist season, which explains the resilience of the unemployment rate in the euro area.

The job vacancy rate remains on an upward trend in the euro area in Q2 2022 (reaching 3.2% of all vacant and occupied positions in Q2, following a rate of 3.1% in Q1), but the increase is weakening. The share of vacancies remains particularly high in the Netherlands (5.1%), Belgium (5.0%), Austria (4.8%) and Germany (4.5%). It is in accommodation and food service activities (5.3%), construction (4.6%), business services (4.6%) and ICT (4.5%) that the proportion of vacancies is the highest.

Graph 4.3
Quarterly employment growth has been falling since the start of the year

Source: STATEC, National Accounts

Graph 4.4
Rate of absenteeism remains high (and even increased in 2022)



Source: IGSS
*Number of calendar days of absence due to illness/Number of calendar days of employment.

Employment also tends to slow down in Luxembourg

In Luxembourg, job creations remained relatively high in Q3 2022 (employment increasing by 0.7% over one quarter), but the trend is slowing (+0.9% in Q1, +0.8% in Q2, see graph 4.3).

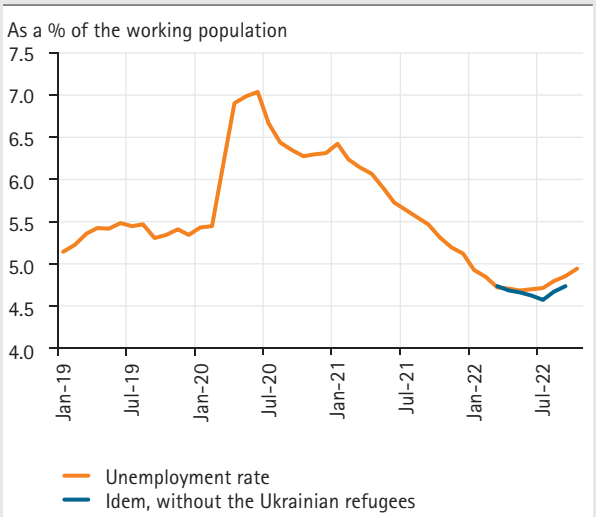
This inflection during the summer was mainly due to business services, whose quarterly growth fell from 1.4% in Q2 to 0.8% in Q3. It stems in particular from a slowdown in head office activities; management consulting (from +1.9% over one month in January 2022 to +0.0% in August) and a drop in employment in building cleaning in summer, but also in accommodation and food service activities, transport, ICT, construction and the financial sector. Personal services show the most sustained employment growth in Q3 (+1.5%), followed by education (+1.4%) and the branch comprising "arts, entertainment and recreational activities" (+1.2%).

As traditionally observed when the economic climate deteriorates, the slowdown in employment is more marked for cross-border workers, it fell from a quarterly increase of 1.3% in Q4 2021 to 0.7% in Q3 2022. National employment (i.e. residents) has remained rather stable over the last quarters (around +0.6% per quarter).

Over the first nine months of 2022, working time increased by 0.3% year on year, compared to -0.1% over the long term (and +4.1% in 2021 after -5.6% in 2020). This increase is partly explained by overtime, which increased by 11% year on year in the first eight months of the year. Undoubtedly, recruitment difficulties are an explanation for this increase. The job vacancy rate remains at a record level in Q3 2022. In addition, the rate of absenteeism due to illness remains high, even exceeding the rates recorded during 2020 and 2021 (see graph 4.4), despite a decline in coronavirus infections. The reduction of the isolation period (from 7 to 4 days from 27.10.2022 onwards[1]), should however pull the absenteeism rate down and increase working time by the end of the year.

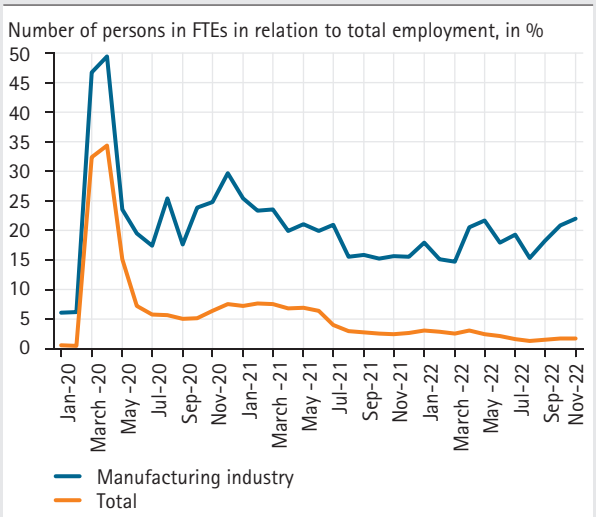
[1] Law of 26 October 2022 amending the amended Law of 17 July 2020, on measures to combat the COVID-19 pandemic.

Graph 4.5
Unemployment rises again, with or without refugees from Ukraine



Sources: ADEM, STATEC (seasonally adjusted data)

Graph 4.6
Short-time work applications are on the rise again in industry, but remain weak



Sources: Comité de conjoncture, STATEC

Unemployment remains low, but has resumed an upward trend

In Luxembourg, unemployment is at the moment only increasing slightly (from 4.7% of the labour force in April to 4.9% in October) and remains at a historically low level, but the upward trend should become more pronounced in the coming months. In addition, while unemployment had stabilised in the spring under the effect of registrations of Ukrainian refugees, the increase in the last two months is mainly due to other categories (see graph 4.5). In particular, people younger than 30 and with an upper secondary level of education, of Luxembourgish or Portuguese nationality, contribute most to this increase.

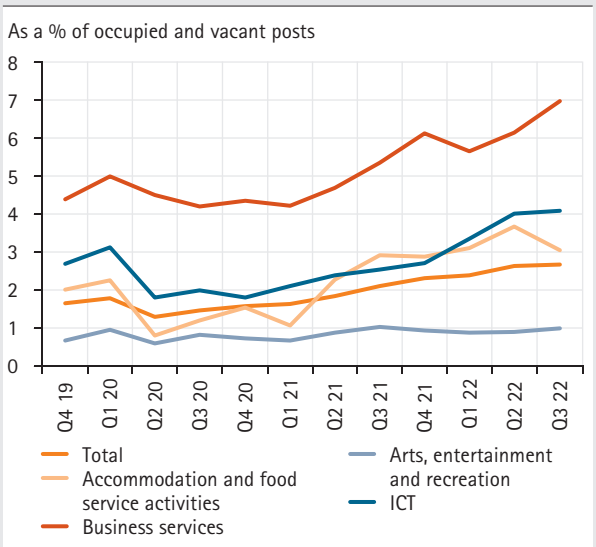
While new registrations have increased since the start of the year, the number of long-term unemployed (registered for more than 12 months) continued to decline in September, a trend that began at the start of 2021. However, despite this continuous decline, this group still represents almost half of the unemployed registered with ADEM.

Employment programmes, which employed approximately 4,200 people in 2019, dropped to 3,600 people in April 2020, due to lockdowns, to rise again to more than 4,500 people in September 2021 (historic record[2]) and have resumed a downward trend since. Accounting for more than 2,000 persons, special measures managed by non-profit associations remain in the majority. Reintegration contracts experienced the largest increase over the first nine months of the year, while training, employment initiation contracts and employment support contracts contributed the most to the decline in employment measures. Despite this decline, the unemployment rate augmented by beneficiaries of employment programmes also rose in September (to 6.2%, against 6.1% in August).

The use of short-time work fell sharply during the course of 2022. In July 2022, only 0.1% of employees (i.e. about 500 people in full-time equivalent – FTE) took advantage of this system. Industry is, in July 2022, (almost) the only affected sector, with 1.4% of employees on short-time work (in FTE), followed by transport and storage services (0.1% in FTE). However, requests from industry have increased over the last few months (see graph 4.6), and even if some have potentially been introduced preventively, the workforce concerned could represent 1.7% of paid employment at most.

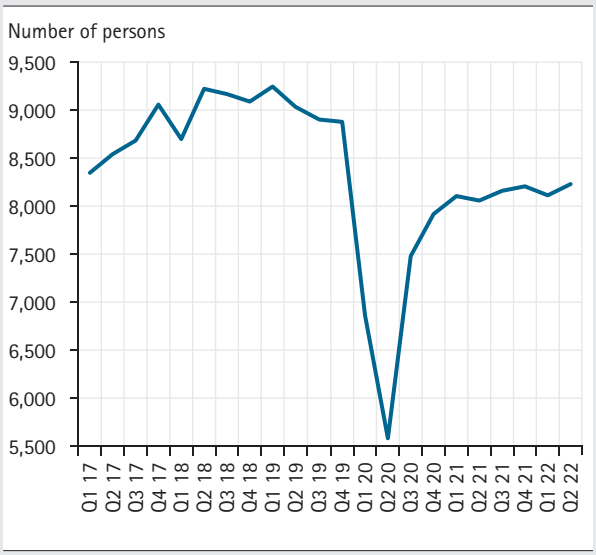
[2] At least without vocational integration activities (Activités d'insertion professionnelle, AIP) which, since 2018, are no longer supported by ADEM but by the National Social Action Service (Service national d'action sociale, SNAS).

Graph 4.7
The job vacancy rate is growing slightly slower



Sources: ADEM, STATEC (seasonally adjusted data)

Graph 4.8
Temporary employment stagnates at a much lower level than before the crisis



Source: IGSS (NACE Rev. 2: 78,200 seasonally adjusted data)

Labour shortages remain a limiting factor

The job vacancy rate, which had increased sharply with the outbreak of the health crisis, has tended to stabilise in recent months (2.7% in Q3 2022, 2.6% in Q2). In Q3 2022, it fell in almost all sectors. The decline is stronger in accommodation and food service activities, where the number of vacancies had significantly increased in Q2, following the end of sanitary restrictions.

Only business services saw their job vacancy rate increase (from 6.1% in Q2 to 7.0% in Q3, a record high). This sector (representing almost a fifth of total employment) is driving the overall rate sharply upwards. The increase in vacancies in recent months can be seen mainly in the following areas[3]: "Accounting and Management" (by up to a third over the first nine months of 2022), "information and telecommunications systems" (18%), "organisation and studies" (8%) and "banks" (7%). Apart from business services, the job vacancy rate is still high in ICT (with 4.1%) and in accommodation and food service activities (3.1%).

Temporary employment, which is often used as an adjustment factor in periods of economic downturn, has remained fairly stable over the last quarters and is at a lower level than the one observed before the pandemic (by approximately 1,000 fewer people, see graph 4.8).

Unlike other countries, such as the United States and Great Britain, which witnessed a wave of resignations following the crisis[4], employees in the Grand Duchy did not change their sector of activity any more in 2020 and 2021 than before the pandemic[5]. In France, the number of resignations is high without being unprecedented or unexpected given the economic climate, DARES notes in a recent publication.[6].

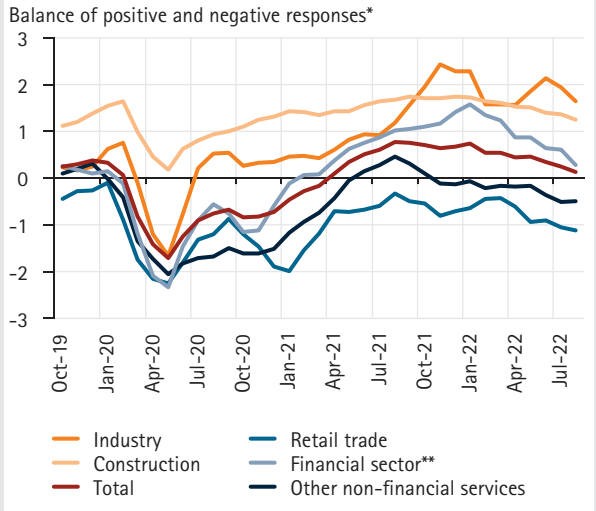
[3] Nomenclature ROME — Operational Directory of Professions and Jobs.

[4] See "Labor Market Tightness in Advanced Economies", IMF, March 2022, Box 3: The Great Resignation, pp.25-26: https://www.imf.org/-/media/Files/Publications/SDN/2022/English/SDNEA2022001.ashx.

[5] This finding is based on a preliminary analysis of data from IGSS files, which combine the end of contracts and the recruitments that follow them.

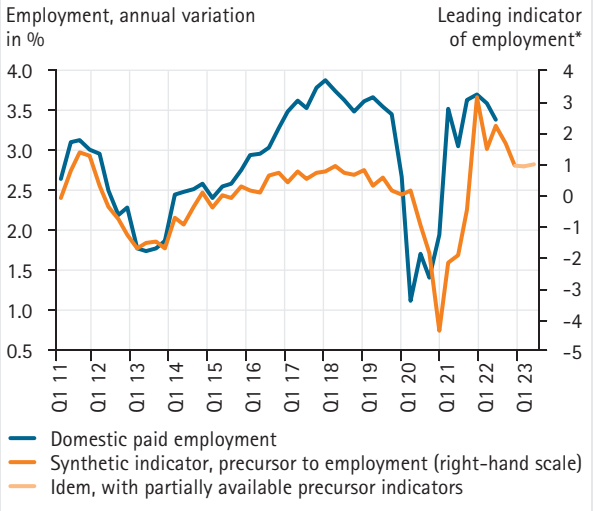
[6] "La France vit-elle une 'Grande démission' ?", Dares October 2022, https://dares.travail-emploi.gouv.fr/publication/la-france-vit-elle-une-grande-demission.

Graph 4.9
Employment prospects deteriorate



Sources: STATEC, European Commission (economic surveys)
* Standardised series smoothed over three months, ** Euro area

Graph 4.10
Leading employment indicators point to a continued slowdown in employment



Sources: STATEC, IGSS, Eurostat
* Average of the five leading indicators: overtime, temporary workers, contractors' employment prospects, stress indicator, euro area GDP.

The outlook is deteriorating

Business' employment prospects have tended to deteriorate since the start of the year. All sectors are affected, even if recruitment activity in Luxembourg's industry remain relatively high (see Graph 4.9). The trends are fairly similar in the euro area, except for construction, for which job prospects have remained at a high level in recent months.

STATEC's synthetic leading employment indicator[7], which takes into account employment prospects, but also overtime, temporary work, the tension indicator and euro area GDP, confirms that the annual growth rate should fall below 3% towards the end of 2022 (last observed rate in October: +3.3%, see graph 4.10).

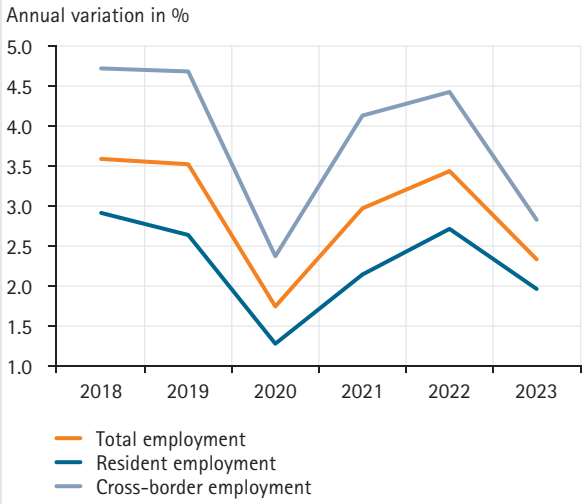
Decline in influx of refugees from Ukraine

After the wave of refugees from Ukraine observed in April 2022 (+1,660 applicants for temporary protection – ATP), the flows have clearly declined (+155 people in September 2022). In September, Luxembourg thus welcomed a total of more than 4,000 Ukrainian DPTs, or 0.7% of its population. This proportion is between the average (0.9%) and the median (0.5%) of European countries, Poland being the country hosting the most refugees from Ukraine (3.6% of its population), France being the last of the list (0.1%).

In Luxembourg, more than a third of Ukrainian ATPs are minors (35% in September), 9% are over 64 years old and about 2,400 people (57% of Ukrainian ATPs) are aged between 18 and 64 (i.e. working age). 15% of these people (363 people) are looking for a job and are registered at ADEM as job seekers (unemployed) and 20% (471 people) have a job according to data from the IGSS. Thus, most of the working age population (65%) remains inactive. Most Ukrainians already on the labour market in Luxembourg before the war, work in specialised, scientific and technical activities or in the financial sector, while the new arrivals are mainly employed in accommodation and food service activities.

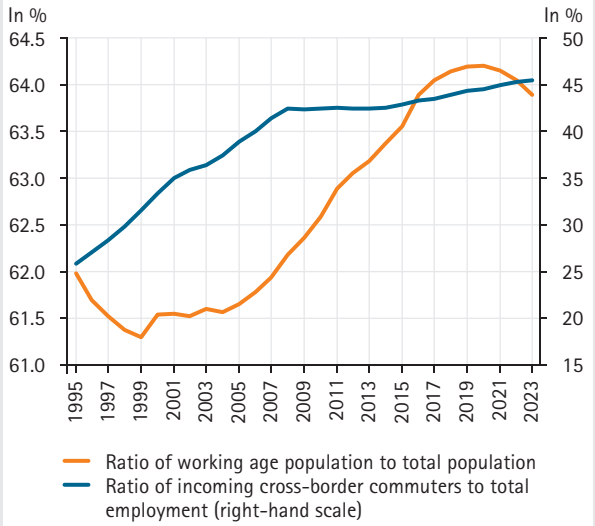
[7] see "6.1 Leading indicators for employment in Luxembourg", in NDC 1-2019, pp.50-57: https://statistiques.public.lu/fr/publications/series/note-conjoncture/2019/note-conjoncture-01-19.html

Graph 4.12
Labour market slowdown



Source: STATEC (2022-2023: forecasts)

Graph 4.12
A demographic that favours job seekers



Source: STATEC (2022-2023: forecasts)

Predicted stagnation of employment in the euro area

According to the International Monetary Fund, employment in the euro area should increase by 2% in 2022, then almost stagnate (+0.1%) in 2023. Forecasts from Oxford Economics and the European Commission confirm this gloomy picture with 2.1% and 1.8% respectively forecast for 2022 and -0.2% or 0.1% for 2023. Regarding unemployment in the common bloc, the IMF estimates a fairly low rate of 6.8% in 2022 (7.7% in 2021), followed by a slight rise to reach an annual average of 7% in 2023.

Gradual slowdown in Luxembourg's labour market

Despite the currently observed slowdown in the labour market, growth in total employment should peak in 2022 at +3.4% over the year as a whole (+2.7% for resident employment and +4.3% for cross-border workers). Similarly, the unemployment rate should reach a minimum of 4.8% on annual average.

Due to its inherent rigidity, the labour market is expected to react with some lag to the sharp economic slowdown (with GDP growth at 1.7% in 2022). Consequently, 2023 should be marked by a less dynamic labour market. On the one hand, the demand for staff should be curbed by rapidly increasing wages (rise in the sliding scale of 5.5%). On the other hand, economic demand (domestic and external) would be strongly impacted by the weakness of activity in the euro area and globally. Thus, total employment would increase by only 2.3% in 2023, a rate slightly above the expansions observed during the previous periods of weak growth. The expected increase in resident employment (+2.0%) would be too weak to avoid a rise in unemployment: this should increase slightly from 4.8% of the labour force in 2022 to 5.1% in 2023.

Table 4.1
Labour market

			Baseline scenario			Gas rationing scenario[1]		Slower policy tightening scenario[2]	
	2021	1995-2021	2021	2022	2023	2022	2023	2022	2023
	Level (persons)	Change (in % or % points)	*Change in % unless otherwise specified*						
Total population[3]	645,487	1.7	1.7	2.3	1.6	2.3	1.4	2.4	1.7
Net migration (% of total population)	9,376	.	1.5	1.9	1.3	1.9	1.0	1.9	1.3
Working age population[4]	414,083	1.9	1.6	2.2	1.4	2.1	1.1	2.2	1.5
Labour force	299,296	2.1	1.9	1.4	2.3	1.3	2.0	1.4	2.3
Activity rate (% of working age population)[5]	.	71.2	72.3	71.7	72.3	71.7	72.3	71.7	72.3
Idem, *women*[5]	.	*61.6*	69.6	*68.3*	*70.0*	*68.3*	*70.0*	*68.3*	*70.0*
Total domestic paid employment	485,573	3.1	3.0	3.4	2.3	3.0	0.3	3.5	2.9
of which: incoming cross-border workers	218,117	5.4	3.9	4.3	2.8	3.8	-0.1	4.4	3.6
resident employment	281,024	2.0	2.1	2.7	2.0	2.4	0.7	2.7	2.3
Average working time	.	-0.3	4.8	1.5	-0.7	1.5	-0.7	1.5	-0.7
Number of unemployed (ADEM)	17,138	5.3	-8.2	-14.2	8.5	-10.7	25.2	-14.2	3.0
Unemployment rate (% of labour force)[5]	.	4.6	5.7	4.8	5.1	5.0	6.2	4.8	4.9

Source: STATEC (2021-2022: forecasts)
[1] The negative scenario with gas rationing is based on assumptions made by Oxford Economics in August. It mainly consists of a complete halt of Russian gas deliveries in Q4 2022 and a 10% rationing in European industry until spring 2023. Inflationary pressures would intensify, which would trigger a tighter monetary policy than in the central scenario. [2] In the upper scenario, production prices would ease in a climate of more fluid supply chains. Inflationary pressures should therefore fade more quickly than expected, prompting an easing of monetary policy. On financial markets, equity prices would rise sharply and government bond yields would fall, while most currencies including the EUR would appreciate against the USD. [3] As at 31 December. [4] 20-64 years. [5] Evolution in level.

The rise in unemployment should be curbed by demographic effects

The increase in the expected unemployment rate appears weak, compared to the trajectory during the Great Recession of 2008-2009 or the sovereign debt crisis in 2011-2012. For example, from 2008 to 2009, the unemployment rate increased significantly, from 4.3% to 5.5%. Today, labour shortages and the high levels of retirement should cushion the impact of the economic slowdown on unemployment. The ratio of the working-age population to the total population has peaked, according to STATEC data (see graph 4.12), a phenomenon observed in neighbouring countries for some years now. In Luxembourg, this trend has been delayed by the strong demographic growth linked to immigration. In conclusion, the potential of resident employees would become relatively weaker, which would put downward pressure on the unemployment rate on the one hand and upward pressure on cross-border employment on the other.

Unemployment trajectory in the alternative scenarios

As a reminder, the two scenarios appearing in this Note de conjoncture are as follows: gas rationing (pessimistic scenario) and slower policy tightening (optimistic scenario). According to the assumptions of Oxford Economics, the adverse scenario would in fact be a severe recession scenario, characterised by a fall in the Euro Stoxx 50 (-21% in 2023) and real GDP in the euro area (-1.4% in 2023). According to this scenario, the labour market would find itself in full crisis in 2023. Employment in the Grand Duchy would stagnate (+0.3%) and the unemployment rate would rise to 6.2% (i.e. almost the level reached in 2020 at the height of the pandemic). Given current developments regarding gas supplies in Europe, however, this scenario may seem too extreme.

The favourable scenario is more nuanced. Its main assumption is a less aggressive monetary policy, followed by a stock market recovery. Consequently, employment would increase by 2.9% in 2023 (compared to 2.3% in the central scenario) and the unemployment rate would stabilise slightly below 5%.

Public finances 5

In 2022, tax revenues in Luxembourg were boosted by the effects of high inflation on VAT revenues, household taxes and social contributions. However, there has been a slowdown in revenue growth since the second quarter, due to weaker fuel sales and the stock market pullback. The slowdown is expected to gather pace in 2023 with the reduction in VAT rates, a less buoyant real estate market and, in general, a more subdued economic climate.

Government spending has increased strongly in 2022, driven by growth in employment, wages, pensions and operating costs. Spending growth is expected to be even stronger in 2023, partly as a result of measures introduced to curb high inflation and to help households and businesses particularly affected by rising energy prices.

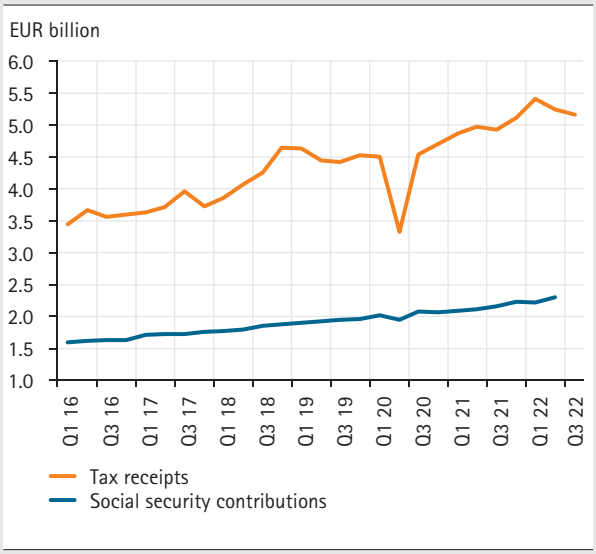
The nominal balance would thus deteriorate from -0.4% of GDP in 2022 to -2.8% in 2023. This is a sharp downward revision from previous forecasts, but it reflects the weaker economic climate and the measures taken as a result of this situation.

Table 5.1
Tax revenues still supported by household taxes and VAT

	2022 - 10 months	Change 2022/2021	
		In EUR million	In percent
Taxes on households	6,386	640	11.1
VAT	4,169	359	9.4
Corporate taxes	2,472	-35	-1.4
Excise duties	1,394	15	1.1
Subscription tax	1,238	-27	-2.1
Other	1,623	61	3.9
Total tax revenue	**17,283**	**1,014**	**6.2**
Social security contributions*	**4,428**	**314**	**7.6**

* Data for the 1st half of 2022, produced according to the ESA2010 (national accounts perspective).
Sources: Tax authorities, IGSS, STATEC

Graph 5.1
Decrease in tax revenues in Q2 and Q3



Sources: Tax authorities, IGSS, STATEC (seasonally adjusted data)

Slowdown in growth of tax receipts

At the end of the first ten months of 2022, tax revenues were up 6.2% year-on-year. The inflationary surge has boosted VAT-type revenue, household taxes and social security contributions (via the last two indexations of October 2021 and April 2022). Revenues from the subscription tax and excise duties, on the other hand, stalled in the second and third quarters, against a backdrop of a fall in value of stock market assets and a drop in fuel sales (linked to the sharp rise in prices and the narrowing of the price differential between Luxembourg and neighbouring countries).

The less favourable outlook for the Euro Stoxx 50, fuel sales and the real estate market are expected to weigh on government revenues in 2023. The latter would also be impacted by the lowering of the VAT rate. Household taxes and social security contributions would continue to rise, while corporate taxes will remain rather sluggish. All of this will lead to a slight slowdown in revenue growth in 2023 (+5.8% year-on-year).

Social security contributions supported by employment and wage growth

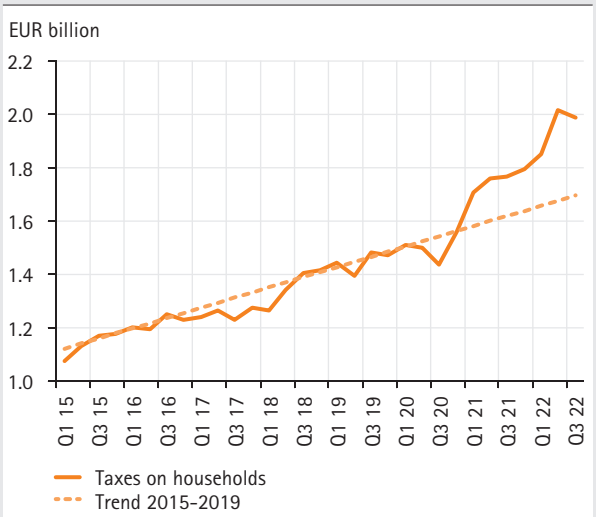
Social security contributions increased by nearly 8% over one year in the first half of 2022 thanks to the strong growth in the wage bill (+11% year-on-year). The index bracket paid in April contributed strongly to the increase in contributions in Q2. Over the whole of 2022, contributions should increase by 10%, stimulated by dynamic employment (+3.4%) and the sliding scale of salaries (+3.8%).

Social contributions should still be supported by wage indexation in 2023, but could suffer from a slowdown in employment growth (+2.3% over one year in 2023). STATEC is thus forecasting an 8% increase in contributions in 2023.

Household taxes continue to rise sharply

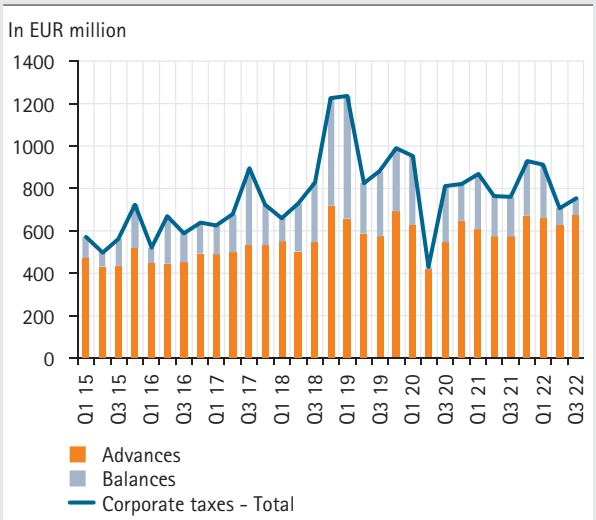
Household taxes are up 11% year-on-year at the end of the first ten months of 2022, tax on salaries and wages being the main growth driver (+13% year-on-year).

Graph 5.2
Household taxes boosted by the latest indexations



Sources: ACD, STATEC (seasonally adjusted data)

Graph 5.3
Drop in the corporate taxes balance



Sources: ACD, STATEC (raw data)

Household taxes will be boosted by the two or three index brackets planned for 2023 and should thus increase by 10.7% year-on-year, after +8.1% in 2022.

Corporate taxes sluggish

After recovering strongly in 2021, corporate taxes are down slightly over the first ten months of 2022 (-1.4% year-on-year). This slight decline is explained by a sharp decrease in balances (-35% year-on-year)[1] while advances - which depend on economic activity - rose 12% (see graph 5.3).

The observed and projected economic slowdown will weigh on corporate tax revenues. STATEC is thus forecasting a slight increase in corporate taxes in 2023 (+2.5%).

The overhaul of the international corporate tax system, drawn up at the initiative of the OECD, should have come into force in 2023, but it has been postponed for a year. A new multilateral agreement for the implementation of Pillar One[2] should be finalised by mid-2023, with a view to entry into force in 2024.

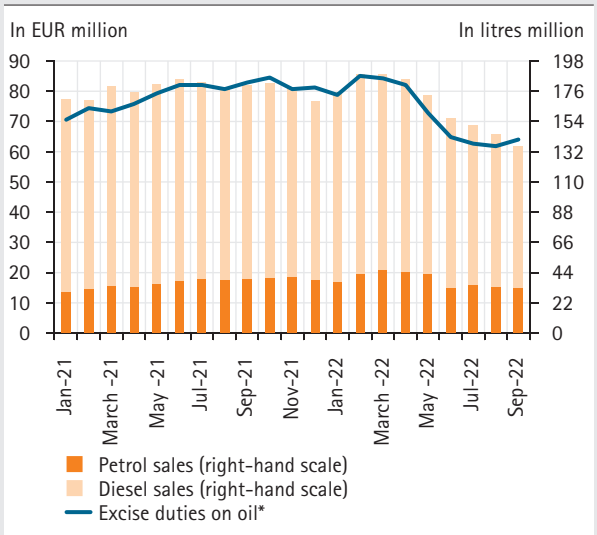
VAT revenue boosted by high inflation in 2022

Revenues from VAT progressed well over the first ten months of 2022 (+9.4% over one year), boosted by inflationary pressures. To slow down inflation, however, the second tripartite agreement plans to reduce by one percentage point the standard VAT rate (from 17% to 16%), the intermediate VAT rate (from 14% to 13%) and lower VAT rate (from 8% to 7%) for the whole of 2023. The cost of this measure will amount to EUR 270 million (see chapter 2). These rate reductions, combined with slower growth and stagnating per capita consumption, will weigh on VAT revenues on residential consumption in 2023 (-1.6% year-on-year). All in all, the growth in VAT revenue should slow down sharply in 2023 (with +2.3% year-on-year, compared to +9.4% in 2022 and +18.5% in 2021).

[1] The decrease in balances is partly related to the introduction of automatic taxation (mandatory from the 2017 tax year), which reduces the stock of balances accumulated due to delays, and to larger or smaller refunds to some taxpayers.

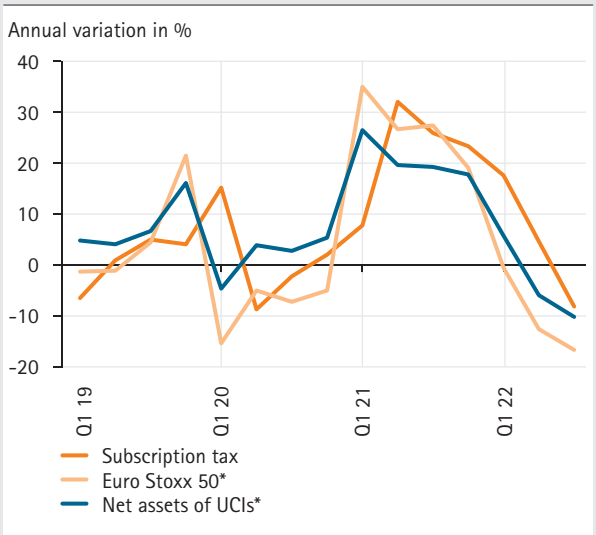
[2] Pillar One aims to ensure a fairer distribution of profits and taxing rights between countries for large multinational enterprises (MNEs), including digital ones. It will make it possible to reallocate part of the taxing rights on MNEs from their country of origin to the market countries in which they do business and make profits, irrespective of whether they have a physical presence on the market in question. This reform will impact on the taxing rights of different countries on multinational companies, but also trigger strategic reactions from these companies and from different countries (see "The global tax reform agreement and its potential impacts for Luxembourg", Note de conjoncture 2-2021, pp. 75-85).

Graph 5.4
Excise duties and sales of petroleum products fall sharply since spring



Sources: ADA, STATEC (seasonally adjusted data)
* Moving average centred over three months

Graph 5.5
Drop in asset valuations weighs on the subscription tax



Sources: EDA, CSSF, Macrobond, STATEC
* Values for the last month of the quarter

Excise duties affected by rising fuel prices

Over the first ten months of 2022, excise revenue on tobacco is up 13% year-on-year, while excise revenue on petroleum products has fallen (-8% year-on-year) due to a temporary reduction in excise duties and the decline in fuel sales linked to high prices and changes in the price differential with neighbouring countries.

In an attempt to stem the surge in fuel prices, the government temporarily reduced fuel sales prices by EUR 7.5 cents per litre through a reduction in autonomous excise duties from mid-April to the end of August[3]. Over this period, excise duties on petroleum products collected by the State fell sharply (-19% year-on-year). They would also have decreased without this measure, because more pronounced price reductions in neighbouring countries would undoubtedly have led to a greater decline in sales in Luxembourg.

Luxembourg and Germany stopped fuel rebates in September. In Belgium, the EUR 17.5 cents rebate remains in effect until the end of 2022, while in France, the EUR 30 cents rebate has been extended until November 15 (as well as the additional EUR 20 cents rebate from TotalEnergies) and it will then be EUR 10 cents per litre until the end of the year (same for TotalEnergies). These various measures make prices at the pump in Luxembourg less attractive and weigh on fuel sales and corresponding excise duties (-13.4% in 2022, then -1.4% in 2023). Lower traffic at service stations would also weigh on excise duties linked to tobacco sales in 2023 (-1.5%).

Subscription tax hit by decline in financial assets

After rising sharply in 2021, subscription tax receipts collected over the first ten months of 2022 are down 2.1% year-on-year. This decline is linked to the fall in stock market valuations and the impact on the assets of undertakings for collective investment in Luxembourg (-10% year-on-year in September). In Q4, revenue from the subscription tax will be affected by the decline in financial assets observed in Q3[4]. STATEC is thus forecasting a drop in revenue from the subscription tax of 3% in 2022, then -2% in 2023.

[3] The autonomous excise duty on unleaded petrol was reduced to zero and the excise duty on diesel used as fuel was significantly reduced (from EUR 90.5 per 1,000 l to EUR 26.4 per 1,000 l).

[4] The subscription tax applies to the assets under management of UCIs and specialised investment funds. It is collected the quarter following that to which it relates.

Table 5.2
Government finances (central and alternative scenarios)

						Lower scenario[1]		Upper scenario[2]	
	2021 levels	1995-2021	2021	2022	2023	2022	2023	2022	2023
	In EUR million					Variation in % (or specified differently)			
Total spending	**31,006**	**6.3**	**2.4**	**9.0**	**11.5**	**9.1**	**12.3**	**9.0**	**11.1**
Intermediate consumption	3,038	6.6	9.0	16.8	14.8	16.9	15.1	16.8	14.5
Capital formation	2,934	6.4	-2.5	10.6	16.4	10.6	16.4	10.6	16.4
Wages paid out	7,362	5.9	6.1	7.4	8.5	7.4	8.9	7.4	8.0
Welfare benefits	13,223	6.4	-1.2	6.2	9.2	6.5	11.0	6.2	8.4
Other spending	4,449	6.5	7.0	13.9	17.3	13.5	16.8	13.9	17.7
Total revenue	**31,580**	**6.1**	**12.6**	**6.0**	**5.8**	**5.2**	**2.2**	**6.2**	**6.4**
Taxes on production and imports	8,427	6.2	20.0	3.6	0.5	2.6	-4.4	4.0	1.8
Current taxes on income, wealth, etc.	11,455	6.3	12.2	5.2	7.7	4.3	3.7	5.4	8.4
Social security contributions	8,592	6.2	5.9	9.8	7.9	9.3	5.2	9.9	8.2
Other revenue	3,106	5.1	14.9	5.0	6.6	4.5	5.3	4.9	6.3
Financing capacity/requirement (as a % of GDP)	**574**	**1.7**	**0.8**	**-0.4**	**-2.8**	**-0.8**	**-5.1**	**-0.3**	**-2.2**

Source: STATEC (2022-2023: forecasts)
[1] The negative scenario with gas rationing is based on assumptions made by Oxford Economics in August. These assumptions mainly consist of a complete halt of Russian gas deliveries in Q4 2022 and a 10% rationing in European industry until spring 2023. Inflationary pressures would intensify, which would trigger a tighter monetary policy than in the baseline scenario.
[2] In the upper scenario, production prices would ease in a climate of more fluid supply chains. Inflationary pressures would therefore fade more quickly than expected, prompting an easing of monetary policy. In financial markets, equity prices would rise sharply and government bond yields would decline, while than most currencies including the EUR would appreciate against the USD.

The forecast for 2023, however, is based on stock index forecasts conducted by Oxford Economics in early October (-2.6% forecast in 2023). From mid-October, the stock markets unexpectedly rose strongly in response to the slowdown in inflation in the United States, making up for the losses recorded over the previous six months.[5].

Expenditure in 2022 boosted by operating costs and pensions

Public expenditure rose strongly in Luxembourg in 2022. With a 9% increase, the increase was higher than the long-term average and it is also very high in a European context (only +3.7% on average in the countries bordering Luxembourg and in the Netherlands).

Among the main categories behind the sharp increase this year - it should be noted that this is a STATEC estimate[6] - is the wage bill (1.8 percentage points of the total increase) and pensions (1.6 points).

In the absence of an increase in the index point in the civil service, the wage bill was mainly driven by the employment trends (+3.4% in 2022), with the remainder coming from the sliding scale (+3.8%). Pension expenditure is also indexed to the cost of living, while the number of pensioners is expected to grow by 3.8% (and has been trending more dynamically than employment in the economy as a whole since 2009). Pensions also legally benefit from real wage growth in the economy – the corresponding adjustment being +1.1% in 2022.

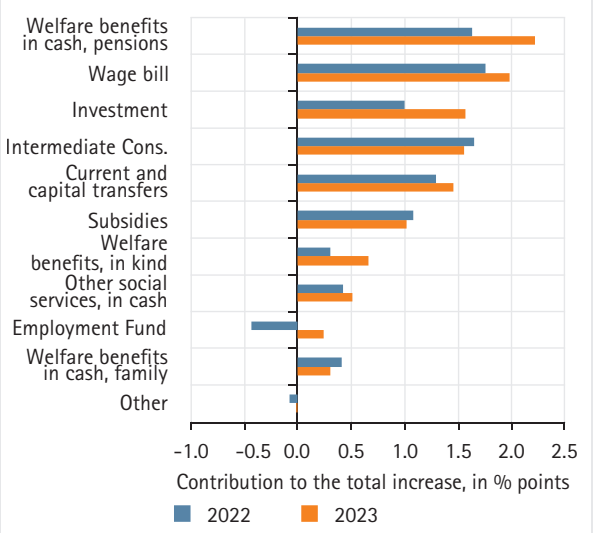
Intermediate consumption (all operating costs) is the third significant variable with a contribution of +1.6% point. On the one hand, its increase is linked to that of employment in the public sector and, on the other hand, on the expansion of infrastructures (following a continuous increase in investment). In fact, the public investment rate has been increasing since 2013 under the major effect of the increase in transport infrastructure spending[7] (for example: EUR 427 million in 2022 compared to EUR 400 million in 2021).

[5] In the upper scenario providing for a rise in the Euro Stoxx 50 of 1.4% in 2023, revenue from subscription tax would increase by 2.3% between 2022 and 2023.

[6] The anticipated increase in the draft Budget is even higher (+9.5%).

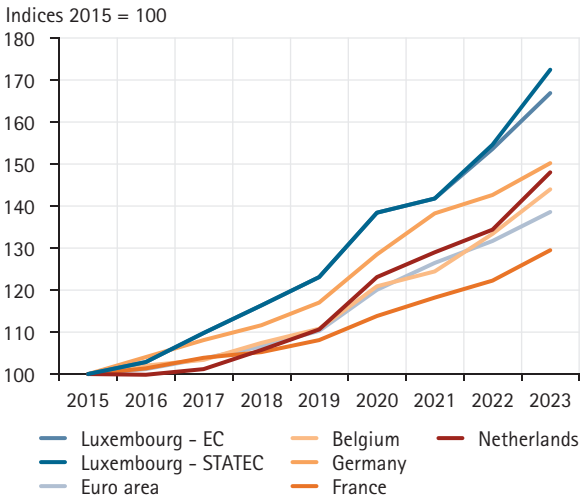
[7] Tram in the city of Luxembourg, CFL and rail infrastructure.

Graph 5.6
Pensions and the wage bill are the main determinants of the increase in public expenditure



Source: STATEC

Graph 5.7
Government spending is more dynamic in Luxembourg than in most euro area countries



Sources: European Commission (AMECO) and STATEC (2022-2023: forecasts)

The relatively higher increase in expenditure in Luxembourg as compared to most European countries is not explained by higher inflation (which would come into play via index brackets). Indeed, inflation (NICP) has been systematically lower in Luxembourg than in most euro area countries since the beginning of 2022, the difference stood at 3 points in September[8].

EUR 1.7 billion planned to combat the effects of the energy crisis

Measures have been taken to counter the effects of soaring energy prices. They result in higher public expenditure or lower revenue. The impact on the main economic aggregates is set out in chapter 2. This section is devoted to estimating the total (or ex post) effect on public finances.

Ex ante, the measures taken at the two tripartite meetings, also including the previous "Energiedësch" package, will cost roughly EUR 1.7bn (see Table 5.3, "ex ante" effect on the balance or line "g"), according to STATEC estimates.

This amount can be broken down as follows: EUR 700 million in 2022 and EUR 1 bn in 2023. On the revenue side, this involves lower revenues from direct taxes (tax credit for households) and VAT (temporary reduction of most VAT rates by 1 percentage point in 2023). On the expenditure side, it includes transfers to energy distribution companies (compensation for the price cap), to companies suffering from the rise in energy prices and to households, especially those with modest incomes. The main effect of these tax cuts and expenditures will be to stimulate the economic activity in 2022 and especially in 2023, as described in chapter 2 (pp. 28-30).

There are however certain requirements for the above to realize, such as the actual spending of the funds (consumption or investment), rather than them being saved. But it can be assumed that the companies benefiting from the aid will need it to maintain their level of investment, or even to remain in business. The money will therefore end up in the economic system, at least in large part[9]. The same applies to transfers to households, which are partly directed to the lower wage quintiles (see study 7.3), which are assumed to be financially constrained (absence of savings or financial cushion).

[8] The postponement of the bracket from July 2022 to April 2023 also contributed to reducing the impact of the surge in energy prices on public expenditure.

[9] It should be noted that STATEC has reduced transfers to companies suffering from the energy crisis on the basis of the first provisional results for 2022, showing that not all the budgeted funds will be used. Of a total amount of EUR 430 million planned for 2022 and 2023, STATEC estimates that around half would not be allocated to companies because they would not need it.

Table 5.3
Breakdown of the ex ante and ex post effects of the measures taken to combat the energy crisis[1]

		2022	2023			2022	2023
Revenue			In EUR million	**Balance**			In EUR million
Impact of ex ante measures	(a)	-330	-433	Impact of ex ante measures	(g)=(a)-(d)	-712	-982
Impact of ex post measures	(b)	-476	-1,032	Impact of ex post measures	(h)=(b)-(e)	-426	-481
Feedback effects	(c)=(b)-(a)	-146	-599	Feedback effects	(i)=(h)-(g)	286	501
Of which: impact of index brackets	(c1)	-481	-1,415	Of which: impact of index brackets	(i1)	15	132
Impact of activity increase	(c2)	335	816	Impact of activity increase	(i2)	271	368
Expenditure							
Impact of ex ante measures	(d)	382	549				
Impact of ex post measures	(e)	-50	-550				
Feedback effects	(f)=(e)-(d)	-432	-1,099				
Of which: EMS impact	(f1)	-496	-1,547				
Impact of activity increase	(f2)	63	448				

Sources: Ministry of Finance, STATEC
[1] Reading grid: the table includes all the measures taken at the two tripartite meetings in 2022 as well as the conclusions of the "Energiedësch" round table; the ex ante quantification corresponds to the amounts from the 2023 draft budget (subject to a few modifications by STATEC), while the ex post quantification takes into account the feedback effects of the measures on the main macroeconomic variables, including government finances; the impact of index brackets represents the mechanical effect of the drop in the sliding wage scale following the tripartite measures (-1.4% in 2022; -2.6% in 2023); the impact of the activity increase represents favourable second-round effects, acting on government finances.

Anti-crisis measures should stimulate activity and reduce their effective cost

The other far-reaching effect of the measures is a reduction in inflation compared to a counterfactual from early September, in which soaring energy prices would have kept inflation at around 6.5% in 2022 and 2023. The energy price cap measures will roughly halve inflation in 2023, slowing down the sliding scale by the same amount (-4.0% compared to the counterfactual) and thus the wage cost[10]. As an induced effect of the September tripartite measures, public expenditure would therefore be reduced by approximately EUR 1.5 billion in 2023. However, this effect also plays a role on the revenue side, to a slightly lesser degree, thus moderating the overall impact on the balance (EUR +130 million, see line i1 of table 5.3).

STATEC's simulations make it possible to differentiate between the direct effect of the measures on expenditure via the sliding scale and the indirect effect, via the increase in activity, amplified by the impact of the fall in wages on employment.

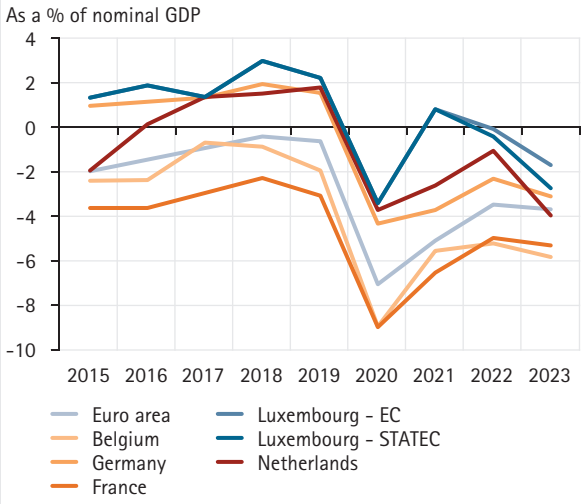
Ex ante, the measures would increase expenditure by 382 + 549 = EUR 931 million. Ex post, expenditure would fall by EUR 550 million in 2023, compared to the counterfactual, due to the drop in the sliding scale. The feedback through activity would have an expansive effect on expenditures, since some of them are directly linked to GDP or employment. This effect moderates quite substantially the favourable (declining) effect passing through the sliding scale (63 + 448 = 511 million EUR in total, see line f2).

On the revenue side, the effect of the feedback via the increase in activity is clearer, with a total of EUR +1.1 billion in 2022 and 2023. Thus, the public balance would not deteriorate by EUR 1.7 billion (ex ante) but by EUR 907 billion (ex post).

However, these figures should be viewed with the utmost caution. They are based on a forecast of energy prices (especially gas) for 2023 established at the beginning of September 2022. If a new price spike were to materialise, the cost of the measures (ex ante) for the State could increase. If, on the contrary, gas prices fell, even perhaps more than at present, the ex ante impact would be less. At the same time, the simulated impact on the sliding scale would be less and with it all the induced effects on activity and employment.

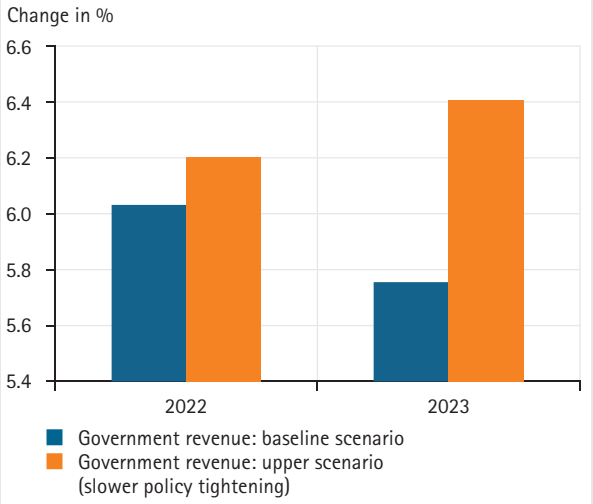
[10] In STATEC's simulations, the drop in the sliding scale relative to the counterfactual is a powerful vector for transmitting the measures taken to the market sector, and therefore at the root of strong multiplier effects. Ex ante, a drop in the sliding scale would lead to a reduction in the wage bill of the market sector of EUR 1.3 billion in 2023. However, due to the fall in the compensation per employee, and the induced increase in employment, the effective fall in the wage bill in the private sector would only be EUR 460 million (with an increase in employment of 2.3% due to the measures).

Graph 5.8
Public balance to deteriorate more in Luxembourg than in the euro area in 2023



Sources: European Commission (AMECO) and STATEC (2022-2023: forecasts)

Graph 5.9
In the upper scenario[1], government revenue could grow by almost one additional percentage point in 2023



Source: STATEC (2022-2023: forecasts)
[1] Less restrictive monetary policy

A further deterioration of the public balance in 2023 against a backdrop of uncertainty

After a solid increase of 6.0% in 2022, government revenues are expected to slow down in 2023. Indirect taxes (+0.5%) would be the main drag due to the VAT reduction, the decline in stock market indices, the reduced momentum of fuel and tobacco sales, and the slowdown in the real estate market. Household taxes and contributions should continue to increase, although less strongly than in 2022 (due to the slowdown in employment), while corporate taxes should remain rather sluggish. In total, revenue would increase by 5.8%[11].

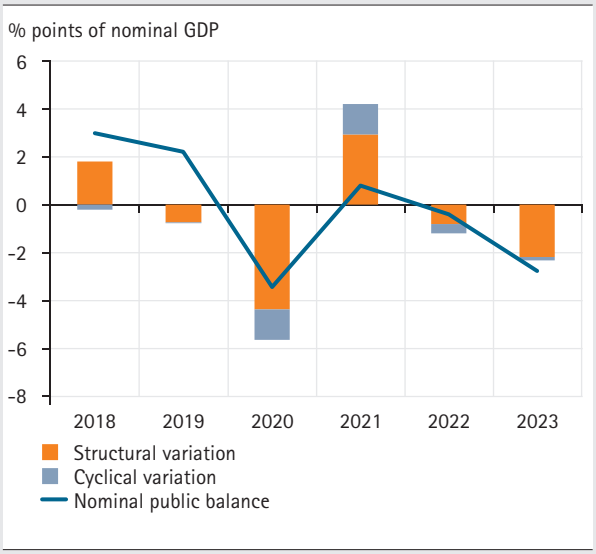
STATEC forecasts a stronger increase in spending in 2023 than in 2022 (+11.5% vs. +9.0%). The elements evolving dynamically in 2022 (wage bill, pensions, intermediate consumption) would continue to do so in 2023, while spending on the Employment Fund and investment would be the expenditures that accelerate most between 2022 and 2023. Moreover, the projected increase in public investment of 16.4% would fall to 5% without CFL and military spending.

The impact of the measures (on expenditure) would pass through current and capital transfers as well as subsidies. As regards the former, a slight acceleration is expected in terms of their contribution to the total, while subsidies, which are already very dynamic in 2022, would limit their contribution in 2023. All in all, the measures would have a moderate expansive impact on public spending (0.6% of GDP on average each year, ex ante).

The nominal balance would still deteriorate quite substantially, changing from -0.4% of GDP estimated for 2022 to -2.8% in 2023. This is a sharp downward revision from previous forecasts, reflecting the weaker economic climate and the measures taken as a result of this situation. In comparison to other European countries, Luxembourg would remain in a fairly comfortable position, even if the decline (year-on-year variation) is quite high (see graph 5.8). In the upper scenario, based on a less restrictive monetary policy, the public balance could improve by half a point compared to the baseline scenario, mainly due to higher revenues (see graph 5.9).

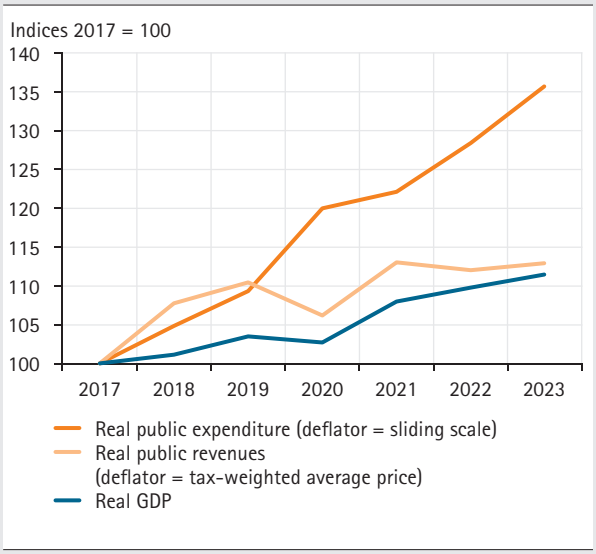
[11] For more details, see table 5.2.

Graph 5.10
Decline of the government balance in 2022 and 2023 mainly due to discretionary measures



Source: STATEC (2022-2023: forecasts)
Reading grid: the nominal balance can be broken down into a structural component (set of discretionary measures) and an economic component (impact of activity, employment, etc.). The change in the nominal balance is therefore the sum of the cyclical and structural change. On this graph, the nominal balance is represented in levels but its two components in variation.

Graph 5.11
Real public expenditures much more dynamic than revenue at constant prices since 2020



Source: STATEC (2022-2023: forecasts)

Since 2018, the deterioration of the public balance mainly stems from crisis containment measures

The measures taken to counter the consequences of the energy crisis are therefore, at least in part, the cause of the current public deficit. There is an analogy with what happened in 2020, during the COVID-19 crisis. The decomposition, since 2018, of the (nominal) balance into a cyclical part and a structural part[12] makes it possible to better understand and quantify the sources of the high public deficit expected in 2023[13]. Graph 5.10 includes these two components, and their sum corresponds to the annual change in the nominal balance.

In 2020, the total of discretionary measures and other changes in the public balance not directly induced by the economic situation[14] amounted to -4.4 points of GDP. The impact of the economic situation added 1.3 points to the decline and the balance swung from a comfortable surplus in 2019 (+2.2%) to -3.4%. In 2021, when a large part of the measures expired and the economy rebounded, the nominal balance (barely) returned to positive territory. Its recovery was hampered by the fact that some of the measures remained in force in 2021, so that, cumulatively, the discretionary measures dragged down the public balance by 1.4 points over 2020 and 2021.

The current crisis is different, because it will probably not be confined to a single year, while STATEC's forecast stops for the moment in 2023. We can already determine that the discretionary measures in total would reduce the public balance by almost three points in 2022 and 2023[15], while an additional half point would come from the economic downturn. Thus, most of the deterioration in the nominal balance since 2018 would come from measures taken to counter the effects of successive crises (-4.4 points since 2020). Over this same period of time, the cumulative impact of the economic situation on the nominal balance would be -0.5 points.

Graph 5.11 illustrates this observation in a different way: deflated public revenues have grown at a higher rate than real GDP since 2017, but they have been largely exceeded by real expenditures since 2020. The deterioration of the public balance is therefore not caused by revenues, even if they are adjusted for observed and forecast price increases.

[12] Nominal balance = Structural balance + Cyclical balance or Structural balance = Nominal balance - 0.44 * difference in output (where 0.44 corresponds to the fiscal semi-elasticity).

[13] Since 1990, the years when Luxembourg's public finances were in the red are 1991, 1992, 2004, 2009, 2010 and 2020. During these years, the deficit was on average -0.5% except in 2020 (-3.4%). 2022 and 2023 remain estimates/ forecasts.

[14] Increase/decrease in investment or employment, other provisions having a structural impact.

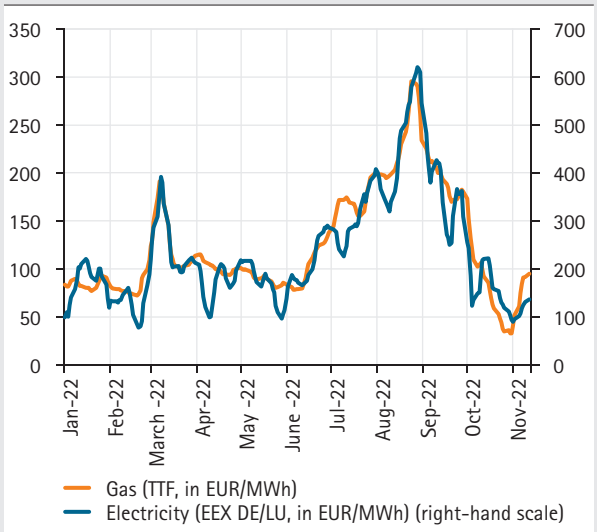
[15] One should be cautious regarding this result, for two reasons: (1) a high level of uncertainty persists as to the cost of the measures taken to cap energy prices, which depend, at least in part, on future gas prices; (2) the evaluation of the structural balance is based on the calculation of potential GDP, an unobserved variable that is generally still subject to revisions well after the end of the financial year to which it refers.

Energy and emissions 6

Energy markets are in turmoil, causing high price volatility. Largely due to the war in Ukraine, gas and electricity prices reached historically high levels this summer, while oil prices returned to levels not seen since 2014. These developments have threatened the purchasing power of households and raised costs for companies. On the other hand, this fossil fuel crisis could accelerate the energy transition.

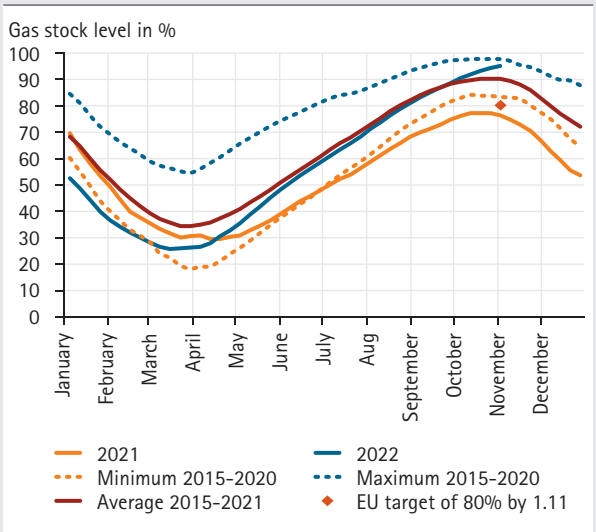
Two tripartite negotiations were held in Luxembourg within six months to implement measures to mitigate rising energy bills and inflation in general. Anticipating a potential shortage of gas, as well as electricity, the EU has issued recommendations to member states to guarantee supply, with targets for storage and reducing consumption. A mild start to winter has also helped to lessen the risk of shortages. Luxembourg consumed much less gas over the first nine months compared to the average of the previous five years (-19%, against -7% in the EU). The surge in energy prices in 2022 has therefore had a resounding impact on consumption. On the other hand, the aid measures taken in neighbouring countries have temporarily removed the competitive advantage of Luxembourg's petrol prices, leading to a fall in fuel sales. Greenhouse gas (GHG) emissions have thus decreased by 10% in 2022, below the level witnessed in 2020 - the year of the crisis.

Graph 6.1
High volatility in spot prices on energy markets



Source: Macrobond (moving averages over one week)

Graph 6.2
Stocks above normal levels in the EU



Source: Macrobond (weekly data)

Soaring natural gas prices pushed up electricity prices

The war in Ukraine disrupted the energy markets in Europe. Following several delivery disruptions via the Nord Stream 1 pipeline, which accounted for around 40% of Russian natural gas deliveries to Europe, natural gas spot prices[1] continued to climb during the summer to peak at over EUR 300 per MWh at the end of August (an increase of over 1,600% compared to the start of 2021). This surge in the price of natural gas has caused electricity prices to soar via the mechanism of the electricity market, called "merit order"[2]. The European Commission has shown its desire to break this coupling between the price of natural gas and electricity, by proposing a maximum cost of EUR 180 per MWh for electricity that is not produced from gas[3]. While the Nord Stream 1 gas pipeline was damaged by explosions in September and has been out of service ever since, gas and electricity spot prices have fallen significantly since their peak in the summer. Gas temporarily reached its lowest level for a year at the end of October (falling below EUR 30 per MWh).

European gas storage well stocked for winter

This recent fall in the price of gas can be explained on the one hand by high temperatures in October, which were about three degrees higher than the average for the last five years, thus delaying the start of the heating period. On the other hand, it is linked to the high fill level of European gas storages. As storages were at historically low levels at the end of 2021, Europe had set itself the target of reaching 80% of storage capacity for 1 November 2022. This goal was already achieved before the beginning of September with the storage operators buying considerable quantities of gas during the summer (at very high prices). The upward pressure on gas spot prices thus eased and the European network was no longer able to absorb additional gas deliveries.[4]. However, Europe cannot rely solely on its reserves, since the European storage capacity only covers the consumption for the months of December and January of an average year of consumption.[5]. Maintaining import routes and achieving energy savings remain essential to ensure security of supply during winter. Extensive use of stored gas could therefore substantially deplete stocks by the end of the heating season, thus making the filling of storage facilities for winter 2023-24 even more difficult.

[1] The price for day-ahead delivery.

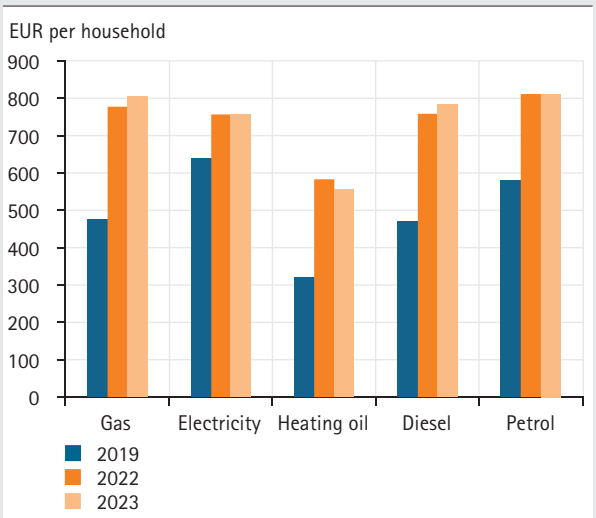
[2] The generating plant with the highest marginal costs determines the price.

[3] European Council agreement dated 30.09.2022 on emergency measures to reduce energy prices.

[4] In October, ships carrying liquefied natural gas (LNG) were waiting off the Spanish coast because they could not offload their gas.

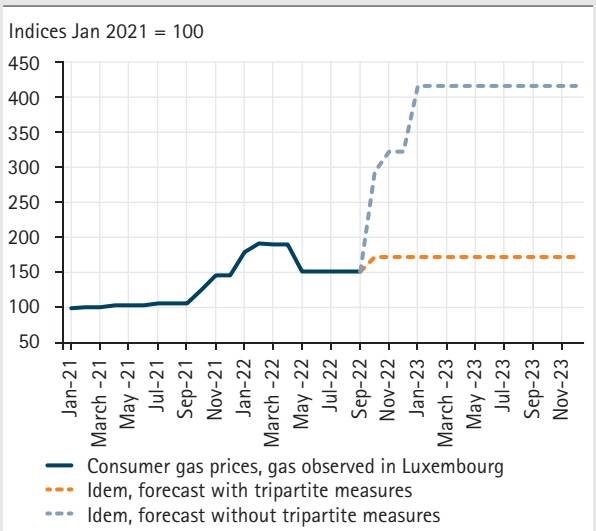
[5] Storage capacity in Europe of 1,110 TWh compared to consumption of 1,075 TWh in December and January (2019-2021 average).

Graph 6.3
Household energy bill stabilises in Luxembourg in 2023



Source: STATEC (2022-2023: forecasts)
Note: static analysis assuming constant household consumption (2019)

Graph 6.4
Gas price cap prevents a fourfold increase compared to 2021



Source: STATEC (2022-2023: forecasts)

Measures to combat the impact of soaring prices on households

Changes to spot prices are not instantly and fully passed on to consumer prices[6]. While private customers experienced the first significant increases in their gas bill at the start of 2022, Luxembourg energy suppliers had to announce additional increases in their basic gas and electricity rates, which would enter into force between October and January[7].

Ultimately, these increases did not materialize because, following tripartite negotiations, the government capped consumer gas price increases for households at 15% (see graph 6.4) and froze the consumer price of electricity until the end of 2023. In addition, the price of heating oil has been subsidised by EUR 15 cents per liter since the beginning of November, thus doubling the aid agreed upon at the first tripartite in March. After an increase in the average household energy bill of around 50% in 2022 compared to 2019[8], it should stabilize in 2023 owing to the various price measures. Without these measures, household energy bills would have increased by more than 35% in 2023.

Industry most affected by increases in energy bills

Companies however cannot take advantage of the price caps for electricity and gas and remain affected by price increases. The energy prices paid by companies strongly depend on the quantities consumed. In 2020, the industry thus paid only around a third of the gas and electricity price of an average professional consumer. However, in the face of increases in spot energy prices, industry prices also increased tenfold. Price increases are thus proportionally higher for the branches most exposed to market fluctuations than for small consumers.[9]. The impact of higher energy prices is nevertheless very mixed and varies according to the sector. At constant consumption, industry would be the most affected with an increase in the energy bill of more than 850% between 2019 and 2023. This rise in prices is explained above all by the price rises observed and forecast for the steel and glass industries – which represent the most energy-intensive consumers in Luxembourg.

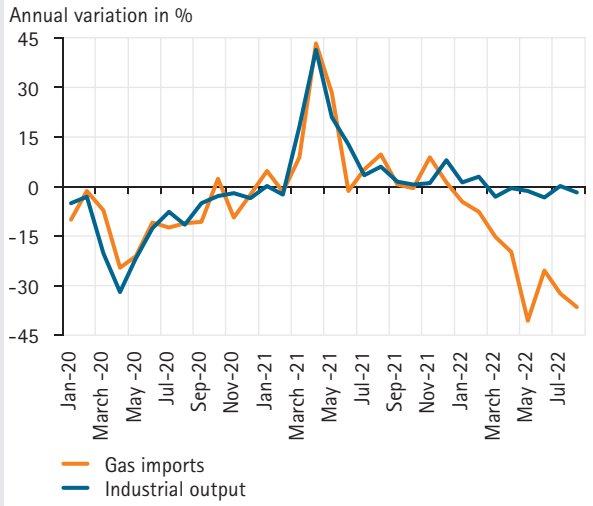
[6] Depending on the markets and their purchasing strategy, suppliers purchase a large part of their energy months or even years in advance.

[7] Increases of around 175% for gas and 45% for electricity were expected until January 2023 and already announced in part by energy suppliers.

[8] Calculations are based on energy consumption as reported by NAMEA tables and may differ from amounts reported in the household budget survey.

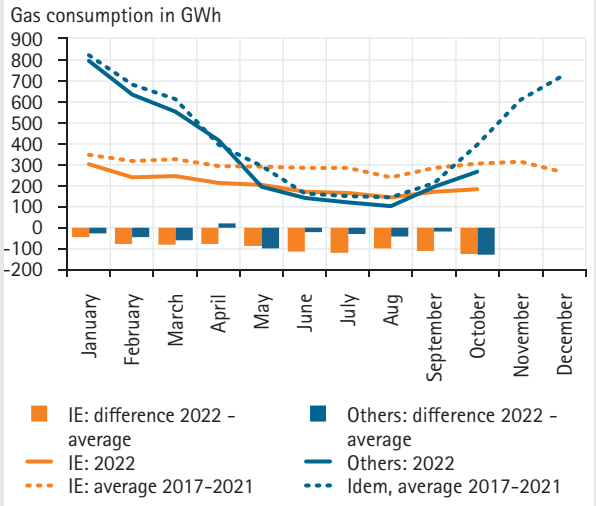
[9] Energy price increases for small business consumers are comparable to those observed in the consumer price index (CPI) for households, while price increases for large consumers follow directly the prices observed on the spot and futures markets.

Graph 6.5
Decoupling of industrial production and gas consumption



Source: STATEC

Graph 6.6
Industry, the main driver for gas savings



Sources: Creos, STATEC
* IE: energy intensive industries

If we assume that the additional costs linked to the energy bill cannot be passed on to selling prices, the additional expenditure would thus absorb 180% of the gross operating surplus[10] of the industry. However, it is likely that most companies can at least partially and progressively pass on this increase in energy prices to their selling prices, and that the others can reduce their production and consumption.

Sharp decrease in gas consumption

The consumed quantities are obviously not constant, as evidenced in particular by the gas deliveries over the last few months. The relationship observed in recent years between gas consumption and industrial production seems to have been broken (see graph 6.5). While gas consumption fell by more than 30% year-on-year between May and August, industrial production remained relatively constant. This decoupling can partly be explained by gains in energy efficiency[11] and changes in energy carriers made by companies[12]. However, it is also the consequence of a downturn in activity: between June and August, the industrial production of the energy-intensive branches (glass manufacturing, steel industry, production of non-ferrous metals and wood industry) fell by almost 20% in terms of annual variation. These branches represent 85% of gas consumption of the industry, but only account for 10% of aggregate industrial production.

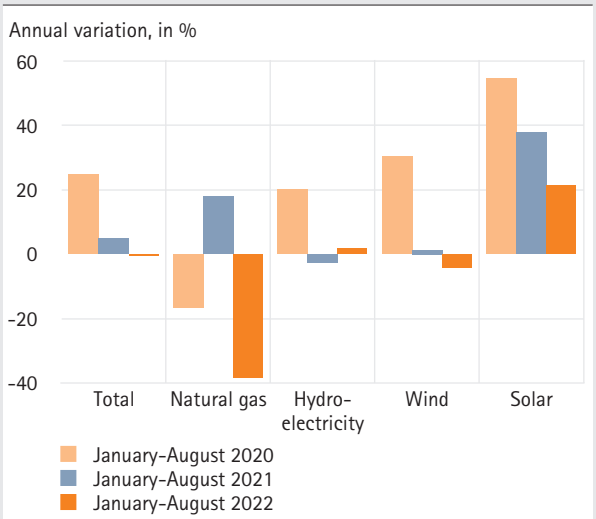
Over the first ten months of 2022, Luxembourg thus consumed 20% less gas than on average from 2017 to 2021. A third of this decrease could be explained by the mild temperatures, the number of heating degree-days for the first ten months in 2022 being around 10% lower than the average, thus reducing consumption related to heating. The remaining two-thirds are attributable to around twenty energy-intensive companies that are directly connected to the gas transmission network (see graph 6.6), half of which is linked to phenomena unrelated to the energy crisis, namely the closure of a factory in 2020 and the replacement of a large industrial furnace that has reached the end of its life.

[10] Gross operating surplus is defined as gross value added less payroll.

[11] Reduction in energy consumption without impact on the quantities produced.

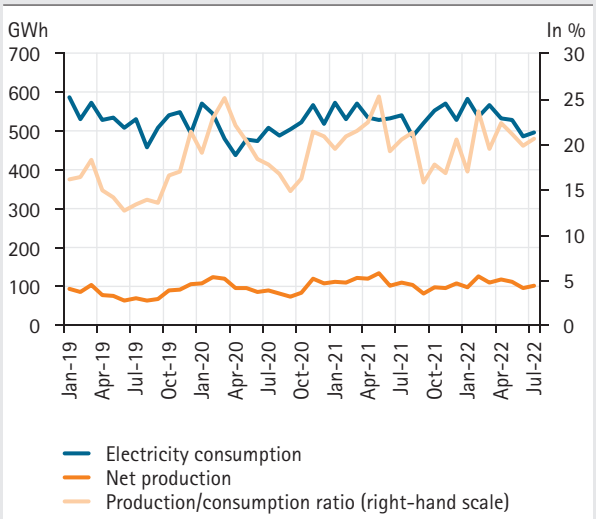
[12] Some companies have bivalent systems for their heat production, making it possible to switch instantly from gas to oil, for example.

Graph 6.7
Strong increase in photovoltaic production



Source: STATEC

Graph 6.8
Electricity consumption still largely dependent on imports



Sources: STATEC, Eurostat

Domestic electricity production remains stable

Luxembourg's gross electricity production for the first eight months of 2022 remained almost unchanged compared to 2021 (1,532 GWh compared to 1,540 GWh in 2021), despite an increase in photovoltaic production of around 20%, to 238 GWh. The rise of photovoltaics is attributable to the increase in installed capacity, but also to more favourable weather conditions in 2022, the number of sunshine hours having indeed increased by approximately 30% over the first eight months compared to 2021.

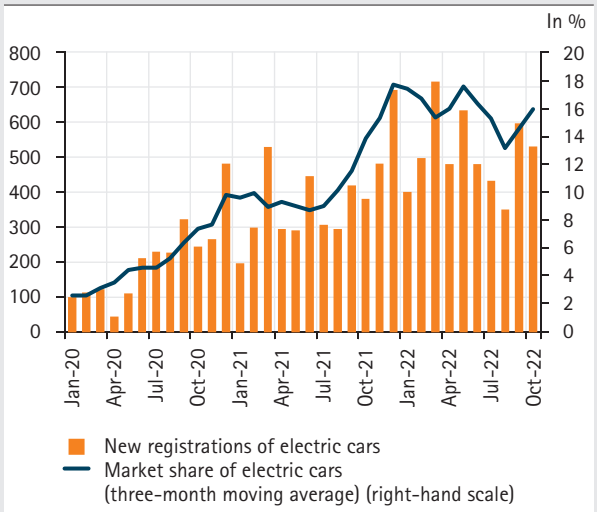
Wind generation, however, fell by 4%, generating 215 GWh between January and August. This decline is mainly linked to the replacement of old wind turbines by new, more efficient models, called "Repowering". The capacities currently connected to the grid are thus lower than those of the previous year. Repowering, on the other hand, should increase wind production by around 70 GWh in the coming years, in addition to new wind turbine projects.

1,532 GWh of gross production includes 675 GWh produced by the hydroelectric power station in Vianden, which is the largest power station in Luxembourg in terms of electricity production. However, as it is directly connected to the German electricity grid, its production is not taken into account in the calculation of Luxembourg's net electricity production.

Even if net national electricity production has increased in recent years, it is far from being able to cover all of Luxembourg's consumption. In 2019, net production thus covered just over 15%[13] of electricity consumption. This proportion has increased slightly in recent years. Over the first eight months of 2022, Luxembourg was able to cover 20% of its electricity consumption (see graph 6.8) with a net national electricity production stemming from more than 85% of renewable sources.

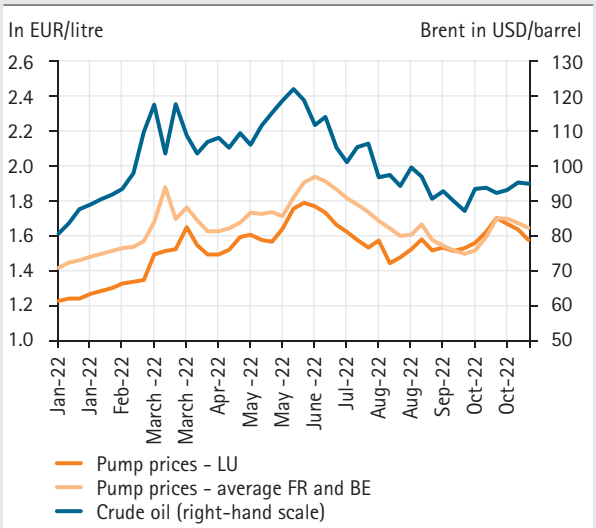
[13] Net production is equal to gross production minus the production of the Vianden hydroelectric plant.

Graph 6.9
Electromobility momentum on hold



Source: SNCA

Graph 6.10
Price trends at the pump



Source: Macrobond (weekly data – 16.11.2022)

Electromobility loses momentum

Over the first ten months of 2022, new car registrations fell by around 6.5% year-on-year. Even though registrations of purely electric cars increased by 50% over this period, their market share seems to be stagnating. Between January and October 2022, it stood at 16%, a level close to that already reached in the second half of 2021. The stagnation in the market share of electric cars could be explained by the supply bottlenecks in microchips, which has affected the entire automotive industry.[14]. This shortage currently seems to be getting less significant and there has been an increase since August in new registrations as well as in the share of electric cars. As of October 1st, the share of purely electric cars in the Luxembourg fleet stood at 3%.

Fuel prices in Luxembourg less attractive

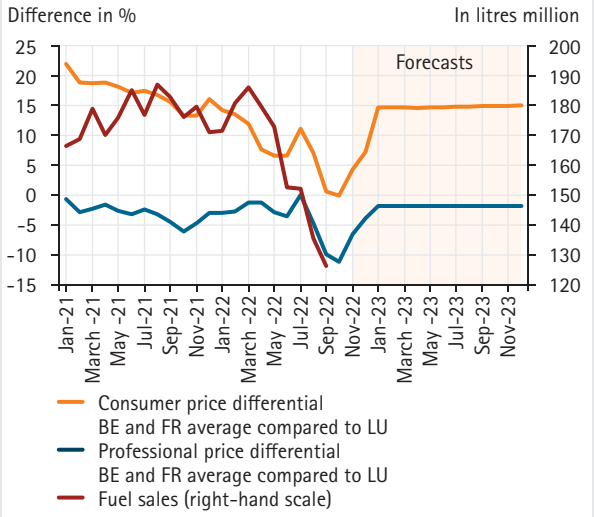
The surge in fuel prices in October (+23 cents per liter for diesel and +20 cents per liter for petrol) was short-lived, but shows the current volatility on energy markets. The price of Brent has fallen slightly in recent months, falling below USD 100 a barrel, in the face of growing risks of economic recession. However, the depreciation of the euro more than offset the downward effect on pump prices in Europe.

To support households and businesses in the face of price increases, the Luxembourg government subsidised fuel[15] from mid-April to the end of August, but more generous measures in Belgium and France reversed the price differentials at the pump. In Belgium, the EUR 17.5 cents rebate will remain in force until the end of 2022. In France, the discount at the pump of EUR 18 cents was increased to EUR 30 cents in September and will be lowered to EUR 10 cents in November. While the professional price differential has not been in favour of Luxembourg since 2021, in October 2022, prices at the pump for individuals are also less attractive in Luxembourg than in neighbouring countries (see graph 6.10). With the gradual end of these measures abroad, prices at the pump in Luxembourg should regain their attractiveness, stimulating fuel sales to non-residents (professionals and individuals).

[14] Electric vehicles use more than conventional cars.

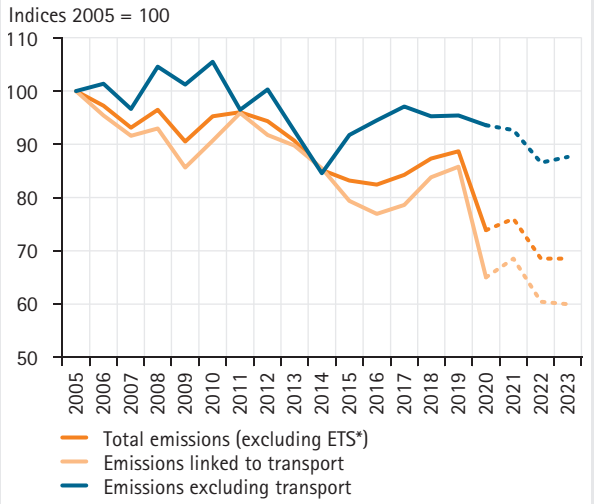
[15] Following the measures implemented as part of the "Solidarityitspak", a temporary reduction of 7.5 cents on diesel and gasoline excise duty was applied from 13.4.2022 to 31.8.2022.

Graph 6.11
Decline in fuel sales in 2022



Sources: STATEC, Ministry of the Environment, Macrobond

Graph 6.12
Decreasing GHG emissions



Sources: Inventory of GHG emissions, STATEC calculations (2021-2023: forecasts)
* EU Emissions Trading System (EU-ETS)

Rising energy prices lead to lower consumption...

The 2022 price increases have therefore had a resounding impact on energy consumption. Fuel sales, still below their pre-COVID levels, began to fall in the spring of 2022 when prices started to soar in the wake of the war in Ukraine. The loss of competitiveness of Luxembourg prices compared to neighbouring countries would probably explain why diesel sales, in particular to professionals, fell again during the summer. Fuel sales fell by 8.5% over the first three quarters and STATEC has projected a drop of 10% for 2022. Soaring heating prices (+50% for gas and +70% for heating oil in 2022) combined with favourable weather conditions imply lower consumption by households and non-industrial businesses.

...and significant declines in GHG emissions in 2022

The fall in fuel sales has led STATEC to revise[16] GHG emissions downwards. Transport-related emissions would decrease by 12% in 2022 in the baseline scenario, then stabilise in 2023 (in the absence of further reductions in pump prices in neighbouring countries). Emissions excluding transport would fall by 6% in 2022, but would increase slightly in 2023 (+1.3%). Total emissions (excluding ETS) would thus fall by almost 10% in 2022. In the baseline scenario and the monetary policy easing scenario, total emissions would stabilise in 2023; in the gas-rationing scenario, emissions would be reduced by 1%.

The impact of gas rationing on climate objectives would be very limited, as the national load shedding plan provides that non-energy-intensive households and businesses (which represent the majority of non-ETS emissions) would be disconnected last.[17]. The situation in 2023 depends on the course of the war in Ukraine, but also on other factors, such as the harshness of the winter and the impending economic downturn. The exceptional volatility that currently surrounds energy prices and its impact on consumption makes any forecast extremely unreliable.

[16] STATEC has revised fuel sales for 2022 downwards by more than 16 percentage points.

[17] Three levels of crisis have been identified at national level: early warning, which corresponds to a disconnection of energy-intensive companies subject to the emission quota trading system (EU-ETS, SEQE in French), warning and emergency.

7 Thematic studies

7.1
Economic impact of a halt in Russian natural gas deliveries for Luxembourg

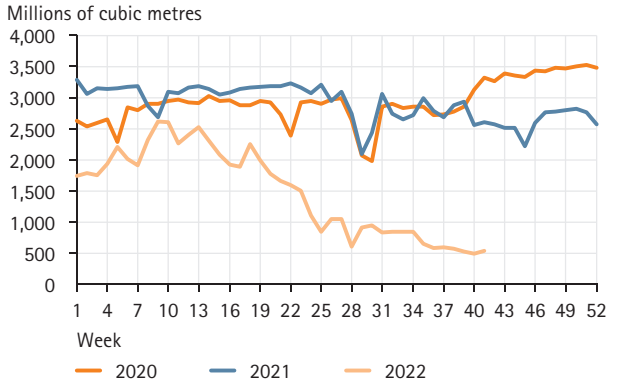
Against the backdrop of the war in Ukraine, Russia has sharply reduced its deliveries of natural gas to European countries and could suspend them completely. This calls into question the security of natural gas supply in the European Union and raises the issue of the economic cost of such a shutdown or possible rationing. This study aims to analyse the impact on Luxembourg, by taking into account the measures set out in the national emergency plan and international studies already carried out on this subject. Broadly speaking, it appears that the overall effect on the Luxembourgish economy would remain limited.

Evolution and importance of Russian natural gas deliveries

Since the outbreak of war in Ukraine, deliveries of Russian natural gas have become a major source of uncertainty for Europe. As a matter of fact, Russia uses its deliveries strategically and has already significantly reduced supply in 2022. In the third quarter of 2022, deliveries were thus around 70% lower than in the previous year. Since then, they have fallen even more with deliveries through Nord Stream 1 shut down in early September.

Russia is a major supplier of natural gas for the EU and these reductions therefore threaten its security of supply. In 2020 (latest available data from Eurostat), about 40% of EU natural gas imports came from Russia. Dependence on Russian natural gas[1] varies greatly within the European Union. Thus, some countries depend very little on Russian supplies, such as the Iberian countries, while others are almost totally dependent, such as the Czech Republic and Latvia. For Luxembourg, this figure stands at around 27% in 2020, compared to 14% for Belgium, 19% for France and 69% for Germany. Moreover, the share of natural gas in the national energy mix also differs across the EU, ranging from 0% in Cyprus to 40% in Italy (16% in Luxembourg in 2020).

Graph A
Imports of Russian natural gas by the EU and UK



Source: Bruegel

Alternative sources of natural gas and consumption reduction targets

As natural gas consumption is higher in winter due to its use for heating, and given the decrease in Russian supplies, various measures have been taken to avoid a shortage. On the one hand, alternative suppliers have been sought, both of liquefied natural gas (LNG) and via existing gas pipelines. Thus, deliveries from Norway and Azerbaijan have increased considerably over one year and LNG imports have increased by 65% over the first eight months of 2022.[2,3].

[1] The dependency by country of origin calculated by Eurostat considers the ultimate source of imports (and also takes into account possible exports and domestic production).

[2] International Energy Agency Gas Market Report (https://www.iea.org/reports/gas-market-report-q4-2022).

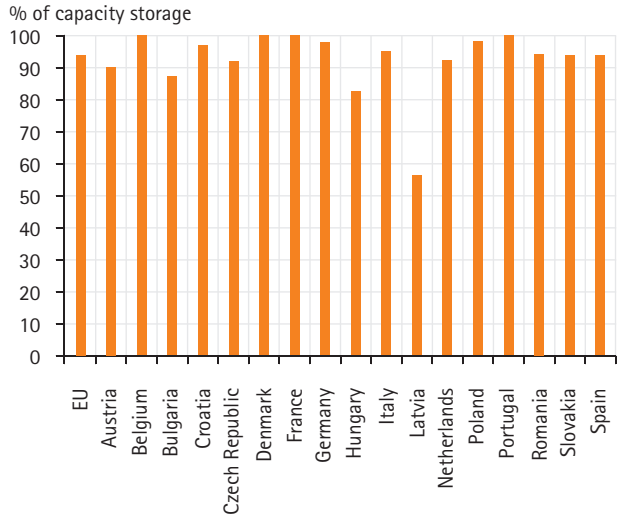
[3] LNG imports represent approximately 21% of total gas imports into the EU over the first eight months of 2022. Approximately 14% of LNG deliveries are of Russian origin over this period. Compared to 2021, this represents a decrease in terms of share in the total despite an increase in quantities (Eurostat data).

LNG deliveries are more flexible as to their destination, and some European countries have invested in their regasification capacities[4]. In the global LNG market, Europe is mainly in competition with Asia. Another important measure is the filling of gas reservoirs, for which there is a European minimum storage obligation of 80% before winter 2022/2023[5]. This objective was achieved on EU level, with storage reaching more than 93% of capacity at the end of October. It should be noted that storage capacities represent a more or less significant part of national consumption depending on the country.

In addition to alternative sources of supply, gas-saving measures are an important lever to avoid shortages. Thus, the European Union has set itself a target of reducing the demand for natural gas by 15% during the period from August 2022 to the end of March 2023, compared to the average consumption of the last five years from August to March.[6]. For the moment, this is a voluntary objective, which could however become mandatory if an alert at European level were triggered. According to a recent report by the International Energy Agency, demand reductions of between 9% and 13% (depending on the amount of LNG obtained) would be needed in order to maintain sufficient storage levels to get through the winter without risk of gas cuts.

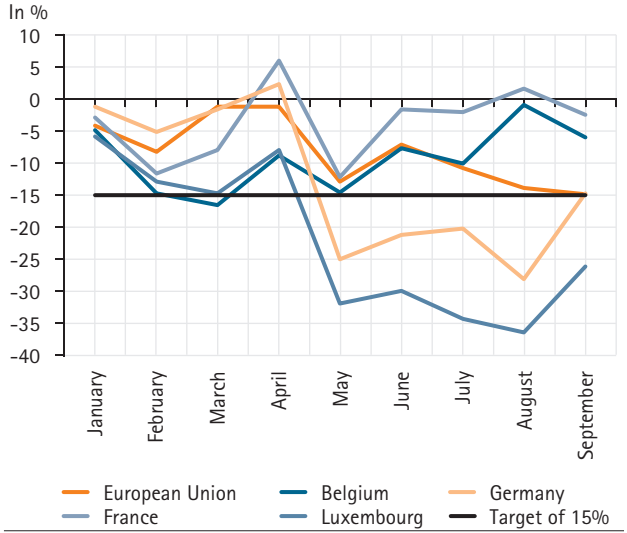
The reductions already achieved vary across the European Union. Eurostat data on gas consumption show disparities ranging from an increase in consumption (in Slovakia) to consumption halving compared to the average of the last five years (in Finland). Luxembourg reduced its gas consumption more sharply than its neighbours in the summer, with a reduction of approximately 26% in September, compared to approximately 15% for Germany, 6% for Belgium and 3% for France. An important factor in the coming months will be the outdoor temperature, which will significantly influence the use of gas for heating.

Graph B
Gas storage by country[1], as at 24.10.2022



Source: Gas Infrastructure Europe - Aggregated Gas Storage Inventory
[1] Luxembourg does not have storage capacities on its territory.

Graph C
Variation in natural gas consumption compared to the 2017-2021 average



Source: Eurostat

[4] In particular Germany, which is expected to have two additional floating terminals in operation by the end of 2022, with a further three planned for 2023 (https://www.dw.com/de/bundesregierung-mietet-f%C3%BCnftes-fl%C3%BCssiggas-terminal/a-62991618).

[5] https://www.consilium.europa.eu/fr/press/press-releases/2022/06/27/council-adopts-regulation-gas-storage/

[6] https://www.consilium.europa.eu/fr/press/press-releases/2022/08/05/council-adopts-regulation-on-reducing-gas-demand-by-15-this-winter/

Table A
Measures provided for in the emergency plan, by level of crisis

I. Early warning	II. Alert	III. Emergency

• Daily monitoring of security of supply
• Weekly follow-up with Belgian actors
• Awareness campaign for a reduction in gas consumption
• Increase in nomination at the Remich entry point by the TSO
• Deviation of inflows
• Reduced scheduled maintenance and infrastructure works on transmission and/or distribution networks
• Local interruption for customers at the interruptible rate
• Assessment of the impact of the event triggering the crisis on supply and customer information
• Adaptation of supplier strategy and means of supply
	• Purchase of gas on the wholesale market by the TSO
	• Use of pipeline stock
	• Use of Operating Balancing Agreements with Upstream TSOs (inter-TSO agreements)
	• Clearance of customers at the erasable rate
	• Cancellation of infrastructure works
	• Installation of a bypass on a damaged pipe
	• Adaptation of supplier strategy and means of supply
	• Request to the European Commission to declare a European alert
		• Mandatory natural gas consumption reduction measures
		  • Measures concerning swimming pools and saunas open to the public
		  • Measures relating to the heating of buildings
		  • Measures relating to the heating of functional buildings
		  • Measures relating to the heating of residential buildings
		  • Obligation to reduce the natural gas consumption of professional customers
		  • Fuel switch obligation
		  • Haircut obligation for N3 and N4 professional customers (including the possibility of "trading obligations")
		  • Obligation to reduce consumption for professional customers N1
		• Activation of the load shedding plan
		• Application of the solidarity measure
		• Technical disconnection of part of the main gas network

Source: Ministry of Energy and Spatial Planning

National emergency plan in Luxembourg

Despite these initiatives, the possibility of a gas shortage cannot be completely excluded. In Luxembourg, a national emergency plan[7] has been drawn up, comprising five levels of crisis, including three national ones and two European ones, with associated potential measures (see table A).

- The early warning refers to a situation with a clear anticipation of events that can significantly affect supply;
- The alert corresponds to a situation where events causing a major deterioration in the state of supply have occurred;
- The emergency level is triggered if the supply condition has deteriorated significantly and the alert level measures are not sufficient to prevent a gas shortage.

For the moment, no crisis level has been activated in Luxembourg. Moreover, certain measures such as campaigns to reduce consumption have been put in place. In the event that mandatory reductions are necessary, due to a lack of supply, the question of their economic cost will arise.

[7] https://gouvernement.lu/dam-assets/documents/actualites/2022/10-octobre/19-turmes-plan-urgence/lu-plan-durgence-gaz-naturel-version-20221019-final.pdf

It is mainly the measures set out for the emergency level that are likely to have a direct impact on the economy. These mandatory reduction measures include lower heating temperatures, reduced temperatures or closures for swimming pools and spa facilities, a "fuel switch" obligation[8] for customers able to switch to another energy carrier, a mandatory reduction where large non-residential customers[9] are forced to reduce their consumption by a given percentage ("haircut"), and a similar reduction for professional customers with lower consumption[10] (see table A). If these measures prove insufficient, the load shedding plan could be applied. This plan consists of "temporarily limiting or suspending the energy supply to all or some of the networks' users, all the while ensuring consumer safety"[11].

Among these measures, it is mainly the mandatory reductions in non-heating gas consumption that would have an economic impact. The share of large professional customers (who would be affected first by such rationing) in total gas consumption varies during the year depending on temperatures. Total consumption is much lower in summer than in winter, when more gas is used for heating. Thus, large non-residential customers represented around 65% of gas consumption in the third quarter of 2021, but only around 35% in the first quarter. Looking at activity sectors, a dominance of the manufacturing industry (to which many large non-residential customers belong) is observed for gas consumption, with a considerable concentration also within this sector. The picture is different for value added (GVA) and employment, for which the weight of manufacturing industry is much lower.

In 2021, the manufacturing industry accounted for around 5.5% of GVA and around 7% of employment in Luxembourg. This constitutes a major difference compared to Germany for example, which not only is more dependent on Russian gas supplies, but which also has a much larger manufacturing industry, representing more than 20% of GVA. Thus, the structure of the Luxembourgish economy can contribute to containing the economic impact in comparison to other countries.[12].

Substitution possibilities and direct effect

To get an idea of the direct economic consequences if the emergency level measures of the national plan were to be implemented, the focus will be on rationing of large professional customers. It is assumed, in a simplified way, that this measure applies to the manufacturing industry (as large non-residential customers mainly belong to this sector), and that the mandatory reduction would be 30%, as this is the level of reduction for which the contribution in GWh is assessed in the contingency plan. This, however, represents very high rationing, and it is doubtful that such a compulsory reduction will become necessary.

In order to assess the direct impact of gas rationing on production, production functions, which represent in a stylised way the production given the inputs used, can be applied. The choice of the appropriate production function is guided among others by the substitutability between inputs. Thus, a central element of the impact of a possible lack of gas is the ability of companies to replace it with other inputs. This can vary greatly depending on the type of production, with substitution much more difficult if the gas is used directly in the production process. Moreover, the possibilities of substitution are higher in the long term than in the short term.

[8] Use of a fuel other than gas (owing to existing technical installations that can operate with this other fuel).

[9] N3 and N4 customers, which are defined as follows:

- "Level 3 (N3): non-residential customers with an installed or subscribed capacity greater than 2 MWh/h or an annual consumption greater than 1 GWh/year. Protected customers, educational establishments and electricity production and cogeneration plants are excluded";

- "Level 4 (N4): non-residential customers directly connected to the transmission system operator's network. Protected customers, schools and electricity production and cogeneration plants are excluded".

[10] N1 non-residential customers, defined as "non-residential customers with an installed or subscribed capacity less than or equal to 2 MWh/h and an annual consumption less than or equal to 1 GWh/year".

[11] https://www.creos-net.lu/fileadmin/dokumente/Entreprises/Gaz_naturel/pdf/plan_de_delestage_gaz_2.1.pdf

[12] In terms of direct impact, disregarding for example potential consequences on the financial markets, which would have a strong impact on the Luxembourgish economy.

The extreme case, where production takes place in fixed proportions, is translated by a Leontief production function[13]. In this case, assuming efficient production, the reduction in output is proportional to that of the input that falls the most. Thus, a 30% reduction in gas for the manufacturing industry would result in a 30% drop in the GVA of this branch[14], which would imply a 1.8% drop in total GVA. However, the hypothesis of a complete absence of substitution seems implausible at this level.

On the one hand, one does not consider an individual company, but a whole industry, and thus substitutions at a more macro level are feasible. In addition, the contingency plan provides a mechanism for companies to trade reduction obligations among themselves, so that companies with greater ease of substitution or reduction of gas consumption can further reduce their consumption in order to limit the overall reduction.

On the other hand, historical examples show that in the face of input restrictions, more efficient use and substitution possibilities are possible.[15]. This does not mean that there were no reductions in production, only that these were proportionally less severe than the reductions in inputs. A meta-analysis on elasticities for energy by Labandeira et al. (2017) finds an average short-term elasticity of -0.18 for natural gas (while a Leontief function has an elasticity of substitution of 0).

Table B
Reduction of Luxembourg's total GVA based on reductions in gas consumption without substitutability

	30%	20%	15%	10%
GVA reduction	-1.8%	-1.2%	-0.9%	-0.6%

Source: STATEC calculations
Reading grid: the table indicates the direct impact on the total GVA of Luxembourg in the case of a mandatory 30% reduction in gas consumption for the manufacturing industry, according to the possibilities of substitution. The percentages at the top of the columns indicate the reductions taking place without substitutability. For example, the second column represents the assumption that the gas consumption of the manufacturing industry can be reduced by 10% without reducing the production, and that the remaining 20% imply a proportional reduction of the GVA of the manufacturing industry.

An alternative is to consider that companies can substitute a certain part of their gas demand in the short term without having to reduce their production, and that it is only afterwards that they find themselves limited by the possibilities of substitution (therefore in a quasi-Leontief situation). One could, for example, assume that companies succeed in reducing their gas consumption by 10% without impacting their production, but that the remaining 20% involve a proportional reduction in their production. Table B shows the effect on the total GVA depending on the reduction that is done without substitutability[16].

Production functions that allow much more substitution, such as a Cobb-Douglas production function (elasticity of substitution of 1) could also be used. The most simplified version of this function could differentiate between natural gas and aggregated other inputs. In this case, the change in GVA following a change in gas is a direct function of the income share of this factor (in a competitive economy). This share is around 0.5% for gas, so that a 30% reduction for the whole economy would lead to a 0.15% reduction in GVA. This effect would decrease to around 0.08% if only manufacturing were taken into consideration. However, the use of this function at such an aggregation level does not reflect the real production structure and presents too much substitutability[17].

[13] To illustrate how this type of production works in a discrete case, we can imagine that a bicycle is produced with two wheels and a frame. If initially there are four wheels and two frames, two bikes can be produced. However, if the available quantity of wheels drops to two, only one bike can be produced, despite there still being two frames.

[14] Assuming a change in intermediate consumption proportional to the change in output (assuming fixed proportions of production and efficient production), GVA falls by the same proportion as output.

[15] For example, during China's rare earth embargo against Japan (Gholz and Hughes, 2021).

[16] These reductions can also be interpreted as the direct effect of lower rationing with a complete absence of substitutability.

[17] Single production function for the entire economy, pooling of all factors other than gas, elasticity of substitution higher than empirical estimates.

Limits and indirect effects

It is obvious that the aforementioned approach overlooks a significant number of factors that determine the total economic impact. First of all, the impact set out only takes into account the direct effects and not the indirect effects of a drop in production. In fact, the latter should imply both less demand to the suppliers of the companies concerned and fewer inputs available for the customers using these (intermediate) goods in their production. In addition, sectors that are not dependent on physical products are also likely to be impacted by this drop in activity in the industry. All of these impacts through other sectors are missing from the impact assessed in the previous section.

Secondly, such a gas shortage would be accompanied by a price increase due to excess demand and increasing gas scarcity, which are not taken into account at all here. As rationing is considered, the focus is on quantities, while price changes would also have a negative impact on demand and production. Rising prices would lead to a fall in demand and could even make entire productions unprofitable, which would reinforce the contraction (but at the same time make mandatory rationing less likely).

Thirdly, the evaluation of this 30% rationing is established under the assumption that all other things remain equal, which implies that the context in which the rationing is applied is not sufficiently taken into account. Thus, the previous calculations assume that the only difference with the previous year is gas rationing in manufacturing, while the overall economic context is different. Moreover, if this measure were implemented in Luxembourg, other European countries would probably impose similar mandatory reductions. This lower production at European level would have repercussions on Luxembourg, which is very dependent on the international situation.

Input-output tables can be used to illustrate the links between different industries, showing how many goods produced by one industry are used by other industries. This can help to understand the effects of a change in demand or factors of production in one sector of activity on the other sectors in the economy. However, in the OECD tables (2018 data), gas does not appear in isolation, but is part of the category "Electricity, gas, steam and air conditioning supply". The ratio of inputs of this category to output is highest in the " Paper products and printing", "Other non-metallic mineral products", "Basic metals" and "Rubber and plastics products" sectors. On the basis of the input-output tables, it is possible to obtain an idea of the total impact, direct and indirect. An initial reduction in primary factors in the sector that includes gas could lead to a drop in total production that is about four times greater than this initial reduction.[18].

International studies point towards a rather weak impact on Luxembourg

Numerous studies carried out at international level use more complex methodologies to address the question of the economic impact of a halt in Russian gas deliveries. Although they do not focus on Luxembourg, some of them include a quantified impact. It should be noted that the scenarios considered in the studies below differ greatly from the previous simplified quantification. For the direct impact on the Luxembourgish economy, a very high level of rationing of 30%, imposed exclusively on a single branch of activity, was considered, without taking into account the probability of this scenario. Instead, the following studies try to take into account the likely reduction of available gas (based on alternative sources, etc.), across all sectors of the economy. To better understand the difference in results, two of the methodologies used are explained below.

[18] Result obtained using the Ghosh model (described e.g. in Miller and Blair (2009)). However, this model is subject to criticism because, among other reasons, there is no corresponding production function and changes in intermediate consumption are not accompanied by changes in primary factors, which may seem unlikely.

Table C
Economic impact for Luxembourg according to various studies

Study	Impact on Luxembourg	Model type
DiBella et al. (2022)	-0.3% (GDP) (Counterfactual based on adjusted 2021 quantities)	Production function – partial equilibrium
Albrizio et al. (2022)	-0.2%; -0.7% (GNI) (depending on scenario with or without global LNG market)	General equilibrium - sufficient statistics
Baqaee et al. (2022)	+0.2% (GNI)	General equilibrium
Langot and Tripier (2022)	+0.2% (GNI)	General equilibrium

Sources: as indicated in the table

The first approach described in DiBella et al. (2022) assumes that the European gas market is fragmented and therefore that gas availability is to be considered at local level, which justifies their focus on quantities while neglecting the price effect. They use a 21-sector model with a Cobb-Douglas production function with capital, labour and energy of which natural gas is one of the components (gas is also used in the production of electricity). Depending on the energy reduction that cannot be compensated by alternative sources, the total loss of GDP is calculated on the basis of sectoral production functions, by applying a demand multiplier that takes into account the links between countries. It should be noted that in this study, the authors estimate that Luxembourg would not face a gas deficit directly, but that the negative impact on GDP would result entirely from spillover effects (following reductions in exports to other EU countries due to declines in activity in these countries).

A second approach, initially used by Bachmann et al. (2022) to quantify the economic impact for Germany, relies on Baqaee and Farhi (2019). It is a general equilibrium model comprising several sectors and countries. Albrizio et al. (2022) apply this methodology[19] by considering the amplitude of the shock of a halt in Russian gas deliveries, either in relation to the European market, or to the total of the European market and the global LNG market. Then they calculate the price change associated with this shock and, based on this, the impact on production. In this approach, there are no technical or physical constraints that come into play and the markets are in equilibrium with prices that adjust. However, this model compares two different situations (with or without Russian gas) and not the transition between the two and the configurations of the model may overestimate the possibilities of substitution in the short term.

In studies that include Luxembourg, it emerges as one of the European countries least impacted by a halt in Russian gas deliveries, with a drop in activity of less than 1%. However, uncertainties regarding these estimates remain[20] and other reactions could amplify the impact, including demand effects. The partial equilibrium model of DiBella et al. (2022) contains a Keynesian multiplier, unlike the general equilibrium models listed in table C, but the effects of degraded confidence following the geopolitical situation are not considered in any approach.

[19] Using a second degree approximation of the model.

[20] As an illustration of the uncertainties attached to this type of assessment, the estimates of the economic effects for Germany (which are the subject of many more studies) vary from around -0.5% to -10% depending on the assumptions and methodology considered.

Box A

Forecast - Gas rationing scenario

In addition to a baseline scenario and a favourable scenario, forecasts for a negative scenario with gas rationing were conducted. These are based on Oxford Economics assumptions for the global and European situation. The scenario was drawn up in August, and, given the developments observed in the meantime, it can be considered as an extreme case in which certain assumptions turned out to be too negative.

The main assumptions are as follows:

- Deliveries of Russian natural gas to Europe through gas pipelines completely stop from the fourth quarter of 2022;
- There is a 10% natural gas rationing in industry in all European countries in Q4 2022 and Q1 2023;
- Inflationary pressures would intensify, which would trigger a tighter monetary policy than in the baseline scenario;
- Equity markets would fall sharply, with the Euro Stoxx 50 moving about 4 percentage points and 19 percentage points lower in 2022 and 2023 respectively as compared to the baseline scenario.

As a result, euro area growth would be only 2.5% in 2022 (compared to 3.0% in the baseline scenario) and -1.4% in 2023 (compared to -0.1%). Most of the economic impact would be felt in 2023, although there is already a deterioration in 2022. However, it should be noted that these assumptions have not been fully realised, with notably no forced rationing in industry to date. Given recent developments, compulsory rationing seems less likely this winter than anticipated last August, when the scenario was drawn up. The main determinant will be the temperatures, which at the moment favour less gas consumption (as they are very mild in autumn 2022). However, if they become exceptionally low, it would make rationing more likely again.

In the gas rationing scenario, the European economic situation develops less favourably, which implies less demand for Luxembourg companies and thus weaker exports (-0.7% compared to +3.6% in the baseline scenario in 2023). Moreover, higher inflation and higher interest rates lead to lower consumption and lower investment. National demand thus falls by -1.7% in 2023 (compared to +2.9% in the baseline scenario). These reductions, foreign and domestic, lead to a fall in activity, which also implies a slowdown in employment, which in turn weighs on consumption and demand. Another important element in understanding the economic impact is the sharp deterioration of the stock markets, which is affecting the activity of the financial sector (which is very important in Luxembourg's economy). Thus, in the end, the Luxembourgish GDP growth forecast is lower than in the baseline scenario, by 1 percentage point in 2022 and 4.4 points in 2023. Luxembourg would therefore be more strongly affected than the euro area as a whole.

Conclusions

- In the face of cuts in Russian natural gas deliveries, the EU is obtaining more gas from other suppliers, it has reached its target of filling gas storages before winter, and a target of reducing consumption by 15% over the winter period has been fixed.
- In Luxembourg, the emergency plan includes different levels of crisis, and it is above all the mandatory reductions in consumption of large professional customers that are likely to have a significant economic impact.
- The extent of this impact depends mainly on the substitution possibilities by other energy sources. The direct effect on the total economy of rationing for manufacturing industry varies from -1.8% to -0.08% depending on the assumptions considered.
- This quantification using simple production functions has important limitations: only the direct effect is evaluated, without taking into account secondary effects in industry and other sectors, price effects or the adverse international situation. These elements would increase the negative impact on the economy, but the probability of actual rationing is not taken into account in these estimates.
- STATEC has developed macroeconomic forecasts for a negative scenario, which incorporate these links. However, the assumptions underlying this gas rationing scenario now seem too pessimistic.
- Under the effect of weaker European activity, compulsory rationing for industry and a downturn on the stock market, Luxembourg's GDP growth in the unfavourable scenario would only be +0.7% in 2022 (1 percentage point lower than in the baseline scenario) and -2.9% in 2023 (4.4 percentage points lower).
- International studies on a halt in Russian gas deliveries indicate a relatively low impact for Luxembourg, assuming that it does not face compulsory rationing.
- These studies also have limitations, ranging, among others, from excessive short-term substitutability to limited reactions on the demand side.
- Uncertainties remain about the economic impact of a possible halt in Russian gas supplies this winter, and (unpredictable) temperatures are a key factor, as they strongly influence gas consumption for heating.
- Even if a gas shortage is avoided this winter, without Russian deliveries it could become more difficult to fill up storage sufficiently before the winter of 2023/2024, so that gas shortage concerns are likely to persist and even increase beyond this year.

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7.2
Impact of the rise in interest rates on banks in Luxembourg

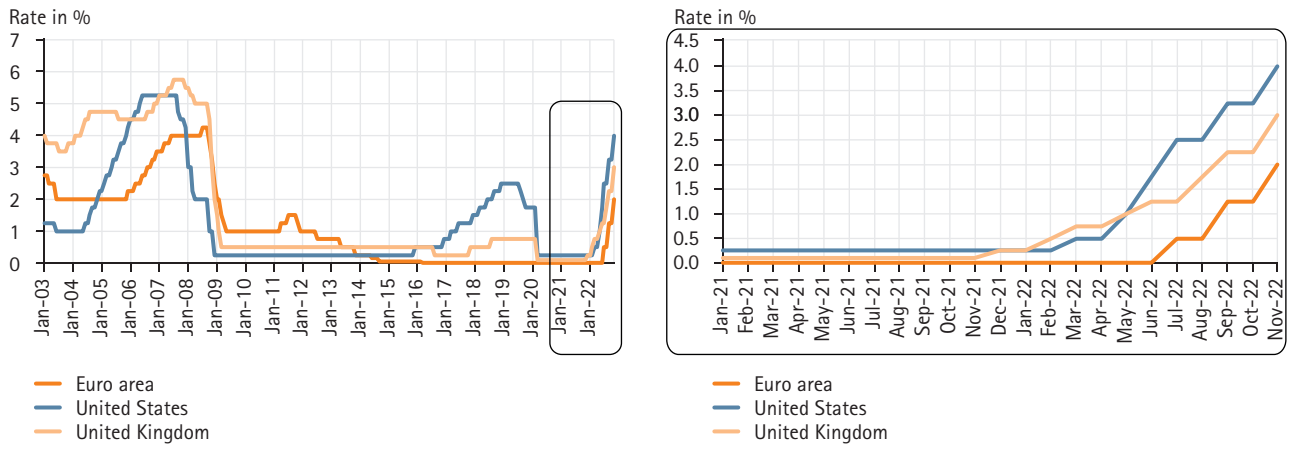
After a decade of very accommodating monetary policy, inflationary pressures have prompted central banks to raise policy rates sharply and rapidly in order to moderate demand and contain inflation expectations. In this study, panel estimates and forecasts were conducted to assess the impacts of interest rate increases on the revenues, added value and assets of banks in Luxembourg. The results of the estimates highlight the positive impacts of rate hikes on the interest margin and the added value of banks.

Sudden hike in key interest rates

In response to persistent inflationary pressures across the globe, central banks have raised their policy rates sharply and rapidly since the end of 2021. After eleven years of low rates, the European Central Bank (ECB) raised key rates three times (+50 basis points in July 2022, +75 basis points in September and October)[1], increases on a scale never before seen in the euro area.

The Bank of England, which was one of the first to raise rates at the end of 2021, made eight rate hikes between December 2021 and November 2022. The US Federal Reserve, for its part, carried out six rate hikes between March and November 2022 (including four consecutive hikes of 75 basis points). The increase in US policy rates, which is expected to continue in the coming months, is prompting many other countries to do the same to ease inflation expectations and support the value of their currency against the dollar.

Charts A
Key interest rates



Source: Macrobond

[1] The refinancing rate (at which the ECB lends to commercial banks and remunerates reserve requirements) rose from 0% to 2% between June and October 2022. The deposit rate (applied to excess reserves) increased from -0.5% to 1.5%. The marginal rate (for emergency financing) went up from 0.25% to 2.25%.

These increases in key rates directly increase the cost of short-term refinancing for banks and are therefore passed on by the latter to variable loan and deposit rates and to new contracts with businesses and individuals. According to the bank lending survey conducted in the euro area, the criteria and conditions for granting credit to businesses and households have been tightening since the beginning of 2022, with a much stronger tightening in the third quarter. The tightening of monetary conditions reduces the financing capacity of companies and households and should therefore slow down consumption and investment, which will ultimately weigh on economic growth. The deterioration in the economic outlook and in investor confidence is also impacting stock market valuations and government borrowing rates, which increased by 2.5 percentage points in the euro area between the end of 2021 and September 2022.

Monetary policy transmission mechanism for banks

To understand the effects of interest rate hikes on banks' revenues and earnings, several mechanisms need to be taken into account: direct price effects (i), interest rate adjustments (ii), volume effects (iii) and impacts on asset valuation and quality (iv).

(i) Key rate hikes allow banks to lend at higher interest rates and achieve better margins on new loans. Moreover, while banks had to pay interest on part of their excess deposits at central bank since June 2014, since September they are remunerated on their excess deposits, and further remunerated on their reserve requirements, a second source of direct interest earnings[2].

(ii) Hikes in key interest rates increase the refinancing costs of banks and the rates on customer deposits, but do not immediately affect the rates of all outstanding loans[3]. Banks have granted more fixed rate loans in recent years in Luxembourg. Fixed-rate home loans account for 60% of new home loans granted between 2016 and 2021 (45% if we only take into account loans with a fixed rate over at least 10 years). Fixed rates on mortgages granted during this period were 1.6% on average, compared to nearly 3% currently.

(iii) The purpose of the rise in rates is to curb the demand for credit. If the demand for loans decreases because of the rise in interest rates and the deterioration of the economic climate, banks would lend at higher rates but on lower volumes. According to the bank lending survey, the tightening of criteria and conditions for granting credit has weighed since July on the demand for loans from households in Luxembourg and the euro area. Demand for corporate loans decreases in Luxembourg due to the rise in interest rates and a reduction in investment in fixed capital. In the euro area, it remains supported by financing needs (working capital and inventories) against a backdrop of inflated production costs, slowing demand and cautious behaviour in the face of bottlenecks in supply.

(iv) Rising interest rates affect the value of financial assets and make equities relatively more risky, which may weigh on trading activities and commission income. The depreciation of assets also weighs on collateral and on the stock market value of banks. The higher cost of credit and the deterioration of the economic outlook also increases the risk of default on loan repayments, increasing the cost of risk for banks.

[2] From 21 December 2022, the rate applied to required reserves will be lower. Reserve requirements will thus be remunerated at the deposit facility rate and no longer at the rate for the main refinancing operations (75 basis points higher than the deposit facility rate).

[3] This mechanism applies to retail banks but is not valid for all types of banks.

Estimated impacts of rate increases on banks in Luxembourg

To assess the effects of interest rate variations on the income and assets of banks in Luxembourg, models were estimated on an unbalanced panel of 106 banks over the period Q1 2003 to Q2 2022. The selection of banks to be included in the panel was made by filtering banks with extreme values on the variables to be estimated and according to the duration of activity.[4]. The revenues estimated are the net interest margin (as a percentage of interest-bearing assets) and net commissions (as a percentage of total assets)[5]. Several studies propose panel models to estimate these variables (see for example Altavilla et al. (2017), Borio et al. (2015), Madani-Beyhurst et al. (2017), Stráský and Hwang (2019), Alessandri and Nelson (2012)).

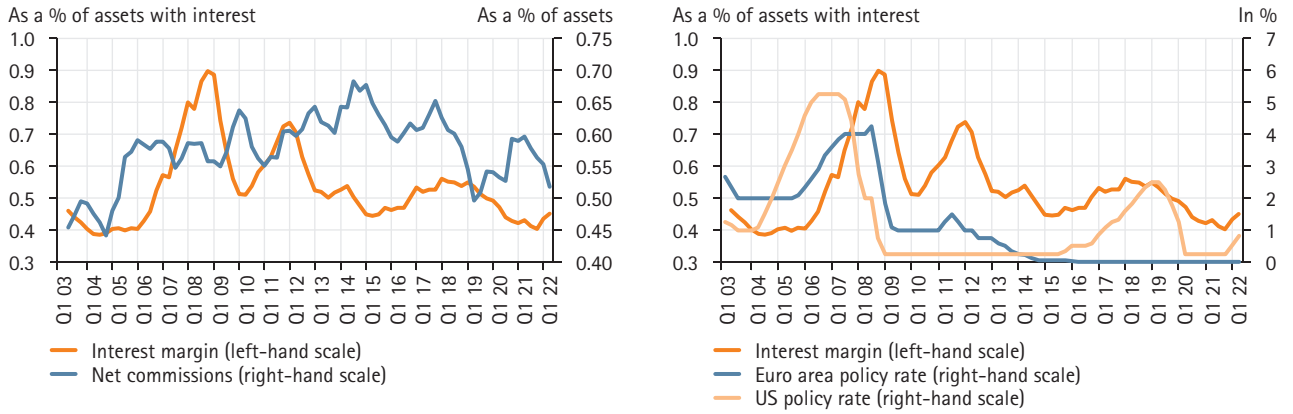
The first estimated model is as follows:

$$Y_{it} = \rho\, Y_{i,t-1} + X'_{it}\,\beta + Z'_{it}\,\delta + \alpha_t + C_i + \varepsilon_{it}$$

where Y_{it} represents the income to be estimated, i.e. the interest margin (as a % of interest-bearing assets) or the net commissions (as a % of assets).

X_{it} contains the explanatory variables on short-term interest rates (3 months), the differences between short (Euribor 3 months) and long (10-year rates in the euro area) rates and the quarterly change in the Euro Stoxx 50 stock market index[6]. Given the non-negligible share in the balance sheet of banks in Luxembourg of deposits and loans in USD and GBP (respectively a quarter and 5% of loans and deposits between 2015 and 2022) and the exchanges of the many international banks with their subsidiaries and other banks abroad, it is interesting to take into account the interest rates in the United States and the United Kingdom in the estimates, in addition to the rates in the euro area. The short-term interest rate is thus measured as the weighted average of three-month rates in the euro area, the United States and the United Kingdom according to the share of outstanding loans in EUR, USD and GBP in the balance sheet from each bank. Individual fixed effects C_i capture the heterogeneity of the different banks in the panel, while the time fixed effects α_t (aggregated at the annual level) capture the unobserved temporal heterogeneity with the model variables.

Charts B
Median margin vs. net commissions and key rates



Quarterly decumulated and annualised data, medians of the panel studied.
Sources: CSSF, STATEC calculations, Macrobond

[4] Banks with less than ten years of activity were not selected in order to limit the disturbances of the main variables when the banks start or end their activities, and in order to ensure that the banks in the panel have experienced at least one change in key rates during their activity. Selected banks account for at least 80% of total assets and revenues in each quarter.

[5] The two variables are calculated on the quarterly data (decumulated and annualised) of banks' balance sheets and profit and loss accounts. The decumulation of income is necessary for the calculation of the quarterly added value. The Im-Pesaran-Shin, Philips-Perron and Dickey-Fuller unit root tests confirm the stationarity of the two variables.

[6] Several other macroeconomic variables were tested, such as GDP growth in the euro area and property prices, but they did not appear to be significant and are not presented in this study.

The income of banks also depends on their specificities, their main activities and their efficiency. Z_{it} represents a set of variables specific to each bank, supposed to capture these effects: cost-income, capital-asset ratios and the share of loans to the non-financial private sector (companies and households) in total outstanding loans, a variable which helps to differentiate the different types of banks and their main activity. It would be relevant to take into account other indicators to assess the sensitivity of the interest margin to interest rate variations, such as the share of non-performing loans and the share of fixed-rate loans or real estate loans in banks' outstandings. However, these indicators are not available at the disaggregated level at STATEC and could not be integrated into the estimated models.

With the presence of the lagged dependent variable $Y_{(i,t-1)}$ in the explanatory variables of the model (which leads to a problem of endogeneity), it is necessary to estimate this model via the Generalised Method of Moments (GMM) of Hansen (1982) with the instrumental variables recommended by Arellano and Bond (1991).

Table A
Results of panel estimates on bank revenues

	Interest margin (as % of interest-bearing assets)	Net commissions (as % of assets)
Lagged dependent variable	0.448*** (6.82)	0.321** (3.24)
Short term rate$_{it}$	-0.0208 (-0.72)	-0.0846* (-1.92)
Short term rate$_{it-1}$	0.0910** (3.12)	
Rate spread$_{t}$	-0.00422 (-0.22)	-0.00574 (-0.20)
Rate spread$_{t-1}$	0.0340* (2.39)	
Euro Stoxx 50$_{t}$	0.0339 (0.53)	0.143* (2.29)
Cost/income$_{it}$	-0.0614** (-3.10)	-0.0631 (-1.34)
Capital/assets$_{it}$	0.365* (1.96)	1.268* (1.95)
Share of non-financial private sector loans$_{it}$	0.580*** (6.06)	-0.563*** (-3.39)
Constant	-0.0438 (-0.55)	0.922*** (4.62)
Number of instruments	105	103
Hansen test (p-value)	0.115	0.063

Note: Robust t-stat in parentheses, *p < 0.05, **p < 0.01, ***p < 0.001. Source: STATEC calculations

The estimation results are displayed in table A. It appears that the short-term rate has a positive and significant impact on the interest margin with a delay of one quarter. The adaptation time between a rise in the bank refinancing rate and loan rates may explain this delayed effect. An increase in the spread between short and long rates also has a positive and significant impact after one quarter. Banks with a higher capital ratio, better cost/revenue efficiency and lending relatively more to non-financial companies and households have a higher interest margin, which is confirmed if we look at the median margin by type of bank in 2021 (see table B).

Net commissions (as a percentage of assets), on the other hand, depend rather negatively on the short-term rate. When rates rise, financial assets lose value and stocks become riskier, which could affect asset management fees. Commissions are positively and significantly dependent on variations in the Euro Stoxx 50 index. Banks that are less capitalised and/or that lend relatively more to non-financial companies and households have lower net commissions.

To assess the effects of rate changes on the volume of bank assets, fixed-effect models were estimated on the quarterly change in interest-bearing assets (receivables and debt securities) and on the change in total assets:

$$\Delta Assets_{it} = X'_{it}\beta + Z'_{it}\delta + \alpha_t + C_i + \varepsilon_{it}$$

where Z_{it} includes variables on bank characteristics and X_{it} includes the short-term rate in the euro area, the difference between long rates (10 years) and short rates (3 months) in the euro area, quarterly GDP growth in the euro area, the quarterly variation of the Euro Stoxx 50 and the quarterly change in property prices in Luxembourg.

It appears that a rise in short-term rates and an increase in the spread between long and short rates have negative impacts on asset growth. The change in assets depends positively on changes in the stock market index in the euro area, growth in activity and property prices in Luxembourg. Thus, rate hikes and the slowdown in activity and real estate prices should weigh on the volume of bank assets, as demand for credit to consume or invest becomes weaker.

Table B
Highly differentiated income depending on the business model

	Interest margin in 2021 Median, as % of interest-bearing assets	Net commissions in 2021 Median, as % of total assets
Retail banking	1.23	0.30
Universal banking	0.82	0.53
Corporate finance	0.46	0.05
Private banking	0.37	1.00
Custodian banking	0.13	1.58
All banks	**0.35**	**0.53**

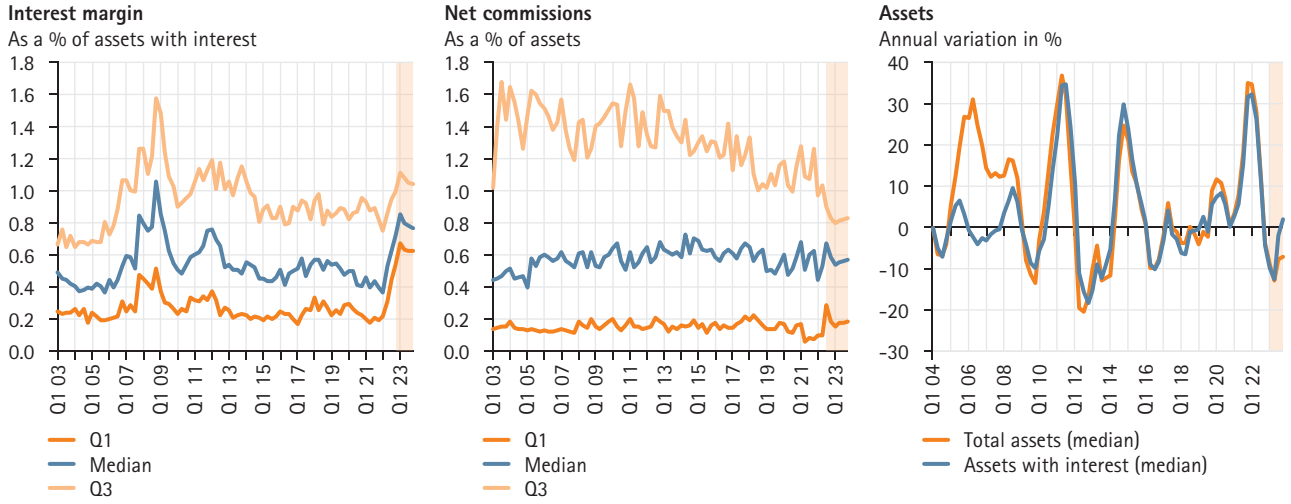
Sources: CSSF, BCL, STATEC calculations

Table C
Results of panel estimates on changes in bank assets

	Interest-bearing assets	Total assets
Short term rate$_{it}$	-0.0307 (-1.46)	-0.0162 (-0.78)
Short term rate$_{it-1}$	-0.0269* (-2.09)	-0.0294* (-2.13)
Rate spread$_t$	-0.0423** (-2.99)	-0.0329* (-2.41)
Euro Stoxx 50$_t$	0.137** (2.69)	0.126* (2.21)
Luxembourg property prices$_{t-1}$	0.413* (2.30)	0.562** (3.01)
Euro area GDP$_{t-1}$	0.132 (1.19)	0.160 (1.43)
Cost/income$_{it}$	0.0061 (0.48)	0.0058 (0.54)
Share of non-financial private sector loans$_{it}$	0.0431 (0.92)	0.0540 (1.07)
Constant	-0.00858 (-0.44)	-0.0228 (-1.14)

Note: Robust t-stat in parentheses, *p < 0.05, **p < 0.01, ***p < 0.001.
Source: STATEC calculations

Graphs C
Forecast of bank revenues and assets to 2023



Source: STATEC calculations (decumulated quarterly data) Note: Q1 is the first quartile (75% of banks have a value above Q1) and Q3 is the 3rd quartile (75% of banks have a value below Q3).

What impact will the key rate increases have over the next few months?

Oxford Economics forecasts[7] on interest rates, the Euro Stoxx 50 and GDP in the euro area at quarterly level have been implemented in the models estimated previously in order to predict changes in the interest margin, net commissions and assets. Oxford Economics forecasts a recession at the crossroads of 2022 and 2023 in the euro area. The Euro Stoxx 50 would remain on a downtrend at the end of 2022 and rise slightly over 2023. Key interest rates should increase further towards the end of 2022 and in the first half of 2023, then they should stabilise at high levels over the rest of the year.

Bank-specific variables are assumed to remain constant at their 2022 Q2 level over the forecast period, while property prices in Luxembourg are expected to increase by 6.5% in 2022, then they would stabilise in 2023 (+0.8%)[8].

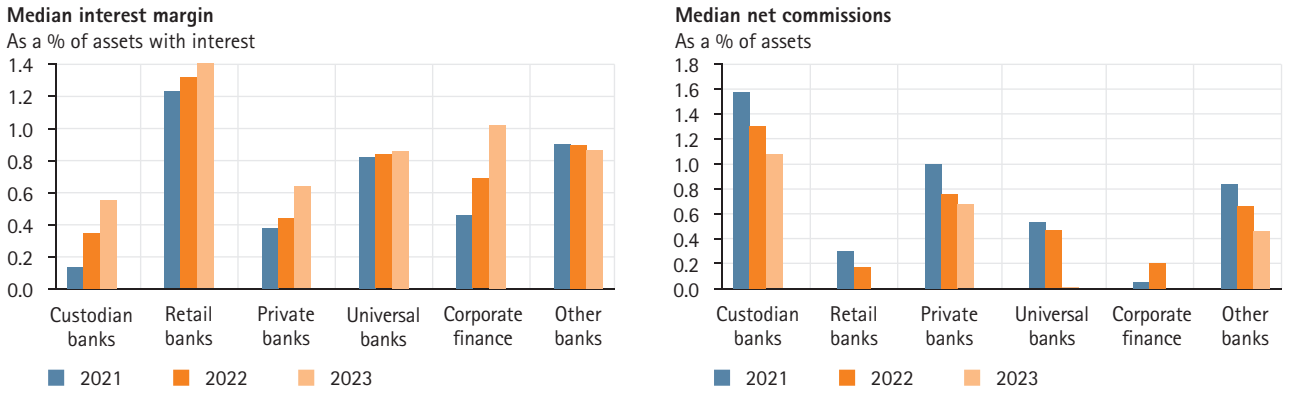
The results of the forecasting exercises point to a strong increase in the median interest margin of +0.4 percentage points between 2021 and 2023, but a slight decline in net fees of 0.05 percentage points due to the increase in interest rates and the decline in the Euro Stoxx 50. Banks' median interest-bearing assets would decrease by almost 6% in 2023 (-9% for total assets) as a result of higher interest rates, the downturn in euro area activity and the expected stagnation of house prices (see table D).

The forecasts of the Banque centrale du Luxembourg (2022) indicate an increase in the average return on assets ratio of 0.2 percentage points between the beginning of 2022 and the end of 2023 (from 0.37% to 0.56%) based on the growth projections of the European Central Bank established in June 2022. However, the latter were revised downwards in September (from +2.1% to +0.9% for GDP growth in the euro area in 2023), which could revise earnings forecasts slightly downwards.

[7] Oxford Economics forecasts are used by STATEC in establishing its macroeconomic forecasts to determine the framework of assumptions relating to the international environment. They were updated on 12 October 2022.

[8] This stagnation is justified by an observable slowdown in the rise in prices announced in the third quarter and with the assumption that the slowdown will be accentuated in the following quarters.

Graphs D
Expected median revenues by business model of banks



Source: STATEC calculations

The changes foreseen for each source of income are in the same direction, regardless of the business model of the bank.[9] (see graph D). The difference is in the share of each type of income in the banking product, with interest margin being the main source of income for retail, corporate and universal banks, while the income of private banks and custodian banks (for investment funds) relies more on net fees (which would decrease by 2023).

By multiplying the interest margin by the expected interest-bearing assets, and the ratio of net fees to total expected assets for each bank, it is possible to approximate the amount of interest margin and net fees per quarter. At the aggregate level, the interest margin would increase by 37% between 2021 and 2022 and by another 28% in 2023, while net commissions would increase by 5% in 2022 but could decrease by almost 10% in 2023 (see table D). It should be noted, however, that changes in the total income of the banking sector depend on the closure of some banks and the establishment of new ones, while banks that have just started operations may also increase their income and assets significantly, irrespective of the economic climate.

According to observed data, 71% of banks have already significantly increased their interest margin in the first half of 2022 (+28% over one year in total) and 50% have increased their net commissions (+7% over one year). According to the Commission de surveillance du secteur financier (CSSF)[10], the sharp increase in the interest margin is explained by the growth in activity and the rise in interest rates in USD. A survey conducted in July 2022 by S&P among 85 major European banks also indicates that a 200 basis point increase in interest rates would increase the annual net interest income of these banks by around 18% on average compared to 2021[11].

[9] Defined on the basis of clustering techniques and information available on the banks (see NDC 2-19, p. 56).

[10] Commission de surveillance du secteur financier (2022), Profit and loss accounts of credit institutions as at 30 June 2022, Press release 22/22.

[11] https://www.spglobal.com/en/research-insights/articles/daily-update-july-12-2022

Table D
Forecasts at the annual level

	Average annual observed/forecast levels			Variations (in % or percentage points)		
	2021	2022	2023	2022	2023	2023/ 2021
Key rate in the euro area (%)	0.0	0.6	2.7	0.6	2.1	2.7
US policy rate (%)	0.1	1.7	4.4	1.6	2.6	4.2
UK policy rate (%)	0.1	1.5	4.0	1.4	2.5	3.9
Weighted average policy rate (%)	0.1	0.9	3.1	0.8	2.2	3.1
Three-month rate in the euro area (%)	-0.5	0.3	2.3	0.9	2.0	2.8
Three-month rate in the United States (%)	0.2	2.4	4.6	2.2	2.2	4.4
Three-month rate in the United Kingdom (%)	0.1	2.0	4.3	1.9	2.3	4.2
Weighted average three-month rate (%)	-0.4	0.9	2.9	1.2	2.0	3.3
Ten-year rate in the euro area (%)	0.1	1.9	2.7	1.8	0.8	2.6
Real GDP in the euro area (EUR billion)	11,226	11,562	11,551	3.0	-0.1	2.9
Euro Stoxx 50 (index)	4,020	3,663	3,567	-8.9	-2.6	-11.3
Property prices in Luxembourg (index)	172	183	185	6.5	0.8	7.3
Median interest margin	0.42	0.56	0.80	0.14	0.24	0.38
Median net commissions (% of assets)	0.60	0.56	0.55	-0.05	0.00	-0.05
Median assets (EUR million)	3,732	4,336	3,939	16.2	-9.2	5.5
Median interest-bearing assets (EUR million)	3,487	4,009	3,781	15.0	-5.7	8.4
Added value of banks (EUR million)	7,307	9,063	9,973	24.0	10.0	36.5

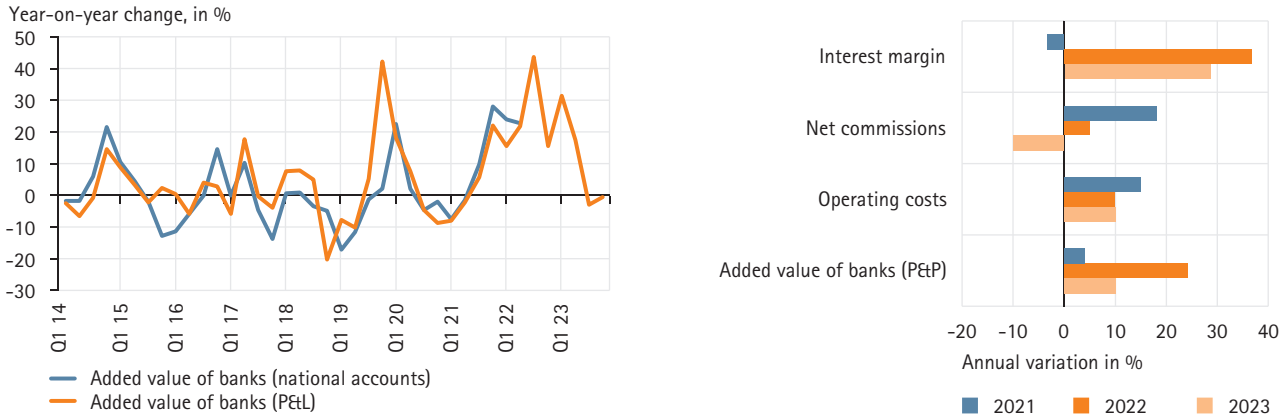
Sources: Forecasts from Oxford Economics (baseline, October 2022) and STATEC

The total revenue generated through the interest margin and the net commissions could increase sharply for banks specialised in corporate finance, universal banks and custodian banks (growth of median total revenue above 20% in 2022, and +30%, +20% and +6% respectively in 2023). Retail banks could increase their revenues by 9% in 2022 and 7% in 2023. On the other hand, revenue growth would be weaker for private banks (+14% in 2022, -4% in 2023) which are more dependent on commissions and other non-interest income, affected by an unfavourable stock market scenario.

Assuming an upward trend in operating costs of around 10% per year (average annual increase observed over the last five years), it is possible to estimate the impacts on gross value added (GVA) at current prices. Gross value added, calculated by the national accounts for each industry for the calculation of GDP, can be approximated for banks by the sum of the interest margin and net commissions minus operating costs[12]. The value added at current prices estimated on the basis of the profit and loss accounts of banks (P&L) would increase by 24% in 2022 then by 10% in 2023. The strong growth forecast for 2022 is in line with national accounts estimates of banks' GVA in the first half of the year (+23% over one year at current prices, +3% at constant prices).

[12] The calculation is similar in national compatibility, only the interest margin is measured differently via FISIM (financial intermediation services indirectly measured).

Graph E
The value added of banks would remain supported by the rise in interest margins



Sources: STATEC, CSSF (aggregated data at current prices - quarterly and decumulated in the graph on the left, annual and cumulated data in the graph on the right).
Note: the value added calculated on the basis of the profit and loss accounts (P&L) is an approximation of the value added calculated by the national accounts.

Box A

STATEC's macroeconomic forecasts on the GVA of the financial sector

STATEC's forecasts are established for the financial sector as a whole and depend in particular on the changes forecast by Oxford Economics on GDP growth in the euro area and the Euro Stoxx 50 index. The latest forecasts commented on in this Note de conjoncture anticipate a slight drop in the real gross value added (GVA) (at constant prices) of financial services in 2022 (-0.7%) followed by a stabilisation in 2023 (+0.2%). Implicit prices are expected to rise 9% in 2022 and 2% in 2023[13], bringing the GVA at current prices of the financial sector to growth of 8% in 2022 then 2% in 2023.

Based on data observed in the first quarter and the forecasts made for the banks in this study, we can assume that the growth forecast for 2022 and 2023 would come mainly from the banks, whose value added has already increased sharply in the first half of 2022, while the financial ancillary activities (mainly related to the management of investment funds) are affected by unfavourable developments on the stock markets and the decline in assets of undertakings for collective investment (-3% of GVA at current prices over one year during the first half of the year, with a weight of more than 30% in the GVA of the financial sector).

[13] Models for forecasting implicit GVA prices in the financial sector are based on changes in the unit labour cost and the user cost of capital in the financial sector, long and short rates, and the Euro Stoxx 50 stock market index.

Conclusions

The estimates and the forecasting exercise carried out highlight the positive impacts of the increase in key rates on the interest margin of banks in Luxembourg, but also show a decline in net commissions by 2023, linked to the rise in rates and the decline in the stock markets. These developments would lead to an increase in the added value of banks at current prices of 24% over one year in 2022 and 10% in 2023.

However, the forecasts are based on an approximation of banks' value added at current prices, which differs slightly from the value added calculated by the national accounts and STATEC's forecasts at constant prices, which are useful for forecasting developments in employment in the financial sector and real GDP. Furthermore, the estimates do not take into account structural changes such as the increase in the share of fixed interest rate assets in banks' balance sheets, which could limit the positive effects of higher rates on interest margins, or the diversity of assets on the balance sheet (different types of loans, bonds and other financial assets react differently to rate increases and stock market developments).

There is also a large margin of uncertainty around these forecasts, which can be revised downwards or upwards depending on the pace of future interest rate hikes, developments in the Ukraine conflict, the materialisation of risks to financial stability and the effects of all this on stock markets as well as consumer and investor confidence.

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7.3
Gains and losses in household purchasing power in the context of the energy crisis

In September 2022, the Tripartite Coordination Committee again agreed on a package of measures to limit the effects of inflationary pressure on households and businesses. This study assesses the impact of these measures on the purchasing power of households in Luxembourg in 2022 and 2023. Across all income quintiles, with or without measures, average purchasing power is higher in 2022 and 2023 than in 2019. In contrast, the measures intensified the average purchasing power gains of the lower quintiles and worsened those of the upper quintiles. These conclusions are nevertheless nuanced for households in the same quintile according to the type of main fuel used to heat their home.

Since April 2022, the annual rate of inflation has been close to 7% in Luxembourg, a level not witnessed for forty years and well above the average of around 2% over the last twenty years. This historically high level of inflation is making an increasing number of products more expensive and directly affecting purchasing power. These effects are felt all the more by the poorest households who, unlike the better-off, did not see their savings levels increase during the COVID crisis.

In Luxembourg, the automatic wage indexation mechanism, which aims to compensate for the loss of purchasing power due to inflation, was modified by the decisions taken following the tripartite meetings of March 2022, resulting in the postponement of the payment of the July 2022 bracket to April 2023. More recently, a second tripartite agreement in September 2022 led to measures (hereinafter "tripartite measures") to limit the impact of inflationary pressures on households and businesses, thus delaying the maturity of the index brackets.

In this context, this chapter assesses the impact of the new tripartite package on the purchasing power of households in Luxembourg in 2022 and 2023.

The analysis is thus an update of chapter 7.2 of the Note de conjoncture 1-2022 on the basis of inflation forecasts made on 1 November 2022 considering two scenarios: with tripartite measures and without tripartite measures.

Reminder on the methodology

The purchasing power analysis is a static assessment, which means that the volumes consumed are assumed to remain constant compared to the pre-COVID situation (2019)[1]. Expenditure in 2022 and 2023 is estimated by applying observed (2019-2021) and forecast (2022-2023) price changes to 2019 amounts.

The evolution of income[2] during the 2019-2021 period is measured by administrative data provided by the IGSS. For the years 2022-23, the income increases under consideration are:

- Indexation of wages, salaries and pensions;
- Family allowances;
- Cost-of-living allowance;
- Scholarships;
- Energy premium;
- Energy tax credit (CIE).

[1] The detailed methodology can be consulted in chapter 7.2 of the Note de conjoncture 1-2022. Against a backdrop of supply bottlenecks and price increases, there could be a decline in consumer spending. If this is the case, the evolution of purchasing power would actually be more favourable than the estimate presented in this chapter.

[2] The notion of disposable income is a very broad concept integrating all household income, including income on movable and immovable capital or even transfers between households. These incomes are all taken into account when dividing households into living standard quintiles. They are not included in the list here due to lack of data, and their levels are therefore assumed to remain constant from 2019.

Furthermore, the analysis considers the evolution of two sources of income that were previously considered constant:

- The minimum social wage;
- The rent subsidy.

The loss or gain in purchasing power is calculated on average by standard of living quintile and corresponds to the difference between the increase in expenditure generated by inflation and the observed and projected increases in income since 2019.

Consideration of new elements

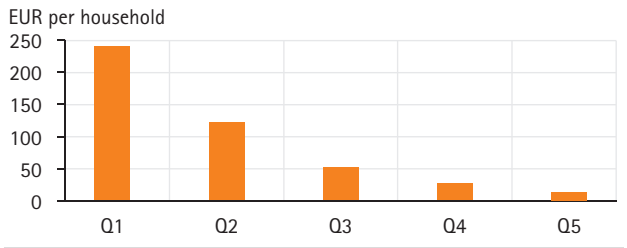
In addition to the update of inflation forecasts, the analysis of household purchasing power has been completed to take into account new elements, both in terms of expenditure and income. The analysis now includes the increase in the minimum social wage on 1 January 2023, the increase in the rent subsidy as well as the rise in interest rates increasing the cost of mortgages.

Impact of the increase in the minimum social wage on household income in 2023

In addition to the adjustment to the sliding wage scale, the minimum social wage (SSM) is generally adjusted every two years to the past development of the median wage. According to the calculations of the IGSS, the SSM should increase by 3.3% on 1 January 2023 following this adaptation. The qualified SSM would thus rise from the current level of EUR 2,776 to EUR 2,868, i.e. an additional increase of nearly EUR 92 per month or EUR 1,099 over the whole year.

Households belonging to first income quintile[3] are the most affected by the increase in the SSM, which represents 24% of salaries in this quintile. The average increase in household income in Q1 should thus amount to nearly EUR 240 in 2023[4]. These average increases per quintile decrease proportionally with the fall in this share in the other quintiles (7% in Q2, 2% in Q3, 0.9% in Q4 and 0.3% in Q5).

Graph A
Impact of the increase in the minimum social wage on income in 2023



Source: EU-SILC 2021, STATEC calculations

Impact of the increase on rent subsidy

One of the measures of the first tripartite of 2022 was the increase in the rent subsidy, with the law coming into force on 22 July 2022[5]. The amounts of subsidies have been revised upwards and the eligibility thresholds in relation to income have been adjusted downwards, which increases the number of potential beneficiaries.

The income criteria used imply that the measure essentially benefits the first two quintiles. The average amounts per quintile depend on the number of households that are tenants on the free market, as well as the size of these households.

The analysis considers that 20% of eligible households would receive the rent subsidy in 2022 and 2023, in line with recent administrative data provided by the Ministry of Housing for the beginning of 2021.

Table A
Average value of rent subsidy (EUR/month)

Quintile	from January 2022 to July 2022	from August 2022 to December 2022	2023
Q1	10	17	17
Q2	2	3	3
Q3	0	0	0
Q4	0	0	0
Q5	0	0	0

Note: The average value for 2023 takes into account the increase forecast for the SSM and assumes the payment of three index brackets (including the one that will be applied in April 2023 in accordance with the Law of 29 June 2022), as anticipated in the baseline scenario of the inflation forecasts. Sources: EU-SILC 2020, EU-SILC 2021, STATEC calculations

[3] Income quintiles divide households into five groups of equal size according to their standard of living. Q1 thus represents the most modest households, Q5 includes the wealthiest households.

[4] The calculations are made on the basis of actual salaries. Thus, the analysis takes into account wages below the qualified SSM as well as part-time work.

[5] https://logement.public.lu/dam-assets/documents/legislation/lois/2022-07-26-loi-22-07-2022-subvention-de-loyer-a396.pdf

Impact of rising interest rates on home loan repayments

The European Central Bank increased its key rates by 0.5 percentage points in July, then by 0.75 percentage points in September and October. Further increases are expected before the end of the year as well as in 2023. The analysis is based on the latest forecasts from Oxford Economics, which assumes a cumulative increase in key rates in the euro area of 1.4 percentage points in Q4 2022.

The rise in interest rates increases the expenditure of owner households who have taken out a variable-rate mortgage. In 2022, the rate hike would increase the expenditure of affected households in Q1 by an average of almost EUR 10 compared to 2019. In 2023, the expenditure of these households would further rise by an additional EUR 296 compared to 2019. However, the share of households in Q1 with a variable rate mortgage is only 17%.

More generally, the households affected by these additional expenses, i.e. owners with a variable rate mortgage have a relatively low weight within each quintile (21% in Q2, 29% in Q3, 31% in Q4 and 22% in Q5). Taking into account their weight in the total of households by quintile, the rise in interest rates has a lesser impact on the expenditure of the different quintiles, with an average of EUR 2 more in 2022 and EUR 55 more in 2023.

Table B
Increase in expenses related to the repayment of mortgages

		Q1	Q2	Q3	Q4	Q5
	Average interest rate on outstanding home loans (%)					
	2019	2.0	2.2	1.9	1.8	1.8
	2022	2.0	2.2	1.9	1.8	1.8
	2023	3.7	3.9	3.6	3.5	3.5
	Change in expenses related to the repayment of a mortgage (EUR/year)					
[A]	2022 (difference from 2019)	10	7	6	6	10
[B]	2023 (difference from 2019)	296	208	197	190	316
[C]	**Share of households with a variable rate mortgage (%)**	17	21	29	31	22
	Impact on average expenditure by quintile (EUR/year)					
[D] = [A]*[C]	2022 (difference from 2019)	2	1	2	2	2
[E] = [B]*[C]	2023 (difference from 2019)	49	44	58	58	68

Sources: EBM 2019, HFCS 2018, STATEC calculations

Impact of tripartite measures on purchasing power

Tripartite measures limit the evolution of inflation and consequently reduce household spending, thus promoting their purchasing power. However, with this lower level of inflation, fewer indexations are carried out. This has a negative impact on income subject to indexation.

The analysis is based on the inflation forecasts published in the Statnews of 7 November 2022. The latter take into account the tripartite measures and forecast inflation at 6.4% in 2022 and 3.4% in 2023, with the payment of three index brackets in 2023: in the first quarter of 2023, in April 2023 in accordance with the Law of June 29, 2022 and in the fourth quarter of 2023.

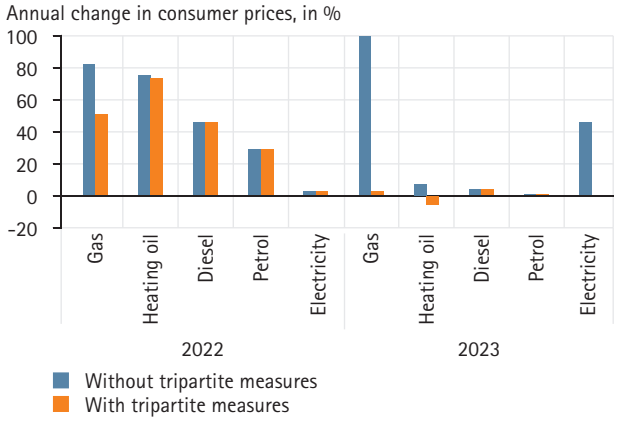
The following measures provided for in the tripartite have been taken into consideration:

- Limitation of the gas price increase to +15% compared to the September 2022 level;
- Electricity price-freeze in 2023;
- Reduction of EUR 15 cents per litre of heating oil from 1 November 2022 to 31 December 2023;
- Reduction of VAT by 1% point (for the normal, intermediate and reduced rates) in 2023.

In order to assess the impact of these measures on purchasing power, a counterfactual of inflation forecasts excluding measures has been considered. Thus, it is assumed that, without the tripartite measures, there would have been an increase in the price of electricity by 46% in January 2023 and several increases in the price of gas: +93% in October 2022, +10% in November 2022 and +29% in January 2023. In this scenario, inflation would have been 6.8% in 2022 and 8.0% in 2023 with the payment of five index tranches: in the fourth quarter of 2022, in the first quarter of 2023, in April 2023 in accordance with the Law of June 29, 2022, in the second quarter of 2023 and, finally, in the fourth quarter of 2023.

The analysis assesses to what extent the reduction in expenditure generated by the tripartite measures compensates for the loss of earnings due to the longer time frame between index brackets.

Graph B
Inflation of energy products with and without tripartite measures



Source: STATEC calculations

Results

As in previous versions of the assessment on purchasing power (documents provided at the end of March to the tripartite, and chapter 7.2 of NDC 1-2022), the average household would see its purchasing power increase in 2022 and 2023 compared to 2019 with or without tripartite measures. The results for 2023 correspond, as for the inflation forecasts, to a so-called "policy unchanged" scenario[6].

[6] Thus, any time the threshold is exceeded it is supposed to give rise to an indexation in the following month, in line with the legislation currently in force. The rise of the social minimum wage on 1 January 2023, corresponding to an adoption traditionally applied on a biennial basis, is also included in the calculations, as is the maintenance of full coverage of gas network costs in 2023. In the absence of measures, the cost of living allowance and the energy bonus would not be maintained in 2023. Scholarships would, on the other hand, be adjusted in August 2023 in order to take into account all the index brackets paid since August 2022.

Table C
Comparison of the results of the analyses on purchasing power in chronological order

2022 (difference compared to 2019 in EUR per household)		Q1	Q2	Q3	Q4	Q5
Tripartite version March 2022	Purchasing power trends with "Energiedësch" and "Tripartite" measures reducing fuel prices (May to July) and heating oil prices (May to Dec.) by 7.5 cents/litre and the postponement of the wage indexation (wage adjustment in April 2022 and April 2023), excluding the energy tax credit	-419	-380	12	248	1,299
Updated May 2022 (NDC)	Idem, (including family allowances, study grants, energy tax credit and other adjustments such as updated inflation forecasts and incorporation of administrative data on income growth over the period 2019-2021)	218	1,164	2,203	2,817	4,921
Updated November 2022	Idem, with an update of the baseline scenario of inflation forecasts, taking into account the rent subsidy, expenditure related to the repayment of mortgages and segmentation of expenditure on electricity and food	45	973	2,050	2,721	4,890
	Idem, with measures agreed in the September 2022 tripartite	150	1,081	2,137	2,806	4,966

2023 (difference compared to 2019 in EUR per household)		Q1	Q2	Q3	Q4	Q5
Tripartite version March 2022	Purchasing power trends with "Energiedësch" and "Tripartite" measures reducing fuel prices (May to July) and heating oil prices (May to Dec.) by 7.5 cents/litre and the postponement of wage indexation (wage adjustment in April 2022 and April 2023), excluding energy tax credit	-164	31	584	953	2,488
Updated November 2022	Idem, with an update of the baseline scenario of inflation forecasts, taking into account the rent subsidy, expenditure related to the repayment of mortgages and segmentation of expenditure on electricity and food	423	1,834	3,779	5,247	9,288
	Idem, with measures agreed in the September 2022 tripartite	1,023	2,049	3,505	4,600	7,903

Notes: The purchasing power for 2023 had not been assessed in NDC 1-2022.
The values presented in this table are lower than those presented to the Chamber of Deputies on 30 September 2022 due to the update of inflation forecasts for November 2022 which has revised inflation forecasts upwards. Nevertheless, the rise in the price of gas in October was 13.6%, whereas the inflation forecasts used in the calculations presented to the Chamber of Deputies were projecting a rise of 15%, i.e. the limit provided for by the tripartite measures. Inflation forecasts without measures have also been revised upwards due to an increase in the price of gas which would have been greater in October (+93%) than the price anticipated at the beginning of September (+69%). Sources: EBM 2019, EU-SILC (2020), IGSS, Oxford Economics, STATEC calculations

The average household in Q1 would have experienced purchasing power gains of EUR 45 in 2022 and EUR 423 in 2023 in the absence of the tripartite measures. Following the measures, these gains are higher and reach EUR 150 in 2022 and EUR 1,023 in 2023. This is explained by a drop in expenditure, in particular on energy goods, which overcompensates for the shortfall in income due to the lower number of indexations resulting from the measures. The same effect is observed for the average household in Q2. With the measures, the gain in purchasing power compared to 2019 is EUR 1,081 in 2022 and EUR 2,049 in 2023 (as compared to EUR 973 and EUR 1,834 respectively without the measures). These values are consistent with the results published in the NDC 1-2022 which estimated an average gain in purchasing power in 2022 of EUR 218 and EUR 1,164 respectively for households in Q1 and Q2.

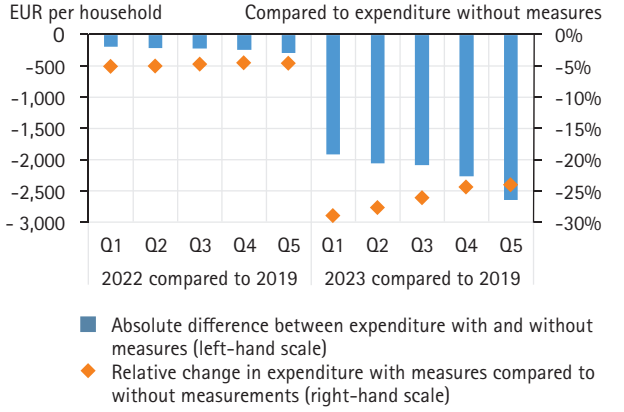
For the average household in the upper quintiles, the measures have an impact of less than EUR 100 on purchasing power in 2022, and a negative impact in 2023 which increases with the quintiles. This is explained by the marginal propensity to consume which decreases with income. In other words, when a household is better off, it spends a lower the share of its income on consumption. However, in the absence of the measures, the successive index brackets, intended to compensate for the loss linked to the increase in the price of goods and services, would also have increased the part of income that is not intended for consumption and would thus have overcompensated the well-off households whose the propensity to consume is relatively lower[7]. As a result, the measures generate less purchasing power gains for Q5.

Analysis of the impact of the measures on household expenditure and income

Across all quintiles, with or without measures, average purchasing power is higher in 2022 and 2023 than in 2019. Nevertheless, for some quintiles, the measures have a negative impact on purchasing power gains. In order to understand this effect, this section analyses in more detail the impact of the measures on average household expenditure and income by quintile.

Following the measures, the decrease in total expenditure increases with income. Higher quintiles see their spending decline by a larger absolute amount than lower quintiles. Nevertheless, in relative terms, the decrease in expenditure declines with income – i.e.. the most modest households see their average expenditure decrease by a higher proportion. This is explained by the fact that a larger part of the budget of households in the lower quintiles is devoted to energy expenditure (whose projected increases have been alleviated by the measures).

Graph C
Absolute and relative impact of the measures on expenditure

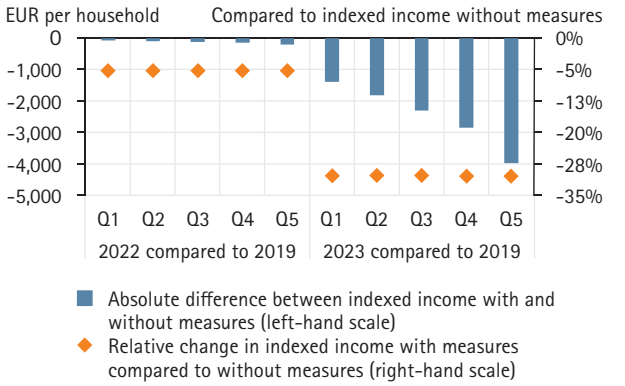


Sources: HBS (2019) and EU-SILC (2020), IGSS, STATEC calculations

With respect to income, the upper quintiles would earn higher amounts than the lower quintiles with the indexations that would have taken place without measures. In relative terms, for households from the first quintile, revenue foregone represents a slightly smaller fraction of total income. This is explained by the inclusion of the cost of living allowance and the energy bonus in the calculations with measures. Together, the weight of these two sources of income compared to total income without measures is greater for the lower quintiles (3% and 0.5% respectively for Q1 and Q2, as compared to 0.02% to 0.00% for the other quintiles).

[7] This same reasoning explains why, in general, the gains in purchasing power compared to 2019 are greater for households in the upper quintiles.

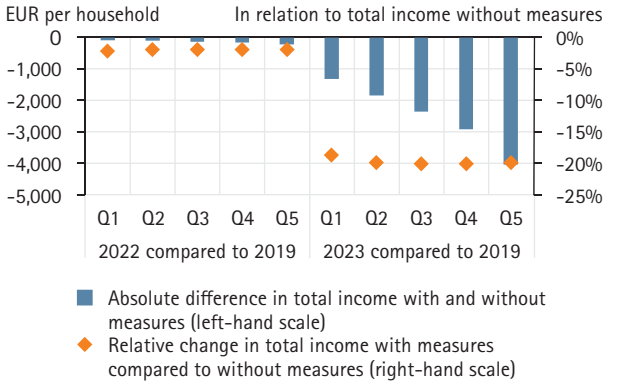
Graph D
Absolute and relative impact of measures on total income



Sources: HBS (2019) and EU-SILC (2020), IGSS, STATEC calculations

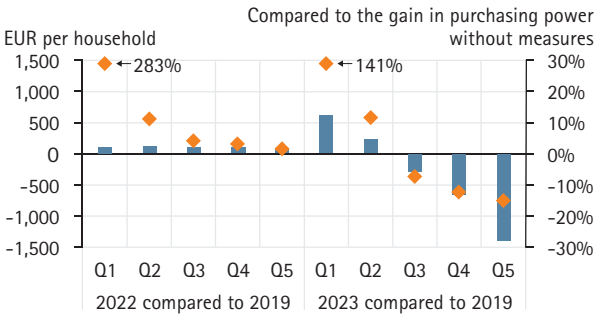
The loss of indexed wage income increases with the level of income. The upper quintiles would earn higher amounts than the lower quintiles following the indexations that would have taken place in the absence of the tripartite measures. Nevertheless, in relative value (i.e. relative to income without measures), the shortfall is equivalent across quintiles. For all quintiles, on average, lost earnings represent a similar fraction of indexed earnings. This is not surprising since the effect of an indexation (+2.5%) is the same for all quintiles.

Graph E
Absolute and relative impact of measures on wage indexation



Sources: HBS (2019) and EU-SILC (2020), IGSS, STATEC calculations

Graph F
Absolute and relative impact of measures on purchasing power



Note: Households in Q1 experience an average purchasing power gain of EUR 150 in 2022 and EUR 1,023 in 2023 compared to 2019 with the measures (as compared to EUR 45 and EUR 423 respectively without measures). For reasons of visibility, these gains are not represented on the graph following the right-hand scale.
Sources: HBS (2019) and EU-SILC (2020), IGSS, STATEC calculations

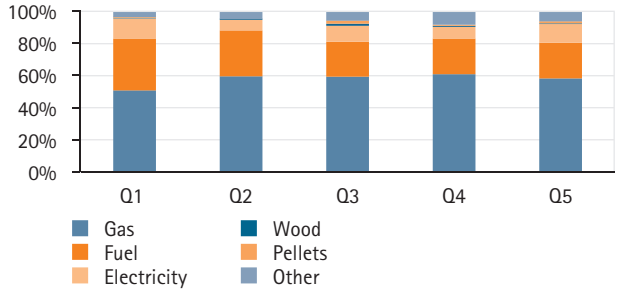
Tripartite measures therefore have a redistributive effect. The relative impact is greater on the average purchasing power of households in the lower quintiles. More specifically, the measures intensify the gains in terms of purchasing power for households in the first and second quintiles and diminish those of the upper quintiles. The negative effect of the measures increases with the standard of living of households. Following the measures, in 2023, the gain in terms of average purchasing power for households in the third quintile is reduced by EUR 274, while that of households in the fifth quintile declines by EUR 1,385.

Impact of the measures according to the type of household heating

The tripartite measures relating to gas and heating oil mainly affect households via a reduction in their heating expenditure. In this context, this section assesses how the measures resulting from the September 2022 tripartite affect households according to the main fuel used to heat their home.

In Luxembourg, most households heat with gas (nearly 60%) or heating oil (around 25%)[8]. The distribution of the main fuel used for heating is relatively homogeneous across the quintiles, with the exception of Q1 for which gas is used relatively less and heating oil is used more (see graph G).

Graph G
Distribution of main fuel type used for heating within income quintiles



Source: EBM (2019)

For each quintile, the average expenditure is calculated by distinguishing between three categories of households, according to the main fuel used for heating: gas, oil and other (which includes electricity, wood and pellets).

The loss or gain in purchasing power is calculated on average by standard-of-living quintile and corresponds to the difference between the increase in expenditure by type of heating fuel and the observed and forecast increases in income since 2019 (without distinction by main heating fuel).

The measures have a mixed impact on the average expenditure of households belonging to the same income quintile. Within the same quintile, households that use gas as their main heating fuel benefit more from the measures. This is not surprising since these households would have been the most affected by the sharp increases in gas prices in the absence of measures. Thus, following the measures, these households benefit from a greater reduction in expenditure than that of other types of heating in 2022 and 2023, both in relative and absolute terms.

Conversely, households that heat with oil are those that benefit the least from the measures. These households experience a less significant drop in expenditure than the others, both in relative and absolute terms.

For households that heat with gas, the upper quintiles reduce their expenditure by a greater amount than the lower quintiles (see the evolution of the bars on graph H). Nevertheless, in relative value, the decrease in expenditure decreases with income (see the evolution of the diamonds on graph H). As discussed in the previous section, this is explained by the fact that a larger part of the budget of households in the lower quintiles is devoted to energy expenditure (in this case gas, the forecast increases in the price of gas have been alleviated by the measures).

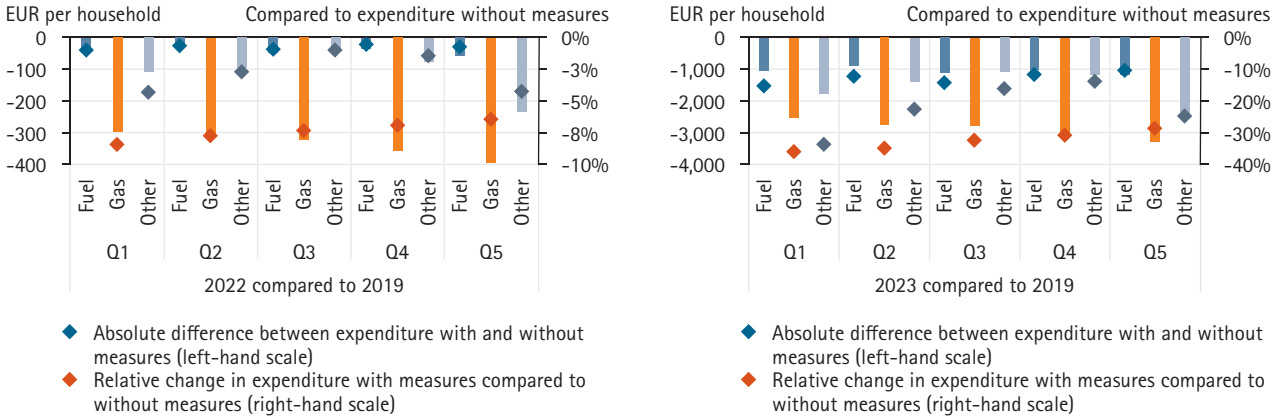
For households that heat with oil, the decline in average expenditure is comparable across quintiles. In relative terms, the reduction in expenditure is slightly greater in 2023 for households belonging to Q1 and Q3. This can be explained by higher fuel consumption levels in these households, and therefore a greater effect of the measures.

For households using another main heating fuel, both at the absolute and relative level, the drop in expenditure is concave (see the bars and diamonds on graph H have an inverted "U" pattern). In other words, the measures further reduce the average expenditure of households belonging to Q1 and Q5 and have a lesser impact on the expenditure of households in Q3. Further analyses are still needed to understand this trend. Nevertheless, given the high share of electricity in "other", this could be explained by electricity bills which represent a larger part of the budget of households in Q1 and Q5 (in particular due to the larger size of the dwellings).

The impact on purchasing power is also mixed. For all quintiles, households that use fuel oil for heating have experienced a drop in average purchasing power with the measures. This is due to a reduction in expenditure that does not compensate for the lower income resulting from a limited number of index brackets. On the other hand, following the measures, all households that use gas have experienced on average a gain in purchasing power in 2022 compared to 2019. This gain in average purchasing power is maintained in 2023 for all households except Q5.

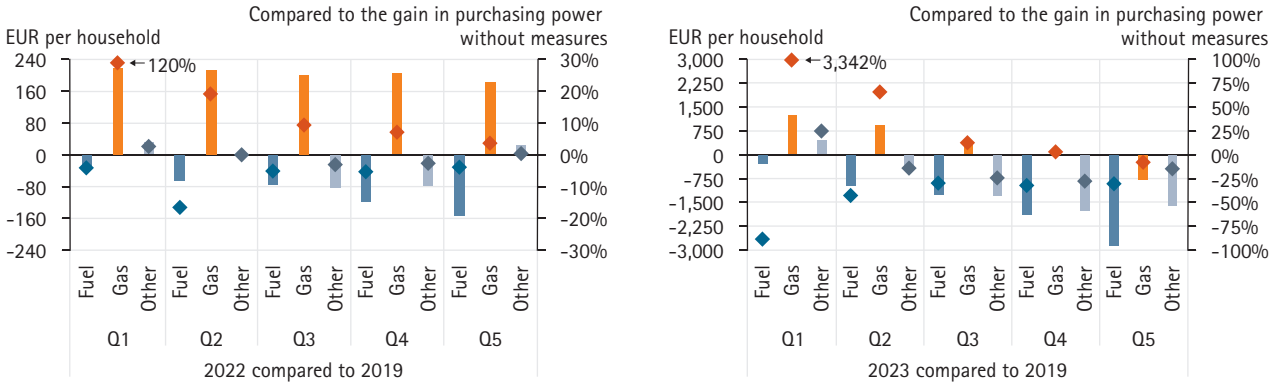
[8] EBM data 2019.

Graph H
Absolute and relative impact of measures on expenditure, by heating source



Sources: HBS (2019) and EU-SILC (2020), IGSS, STATEC calculations

Graph I
Absolute and relative impact of measures on purchasing power, by heating source



Note: Households in Q1 that use gas as their main heating fuel experience an average purchasing power gain of EUR 399 in 2022 and EUR 1,243 in 2023 compared to 2019 with the measures (as compared to EUR 181 and EUR 36 respectively without measurements). For reasons of visibility, these gains are not represented on the graph following the right-hand scale.
Sources: HBS (2019) and EU-SILC (2020), IGSS, STATEC calculations

In relative terms, following the measurements, the gain (or loss) in average purchasing power depends on the main fuel used for heating. For households heating with gas, the relative impact of the measures has a redistribution effect – i.e. that the gain in average purchasing power is greater for households belonging to the lower quintiles. For households heating with oil, the relative loss of average purchasing power of the lower quintiles is, on the other hand, greater than that of the upper quintiles.

Finally, for households using another source of heating fuel, the relative gains in purchasing power are partially redistributive – i.e. the relative gains in average purchasing power are greater for households in the lower quintiles as well as those in Q5.

Conclusions

The analysis presented in this study evaluates the extent to which the reduction in expenditure generated by the tripartite measures makes it possible to compensate for the loss of earnings due to the longer time frame between index brackets.

Across all quintiles, with or without measures, average purchasing power is higher in 2022 and 2023 than in 2019. Nevertheless, for some quintiles, the measures have a negative impact on gains in terms of purchasing power.

Even if the tripartite measures concerning energy prices are not targeted, an initial analysis on average by quintile reveals the redistribution effect of these measures. In fact, the impact of the measures on average purchasing power is positive for households in the lower quintiles. In relative terms, this impact decreases with income. More specifically, the measures intensify the gains in terms of purchasing power of the poorest households and reduce those of the wealthiest. The negative effect of the measures increases with the standard of living of households. Following the measures, in 2023, the average gain of household purchasing power of the third quintile has declined by EUR 274, while that of households in the fifth quintile has fallen by EUR 1,385.

A second analysis assesses how the measures resulting from the September 2022 tripartite affect households according to the main fuel used to heat their home.

This second analysis confirms the mixed impact of the measures on average purchasing power. For all quintiles, households that use fuel oil for heating experience a drop in average purchasing power with the measures. On the other hand, following the measures, all households that use gas experience, on average, a gain in purchasing power in 2022 compared to 2019. This gain in purchasing power is maintained in 2023 for all households except Q5.

In relative terms, following the measurements, the gain (or loss) in average purchasing power depends on the main fuel used for heating. For households heating with gas, the measures have a relative redistributive impact – i.e. the gain in average purchasing power is greater for households belonging to the lower quintiles. For households heating with oil, on the other hand, the measures have an anti-redistribution effect, especially in 2023. Finally, for households using another source of heating fuel, the relative gains in purchasing power are partially redistributive – i.e. more significant for households in the lower quintiles as well as those in Q5.

List of studies published in the latest Notes de conjoncture

NDC 01-2015	June 2015
Price of oil passed on to energy consumer prices	Page 31
Impact of VAT hike on inflation	33
Potential effects of indexation and the minimum social wage on inflation in Luxembourg	35
Soparfis – driving financial sector employment	50
Fewer jobs created in the public sector	52
ICT and logistics: mixed impact in terms of employment	54
Evaluation of the "Zukunftspak" measures using STATEC models	86
Impact of a favourable growth shock in the euro zone	94

NDC 02-2014	November 2014
Impact of revisions to the national accounts and balance of payments	16
The Youth Guarantee and its potential impact on unemployment	68
On the relationship between unemployment and employment in Luxembourg	70

NDC 01-2014	May 2014
Households' perception of consumer price trends	53
A disinflationary trend confirmed by various underlying inflation indicators	55
Downsizing in the banking sector: rising impact on wage costs	62
A changed relationship between unemployment and employment?	92
Potential growth for Luxembourg: recent evolutions and projections until 2018 according to different sources	115
Impact of the lifting of VAT from e-commerce	136
Impact of VAT hike	138

NDC 02-2013	October 2013
Temporary employment: a leading indicator for the Luxembourg labour market?	71
Stress indicator on the labour market	83
Has the labour market become more precariousness since the crisis?	84
Impact of the introduction of automatic exchange of information on interest payments within the EU	118

NDC 03-2012	November 2012
Cyclical trends in terms of paid hours	56
Fiscal measures, economic activity and the public finance balance: a brief look at Keynesian multipliers	95

NDC 02-2012	July 2012
Changes in Luxembourg labour market data: definitions, explanations, impacts	69
Comparative productivity analysis (Luxembourg, euro zone) since the beginning of the crisis	91

NDC 01-2012	April 2012
New economic governance for the European Union	10
Analysis of various successive forecasts drawn up as part of the European semester	37

NDC 03-2011	December 2011
Revisions to the annual national accounts published in autumn 2011	Page 19
Retrospective analysis of revisions to nominal GDP	22
Redirecting exports of services to high growth markets: a reality for Luxembourg?	24
Cyclical nature of employment measures	85
Unemployment in Luxembourg is becoming increasingly structural	90
Effects of workers with disabilities and/or reduced work capacity on ADEM unemployment structure	94
Alternative scenario based on a substantial worsening of the financial crisis	116
How significant for the Luxembourg economy is the fall in stock market indices since spring 2011?	118

NDC 02-2011	July 2011
Inflationary gap between Luxembourg and the border countries	49
Price of oil passed on to consumer prices	52
Inflation rate by household category	58
Macroeconomic impact of changes to the automatic wage indexation mechanism in 2011	106
Macroeconomic impact of the 10% fall in the Eurostoxx European stock market index	111

NDC 01-2011	May 2011
Comparison of potential growth rates and output gaps for Luxembourg	29
Changes to automatic indexation and inflation	51
The equations linking euro zone GDP and foreign demand variables in Modux	63

NDC 02-2010	November 2010
Luxembourg during the crisis: a look back at 2008 and 2009	15
Usefulness of the construction sector opinion survey for business cycle analysis	28
Observed impact of the wage indexation adjustment on the price of certain services	49
Impact of the economic situation on tax revenues	86

NDC 01-2010	June 2010
Statistical analysis of revisions to Luxembourg's quarterly GDP	14
Trends in Luxembourg's export market share between 2002 and 2009	56
Companies active in the IT and information sector are relatively unscathed by the crisis	61
Financial crisis and government interventions	90
Impact of high labour force retention on short-term labour market prospects	115
Inclusion of the STATEC leading indicator model in GDP forecast	130

NDC 02-2009	November 2009
Relation between economic surveys and activity surveys applied to Luxembourg industrial output	19
Massive use of short-time working in 2009	64
Effect of job schemes on the unemployment rate	72

NDC 01-2009	May 2009
What do leading indicators suggest as regards short-term GDP trends	Page 8
Recent developments in lending activity	69
Profiles of cross-border and resident workers	112

NDC 02-2008	November 2008
The extent of the current economic crisis compared to the 2001-2003 downturn	17
Commodity prices down	49
Mechanical impact of automatic indexation on wage trends	56
Financial sector employment recovers	74
Macroeconomic consequences of the introduction of the "single status" for private-sector workers	86

NDC 01-2008	June 2008
Is the low diversification of the Luxembourg economy a risk factor?	50
European comparison of inflation over the last ten years	75
Differences between projected and actual government balances for the years 2005-2007	125

NDC 03-2007	March 2008
Recent purchasing power trends in Luxembourg	39
Impact of the financial sector on the rest of the economy	70

NDC 02-2007	October 2007
Rise in interest rates affects the cost of mortgages	23
Labour productivity in industries: comparison between Luxembourg and the euro zone	35
Influence of consumption patterns on inflation	47

NDC 01-2007	May 2007
Business cycle momentum across sectors: the influence of the financial sector	62
Implications of China's re-emergence for the world economy and for Luxembourg	72
Changes to the sliding wage scale system	84
From analysis of workforce numbers to labour flow analysis	108
Shift from institutional budget to central government deficit/surplus	134

NDC 03-2006	February 2007
Volatility and growth: a comparative country approach	69
Trends in working hours in Luxembourg	77

NDC 02-2006	October 2006
Taking into account the main economic and fiscal policy guidelines in the forecasting process	20
2000-2005: a look back at 5 years of inflation	44
Recording of Arcelor-Mittal share exchange transactions in the economic accounts	68