Economy

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INTRODUCTION

Situated in the centre of Europe and bordered by two major powers, France and Germany, the small Grand Duchy of Luxembourg (with a total area of just 2,586 sq km and, in January 2021, a population of 634,730 inhabitants, according to official estimates, of whom 47.2% were foreigners—of some 170 different nationalities)—a multicultural, multilingual and cross-border area *par excellence*—has always sought to maintain an openness to its neighbours, both for reasons of security and to give itself access to larger markets. The fact that the country did not have its own currency increased this need for openness and made monetary policy a key factor for integration.

In the 19th century Luxembourg was part of the German customs and trade union (Zollverein). Following the First World War, the country embarked on a process of economic and monetary integration with Belgium via the Belgium-Luxembourg Economic Union (initially set up in 1921 and regularly extended over the ensuing decades). It also played a driving role in the economic and political rapprochement of Belgium, the Netherlands and Luxembourg in the Benelux Economic Union (established in 1944 and restyled as the Benelux Union in 2008). Following the Second World War, it was ultimately with the European project that these integration efforts began to bear fruit and take on a new dimension. Luxembourg was one of the six founding members of the European Coal and Steel Community (ECSC) and the European Economic Community (EEC); in 1952 the country became the workplace and one of the permanent seats of the institutions of the European Community (EC, later European Union—EU), and it played a pioneering role in the establishment of Economic and Monetary Union (EMU). The Treaty of Brussels of 1965 merging the executive bodies of the European Communities recognized Luxembourg as the seat of the (present and future) legal and financial institutions of a united Europe; the country is now carving out its role as the EU's digital capital, and the supercomputer MeluXina—one of the most powerful high-performance computers in Europe and a key element of Luxembourg's data-driven innovation strategy, catering for the needs of companies, start-ups and public and research institutions—became operational in June 2021.

In political terms, European integration and multilateral co-operation enabled Luxembourg to become an equal partner in the decision-making processes and leadership of European organizations. In economic terms, these features gave the country the tools it needed to forge a development model that could underpin the creative growth of its social market economy, while preserving the majority of its vital interests—particularly the steel industry and the financial centre—over the long term. In 2020, owing to the impact of the coronavirus disease (COVID-19) pandemic, gross domestic product (GDP) contracted by 1.3%, compared with growth of 2.6% in 2018 and 2.3% in 2019; between 1996 and 2019 the average annual growth rate was 3.4%—the highest GDP per head among the Organisation for Economic Co-operation and Development (OECD) member states. With a level of material wellbeing above the European average and sound public finances, Luxembourg is currently one of the most politically stable, innovative and prosperous countries in the world. Its strong fiscal position is well illustrated by a longstanding AAA credit rating, a significant accumulation of government financial assets and a generally balanced, healthy fiscal position. This essay will endeavour to explain how Luxembourg managed to achieve this; its current strengths and weaknesses; and its future challenges in an increasingly globalized, competitive international environment.

A CENTURY OF STRUCTURAL ECONOMIC CHANGES

Beginning in the 20th century, Luxembourg experienced several periods of transition. The largely agriculture-based economy became industrialized, driven by a powerful steel industry which remained the dominant sector from the immediate post-Second World War years to the mid-1970s. The country had a considerable competitive advantage in this respect owing to iron ore deposits in Luxembourg itself and in the neighbouring French region of Lorraine. The industrial flagship was Aciéries Réunies de Burbach-Eich-Dudelange (ARBED), founded in 1911, which developed its production in Europe and established a global network of sales outlets. Between 1953 and 1968 the steel industry contributed approximately 25% of the country's GDP growth, and steel production represented 50% of its added industrial value. Over the same period, the nominal wage grew by 29.3%. The improvement in living standards led to the emergence of the middle class and to an increase in urbanization. The Government improved the social security regime and extended it to all workers, thus helping to close the gap in social equality, raise living standards further and boost social cohesion in the country over the long term. The asymmetry between steel output (e.g. 6.4m. metric tons of steel in 1974) and national requirements (approximately 5% of this output) meant that Luxembourg had to export its steel production, which made the country entirely dependent on the international economic climate. Most of Luxembourg's steel went to the EEC. Membership of the Community organizations had a positive impact on the country, multiplying its wealth and boosting living standards. At the same time, the contrast between Luxembourg's thriving steel industry and its small population prompted it to look beyond its borders to augment its workforce. This resulted in several waves of immigration, especially from Italy at the turn of the 20th century and from Portugal in the late 1960s. The discrepancy between the required and available capital in the country meant that it needed to tap into foreign capital. Luxembourg also looked abroad for expertise.

Even as the steel industry reached its peak, the Government set about exploring possibilities for economic diversification, introducing a suitable legislative framework with the establishment of the Board of Industrial Development in 1959, the adoption of the framework law on economic expansion in 1962 and the creation of the Société Nationale de Crédit et d'Investissement (SNCI) in 1980. It managed to attract major multinational companies in other manufacturing sectors (glass, chemicals and plastics) and in the service industry (trade, tourism and public administration). Most of the new companies that came to the country were from the USA, such as Goodyear, DuPont de Nemours and Guardian. None the less, 60% of foreign direct investment into Luxembourg was from its neighbours, Germany and Belgium. The early 1970s saw the rise of a new growth sector for Luxembourg: the international financial centre. This was the result of action taken by the Government as well as several external factors, including the interest equalization tax introduced by the USA in 1963 and the German securities transfer tax (Kuponsteuer) introduced in 1965. US capital and German banks were attracted to Luxembourg. Germany was the main investor in the banking sector, with 53% of all investments. Luxembourg would also become a 'laboratory' for the single European currency, one of the architects of which was Pierre Werner (Prime Minister of Luxembourg in 1959–74 and 1979–84 and Chairman of the expert committee that drafted the 1970 Werner Report, which formed the basis of EMU). The Luxembourg Stock Exchange (LuxSE), Kredietbank SA Luxembourgeoise, the Banque Internationale à Luxembourg, the Banque et Caisse d'Epargne de l'Etat, Luxembourg (the latter two recognized as systemically important banks in the country) and Cedel (which became Clearstream Banking in 1999) also played a major role.

In 1974 the steel industry began to decline, marking the end of the 'Trente Glorieuses'. Luxembourg was forced to implement considerable structural changes and embarked on its second major transition, from an industrial economy to a service economy based on the financial sector. This was reflected by fundamental changes in the structure of the country's economic value added. Between 1970 and 2019 the share of industry contracted sharply, from 47% to 6.9%, while the share of the steel industry shrank from 28% to 1.5%. The share of industry in total employment contracted from 33% in 1970 to 7.8% in 2016, but increased by about 12% in 2019. Expressed in absolute figures, this downward trend—from 45,800 workers in 1970 to 32,700 in 2016, 41,100 in 2018 and 37,300 in 2020—is less pronounced. The weight of agriculture in the economy has also fallen considerably, representing just 0.2% of GDP and 0.8% of total employment in 2020. From the mid-1980s the country's economic growth accelerated, driven by its financial centre, whose contribution to GDP stood at 26.8% in 2020, followed by distributive trades, transport and communication, with 22.3%. In 1998 the financial industry generated some 20% of GDP. An indirect impact of this sector has been the development of business in related specialist areas, including information technology (IT), data processing, intellectual property, legal and accounting expertise, training and business services. From 1985 to 2018 average annual GDP growth was about twice as much as that of neighbouring countries and of the member states of the EC/EU.

With an openness rate of 158.2% of GDP, Luxembourg is considered as the third most open economy in the world. Luxembourg is an export-intensive economy, and a trade deficit is a recurrent characteristic. Between 1988 and 2019 the balance of trade averaged −€340m., reaching an all-time high trade deficit of €30m. in February 1988 and a record low of −€1,060m. in September 2012. The trade balance for 2020 as a whole stood at –€6,400m., or about 10% of GDP, compared with 11.9% of GDP in 2019. The pandemic crisis led the deficit in trade in goods to fall for the first time since 2016. In 2020 the coverage of exports by imports stood at 65.3%.

Although Luxembourg regularly records a considerable deficit in trade in goods (equivalent to about 10% of GDP in 2020), this is largely offset by a surplus in the services balance (33% of GDP), with the volume of trade in 2020 standing at €172,800m.—almost six times higher than the volume of trade in goods (€30,200m.). There is a structural surplus in the services balance resulting from financial services, which reached €17,400m. in 2020 (down from about €18,200m. in 2019).

The share of foreign trade in Luxembourg's GDP is currently higher than 30%. EU countries are by far the country's largest trading partner, accounting for about 85% of exports and 87% of imports. Trade in Luxembourg is highly concentrated in both geographical terms (with its three neighbours—Germany, France and Belgium) and at sectoral level (with a majority of manufactured goods). In 2020 its three main trading partners were Germany, France and Belgium, which represented 65.8% of trade in goods; its top customer is Germany (27.2% in 2020), and its leading supplier is Belgium (34.1% in 2020). Luxembourg exports mainly iron and steel, chemical and rubber products, glass, electrical and electronic equipment and financial services (its most profitable export). Its other significant partners are based in Europe—the Netherlands (5.4% of trade), Italy (3.2%) and the United Kingdom (2.8%). The USA (in seventh place) is Luxembourg's main non-European partner (2.5%), ahead of the People's Republic of China (10th, 1.6%).

Luxembourg remains dependent on imports of energy (mineral fuels and oil) and most of its consumer goods. Luxembourg has successfully diversified its exports outside the EU, and the country is now developing trade relations with countries in Asia and the Middle East. Luxembourg has managed to establish itself as a hub for international trade, and this contributes significantly to the country's economic activity and domestic employment. Although in 1970 exports of goods represented more than twice the value of exports of services, the growth of the service sector has led to a reversal of this situation: nowadays Luxembourg exports more services than goods. In terms of services, its four main partners are Germany (19.8% of trade in 2020), the UK (15.4%), the USA (9.9%) and France (8%). Luxembourg has a trade surplus with most of its partners in the EU, including Germany (€8,600m.), France (€3,000m.) and Belgium (€2,800m.), as well as with the UK (€4,300m.). The only countries with which it has a substantial bilateral deficit in trade in services are the USA (–€6,800m.), Singapore (–€4,200m.) and Ireland (–€3,000m.).

The expansion of the financial industry resulted in the emergence of a new phenomenon in Luxembourg: in order to meet its workforce requirements, the country turned to cross-border workers. This new development was made possible only by labour mobility, the discrepancy in unemployment rates between Luxembourg and its neighbours, and a positive wage differential. In 1998 cross-border workers made up one-third of the country's workforce. Of the total workforce, 55% were non-Luxembourgers. Concerted state intervention (in the form of investing to boost productivity, controlling mass unemployment by introducing community projects, activating the ECSC's aid mechanisms and developing a productive synergy with Belgium) and the spectacular growth of the financial sector enabled the country to avoid a painful socioeconomic crisis. Political leaders improved the legislative and institutional infrastructure underpinning the financial centre in three main areas: implementing international regulations; setting low taxes; and establishing strict rules on banking secrecy. The leaders explored possibilities for further economic diversification in innovative, competitive areas such as audiovisual technologies and communications satellites, as reflected in companies such as the Compagnie Luxembourgeoise de Télédiffusion and the Société Européenne des Satellites (SES). SES is now the world's leading satellite operator, reaching 99% of the global population. As regards the steel industry, in 2001 ARBED merged with Usinor and Aceralia, creating Arcelor, which in turn merged with Mittal Steel in 2006. ArcelorMittal, which has its headquarters in Luxembourg, is currently the world's largest steel producer. ArcelorMittal's presence in Luxembourg explains the prevalence of items produced from base metals among the country's imports, including transport equipment (18.3% of imports), machines and equipment (17%), chemical and allied products (12.3%) and miscellaneous manufactured articles (10.9%).

To reconcile economic interests and social stability, the Government opted for a proactive social policy, with key measures including an automatic wage indexation mechanism based on increases in the cost of living (1965), the 40-hour working week (1975), a guaranteed minimum income (1986) and the expansion of the health care system. Labour relations were strengthened. In 1977, during the steel crisis, a Consultative Tripartite Committee (comprising the Government, employers and the unions) was established, acting as a shock absorber for both sides of industry. The Committee formed the basis of the Luxembourg social model, which relies on democracy, social solidarity and consensus to underpin social and economic development.

In 2007, during the emergence of the sub-prime mortgage crisis stemming from low-income borrowers' inability to meet repayment obligations on lending, Luxembourg had the EU's largest banking sector and was a highly specialized, widely diversified global financial centre (with investment funds, insurance companies and banks, most of which were branches of foreign-based establishments). As Luxembourg's economy was driven strongly by this sector, the potential vulnerabilities were considerable. In 2008 the financial sector contributed 29% of the country's GDP, 12% of jobs and 20% of total tax revenues—a significantly higher proportion than in any other OECD country. The global financial crisis resulted in a decrease of 20% on the aggregated balance sheet of Luxembourg's banks and a decline in GDP of 5.4%. The contraction of the financial sector led to a fall in tax revenues, which raised the risk of a long-term impact on the sustainability of the generous Luxembourg social security system, placed under growing pressure by an ageing population.

Another long-term problem was the country's ongoing structural unemployment, despite a rise in the overall employment rate. In 2015 GDP increased by 4.9%, returning to its pre-crisis level (during 2000–07 GDP rose by roughly 4.7% per annum). The Government bailed out two major cross-border banks, Dexia and Fortis, which were experiencing serious difficulties; both required recapitalization equivalent to some 6% of GDP. However, government aid, in the form of guarantees and injections of capital, was less extensive than in other OECD countries. Three small Icelandic banks were placed under the legal administration of the Commission de Surveillance du Secteur Financier (CSSF—Financial Sector Supervisory Commission). These problems, which were caused by cross-border issues, were resolved without severe difficulties, and contagion to other establishments in the financial centre was avoided. Although Luxembourg fared better than its partners in the eurozone, the crisis had a lasting effect on the country's competitive advantage, particularly because it had to align its financial regulations with European and international initiatives, such as budget constraints, prudential supervision and increased transparency.

To guarantee its future position in a competitive globalized environment, the country needed to diversify its economy by focusing on state-of-the-art fields with high added value, while preserving the competitiveness of the financial sector. Luxembourg continued to prioritize innovation as the main driver of smart, sustainable and inclusive growth, embarking on its third major transition—from a financial economy to a knowledge-driven economy.

SOCIOECONOMIC OBJECTIVES AND THE IMPACT OF REFORMS IN 2020

When the COVID-19 pandemic spread to Luxembourg, the Government was approaching the mid-point of its term: since the general election held on 14 October 2018, the governing coalition comprising the Demokratesch Partei (DP—Democratic Party), the Lëtzebuerger Sozialistesch Arbechterpartei (LSAP—Socialist Workers' Party of Luxembourg) and Déi Gréng (The Greens) had been in power under Xavier Bettel of the DP. The Government's programme for 2018–23, described by the Prime Minister as 'social, liberal and eco-friendly', reflects an approach based on 'justice, sustainability and social cohesion, while promoting the country's competitiveness'. The main priorities are the protection of resources, the preservation and strengthening of quality of life and a commitment to diversity, multilingualism, history and the Luxembourgish language. In terms of the economy, there is a focus on the diversification of the economy, digitization and investment in mobility and infrastructure.

From 2018 to 2020 the reforms planned under this strategic agenda led to a number of tangible results. First, significant social policy measures were introduced, including a reduction in working time of two days per year and more flexibility in the organization of working time; an increase in the minimum social wage, which stood at €2,202 on 1 January 2021; support for job seekers and those receiving social and employment activation measures via the social inclusion income (as at January 2021 the monthly social inclusion benefit stood at €751.46 per adult and €233.32 per child); a change in the indexation of family allowances, which, unlike salaries, pensions and other social transfers, had not been indexed to living costs since 2006 (a new indexation mechanism was to be introduced by the end of the parliamentary term in 2023); and proposed changes to the health care third-party payer system, set to come into force by 2023 (health care costs for patients under the age of 18 are entirely refunded). Second, a key aim was to relieve insufficient supply and high prices in the housing market, which represents a major challenge for the country's competitiveness. The Government proposed a series of measures—primarily large-scale investment in social and affordable housing; a new 'Housing Pact 2.0' between the Government and local authorities to give as many residents as possible access to public housing; increasing the state guarantee for those purchasing their first property; and measures to encourage affordable accommodation for students, including inter-generational living. Third, a major tax reform was initiated with the aim of achieving a single tax scale by 2023, regardless of marital status or changes thereto during individuals' lifetime. Households with children were to continue to enjoy tax breaks, which take into account other family or social criteria. Fourth, the Government has drawn up a national mobility plan with a strong environmental component. On 1 March 2020 all buses, trams and trains became free of charge in Luxembourg, making it the first country in the world to introduce free public transport. A number of priority investments to target the quality of public transport are also planned. To improve the quality of the environment, especially in urbanized areas, the emphasis will be on electromobility. The Climate and Energy Fund offers subsidies to companies that reduce their impact on the environment via employer mobility. Finally, Luxembourg intends to become a global leader in the digital economy by diversifying its economy generally via new innovative sectors based on a national strategy for artificial intelligence, encouraging widespread adoption of digital culture and literacy throughout society and adopting taxation measures in support of diversification and competitiveness (i.e. freezing the subscription tax on investment funds for five years and reducing corporation tax by 1 percentage point from 1 January 2019).

DEALING WITH THE COVID-19 PANDEMIC

The first case of COVID-19 in Luxembourg was detected on 29 February 2020. The next day Prime Minister Bettel convened a pandemic crisis unit, and on 12 March he announced the adoption of measures on a scale never seen before in Luxembourg, which came into force on 16 March, including closing schools, restricting movement, closing businesses and commercial premises open to the public, prohibiting visits to hospital patients, preventing health care workers from taking leave and requiring employees to work from home where possible. In a televised address to the nation on 17 March, Bettel announced that he intended to declare a state of emergency so that the Government could introduce urgent measures, especially in light of the tensions in the Schengen Area of free movement caused by the closure of borders in Luxembourg's neighbouring countries, which led to major complications for cross-border workers. Owing to the COVID-19 crisis, the EU closed its external borders in March, and several countries (including Germany, Spain, Italy, Belgium, Austria and Poland) used their prerogatives under Schengen to close their national borders. (In the event of a serious threat to public order or internal security, Schengen member countries can temporarily reintroduce controls at their national borders, for renewable periods of 30 days, up to a maximum of six months.) Luxembourg chose to keep its borders open as an expression of its attachment to the European project and also to allow the continued entry of the cross-border workforce on which the country's economy depends and on which the health care sector is particularly reliant. The state of emergency entered force on 24 March to last initially until 22 June (although some measures began to be eased from early May, including in-person teaching and the reopening of the airport and bars, cafés, restaurants and gyms). The Government prioritized measures to support the economy, workers and the most deprived sectors of the population, as well as public health measures, including mask distribution campaigns and a large-scale COVID-19 testing scheme, which placed Luxembourg at the vanguard of the international community.

STABILIZING THE ECONOMY AND IMPROVING ITS ABILITY TO REBOUND

An Economic Stabilization Programme was announced in late March 2020, including 40 measures to meet the immediate needs of maintaining employment, supplying liquidity to companies and facilitating bank financing, covering large firms as well as small and medium-sized enterprises (SME), their employees and self-employed individuals, providing for non-repayable grants and direct financial support. The latter consisted of repayable advances (intended to cover cash-flow requirements) and Government-guaranteed loans. The upper limit of the loans—up to €800,000 per company in 2020 and up to €1.8m. per company in 2021—covered up to 50% of eligible costs (staff and rental costs) for the period. By May 2021 a total of €162.2m. had been allocated in repayable advances to 2,117 companies, with the construction sector receiving the most (more than €30.5m.), followed by the hospitality sector, which was severely affected by a further lockdown introduced in November 2020 and was granted nearly €9m. to tackle the crisis. The aid programmes were subsequently extended until the end of 2021. It is worth noting that the Government aid scheme for costs not covered was awarded on 3,104 occasions to companies in the sectors most affected by the health crisis, representing a total of €50.6m. The system of Government-guaranteed loans, based on an agreement between the Ministry of Finance and eight Luxembourg-based banks, gave companies the option of taking out a six-year loan of up to 25% of their turnover. If a company defaults on its loan, the Government is committed to covering up to 85% of the amount. To date, 382 loans have been awarded, 85% of which are Government-guaranteed, amounting to €176.3m. To date, the Government has not yet had to intervene as guarantor for any outstanding loan payments.

An additional package of measures was adopted in May 2020 as part of the 'Neistart Lëtzebuerg' scheme, with a threefold objective: encouraging employment, supporting companies in the most affected industries and promoting a sustainable, inclusive recovery for the economy. One of the key measures was the short-time working scheme to guarantee continued pay for employees, funded by the Government and covering 80% of the employee's salary (or 100% of the social minimum wage, which was €2,202 gross per month on 1 January 2021). Since the start of the crisis 14,537 companies (amounting to 375,196 employees) have benefited from the scheme, under which €859.1m. has already been paid in the form of advances, while €399.3m. of repayable loans are to be paid back by applicant companies to the Employment Fund. In July 2020 a new incentive instrument was introduced as part of the 'Neistart' package to encourage companies to embark on development projects (especially related to the circular economy) and projects related to digitization and environmental protection (despite the unfavourable investment climate resulting from the pandemic), in exchange for financial assistance of up to 50% of eligible costs. So far, 219 grants worth €63.1m. have been awarded for projects in the sectors of industry (31.8%), construction (24.9%) and trade (15.7%). The initial deadline of 30 June 2021 for the scheme was extended until the end of the year. Those companies most severely affected have been eligible for specific emergency aid (lasting six months) from a recovery and solidarity fund (worth €65.7m, with 8,393 applications already approved).

The series of measures, which helped to mitigate the short-term social and economic consequences of the crisis while paving the way for effective medium- and long-term strategies, entailed spending of approximately €2,050m. (an increase of 21.9% compared with 2019). In terms of structural improvements to SMEs, which underpin the Luxembourg economy, capital grants increased by €142.7m. compared with 2019, while investment expenditure rose by €301.8m. (26.2% higher than in 2019). Social benefits grew by an even higher proportion, increasing by 88.6% between June 2019 and June 2021 (an increase of €797.6m.).

It is notable that the Luxembourg news media—one of the sectors particularly badly affected by the pandemic—were the subject of a specific aid programme devised by the Government with the aim of 'improving the quality of journalism and guaranteeing the pluralism of multilingual media'. Following on from this, the Act on Aid for the Press was adopted in July 2021, marking a change in strategy, with online media now also eligible for state aid, as well as the print press. The assistance is also open to monthly publications, the free press, 'citizen media', 'emerging publishers' and start-ups in the sector.

HEALTH CARE REFORM

According to World Health Organization (WHO) data, at 29 September 2021 Luxembourg had recorded 77,998 cases of COVID-19, including 835 deaths. The country has managed to bring the epidemic under control thanks to the effective strategy pursued by the Government and other public health stakeholders, drawing on funds available because of sound public finances and relying on individual responsibility from a disciplined population. The mass testing campaign, available free of charge to the population, was rolled out in three phases (April–August 2020, August 2020–March 2021 and March–September 2021). It absorbed considerable funds (on average €2.2m. each week) and was laborious to organize, but it enabled more than 1.8m. COVID-19 tests to be performed, helping to keep the rate of infection among the population in check. The (free) vaccination campaign began in January 2021, and by early October 2021 about 784,000 doses had been administered, and 63.2% of the population had been fully vaccinated.

The Luxembourg health care system has considerable material resources for the size of the country. In 2020 the Hospital Federation—which has four hospital centres, six specialized hospital establishments (heart surgery, radiotherapy, neuropsychiatry, post-oncology, geriatrics and functional re-education), an institution for end-of-life care and a diagnostics centre—had 2,657 beds (1,896 for general care and 159 for intensive care), an operating budget of €1,182.9m., hospital investments of €105.4m. (with an annual average of €43m. between 2011 and 2019) and a workforce of 17,595, including 2,331 physicians and 15,061 other health care professionals, some 70% of whom are cross-border workers (mostly from France). In 2020 a total of 203,587 cross-border workers entered Luxembourg on a daily basis, rising to an estimated 209,014 in 2021. The medical and hospital sector is almost entirely dependent on the cross-border workforce. When France decided to close its border with Luxembourg on 13 March 2020 because of a high COVID-19 infection rate in the Grand Est region of France, Luxembourg faced the very real risk of a collapse of its health care system.

With the growing realization that it was in 'a situation of false health security' (in the words of the Minister for Health), in early 2020 the Luxembourg Government launched a process of reflection (the 'Gesondheetsdësch') for an overhaul of the national health system, with the adoption of a national strategy designed to address the current gaps. Based around the University of Luxembourg, this strategy involves the establishment of a new system of training for health care professions with several levels of qualification. Another ongoing project is the full digitization of the sector, in particular with the introduction of direct payment for practitioners between 2021 and 2023, thereby preventing patients from having to advance the share covered by the National Health Fund.

In terms of investments, the main focus for 2020–25 is the 'Südspidol' ('southern hospital', with a total estimated budget of €542m., 80% funded by the Government), which will bring together three hospitals in southern Luxembourg (Esch-sur-Alzette, Dudelange and Niederkorn) and will have 583 beds, 16 operating theatres, 12 endoscopy facilities, four computerized tomography (CT) scanners, three magnetic resonance imaging (MRI) scanners and an environmental medicine department. The new hospital complex will meet the health care needs of the growing population of Luxembourg and the Greater Region.

STRENGTHS AND WEAKNESSES OF A HIGHLY SPECIFIC LABOUR MARKET

In Luxembourg, the labour market is both highly specialized and highly dynamic. Between 2005 and 2018 employment rose by 45.8%—an exceptional figure compared with 11% in Germany, 9.5% in Belgium, 4.7% in France and 5% in the EU as a whole. This rising trend continued even during the global financial crisis of 2007-08 and subsequent recession in most of the EU, even though the dynamism tapered off slightly from 2009. On 1 January 2020 the unemployment rate in Luxembourg stood at 5.4% (stable since 2018). The paid workforce is composed as follows: 44% cross-border workers (about one-half of whom are French, followed by roughly equal numbers of Germans and Belgians), 27% Luxembourgers, 25% other EU nationals and 4% third-country nationals. The overall employment growth rate was 1.6% in 2020, rising to 2.2% for cross-border employment. In 2021 growth in the labour market in Luxembourg, which remains more dynamic than that of the eurozone, is expected to stabilize at 2.5% (a much slower growth rate than that of the country's estimated real GDP growth in that year, of 4.3%). Weak labour market outcomes for low-skilled workers, older workers and, to a lesser extent, women, remain an important policy challenge. The most dynamic sectors in 2020 were e-commerce, with a 4% rise in employment; health care (up by 4.3%); specialized, scientific and technical activities (up by 4.2%); construction (up by 4%); and financial services (up by 3.9%).

Regardless of strong economic growth and innovative measures taken by the national employment agency, unemployment in among Luxembourgers under the age of 30 remains high (at 21% in 2020), despite falling significantly (by 15% from 2015 to 2017). Unemployment among those aged between 30 and 44 years fell by 10% in 2017, while among those aged 45 and over it decreased by just 5%.

Luxembourg has a highly qualified workforce (59.6% of the active population in 2015, according to World Economic Forum/International Labour Organization statistics), placing the country in first position among 124 countries in terms of skills development (followed by Singapore, Switzerland and Israel). The percentage of 30–34-year-olds with a higher education qualification stood at 53% in 2020—one of the highest rates in Europe. About two-thirds of jobs created in Luxembourg are aimed at higher education graduates—a trend that was confirmed by the 2014–15 reform of the government-funded grant scheme for students in higher education, which was extended in 2017 to the children of cross-border workers. In the 15–24 age group, 66.9% of individuals are in education or training, and 24.8% are already in employment, but 5.3% are not in employment, education or training. However, this last statistic is lower than in the eurozone as a whole (10.6%). Secondary education none the less remains a cause for concern: basic skills outcomes are lower than the EU average, and this performance worsened between 2012 and 2018. According to the OECD's PISA rankings, Luxembourg is 30th, behind Germany (15th), Belgium (17th) and France (18th). These results can be attributed primarily to the socio-economic difficulties encountered by pupils (50% of 15-year-old pupils are immigrants), but also to the challenge posed by the trilingual approach of the Luxembourg school system. The reform of compulsory education (the first nine years of schooling) began to be progressively implemented from 2017 onwards, based on five key skills (critical thinking, creativity, communication, collaboration and coding), with particular emphasis on the 'Einfach Digital' (simply digital) strategy. The provision by the Ministry of Education of more than 26,500 iPads to schools since 2017 enabled pupils to shift smoothly to full home schooling on several occasions between March 2020 and May 2021, during lockdowns imposed to contain the COVID-19 pandemic.

EMPLOYMENT AND SOCIAL COHESION UNDER PRESSURE

The COVID-19 pandemic had a sudden and severe effect on the labour market and left many people in situations of economic insecurity (compared with January 2020, in January 2021 the number of job seekers had risen by 20.7%, the number of available jobs had fallen by 14.4%, and the unemployment rate had risen to 6.3%).

To safeguard as many jobs as possible during the crisis, the Consultative Tripartite Committee met on a regular basis. The first emergency measure was 'force majeure/coronavirus short-time working' (from 18 March until 24 June 2020). Under this scheme, the Government covered 80% of employees' salaries (via the Employment Fund). In July 2020 'short-time working due to structural economic difficulties' was introduced for the most vulnerable sectors (notably hospitality, tourism, events, small-scale industry and retail). A total of nearly €1,000m. was made available to companies in the form of advance payments. To prevent worker insecurity, the short-time working allowance was increased to 100% of the social minimum wage for unskilled workers. To support people with low incomes, in 2020 the cost-of-living benefit was doubled to €2,640 for people living alone (from €1,320) and to €5,280 for a family of five or more. By June 2021 more than 153,000 people from 4,450 companies had received short-time working benefits, and some 800 applications were being processed. The Government also adopted or extended specific employment support measures, such as the 'professional training internship' (for people under 30), the 'employment reintegration contract' and 'aid for the recruitment of older job seekers' (for those aged 30–45), external redeployment programmes for disabled employees, the compensated temporary occupation scheme, improvements to the redeployment system and the early retirement scheme (for older job seekers), and an initiative to help those in long-term unemployment.

The 'Working, Yet Poor' international study published by researchers (including a team from the University of Luxembourg) in July 2021 shows that, paradoxically, Luxembourg is one of the EU countries where the risk of in-work poverty is the highest: Luxembourg is third in this ranking (with a risk rate of 12.7% in 2019), behind Spain (12.9%) and Romania (15.7%). Some 103,600 people live below the monetary poverty threshold, considered to be €1,804 per month for a single adult. Job seekers are particularly vulnerable (with a risk rate of 40.3%, up by 14 percentage points compared with 2017), as are the economically inactive population (43.9%). The poverty rate among children (aged 0–17) is 24.8%. Those in retirement (aged over 65) fare the best (8.7%), while single young people, foreigners—who have a risk rate twice as high as that of nationals (21.7% compared with 10.9%)—people with low levels of education, job seekers and single-parent families are most exposed to poverty. Both the study and analyses by STATEC (Luxembourg's official statistics agency) reveal that monetary social transfers to households (benefits, subsidies, etc.) are having less and less effect on poverty reduction. However, although the risk of poverty is relatively high for some categories of workers in Luxembourg, the proportion of households facing severe material deprivation is very low (0.9%), while the proportion below the deprivation threshold is 2.4%.

THE UPSURGE IN WORKING FROM HOME

As the Luxembourg economy is highly digitized, largely service-based (87.4%) and involves highly specialized workers, the development of remote working—in particular with changes to cross-border tax arrangements and aid for investment in remote working infrastructures—proved particularly useful during the pandemic crisis. In the second quarter of 2020 a total of 52% of the active labour force (residents and cross-border workers) worked from home (the equivalent figure in 2019 was just 20%), reaching a peak of 58% in April 2020. Sectors that particularly embraced remote working included education (with home schooling and 96% of all activities performed remotely); the public sector, with 74% working from home; information and communication technology, banks and insurance (61%); and research, science and technology. Those in health care and social work, tourism and hospitality, construction, local and community-based work and low-skilled work generally continued to travel to the workplace. Although the limit for days worked outside Luxembourg was previously 29 days for cross-border workers from France, 24 days for workers from Belgium and 19 days for workers from Germany (above these limits, cross-border workers' wages would be taxable in their home country), the Luxembourg Government signed agreements with the respective countries to extend remote working until the end of 2021. The agreements temporarily remove these limits, while also exempting those workers concerned from paying social security contributions in their home country if they exceed the 25% threshold provided in EU legislation. Exceptionally, for the duration of the temporary agreements, cross-border workers can continue to be eligible for Luxembourg social protection and will continue to pay income tax exclusively in Luxembourg, regardless of how many days they work from home.

Given that 71% of those who worked from home during the lockdown would like to continue to do so to some degree (while 18% would prefer to return to the workplace), a new inter-professional agreement on working from home was signed in October 2020 by the Luxembourg Employers' Association, the Independent Luxembourg Trade Union Confederation and the Luxembourg Confederation of Christian Trade Unions. In this agreement, the 'social partners' provide a definition for working from home and set out its scope and its voluntary nature (for employers and employees alike). Points worth noting are the principle of guaranteed equal pay for those working from home and those in the workplace; the possibility for remote workers to request training in the specific tools made available by the employer; and respect for employees' private lives.

STRENGTHENING THE ASSETS AND TRANSPARENCY OF THE FINANCIAL INDUSTRY

Representing 25.7% of GDP, 10.8% of employment and 19.1% of fiscal revenues in 2020, the financial industry continues to drive Luxembourg's economy and to serve as a catalyst for qualitative growth. With its unparalleled range of services, well-developed financial infrastructure and considerable expertise, Luxembourg is a global financial hub. It is currently the leading European centre for investment funds (the country is ranked second at international level, behind the USA) with net assets under management of €5,520,000m. in June 2021, managed by 3,611 investment funds in 14,808 portfolios and traded in more than 70 countries (data from February). The LuxSE lists more than 37,000 securities, and 26% of all bonds listed in the EU are listed on the LuxSE, including sovereign bonds from 17 EU member states. The country houses the European Investment Bank (EIB) and the European Investment Fund, investing roughly €80,000m. per year in the European and global economy.

Luxembourg is also the largest centre for private banking in the eurozone and the largest reinsurance centre in Europe. As at 1 January 2020 it was home to 127 banks from 30 countries (with assets of €815,100m. compared with €768,700m. in the previous year), which employ 26,334 professionals (81% non-Luxembourgers). At February 2021 there were 126 banks operating in Luxembourg. In view of the large number of foreign banks in Luxembourg, the degree of internationalization of its financial centre (96.5%) is the highest in Europe. In recent years, new banks from third countries have established their European hubs in Luxembourg, including the seven largest Chinese banks. In addition, many international banking groups are establishing centres of excellence in Luxembourg, in private banking, fund administration, custodian services or treasury management, or as booking centres for international loans.

Luxembourg has pursued reforms to increase transparency in line with the most important regulations agreed at international level, including the automatic exchange of tax information for individuals in line with the Foreign Account Tax Compliance Act, in force since July 2015, and the end of banking secrecy pursuant to the OECD Common Reporting Standard. Also worth noting are the forthcoming law transposing the EU Anti-Tax Avoidance Directive, the establishment of the Multilateral Convention to Implement Tax Treaty Related Measures to Prevent BEPS (Base Erosion and Profit Shifting) and the international working groups tackling harmful tax competition. These will be enhanced by the Directive on Administrative Co-operation 5 (DAC 5) on access to anti-money-laundering information collected by tax authorities, as well as DAC 6 on transparency rules for intermediaries, and by the General Data Protection Regulation, which came into force in May 2018. Luxembourg is currently implementing DAC 6 into domestic law, and reporting duties have been applicable since mid-2020.

The attractiveness of Luxembourg as a financial centre is liable to be affected by the process of tax and financial harmonization at EU and OECD levels and the new regulatory environment, namely, the three pillars of Banking Union (the Single Supervisory Mechanism, the Single Resolution Mechanism and the European deposit guarantee scheme) and the liquidity regulation provided under the Basel III agreement. To offset this risk, the country is pursuing the diversification and specialization of its financial industry. Luxembourg's investment fund industry benefits from EU passports under the regulatory framework provided by the Undertakings for Collective Investment in Transferable Securities Directive and the Alternative Investment Fund Managers Directive. These enable Luxembourg to offer investment funds to other EU countries which remain under the supervision of the European Central Bank/CSSF. The Systemic Risk Committee (SRC) will closely monitor the links between banks and the fund industry, as well as developments in the housing market. The Banque Centrale du Luxembourg (BCL) serves as the Secretariat to the SRC.

PURSUING AN AGENDA OF INNOVATIVE SUSTAINABLE FINANCE

Since 2017 Luxembourg's financial centre has been at the forefront of developing initiatives and financial instruments that are specifically designed to support sustainable finance.

Through its involvement in a number of initiatives at international and EU level, Luxembourg has the potential to drive the political agenda for sustainable development. It is a member of the International Network of Financial Centres for Sustainability; the BCL is a member of the Central Banks and Supervisors Network for Greening the Financial System; the Luxembourg Government is actively engaged in discussions at EU level as a member of the EU Member States Expert Group on Sustainable Finance; the LuxSE actively contributes to various working groups at EU level and also chairs the United Nations Sustainable Stock Exchanges Initiative's Green Finance Advisory Committee; and the Luxembourg Bankers' Association chairs the working group on incentives and disincentives for sustainable finance in the European Banking Federation.

In 2020 the labelling agency for sustainable financial projects (LuxFLAG) saw record growth in sustainable bond issuance, with €186,000m.-worth of new issuance, 51% of it in sustainable, social and green securities. Meanwhile, Luxembourg and the EIB have launched an innovative climate finance platform, with the aim of encouraging investment in projects combating climate change.

Luxembourg increasingly plays the role of a gateway to and from China. Chinese banks in Luxembourg not only serve Chinese-based clients (enabling them to invest in Europe), but also provide European clients with the expertise and opportunity to invest in China. The LuxSE's Chinese domestic Green Bond Channel bridges the information gap between Chinese issuers and international investors. Green bonds listed on the Shanghai Stock Exchange can be traded via existing channels, and co-operation with the LuxSE focuses on providing exhaustive information in English to offshore investors. With a market share of 50% for European High Yield Bonds, the LuxSE is the leading exchange for this type of security. Luxembourg is also the leading financial centre for Islamic finance outside Muslim countries, demonstrating its expertise by becoming the first country to issue a sovereign sukuk (Islamic bond) in euros. In September 2020 Luxembourg successfully issued its first sovereign sustainability bond of €1,500m., which will go towards financing and refinancing sustainable projects. In October 2020 the European Commission and the LuxSE listed the first bond issued under the EU SURE programme, which was the European Commission's first social bond issuance. (The European Commission listed its first bond on the LuxSE in 1983 and has since listed 107 bonds worth a total of €206,000m. on the exchange, 48 of which are still active.) In June 2021 the LuxSE listed the first bond issued by the European Commission under the Next Generation EU economic recovery package following the COVID-19 pandemic. The €20,000m. 10-year bond is the largest single tranche bond transaction ever issued by the EU. The bond was seven times oversubscribed, attracting an order book in excess of €142,000m. European investors took 87% of the bonds, with 10% going to Asian investors and the remaining 3% to investors from the Americas.

Luxembourg's early development of outstanding expertise in microfinance in the 2000s provided the foundation for its development of impact finance and sustainable finance in general. A total of 31 microfinance funds accounting for 50% of all global Microfinance Investment Vehicles are currently based in Luxembourg. The country has been a driving force for the creation of internationally recognized networks such as the Inclusive Finance Network and the European Microfinance Platform.

Luxembourg has also witnessed a broad spectrum of financial technology (fintech) activities, driven by the integration of social, mobile, analytics and cloud technologies and supported by an innovation-friendly and responsive financial regulator. Leading international players in the payments sector, such as PayPal, Amazon Payments and Six Payment Services, have chosen Luxembourg as their hub to serve the entire EU market. In Luxembourg, they leverage a regulatory framework of payment licences to passport their services across the EU and draw on the country's supportive fintech ecosystem and state-of-the-art IT infrastructure. The Luxembourg House of Financial Technology, founded in 2017, has proved to be a successful national platform for those involved in the digitization of financial services. Several groups of companies have developed projects based on blockchain (cryptocurrency) technology, especially in the area of investment funds. The CSSF has taken a proactive approach to ensure the effective regulation of fintech developments.

PUBLIC FINANCES, DEBT AND INVESTMENT IN EXCEPTIONAL CIRCUMSTANCES

Before the pandemic crisis, public finances in Luxembourg recorded a surplus (a trend witnessed for nine successive years), which in 2019 stood at €1,384.4m., equivalent to 2.2% of GDP. Despite Luxembourg's fiscal position being among the strongest in the EU, long-term fiscal sustainability concerns remain, owing to the projected increase in costs as a result of an ageing population.

In response to the unprecedented circumstances brought about by the pandemic—and with the EU activating the 'general escape clause' of the Stability and Growth Pact, resulting in a temporary suspension of the sanction mechanism—the Luxembourg Government introduced an exceptional system of financial assistance, while taking care not to jeopardize its medium-term budget sustainability. In these circumstances, the data published by STATEC on 30 June 2021 indicated a return to normal for public finances. The revenue collected by the Government for the first half of 2021 amounted to €11,000m. (an increase of 24.8% year on year, when the pandemic was in full swing, and of 10% compared with the first half of 2019). Direct tax revenue stood at €5,200m. (up by 18.9% and 6.5% from the first halves of 2020 and 2019, respectively), with positive growth attributable to a dynamic employment market and to revenue from income tax. Indirect tax (including value-added tax) generated revenue of €3,300m. (up by 35.9% and 21.5% compared with the same periods in 2020 and 2019, respectively), reflecting a pick-up in consumption. Revenue from excise duties was also higher, reaching €852m. in the first half of 2021 (18.7% more than the equivalent period in 2020 but a similar level to 2019). This can be explained in large part by a substantial decline in fuel sales during 2020, which also led to a reduction in greenhouse gas emissions.

In the first half of 2021 government expenditure reached €10,900m. This represents a fall in spending of 4.5% compared with 2020, which can be explained by a decline in recourse to some financial assistance instruments (especially the short-time working scheme). Spending was none the less 16% higher than in 2019, in line with the Government's investment policy. Moreover, the €93m. granted to Luxembourg under the EU's Recovery and Resilience Facility (for social cohesion, the green transition and digitization) will come in addition to the €2,900m. of investments planned for 2021.

As at 30 June 2021 Luxembourg's public debt stood at €17,900m., or 25.9% of GDP; this remains well below the bar of 30% of GDP set by the Government and is one of the lowest levels in the eurozone. By late 2021 Luxembourg appeared to have turned the page on the COVID-19 crisis, with its GDP set to increase by 4.3% in 2021 and a full return to normal expected for 2022, with predicted growth of 3.5% (higher than the pre-crisis period). The rate of employment was expected to grow by 2.5% in both 2021 and 2022, driven by dynamism in most services (especially health care, social action—which includes social services and social housing, for example—and finance), and the unemployment rate is not expected to exceed 6% in either year.

With one of the lowest debt-to-GDP ratios in Europe and strong economic foundations, Luxembourg is the only eurozone country apart from Germany to have been awarded an AAA credit rating by all the major financial rating agencies—a major asset that was confirmed in September 2021, making the country one of only nine worldwide to be given the top rating by the three leading agencies. The main challenges facing Luxembourg are the rising costs of an ageing population—among the highest in the eurozone—as well as the introduction of measures designed to standardize financial practices.

A COMPETITIVE BUSINESS ENVIRONMENT FOR A DATA-DRIVEN ECONOMY

After several years of mixed performances, Luxembourg's business environment has experienced a marked improvement since 2016, driven mainly by increased economic efficiency and competitiveness, reforms introduced by the Government and a more positive sentiment among businesses. In early 2020 there were some 37,807 companies in Luxembourg—1,484 more than in 2019. Over the past five years there has been 2.2% growth in the creation of new businesses, with the largest number of companies created in the area of specialized, scientific and technical activities (8,898 companies) and the fewest in industry (just nine companies). The proportion of companies in financial, insurance and reinsurance services is just 3.3%, but these serve as the driving force of the economy in terms of value added. This sector is likely to continue to grow, with the positive impact of the UK's departure from the EU (especially company relocations) soon to become apparent. In 2020, of the 1,206 companies that filed for bankruptcy in Luxembourg (down by 2.6% compared with 2019), most were holding companies and investment funds (27%), followed by companies in the retail sector (21%) and those in specialized, scientific and technical sectors (12%) and the building industry (10%). A total of 2,032 jobs were lost, with the most affected sectors being the building industry (31%), non-financial services (23%), hospitality (19%), retail (17%), industry (9%) and financial services (2%). According to Eurostat estimates, SMEs (companies with fewer than 250 employees) represented 99.5% of all the country's companies in 2020. The main stakeholders in the field—the Chambers of Commerce, Trades, Crafts, Tourism, Hospitality, etc.—are working alongside the Government on a high-level committee to boost SMEs and entrepreneurship, which since 2016 has developed a National Action Plan to support SMEs. Now in its fifth iteration, in force since 2019, it provides for the implementation of effective, innovative instruments such as the SNCI, guichet.lu (a secure interactive platform, through which individuals and companies can carry out administrative procedures online), the business inventory and LëtzShop. The plan also includes new strategies to help SMEs to access additional funding for the digital transition and introduces a 'second-chance entrepreneurship' scheme, which gives bankrupt entrepreneurs another chance after a failed business venture.

The European Commission's latest Digital Economy and Society Index (DESI 2020) places Luxembourg in 10th position in the EU for the integration of digital technology by companies (a lower ranking than in 2019, when it was in sixth place). In recent years Luxembourg has made progress with its multi-disciplinary 'Digital Lëtzebuerg' strategy, launched in 2014 by the Government together with private, public and academic stakeholders. Since 2018 the Government has included a Ministry for Digitization (led by the Prime Minister), which aims to co-ordinate all stakeholders and to boost development in the field of digitization and e-government. Considerable progress has been made in terms of policy, at government level (including administrative bodies) and in the education sector. Notable achievements are the inclusion of coding in the education curricula of cycle 4 of the basic education programme, the Digital4Education strategy and the artificial intelligence strategy, which includes measures to boost advanced digital skills. The introduction of digital technologies in companies none the less remains a challenge, although in 2019 the first Digital Innovation Hub was set up to boost digitization in industry, particularly among SMEs.

In 2020 Luxembourg gained one position in the DESI in the ranking on connectivity (third place in the EU), but performed less well in terms of the human capital indicator, and it lost three places (falling from ninth to 12th position) in the ranking for use of the internet.

In June 2021 Luxembourg inaugurated one of the most powerful supercomputers in Europe, with a calculating power of 10 petaflops (10 million billion operations per second). Costing €30.4m., this feat of technology, known as MeluXina—a project in which researchers from the University of Luxembourg played a major role—is hosted at the LuxConnect data centre in Bissen and powered entirely by green energy produced in part by the company Kiowatt, which generates power via a co-generation plant fuelled by waste wood. Luxembourg has also signed the Declaration creating a European Blockchain Partnership and the Declaration on Co-operation on Artificial Intelligence, thereby consolidating the potential of MeluXina in the digital economy in general and especially in the financial centre.

Luxembourg is strengthening its position as a centre of excellence for cybersecurity (the country is a leader in certified data centres) and e-embassies—an innovative concept in diplomatic relations that combines hosting sensitive data in a friendly country with guarantees of immunity. After Estonia set up an e-embassy in 2017, hosted in Luxembourg (the world's first), Monaco set up a 'sovereign cloud' in the country in 2021.

CONCLUSION

Luxembourg's economy has come a long way since the Second World War, especially in recent years. The once bipolar agricultural/industrial society has become a competitive society based largely on knowledge-intensive services, characterized by high-performing human capital, political stability, prosperity and a strong welfare system. Among the key growth factors for Luxembourg, five can be identified as particularly important: the country's integration into larger economic areas; the systematic development of infrastructures; a permanently available workforce (through migration and cross-border workers); the existence of growth niches and high-value-added economic diversification; and a high level of social protection. The country's proactive political leadership—a source of long-term continuity—has turned exogenous challenges into opportunities, integrating them into a creative economic policy. Within Luxembourg's long-term strategic vision, the economy has been the main area in which political platforms have converged, underpinned by two pillars: a balanced approach and a culture based on consensus and peaceful labour relations. The 'Luxembourg consultation model' and Luxembourg's specific brand of social stability largely reflect this: agreement is reached between the 'social partners' (within the Consultative Tripartite Committee and the Economic and Social Council) before legislation is adopted by parliament, thereby creating an environment conducive to social solidarity where any potential disagreements can be identified and resolved in advance. The country has consolidated its national identity by opening itself up to the international community. If Luxembourg is to safeguard its welfare state and boost competitiveness, especially in the post-COVID-19 world, it will have to tackle three recurrent issues: an ageing population, unemployment (particularly among young people and over the long term) and the sustainability of the social security system. The growing community of science, research and innovation bodies, with the University of Luxembourg at its centre, is playing a key role in identifying and implementing the most advanced, competitive solutions for Luxembourg's society and economy.