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OVERVIEW

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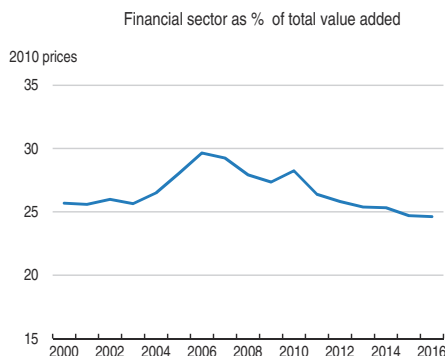
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Executive summary

- *Economic growth is strong*
- *A better skills strategy is needed to make growth more inclusive*
- *Improving integration of immigrants would boost well-being*

Economic growth is strong

Financial sector is the backbone of the economy



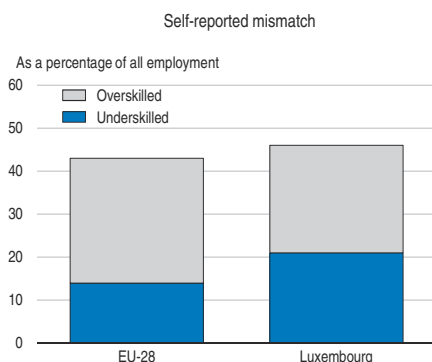
Source: OECD National Accounts Statistics.

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Luxembourg's economic performance is very strong thanks to the dynamic services sector, business-friendly regulations, predictable tax system, sound fiscal policies and openness to global talent. The pace of job creation is strong and benefits not only residents but also cross-border workers and immigrants. The large financial sector is well supervised, but is not exempt from risks. The linkages between domestic banks and international investment funds should continue to be closely monitored. Domestic banks have exposure to high household indebtedness in a context of rising housing prices; this may justify the introduction of additional macro prudential measures.

A better skills strategy is needed to make growth more inclusive

Skills mismatch is high



Note: Workers are classified as underskilled if they report that they need further training to cope well with their duties or overskilled if they report that they have the skills to cope with more demanding duties.

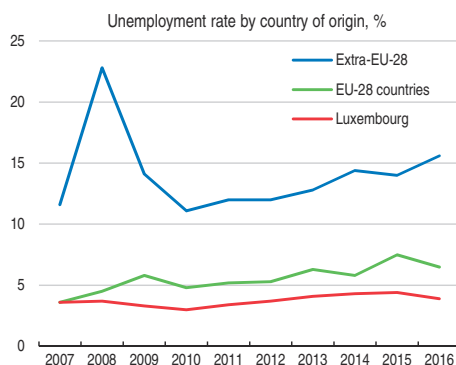
Source: Sixth European Working Conditions Survey, 2015.

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To reduce reliance on the financial industry, the government has prepared the “Third Industrial Revolution” strategy focusing on new digital technologies and renewable energy. This is welcome and should be followed by policy measures to help it happen, such as supplying the skills needed in these new sectors. Skills mismatches are already high and further improvements in the education system will therefore be important, with a focus on lifelong learning. The supply of skills should be better aligned with labour market needs. This would entail reorienting labour market policies from supporting job creation towards funding training programmes to facilitate the reallocation of labour.

Improving integration of immigrants would boost well-being

Non-EU immigrants face higher unemployment



Source: Eurostat, Employment and Unemployment (Labour Force Survey) database.

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Luxembourg benefits from immigrants, which play a successful role in the economy. Integration challenges remain, though, especially regarding people from non-EU countries, who suffer from higher unemployment. As language proficiency is a key precondition for successful integration, public supply of language courses should be stepped up further. To reduce employment segmentation, access to public sector jobs should be improved. Education reforms seek to make schools more equitable for the children of immigrants, but challenges remain. Equality between men and women is being promoted by easing access to childcare and making taxation more gender neutral.

MAIN FINDINGS	KEY RECOMMENDATIONS
Making growth more resilient and greener	
Some banks are exposed to international investment funds. Domestic banks are also exposed to high household indebtedness and increasing housing prices.	<p>Develop further the capacity to undertake regularly system-wide stress tests of fund-bank linkages and consider publishing their results.</p> <p>Introduce additional macro prudential measures, such as limits to loan-to-value or loan-to-income ratios.</p> <p>Improve access to credit for SMEs by introducing a central credit registry.</p>
The supply of housing does not meet the increasing demand, mainly due to weak incentives to use land available for construction.	<p>Reform land planning and introduce time-limited building permits.</p> <p>Increase taxation of non-used constructible land.</p> <p>Limit further mortgage interest deductibility to reduce housing demand.</p>
Short-term fiscal stance is adequate, but Luxembourg faces high age-related costs that may, in the absence of further changes, become unsustainable.	<p>Align the legal age of pension entitlement with increases in life expectancy.</p> <p>Link more closely the level of pensions to the level of contributions.</p>
Taxes and excise duties on transport fuel in Luxembourg are lower than in neighbouring countries, adding to traffic congestion and air pollution.	<p>Increase taxes and excise duties on transport fuel.</p> <p>Explore the introduction of a system of congestion charges.</p> <p>Improve cross-border railway connections and transport infrastructure.</p>
Better skills for more inclusive growth	
Secondary education involves grouping pupils by ability at an early age and high rates of grade repetition.	<p>Provide earlier individualised support to students falling behind.</p> <p>Improve the mobility between education programmes via curriculum alignment and differentiated teaching.</p>
The better educated profit most from lifelong learning, while the participation of adults with lower educational attainment remains low.	Create individual learning accounts and expand the individual study leave to enhance access to lifelong learning.
Low conditionality and generous social transfers reduce incentives to work of low-skilled youth, older workers and second earners.	Adjust the tax and benefit system to increase incentives to work for low-skilled youth, older workers and second earners.
Improving the integration of immigrants	
Most part-time workers are women, which is not always a choice.	<p>Improve the availability of high-quality child care</p> <p>Provide incentives for fathers to share parental leave.</p>
Learning several languages is a key precondition for successful integration in Luxembourg's multilingual society.	<p>Continue to increase public supply of language courses.</p> <p>Diversify language training to take better account of workplace needs.</p>
Asylum seekers face long periods of inactivity.	<p>Speed up decisions on asylum applications. While waiting for a decision, ease provisional labour market access for applicants with high prospects of being allowed to stay.</p>
Immigrants are under-represented in public employment.	Ease immigrants' access to public sector jobs.

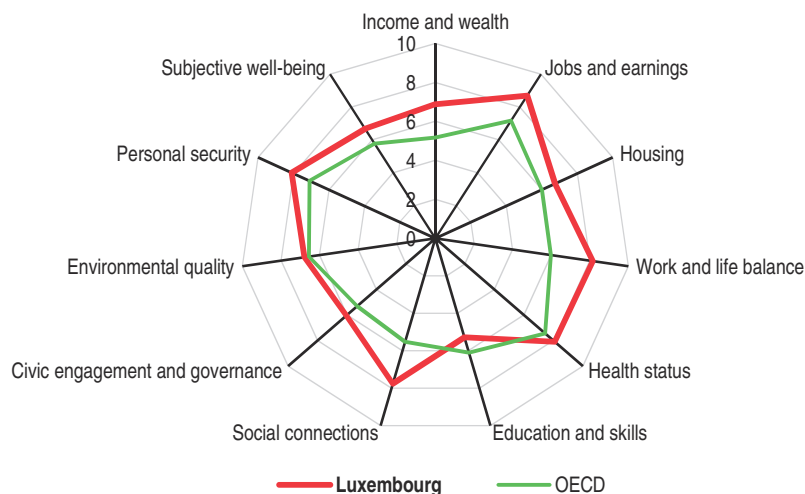
Assessment and recommendations

- *Macroeconomic developments*
- *Green growth requires further investment*
- *Better skills for more inclusive growth*
- *Making better use of existing skills*
- *Improving the labour market and social integration of immigrants*

Luxembourg is an advanced economy with the highest per capita income in the OECD, reflecting the dynamic services sector, notably in banking and other financial services. Foreign investment is attracted by the business-friendly regulations, predictable tax system and sound macroeconomic policies. Foreign workers are attracted by the abundance of jobs and many cross-border workers commute every day from neighbouring regions. More than 40% of total employment is filled by non-residents, while some 45% of residents are foreigners who do not hold Luxembourg citizenship. Because of the high share of cross-border workers the gross national income (GNI), which excludes factor income from domestic production that accrues to non-residents, is lower than gross domestic product (GDP) by about a third (OECD, 2015a).


Strong economic performance and well-run institutions make life good for most residents (Figure 1). Average earnings are the highest in the OECD, while labour market insecurity and the long-term unemployment rate are well below the OECD average. Income inequality is low and poverty is limited thanks to the redistributive tax and transfer system, making Luxembourg one of the most egalitarian countries of the OECD. Yet, outcomes in education and skills remain below the OECD average and room for improvement exists in other areas, such as climate and energy.

Figure 1. **Life is good in Luxembourg**



Note: Each index dimension is measured by one to four indicators from the OECD Better Life Index (BLI) set. Normalised indicators are averaged with equal weights. Indicators are normalised to range between 10 (best) and 0 according to the following formula: $(\text{indicator value} - \text{minimum value}) / (\text{maximum value} - \text{minimum value}) \times 10$. The OECD aggregate is weighted by population.

Source: OECD (2016), OECD Better Life Initiative 2016, www.oecd.org/statistics/better-life-initiative.htm.

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Since the last *Economic Survey*, the government has introduced several reforms to further improve Luxembourg's economic performance. Thanks to fiscal surpluses, a new tax reform will gradually reduce the corporate income tax rate, while making the personal income taxes

more progressive and introducing new tax credits for investors and low-income earners. The disability benefit system was reformed to facilitate labour market re-integration of workers with partial disabilities and increase the effective retirement age by limiting transition from disability to early retirement. Some stringent regulations were eased: the fixed tariffs for services of architects and engineers were abolished and the procedure for issuing housing permits simplified. Education sector reforms increased the availability of early childhood education and care and support for university students.

Against this backdrop, the key messages from the Survey are:

- The fiscal position is currently strong, with a very low public debt ratio, but on unchanged policies, age-related government spending will increase sharply in the long run, especially pensions.
- The modernisation strategy will require improvements in education outcomes, especially for immigrants, to enhance equity and social cohesion, and better upskilling of workers over their lifetime.
- Inclusive growth would also benefit from reducing work disincentives faced by low-skilled youth, women and older workers.

Macroeconomic developments

Economic growth is projected to stay strong

GDP growth has been strong and resilient in the past three years and is projected to remain robust, at 4%, well above the euro area average (Table 1 and Figure 2). The growth of total factor productivity has been strong. The external position remains characterised by a strong current account surplus, stemming from trade in services – mainly exports of financial services, and net international assets of 20% of GDP. The debt of non-financial corporate sector is high, in part due to debt issuance of multinational companies (Figure 2). Exports are projected to strengthen as financial sector activity further expands, thus boosting Luxembourg's external position. In addition to supportive monetary conditions, fiscal policy is projected to provide a strong impetus to domestic demand in both 2017 and 2018, following the reductions in personal and corporate income tax rates. As a result, the fiscal surplus of the general government is projected to decline in 2017 and remain broadly stable in 2018. With economic activity remaining strong, total employment has expanded fast, helping to reduce the unemployment rate from 7.1% in 2014 to 6.4% in 2016. Inflation rebounded in the second half of 2016, following the reversal in oil prices. With the cumulative increase of consumer prices reaching the 2.5% threshold, the automatic indexation of wages and pensions was triggered for the first time since 2013. The immediate wage increase could provide an impetus to the core inflation and rekindle wage growth that stayed below 1% in both 2015 and 2016.

Given the importance of Luxembourg's financial sector, growth will depend on global financial-market developments. Financial and monetary conditions are supportive of the euro area recovery and hence positive for Luxembourg, although the low level of interest rates may also contribute to strong housing price increases. Aggregate indicators of macro-financial vulnerabilities have receded from the pre-crisis levels (Figure 3, Panel A), but high cross-border financial linkages between domestic banks, their parent or other banks, possibly outside the EU regulatory and supervisory framework, and investment funds could transmit external shocks into the domestic economy. External bank indebtedness, measured as a share of cross-border liabilities in total liabilities of banks, has increased from the 2007 levels (Figure 3, Panel B).

Table 1. Macroeconomic indicators and projections
Annual percentage change, volume (2010 prices)

	2013 Current prices (billion EUR)	2014	2015	2016	Projections	
					2017	2018
Gross domestic product (GDP)	46.5	5.6	4.0	4.2	4.5	4.2
Private consumption	14.8	2.9	3.3	1.0	3.2	3.2
Government consumption	8.0	2.0	2.4	3.2	1.8	2.7
Gross fixed capital formation	8.9	5.7	-0.9	0.2	9.2	4.3
Final domestic demand	31.7	3.4	1.8	1.3	4.6	3.4
Stockbuilding ¹	-0.7	0.4	0.8	-0.2	0.0	0.0
Total domestic demand	30.9	7.2	3.4	0.8	4.5	3.6
Exports of goods and services	89.8	11.4	11.2	4.3	5.0	4.6
Imports of goods and services	74.3	12.4	12.1	4.0	5.2	4.5
Net exports ¹	15.6	2.2	2.2	2.1	1.5	2.0
Other indicators (growth rates, unless specified)						
Potential GDP	..	3.4	3.2	3.0	3.0	3.1
Output gap ²	..	-2.0	-1.3	-0.1	1.4	2.5
Employment	..	2.3	2.1	2.2	2.5	2.1
Unemployment rate	..	7.1	6.8	6.4	6.0	5.9
GDP deflator	..	1.6	0.7	-0.6	1.6	2.0
Harmonised consumer price index	..	0.7	0.1	0.0	2.4	1.6
Harmonised core consumer price index	..	1.3	1.7	1.0	1.1	1.7
Household saving ratio, net ³	..	15.1	15.6	16.7	16.7	16.6
Current account balance ⁴	..	5.0	5.1	4.7	4.7	4.8
General government financial balance ⁴	..	1.4	1.4	1.6	0.7	0.6
Underlying government primary fiscal balance ²	..	2.0	1.8	1.4	-0.2	-0.7
General government gross debt ⁴	..	31.6	30.8	27.6	29.9	32.1
General government gross debt (Maastricht) ⁴	..	22.4	21.6	20.0	22.3	24.5
General government net debt ⁴	..	-50.3	-49.6	-50.4	-48.2	-45.9
Short-term interest rates	..	0.2	0.0	-0.3	-0.3	-0.3
Long-term interest rates	..	1.3	0.4	-0.2	0.4	0.8

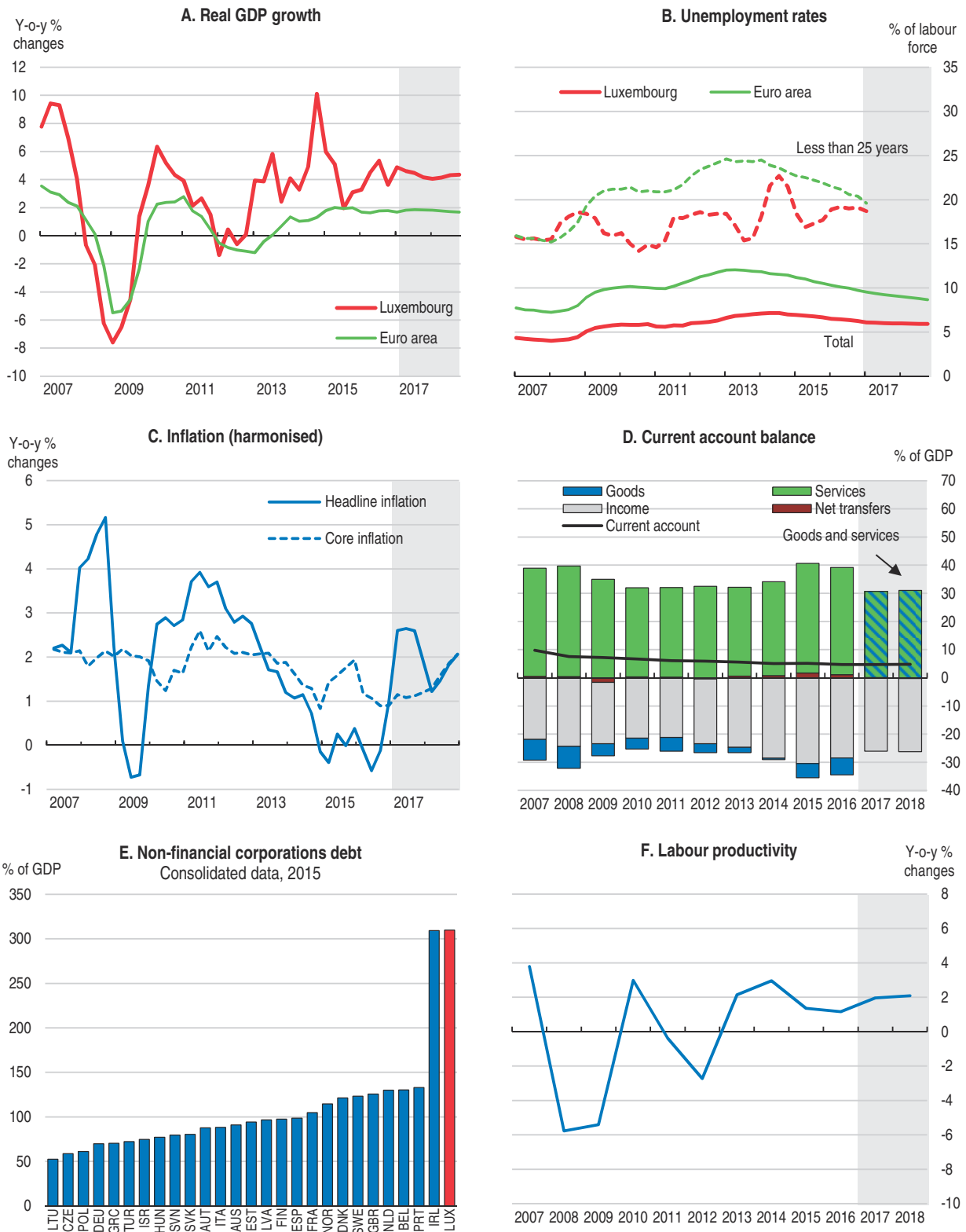
1. Contribution to changes in real GDP.
2. As a percentage of potential GDP.
3. As a percentage of household disposable income.
4. As a percentage of GDP.

Source: OECD Economic Outlook 101 Database.

In the medium term, many mid-skilled jobs, including routine tasks in the financial sector such as accounting, data collection and processing and contract verification, are at risk of automation that does not require substantial capital investment and may occur fast (McKinsey, 2015; Deloitte, 2016). With a specialisation in back-office activities, Luxembourg is particularly exposed. New financial technology (Fintech) is reinforcing pressures on the traditional financial sector. Some 26% of traditional banking business in Luxembourg may be lost to Fintech in the next 5 years, mainly in asset and wealth management and transfer and payments (PricewaterhouseCoopers, 2016), although this loss can be compensated partially by new jobs as Luxembourg is developing its digital financial services. The experience from the outsourcing of iron and steel industry, which slashed production and dismissed two-thirds of workers, underlines the need of preventive measures, in order to avoid the social consequences in case of a major restructuring.

To support the diversification of the economy, the government has formulated a long-term growth strategy centred on digitalisation and renewable energies, the “Third Industrial Revolution” strategy (Rifkin et al., 2016). The ambition is to encourage stakeholders to adapt

Figure 2. Macroeconomic developments are healthy

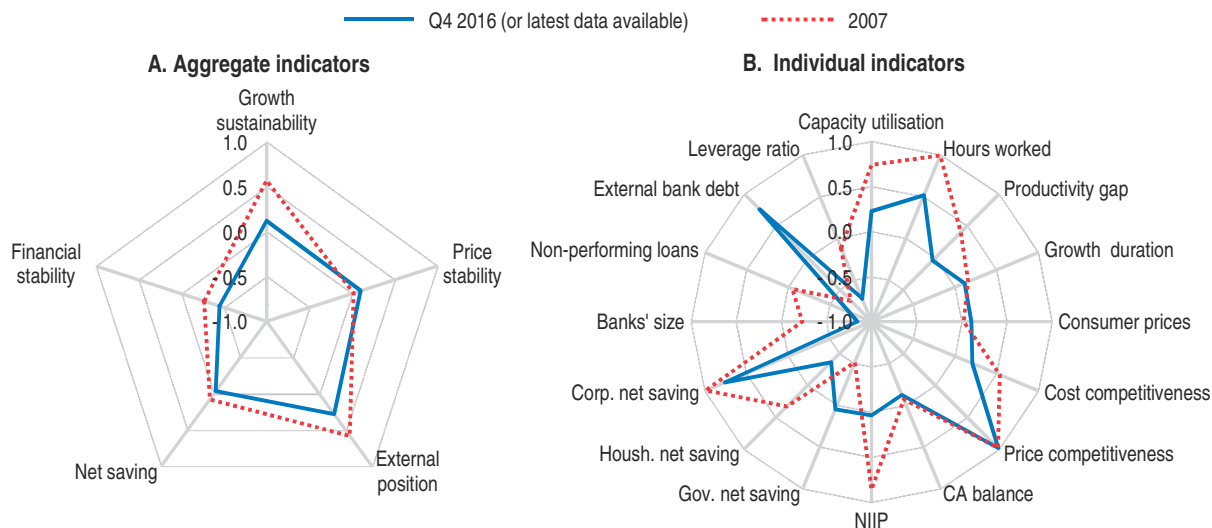


Source: OECD Economic Outlook 101 Database; Eurostat, Employment and Unemployment (Labour Force Survey) Statistics; OECD National Accounts Statistics.

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Figure 3. **Evolution of macro-financial vulnerabilities since 2007**

Deviations of indicators from their real time long-term averages (0), with the highest deviations representing the greatest potential vulnerability (+1), and the lowest deviations representing the smallest potential vulnerability (-1)¹



1. Each aggregate macro-financial vulnerability indicator is calculated by aggregating (simple average) normalised individual indicators. Growth sustainability includes: capacity utilisation of the manufacturing sector, total hours worked as a proportion of the working-age population (hours worked), difference between GDP growth and productivity growth (productivity gap), and an indicator combining the length and strength of expansion from the previous trough (growth duration). Price stability includes headline and core inflation (consumer prices), and it is calculated by the following formula: absolute value of (core inflation minus inflation target) + (headline inflation minus core inflation). External position includes: the average of unit labour cost based real effective exchange rate (REER), and consumer price based REER (cost competitiveness), relative prices of exported goods and services (price competitiveness), current account (CA) balance as a percentage of GDP and net international investment position (NIIP) as a percentage of GDP. Net saving includes: government, household and corporate net saving, all expressed as a percentage of GDP. Financial stability includes: banks' size as a percentage of GDP, the share of non-performing loans in total loans, external bank debt as percentage of total banks' liabilities, and capital and reserves as a proportion of total liabilities (leverage ratio).

Source: OECD calculations based on OECD (2017), OECD Economic Outlook: Statistics and Projections (database), February; OECD (2017), Main Economic Indicators (database), February; OECD (2017), OECD National Accounts Statistics (database), February; IMF, Financial Soundness Indicators database; ECB, Statistical Data Warehouse and Thomson Reuters Datastream.

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to a changing environment and prepare society for upcoming trends such as digitalisation, automation, decarbonisation, the circular economy and the sharing economy.

Luxembourg's future growth also depends on further international trade expansion, and would therefore suffer from an increase in global protectionism. On the upside, Luxembourg's financial centre may become even more attractive in the wake of Brexit. Luxembourg is implementing the OECD/G20 Base Erosion and Profit Shifting (BEPS) project and the EU anti-tax-avoidance legislation, which could be beneficial in the long run, by creating a more level playing field in corporate taxation and emphasising its competitive advantages, such as political stability and a highly qualified labour force (Box 1).

Risks facing the financial sector need to be addressed

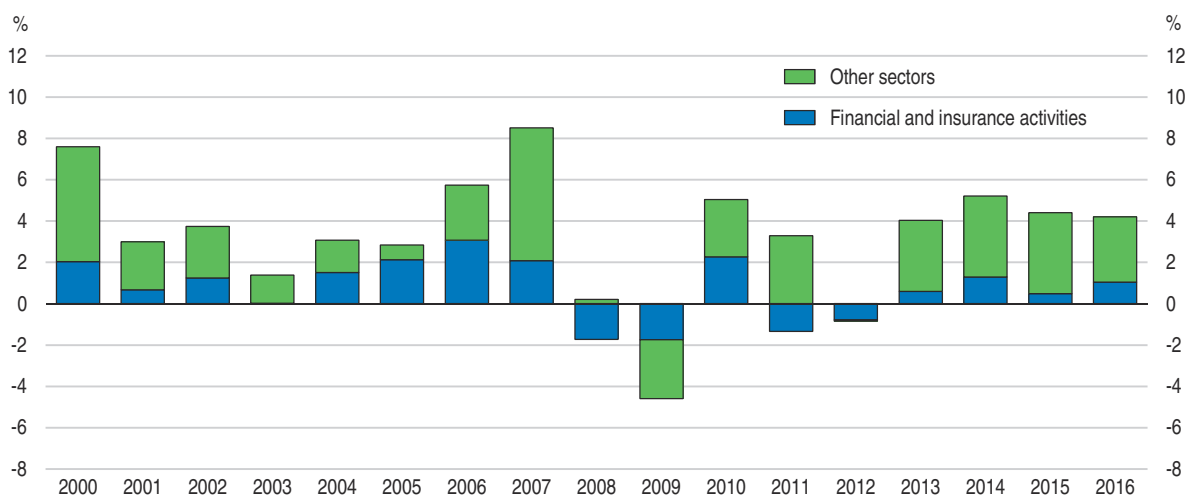
The financial sector remains the driver of economic growth, representing 28% of gross value added and 10% of employment in 2015 (Figure 4). Only a handful of banks in Luxembourg have domestic ownership and focus on the domestic market. The bulk of the financial sector consists of banks with foreign ownership and various non-bank institutions managing the assets of investment funds oriented towards international markets. Conversely to the euro area financial sector with strong downsizing pressures, activity and employment in financial intermediaries in Luxembourg has expanded since 2012. Assets

Box 1. Medium-term vulnerabilities of the Luxembourg's economy


Vulnerability	Possible outcome
High dependence on the financial sector	Linkages between domestic banks their parent or other banks, possibly outside the EU regulatory and supervisory framework, and investment funds could transmit external shocks to the domestic economy. As an established financial centre, Luxembourg may attract new business in the wake of Brexit.
Some financial sector jobs are at risk of automation.	Faster than expected automation of support roles in the financial sector, such as back office, accounting and legal support, may trigger labour reallocations and downward wage pressure.
Rising protectionist pressures in trade and investment	As a small open economy, Luxembourg is highly dependent on unimpeded trade in services and investment flows. An increase in trade protectionism would lead to a decrease in net exports and hence GDP growth.

Figure 4. **Financial services contribute strongly to GDP growth**

Contributions to total value added growth



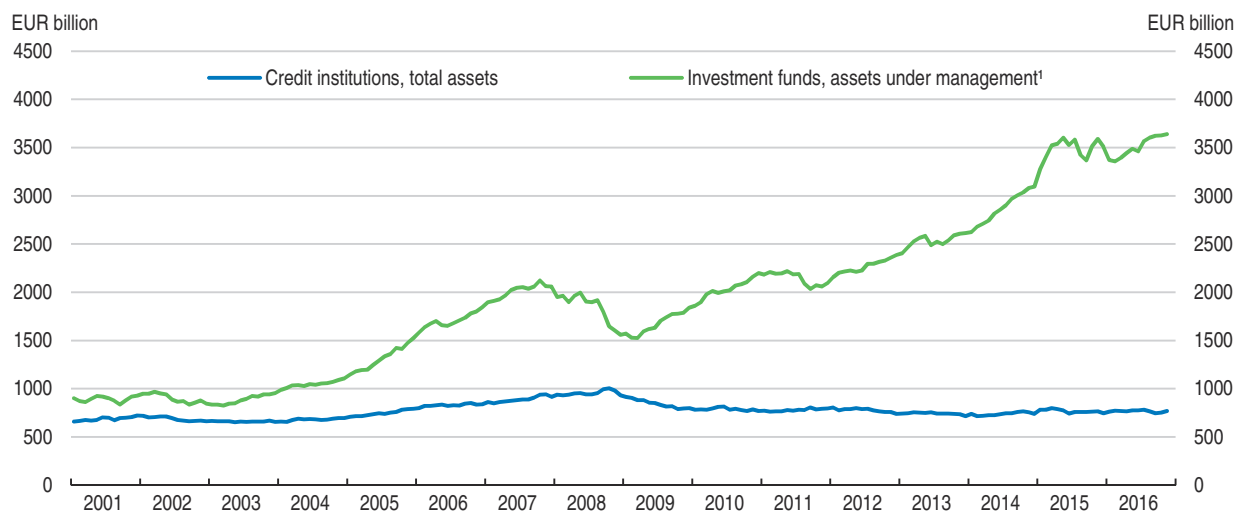
Source: OECD National Accounts database.

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managed by non-bank financial institutions are increasing (Figure 5), although banks still account for majority of profits and employment in the financial industry.

However, as noted, high dependence on the financial sector developments has its risks (Table 2). Investment fund assets tend to be volatile, and the low interest rate environment is an incentive for higher risk taking. The propagation of shocks from investment funds to banks and the real economy may work through several channels. Investment funds hold cash and other direct claims on banks and these deposits are sometimes channelled to the parent or other banks, possibly outside the EU regulatory and supervisory framework. Conversely, banks may also own the asset managers of investment funds that may be obliged to provide liquidity support to funds in the case of stress. Banks could also lose the fees and other payments from investment funds for the depository services, brokerage and accounting (IMF, 2016).

The share of fiscal revenues from the financial sector has declined markedly since the financial crisis, possibly reflecting carried forward losses by banks, and any such negative shock would lower the fiscal revenues further. However, financial sector diversification and

Figure 5. **Assets under management are at a record high**

1. Undertakings for collective investment (UCI), net assets.

Source: Banque centrale du Luxembourg, Statistical tables; Commission de surveillance du secteur financier.


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Table 2. Implementation of OECD recommendations on the financial sector

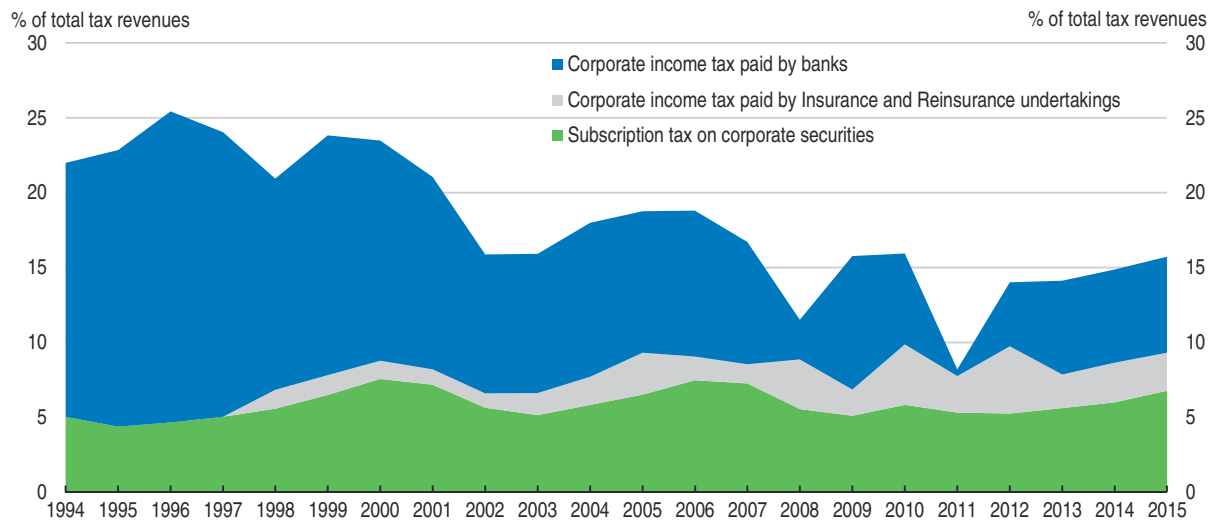
Earlier OECD recommendations	Actions taken
Continue to monitor financial market risk while using a comprehensive approach to risk assessment that accounts for financial linkages between banks and non-bank financial intermediaries, notably investment funds.	A systemic risk committee comprising the central bank, regulators of the banking and insurance sectors and the Ministry of Finance has been established to co-ordinate the implementation of the macro-prudential policy and safeguard the financial system stability. Dedicated working groups have been set up to analyse and quantify linkages between banks and non-bank financial intermediaries.
Continue efforts to develop resolution plans and to undertake resolvability assessments so that important banks could be resolved effectively across borders. For this end, continue to co-operate with regulatory authorities in other jurisdictions outside the EU.	The resolvability assessments and resolution plans for Luxembourg banks were prepared by the domestic regulator (CSSF) and the EU Single Resolution Board in 2016.

the increasing role of non-bank financial institutions may reduce the volatility in fiscal revenue, as the share of volatile corporate income taxes paid by banks in total tax revenues declines and the share of corporate income taxes paid by insurance companies and subscription taxes on securities increases (Figure 6). Analysis of the linkages between banks and investment funds should be continued, both at the national level and within the European Systemic Risk Board. The national supervisory authorities should develop further the capacity to undertake regular system-wide stress tests focusing on fund-bank linkages, consider publishing their results and co-operate in developing further policy measures, if needed.

The constrained supply of housing is fuelling strong price growth

Housing prices have been growing strongly, despite a mild dip in 2009, exceeding growth rates in neighbouring countries (Figure 7) and increasing both in relation to income and the level of rents (Figure 8). The price increases were sustained by an imbalance between strong demand for housing, stimulated by the low interest rate environment, demographic factors and existing fiscal measures, such as the tax deductibility of mortgage interest and the tax credit for administrative costs of buying property for personal use (the Bëllegen Akt), and the limited housing supply. The central bank's models do not indicate a departure from

Figure 6. Tax revenues from the financial sector are volatile



Source: STATEC; Banque centrale du Luxembourg and Commissariat aux assurances.


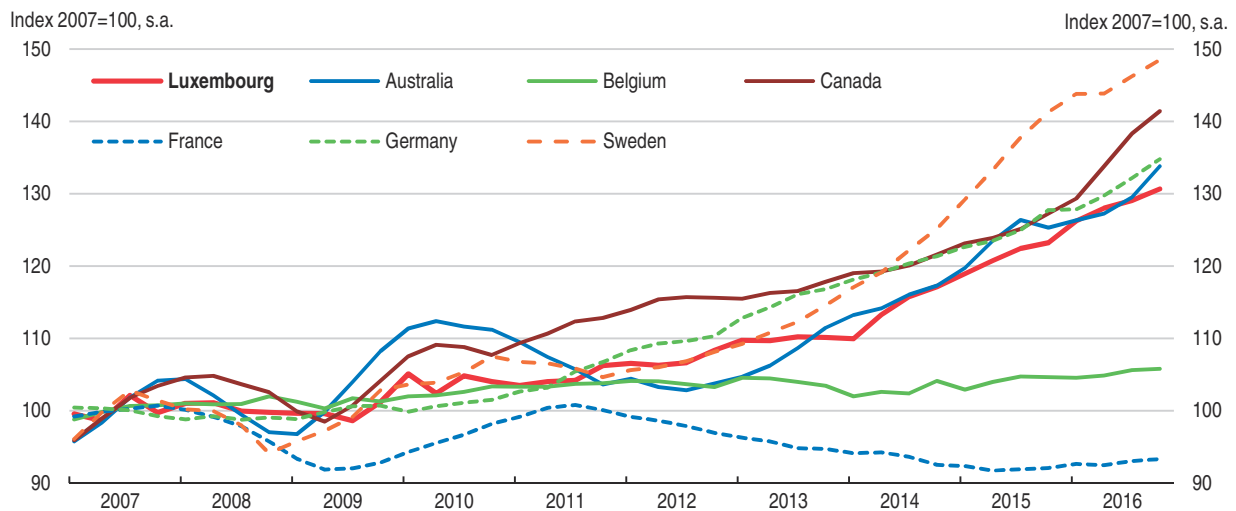

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Figure 7. Real house prices are growing strongly

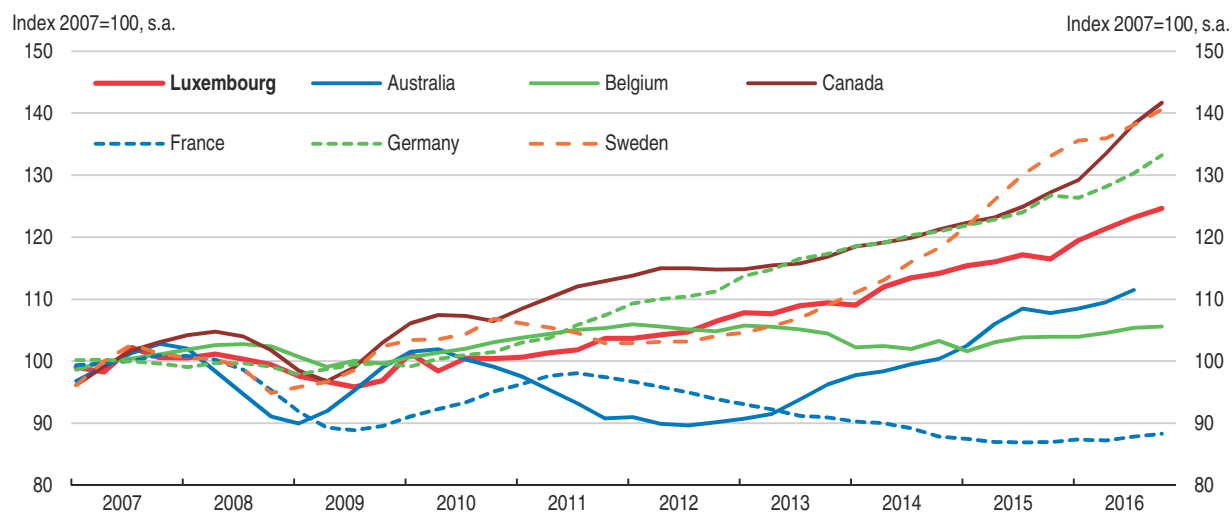


Source: OECD, Analytical house prices indicators database.

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fundamentals, but such assessment comes with high uncertainty (*Banque centrale du Luxembourg, 2016*).

The main risk lies in the combination of rising housing prices and increasing household indebtedness (Figure 9). Mortgage credit has increased rapidly and the level of mortgage debt is now higher relative to disposable income. As less than 40% of new mortgage loans now have variable interest rates, indebted households are becoming better shielded from increases in the level of interest rates. However, some indebted households may still find it difficult to service their debt in the event of a negative economic or financial shock, such as a fall in income growth or a real estate prices correction (ESRB, 2016). The supervisory authorities should monitor the situation closely and implement additional macro prudential measures, such as limits to loan-to-value or loan-to-income ratios.

Figure 8. **Increasing price to rent ratio points to overvaluation**

Source: OECD, Analytical house prices indicators database.


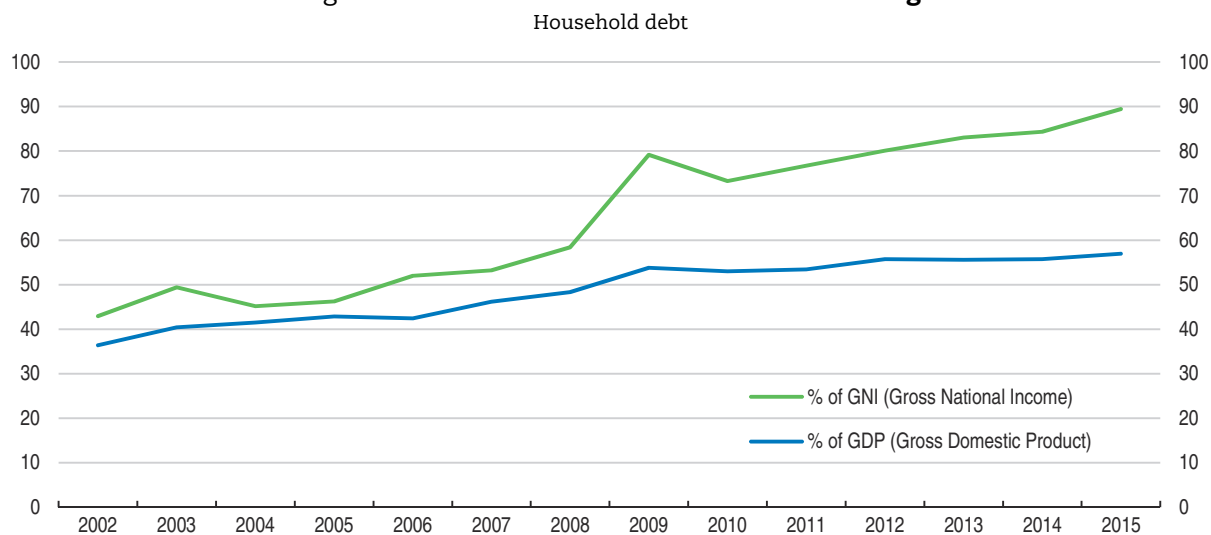
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Figure 9. **Household indebtedness is increasing**

Note: The instruments that are taken into account to compile household debt are debt securities and loans. Data are presented in consolidated terms.

Source: OECD National Accounts Statistics.

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The supply of housing is inelastic and does not increase in step with demand. Although the projected need for new buildings exceeds 6.000 units per year, the average annual construction from 2002 to 2010 was less than half that number (STATEC, 2011). The main reasons behind this inertia are the incapacity to mobilise the land available for construction and a cumbersome procedure for granting building permits, although the latter has been streamlined by the law of 3 March 2017 also called “Omnibus law”. Measures to support affordable housing, such as recent tax exemptions on net rental income for providers, may eventually increase housing supply, albeit from a low stock – social housing in 2015 represented less than 2% of all dwellings (OECD, 2016a) – and with a delay for building.

As more than 90% of the land available for urbanisation belongs to private owners, efficient incentives to improve availability of land for new construction are essential. The recently introduced local tax on undeveloped urban land has been rarely used. As the past experience with a similar measure suggests, the capital gain tax reduction on real estate sales may help stimulate the housing market, but it is regressive and should not be extended beyond the currently planned end in December 2017. Reform of land planning, introducing contracts with an obligation to build within a fixed time period, should be considered, as it may improve the responsiveness of housing construction to price signals (Caldera Sánchez, 2012).

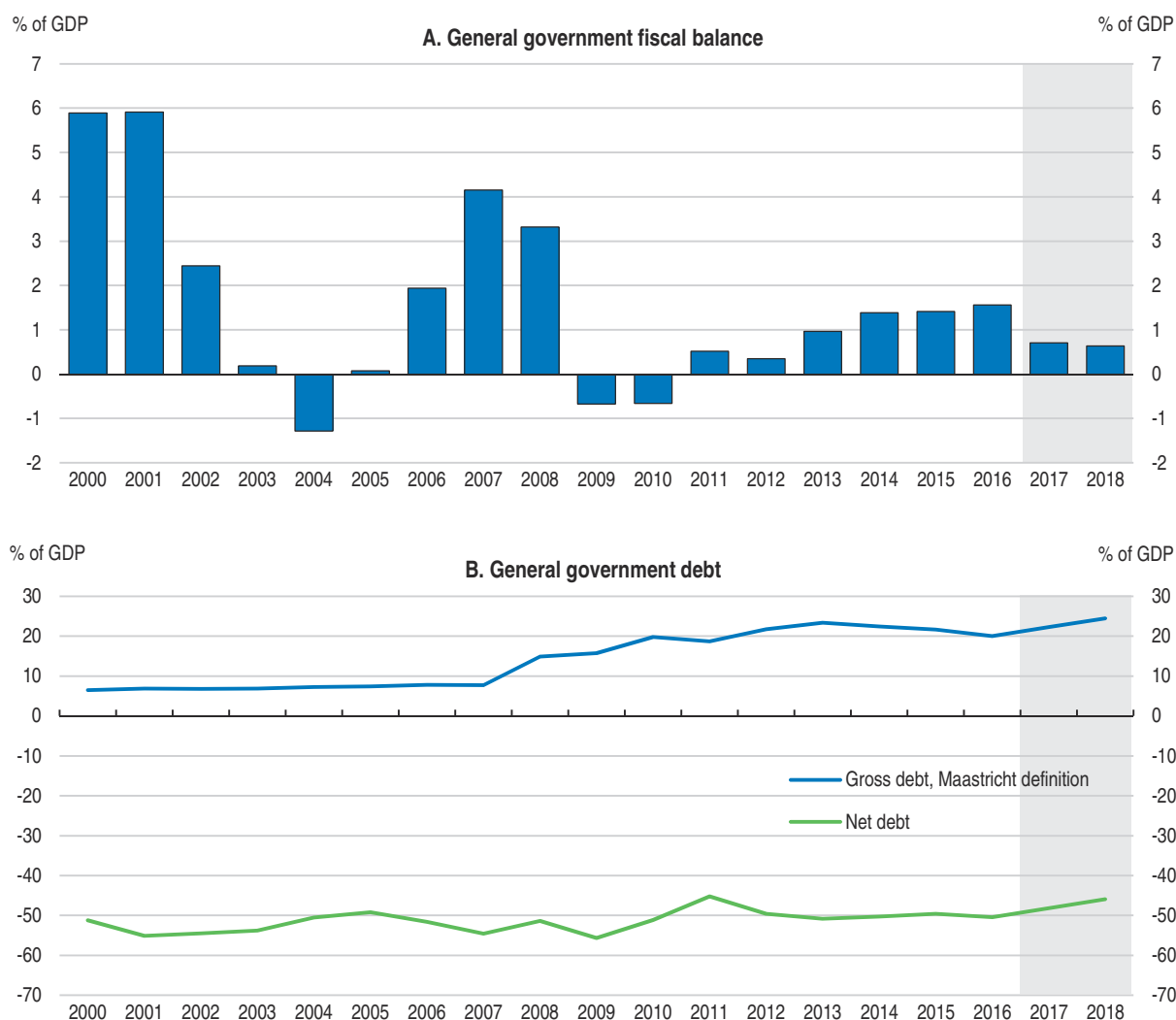
The short-term fiscal space is being used for a tax reform

At the current juncture, the fiscal situation of the government is comfortable. The general government budget is projected to stay in surplus, the general government gross debt is low, at 21% of GDP (at the Maastricht definition), well below the self-imposed government target of 30%, and net debt is negative, reflecting the large financial savings held by the social security administration (Figure 10). The analysis of illustrative public debt paths does not show immediate challenges until 2030 (Figure 11). Making use of the new EU estimates of the costs of ageing population (European Commission, 2015), the government has lowered its medium term budgetary objective for the period 2017 to 2019 from a surplus of 0.5% of GDP to a deficit of 0.5% in structural terms. The new expansionary fiscal policy stance is broadly appropriate given the ample fiscal space afforded by low levels of debt and low interest rates and will facilitate the implementation of a tax code reform. Nonetheless, fiscal prudence is warranted given the uncertainties regarding the cost of the recent tax reform: the assessments of the government and the central bank differ by almost 1 percentage point of GDP.

The tax reform aims at partly offsetting the tax base broadening resulting from European and international tax transparency initiatives. The corporate income tax rate will be reduced by 2018 from 21% to 18%. Investment is encouraged by higher tax credits whose scope has been extended to cover spending within the European Economic Area. The reform also made personal income taxes more progressive by increasing the top bracket from 40% to 42% and by providing additional tax credits to single parents and other low-income earners to meet education and child care costs, so as to make it easier to be employed while having young children. These moves are welcome as they could improve also social cohesion and labour market inclusiveness.

Another welcome purpose of the tax reform is to help women gain access to employment: starting from 2018, the tax reform introduces an optional individual taxation for both resident and cross-border married or co-habiting workers. This policy will reduce the marginal tax rate applied to the earnings of second earners, who are often women, potentially equalising the incentives to work for both partners. Since the policy is optional, allowing couples to freely choose the way of taxation, its effect on decisions to work may be limited. After assessing the impact, the authorities should consider moving to fully individual taxation to make the tax system more gender neutral.

One missing aspect of the tax reform is the lack of a uniform approach to the tax deductibility of interest payments. While the maximum amount of tax deductible interest payments and insurance premiums has been reduced, the ceilings for mortgage interest deductions related to the main residence have been increased. Such move has a regressive

Figure 10. **There is ample fiscal space**

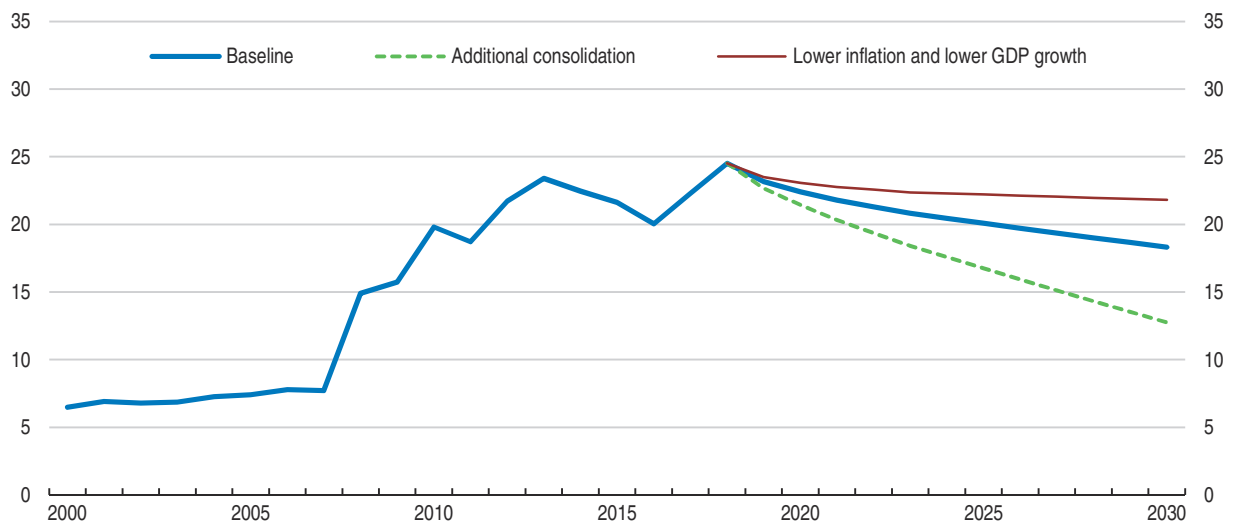
Source: OECD Economic Outlook 101 Database.

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impact on income distribution, reinforces the incentives for debt-financed real estate investment and in the presence of significant supply-side restrictions is likely to push up real estate prices and household debt.

In addition, further sources of revenue could be contemplated. Government raises more revenues from corporate income taxes than the EU average (Figure 12), including the volatile corporate income taxes from the financial sector. Additional revenue could be raised by revisiting the low level of real estate taxation. Revenues from recurrent property taxes amounted only to 0.1% of GDP in 2014, compared to 1.4% in the euro area (European Commission, 2016a), as they are often based on obsolete valuations that do not reflect current market values. The ongoing elimination of special tax regimes, such as the phasing-out in 2016 of the patent box regime, following the international agreement on the “nexus approach” that uses expenditure as a proxy for real activity and allows a taxpayer to benefit from a preferential regime only to the extent of the incurred qualifying expenditures (OECD, 2016b), would similarly imply tax base broadening.

Figure 11. Public debt is low and sustainable
General government debt, Maastricht definition, per cent of GDP¹



1. The baseline consists of the projections for the Economic Outlook No. 101 until 2018. The OECD projection assumes that over the projection horizon general government gross financial assets remain constant as a fraction of GDP. Under this assumption, the change in the general government gross debt-to-GDP ratio is larger than what would be implied by government net lending and nominal GDP growth only. From 2018 onwards, baseline assumptions are in line with those in IMF (2016a). The “additional fiscal consolidation” scenario is identical to the baseline but with a 0.5 percentage point higher primary surplus as of 2019. The “lower inflation and lower GDP growth” scenario assumes lower nominal GDP growth by 1 percentage point and the “lower consolidation” scenario assumes 0.5 percentage point lower primary surplus, both as of 2019.

Source: Calculations based on OECD (2017), *OECD Economic Outlook: Statistics and Projections* (database).


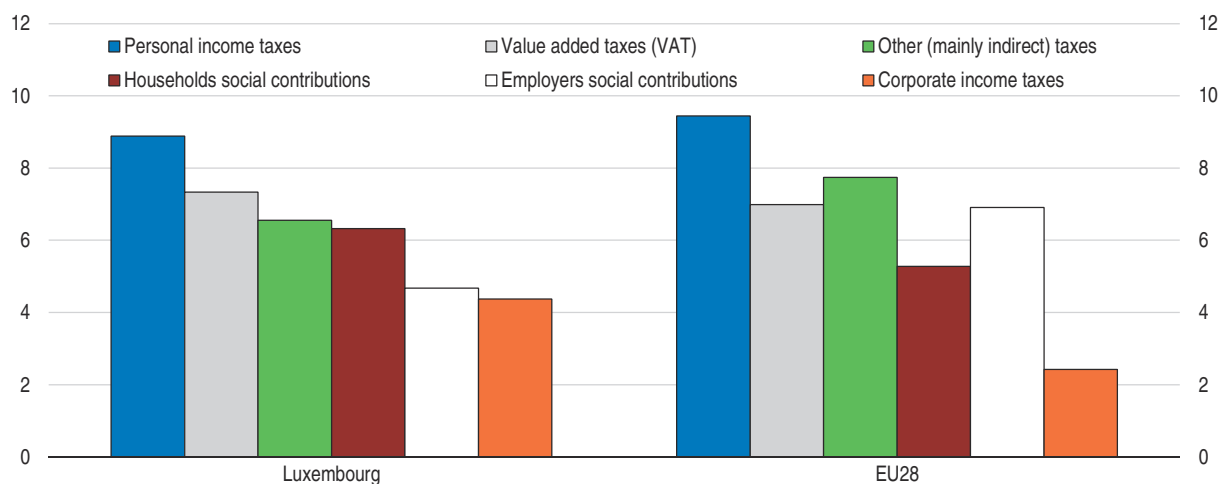
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Figure 12. Tax revenues rely on corporate income taxes
As per cent of GDP, 2014



Source: European Commission, *Taxation trends in the European Union*, 2016 Edition.

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Luxembourg has supported the tax transparency agenda during the presidency of the EU Council in 2015 and actively participated in the OECD/G20 Base Erosion and Profit Shifting (BEPS) project, which aims at achieving greater fairness in international tax matters at the global level. It is important that the authorities continue to participate actively in international negotiations and implement results of multilateral negotiations. Creating a more level playing field in corporate taxation at a global level and upholding the

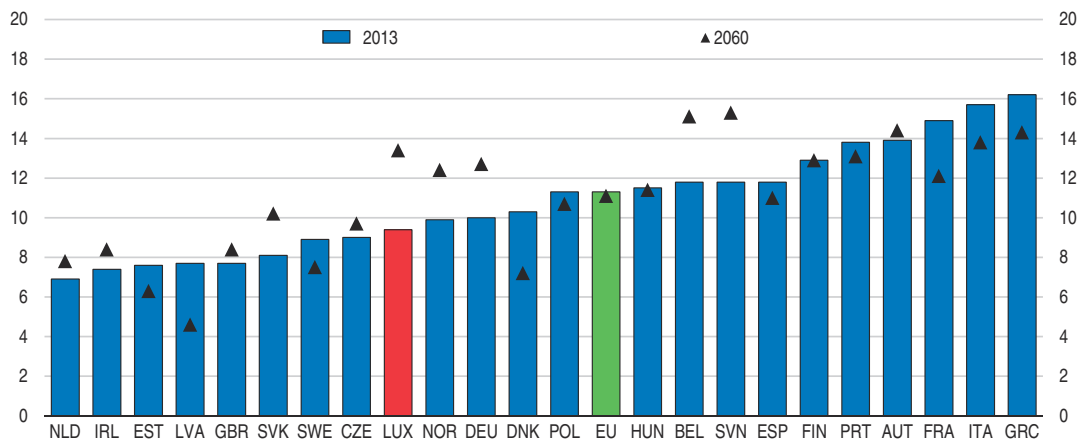
strict standards of responsible business conduct as defined by the OECD could benefit Luxembourg by emphasising its competitive advantages, including political stability, business-friendly environment and a highly qualified labour force.

Further reforms are needed to contain age-related spending

In the absence of further changes, Luxembourg’s pension system will likely face a steady increase in gross pension spending in the long run. The 2015 EU Ageing Report projects the sharpest increase of gross public pension expenditure, from 9.4% in 2013 to 13.4% of GDP in 2060, for Luxembourg (European Commission, 2015; Figure 13), which is almost twice the average OECD increase over the same period, from 9.1% to 11.3% (OECD, 2015b). However, such projections are vulnerable to large revisions – as illustrated by the change in long-term pension costs from 18.6% of GDP in the 2012 EU Ageing Report to 13.4% in 2015 – and declines in migration inflows would result in much larger costs.

Figure 13. Ageing costs are projected to rise

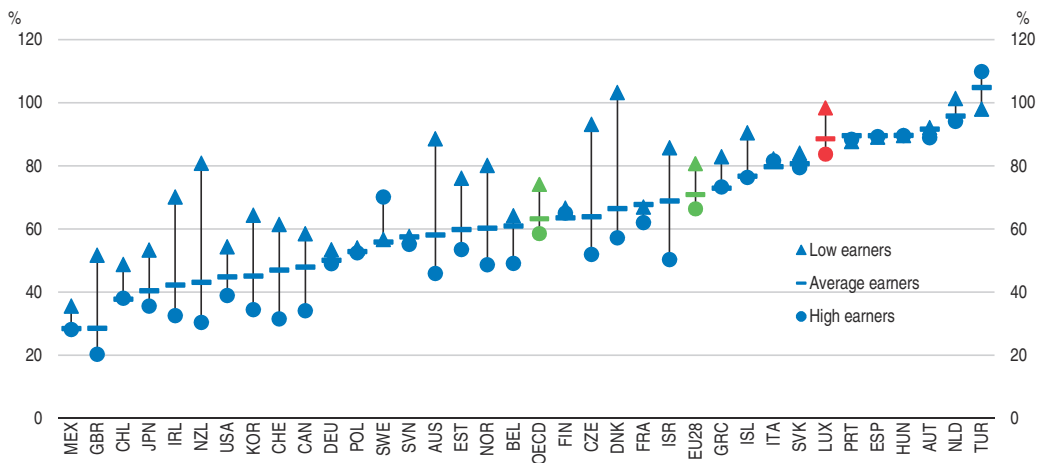
Gross public pension expenditure, per cent of GDP



Source: European Commission (2015), The 2015 Ageing Report: Economic and budgetary projections for the 28 EU Member States (2013-60).
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Figure 14. Net pension replacement rates are high

2014



Note: Data refer to men.
 Source: OECD, Pensions at a glance 2015.

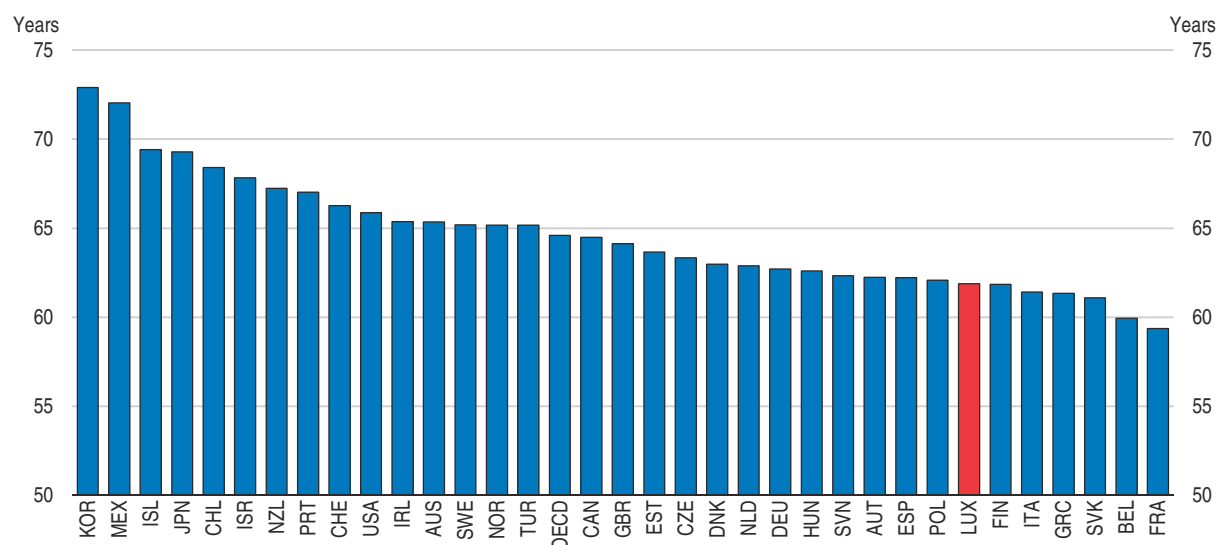
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The authorities plan to contribute to the sustainability of the pension system by closing some of the early retirement schemes and reforming the rules for return to work of people with partial work incapacity. Although these measures are welcome for their positive labour market effects, they may lead to only limited public finance savings. The government should use the ongoing pension review to propose further reforms of the pension system, such as reducing the high replacement rates of pension benefits (Figure 14 and Table 3), setting stricter requirements for imputed years of contributions and increasing the legal retirement age, relating it explicitly to changes in life expectancy (Figure 15).

Table 3. **Implementation of OECD recommendations on fiscal and tax policies and on age-related spending**

Earlier OECD recommendations	Actions taken
Strengthen fiscal planning by introducing a spending review mechanism and link it to the medium-term budgeting framework. Consider introducing a spending ceiling for the general government.	A spending review has been conducted, but it is not planned to be repeated on a regular basis in its current form.
Continue to actively participate in international negotiations on co-ordinated action to combat tax base erosion and profit shifting of multinational enterprises including action to prevent double non-taxation. Change domestic laws as necessary.	Luxembourg has transposed directives implementing automatic exchange of information and introduced several OECD BEPS measures. The anti-tax avoidance directives are currently being transposed.
Increase the effective age of pension entitlement, either directly or indirectly via further reductions in the system's "proportional supplements".	The pension system review has been conducted and shall be followed by proposals for addressing existing challenges regarding pension sustainability.
Reduce disincentives for labour force participation of women by charging health care contributions for each spouse individually and introducing separate income tax assessment of spouses.	Optional individual taxation of spouses from 2018.
Speed up procedures for granting construction permits. Raise property taxes by updating property values used as a tax base.	The process of granting building permits was streamlined by the law of 3 March 2017 also called "Omnibus law" that simplified procedures related to the adoption of general and partial development plans by the communes.

Figure 15. **Average effective age of labour-market exit is low**
Effective age of labour-market exit, 2014



Note: Data refer to men. Effective retirement age shown is for five year period 2009-14.

Source: OECD, *Pensions at a glance 2015*.

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Green growth requires further investment

Environmental indicators for Luxembourg tend to be strongly influenced by its economic linkages with neighbouring countries. CO₂ emissions per unit of GDP are not very different from the OECD average, and the decline in emissions in the 1990s was mainly associated with the declining importance of the steel industry (Figure 16). Emissions per capita are significantly higher than the OECD average, reflecting partly the high number of cross-border workers.

The 2017 reform of the tax treatment of in-kind benefits that increases the cost of company cars and incentivises firms to build fleets of less polluting and hybrid vehicles is welcome and should be complemented by a reform of transport fuel taxation. Taxes and excise duties on transport fuel in Luxembourg are lower than in neighbouring countries and, as in most countries, taxation on diesel fuel is lower than on petrol even though environmental externalities per litre of diesel are higher. Since more than 80% of fuel sold in Luxembourg is diesel, of which 75% is exported, the total negative effects, including costs of air pollution, outweigh the benefits from additional tax revenues, to the amount of EUR 1.4 billion a year (Ewringmann, 2016). Higher taxes and excise duties on transport fuel would lower demand for transport fuel, mitigating the negative environmental effects and reinforcing the move to sustainable mobility promoted by the government.

Investment into renewable energy needs to be stepped up

Following the Paris COP21 Conference in 2015, Luxembourg needs to step up efforts in reducing greenhouse gas emissions, increasing the share of renewable energy and improving energy efficiency and translate them into binding national targets for 2030. Yet, according to updated national projections reflecting adopted measures, the various targets from the currently binding EU Europe 2020 strategy, such as greenhouse gas emissions reduction by 20% from 1990 levels by 2020, greenhouse gas emissions reduction by 20% from 2005 levels by 2020 in sectors not covered by the EU Emission Trading System and the renewable energy target of 11% in all modes of transport, may prove challenging.

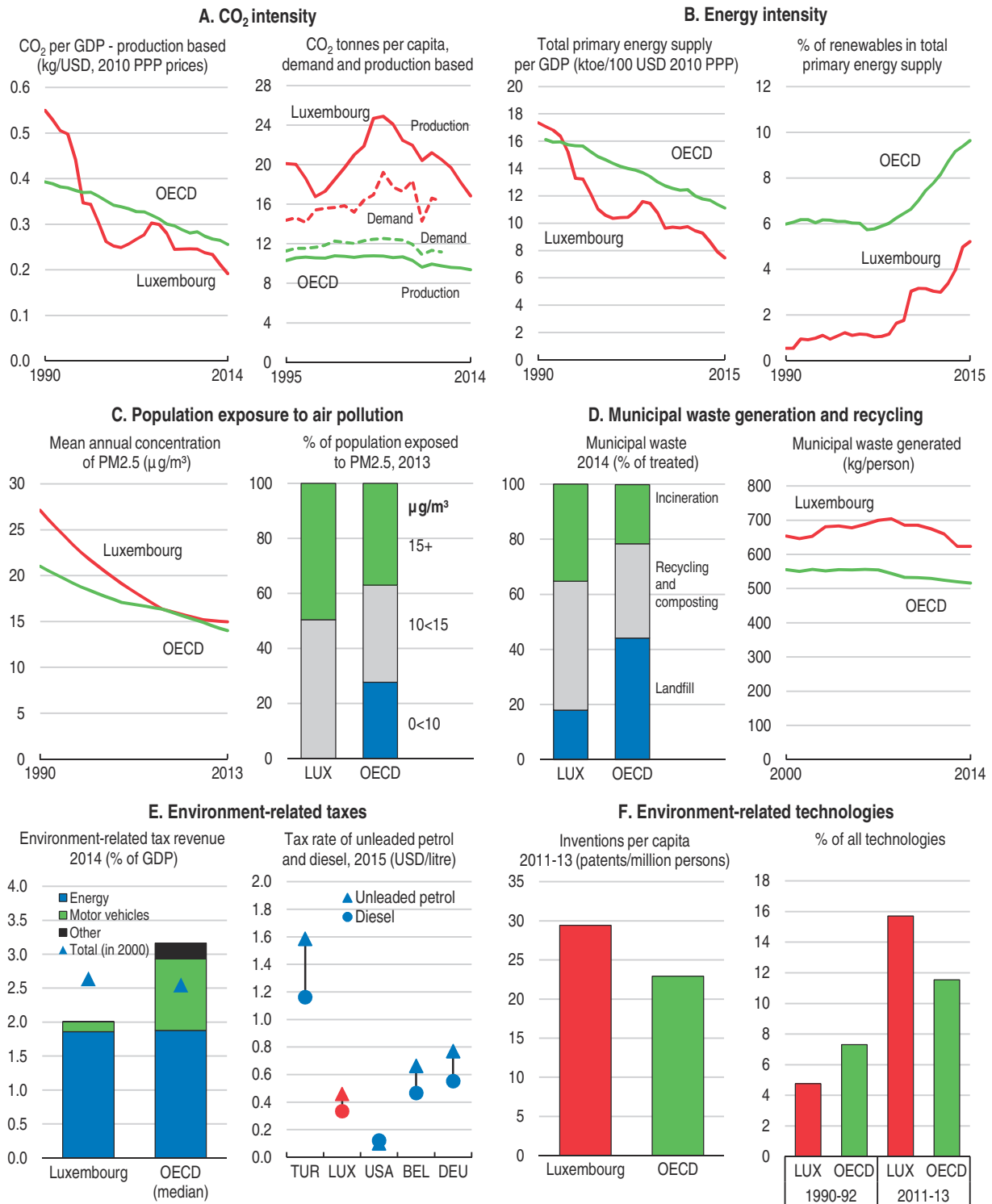
Installed renewable energy capacity in Luxembourg is mainly photovoltaic, as in Saarland, whereas the other neighbouring regions tend to put more emphasis on wind energy (Rheinland-Palatinate) or biomass (Wallonia). However, the total renewable capacity measured both per inhabitant and per square kilometre is considerably lower in Luxembourg than in the neighbouring German regions and in per capita terms even the lowest of the Greater Region, the cross-border region comprising the adjacent areas of Belgium, Germany and France (Table 4).

Smart electricity grids and interconnectivity can contribute to greenhouse gas emission reductions by increasing efficiency and conservation, facilitating integration of renewable energy and decentralized generation, and enabling electro-mobility. Better interconnectivity in electricity and gas markets can help integration of renewable energy by providing more resilience to disturbances. In addition, with better information on how, when and where power is consumed, future energy systems can be developed that more closely match consumers' needs (IEA, 2015).

Better public transport infrastructure is needed for inclusive and sustainable growth

The quality of public transport and accessibility of housing are important factors affecting well-being and attracting highly qualified labour force (OECD, 2015c). Better public

Figure 16. Green growth indicators



Source: OECD (2016), Green Growth Indicators (database). For detailed metadata click here.

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Table 4. **Comparison of installed capacity for renewable energy generation**
2015/16

	Lorraine	Luxembourg	Rhineland-Palatinate	Saarland	Wallonia	Grande Région
kW/km ²	44.0	89.0	249.0	280.0	104.0	133.0
kW/100 inhabitants ¹	44.0	41.0	123.0	73.0	49.0	75.0

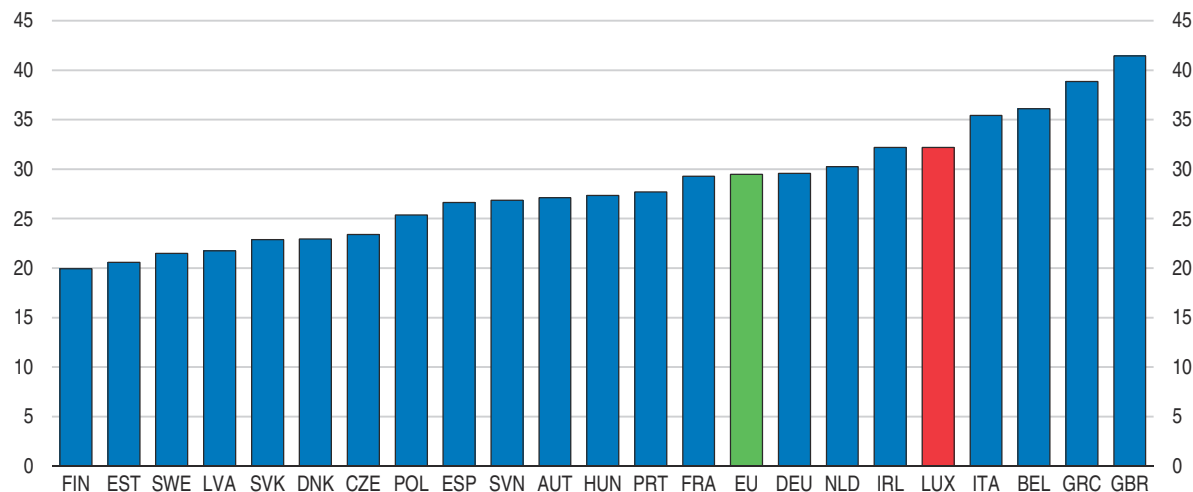
1. 2015 data (2013 for Lorraine).

Source: *Système d'information géographique pour la Grande Région (SIG-GR)*.

transport facilities spur growth by allowing workers to commute longer distances, making for better matching of skills and jobs and expanding the pool of labour that can be attracted to newly created jobs. Moreover, an inadequate public transport leads to higher use of private cars. Luxembourg is one of EU countries where most time is spent in traffic and private cars accounted for 86% of total in-country and cross-border commuting (Schmitz and Gerber, 2011). More than 32 hours per year are estimated to be spent in congestion in 2015 in Luxembourg, compared to the maximum of 41 hours in the United Kingdom, 36 in Belgium and the minimum of 20 hours in Finland (European Commission, 2016b; Figure 17). Using more precise survey data for 2014, Luxembourg residents on average spend 90 minutes each week-day travelling, with 37% of that time taken by trips to and from the office, and car is the most usual means of transport (STATEC, 2016b). Introduction of a system of congestion charges for Luxembourg City would provide incentives for a shift to public transport or car sharing and should be explored as a complement to other measures, such as higher transport fuel taxes and higher parking charges.

Figure 17. **Congestion times are among the highest in Europe**

Hours spent in road congestion by the average driver every year, 2015



Note: This indicator assumes two 30km trips per day (morning peak and evening peak) and 220 working days. It takes into account all major roads in the 27 Member States for which data is available (about 2 500 000 kilometres).

Source: European Commission, EU Transport Scoreboard 2016.

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The first part of the LuxTram line is planned to open before the end of 2017, potentially reducing the congestion in the city centre. However, railway remains the preferred means of transport for cross-border workers who do not use private cars. Cross-border bus lines are mainly used for shorter distances where the travelling times are comparable to those of private cars (SIG/GIS, 2016). The gradual replacement of private cars by public transport

should be promoted further, for example by increasing the number of direct trains and eliminating changes at border stations. Monthly and annual commuter tariffs exist for all neighbouring regions and include unlimited travel on the Luxembourg network. However, these schemes need to provide flexibility for cross-border workers on both ends of their daily trips, allowing choice among railway stations and transferability between modes of transport.

The growing importance of cross-border employment calls for closer co-operation on transport and housing issues at the level of the Greater Region. Elements of such co-operation already exist in some areas, such as the consolidation and exchange of relevant information via the Inter-regional Employment Observatory. Despite the institutional complexity of the Greater Region, where one of the partners is not a region, but a sovereign state and its geographical and development centre, if only because of its financial importance and dynamic employment market, these are policy areas of concern to all parts of the region and whose satisfactory resolution requires close co-operation (OECD, 2007). Infrastructure projects of European interest, such as the high-speed rail corridor connecting Brussels, Luxembourg and Strasbourg (EuroCap-Rail), and other railway axes of the Greater Region should have priority in the effort to improve the quality of public transport (Table 5).

Table 5. **Implementation of OECD recommendations on green growth**

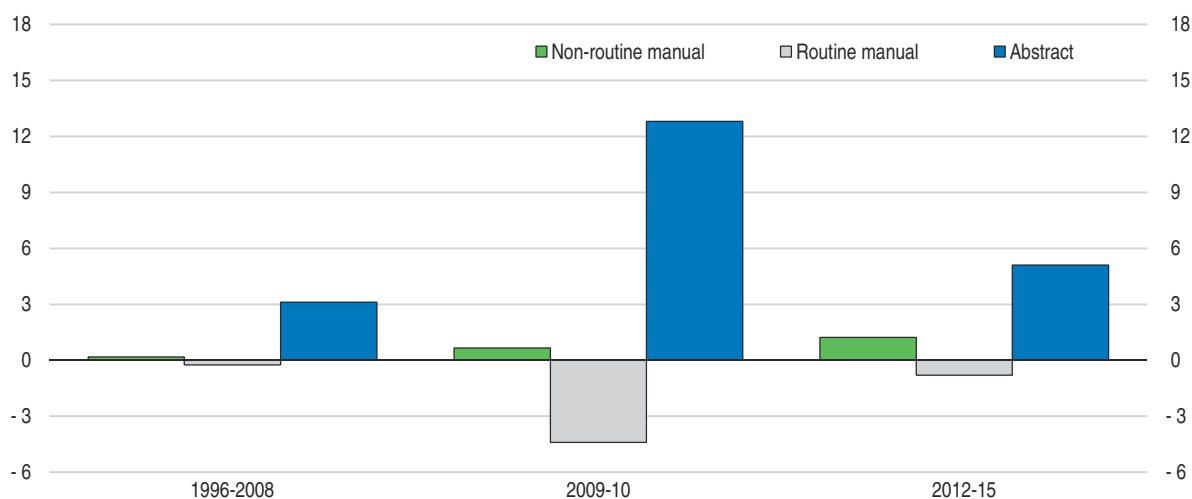
Earlier OECD recommendations	Actions taken
To reduce carbon emission, continue substantial investment in public transport infrastructure, using the receipts from fuel taxation for this purpose. Explore the introduction of a system of congestion charges.	Transport infrastructure projects, such as the first phase of LuxTram and the second railway track to Bettembourg, are enhancing the public transportation system.
Increase excise taxes on gasoline and diesel to gradually narrow price differentials with neighbouring countries.	No action taken.

Better skills for more inclusive growth

The importance of skills for inclusive growth


The development of the digital economy is constantly changing the nature of work, expanding the domain of tasks that can be automatized and affecting both jobs and the skill sets needed to perform them. Low routine jobs, such as support roles in financial intermediation and business services, could quickly disappear owing to technological change (Figure 18). The recent long-term strategy of the government develops a vision for a smart green digital society and identifies ambitious goals in the areas of sustainable energy consumption, mobility, industry and finance (Rifkin et al., 2016 and Box 2). This strategic vision is welcome and should be followed by policy measures to help it happen, such as continuing reform of the education system to improve supply of new and flexible skills.

Helping workers obtain adequate skills and designing institutions to match the supply and demand of skills are essential for inclusive growth (OECD, 2016b). Skills mismatches lower economic growth through less efficient reallocation of resources and slower adoption of new technologies (Adalet McGowan and Andrews, 2015). At the individual level, skills mismatch, in particular over-skilling, entails lower earnings, lower job satisfaction and a higher risk of unemployment relative to well-matched workers (Montt, 2015). Perceived skill mismatch is above the EU average and relatively evenly divided between employees who perceived need for further training and those who felt they could cope with more demanding duties (Figure 19, Panel A). However, other measures, such as

Figure 18. **Labour market polarisation is changing the demand for skills**Average annual change in total employment by occupation categories requiring different tasks, thousand employed persons¹

1. Refers to population aged between 15 and 64. Abstract tasks refer to problem-solving, intuition, persuasion and creativity. Occupations attached to abstract tasks include managers, professionals, technicians and associate professionals. Routine manual tasks refer to well-understood procedures such as book-keeping, clerical and administrative work, repetitive production or monitoring. Occupations attached to routine tasks include clerical support workers, craft and related trades workers and plant and machine operators and assemblers. Although plant and machine operators and assemblers also include occupations such as drivers that should be classified as non-routine manual occupations, it is classified under routine manual occupations due to lack of data at 2-digit levels. Non-routine manual tasks refer to those requiring adaptability, visual and language recognition, and personal interactions. Occupations attached to non-routine tasks include service and sales workers. Occupations such as skilled agricultural, forestry and fishery workers, elementary occupations, armed forces occupations and those with no responses are not included. There is a structural break in the data due to change in classification in 2010/11. ISCO 08 classification 1-digit level.

Source: Eurostat (2017), Employment and unemployment (Labour Force Survey) (database), March.

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Box 2. **Third industrial revolution is taking off in Luxembourg**

The “third industrial revolution” builds on the approach developed by economist Jeremy Rifkin and the idea that the existing economic model can be made more sustainable by enhancing smart networks of information and communication technology, renewable energy and new modes of transport. In order to develop smart network policies on a national scale, the Government carried out a strategic study involving more than 300 national stakeholders from government, the business community, academia and civil society and the TIR Consulting Group LLC’s global team of experts led by Jeremy Rifkin. The result of the process is a detailed study that reviews country’s socio-economic characteristics under nine broad themes: six sectoral topics – energy, mobility, building, food, industry and finance – and three transversal areas – smart economy, circular economy and prosumers and social model. Within each theme strategic priorities were identified, preparing the society and its economy for the process of change. For example, in the field of energy the identified priorities involve creation of a national energy internet, increased energy efficiency through new building renovation and mobility standards, creation of a national legal framework for the promotion of renewable self-consumption, electrification of mobility and implementation of a “smart district” lighthouse project.

The strategic measures in several dimensions make an explicit link to up-skilling and the need for new curricula in education and vocational training, such as education and up-skilling of workers in a digitalised and automated work environment and focus on new aptitudes and competences (industry), the need for new educational curricula and research

Box 2. **Third industrial revolution is taking off in Luxembourg** (cont.)

programmes on sustainable materials, circular product design and production (building, circular economy) and a national strategy for financial literacy and education (finance). In addition, information and communication technology (ICT) skills, research and innovation are central to the actions on smart economy: Luxembourg is lacking skilled ICT professionals and in order to boost economic performance, its outstanding digital infrastructure needs to be complemented by the right mix of institutions, skills, regulation and business ecosystems. Stronger involvement of the local tech industry, focus on a limited number of research topics, mainly in applied research, and better collaboration between the University of Luxembourg and other applied science institutions will be needed to build up competences and boost the supply of specialist skills. On the funding side, public-private partnerships will be used to promote higher private investment in research and development.

At the time of publishing, work has also started on the first nine projects identified by the study, focussing on, among other things, national energy internet, electrically-propelled mobility and smart, sustainable, circular neighbourhoods. Going forward, the outcomes of the study will be consulted with stakeholder groups and institutions, including the Economic and Social Council, and discussed in the Parliament to determine the follow-up legislative, regulatory and technical measures. The implementation will be co-ordinated by a national monitoring committee comprising representatives of concerned ministries, the “Digital Lëtzebuerg” initiative and social partners, under the leadership of the Ministry of the Economy.

Source: Rifkin et al. (2016).

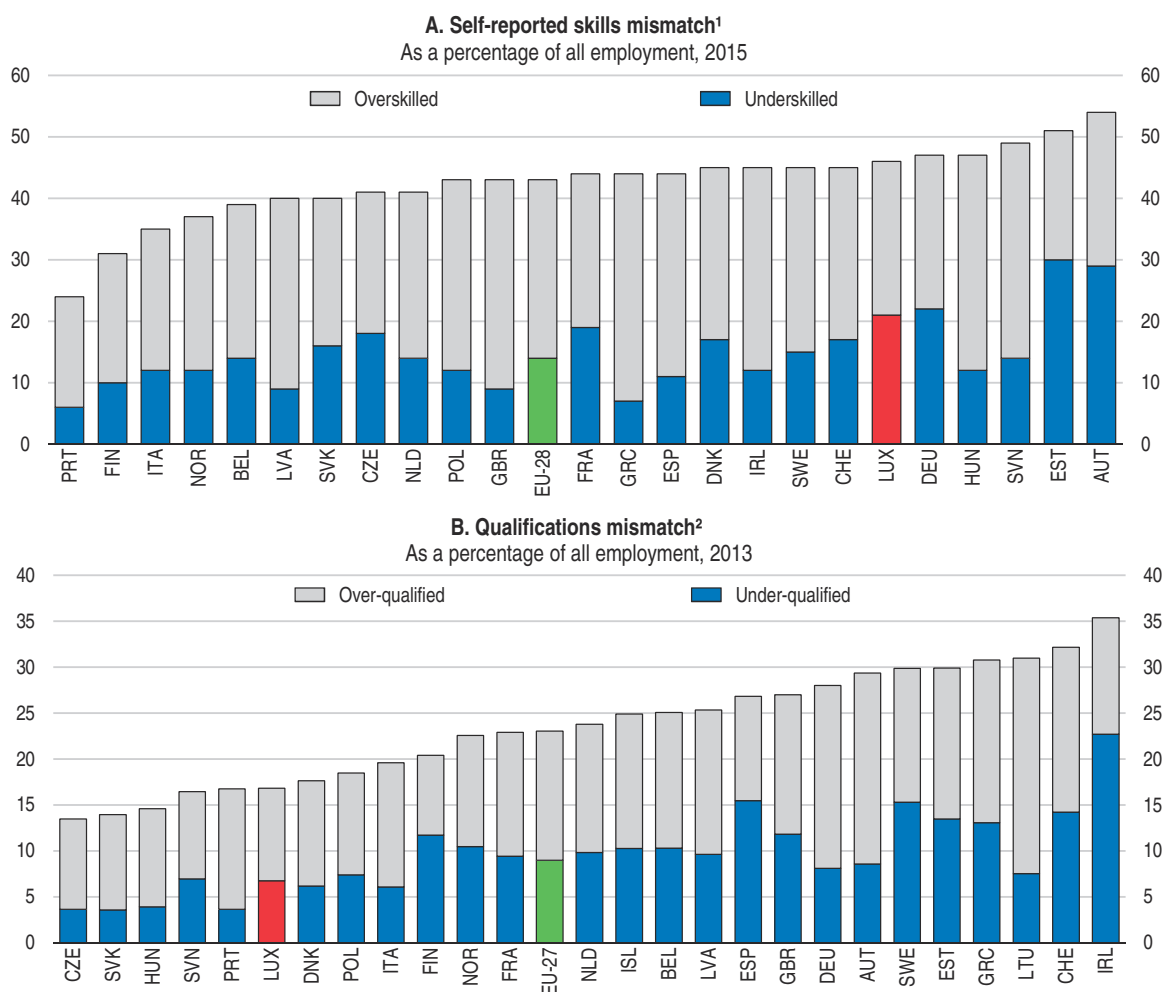
qualification mismatch, suggest less of a skill mismatch problem in Luxembourg (Figure 19, Panel B).

Skills are not distributed evenly in Luxembourg. Many households rely on support from public transfers and low-skilled people are exposed to the risks of unemployment and poverty. Although the social benefits system is relatively efficient at redistributing market incomes, the risk of poverty, measured as a share of population below 60% of the median income after public transfers, increased by almost 2 percentage points between 2010 and 2014 and stood at 16.4%, below the EU28 average of 17.2%, but above that of the Greater Region (IBA/OIE, 2016).

Better skills, especially basic literacy and numeracy skills, are associated with higher likelihood of being in full-time employment and more active engagement in social and political activities (OECD, 2013a). Unemployment rates of those who only attained below upper secondary education, both in Luxembourg and the OECD, are consistently higher than those with higher educational attainment, for all age groups (Figure 20). The OECD evidence suggests that high quality initial education that imparts the learning-to-learn skills for adult life to all children is the most effective way of improving the stock of skills (OECD, 2015c).


Analysing and anticipating changing skill needs

Flexible skills are needed for adapting to technological changes that cannot be projected. Skill assessment and anticipation instruments are scarce and confined to the sectoral level. For example, Luxembourg’s multi-sectoral business federation (FEDIL) has ran biennial surveys of hiring projections of the information and communication technologies (ICT) sector as well as the construction and public works sector. At the EU level, the

Figure 19. **Some measures of skill mismatch are high**

1. Workers are classified as underskilled if they report that they need further training to cope well with their duties or overskilled if the report that they have the skills to cope with more demanding duties.
2. Workers are classified as under-qualified (over-qualified) if their educational attainment (four categories) is lower (higher) than the modal educational attainment of workers in their occupation within the country.

Source: Sixth European Working Conditions Survey 2015; OECD (2016), *Getting Skills Right: Assessing and Anticipating Changing Skill Needs*.

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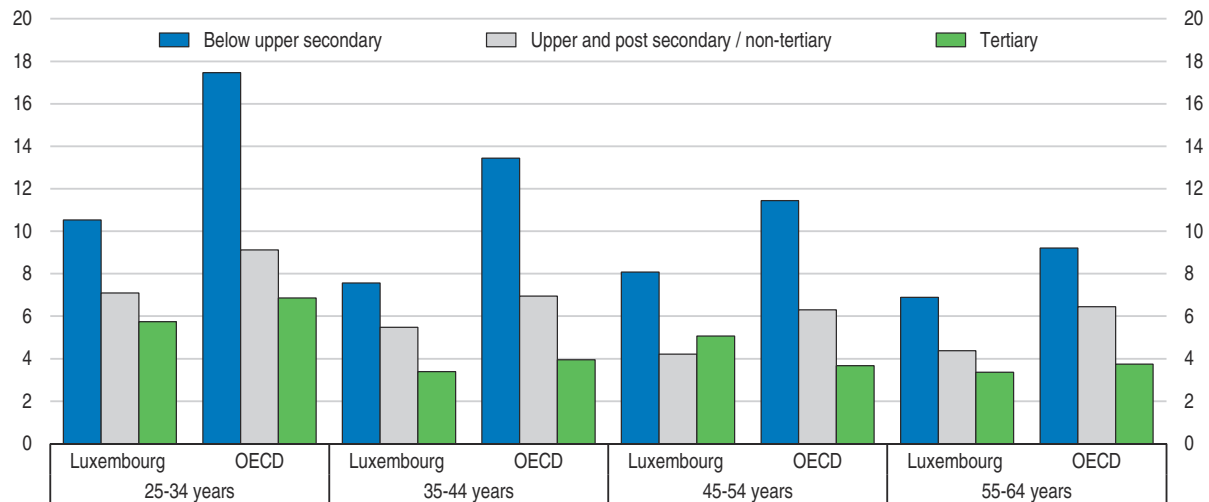
European Centre for the Development of Vocational Training (CEDEFOP) indicates that by 2025 about 49% of jobs in Luxembourg could require higher skills, compared to 39% in 2013 (CEDEFOP, 2015a). Other instruments, such as lists of shortage occupations for assessing migration, exist but are not used in practice. Tools for assessing and anticipating skills needs should be used regularly as they help government to tailor immediate policy interventions, such as migration opportunities, as well as long-term policy orientations, for example in the education policy (OECD, 2016c).

Improvements in the education system


Although the share of people with high level qualifications is well above the EU average, the projected needs for professional skills are even higher. Yet, the PISA results for 15 year-old students show skill levels in Luxembourg consistently below the OECD average for all three core competences – mathematics, reading and science – and after two full

Figure 20. **Unemployment rates are higher for low-skilled workers**

Per cent, 2015



Source: OECD Education and Training Database.

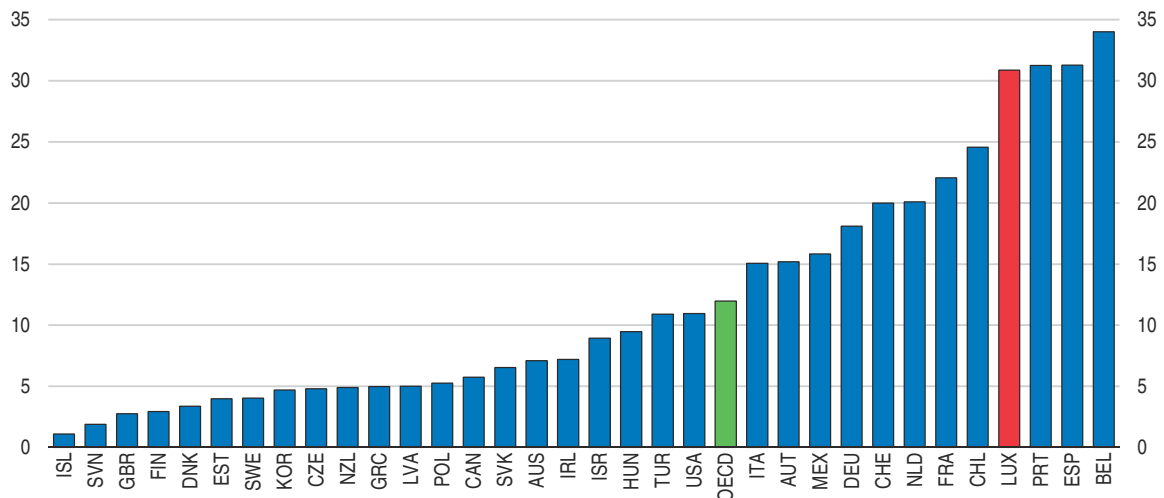
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cycles of the PISA assessment, the gaps in performance appear stabilised. As discussed in more detail in Chapter 2, the below average position in overall PISA scores also reflect a composition effect due to the high number of immigrant students, but the challenge of improving the level of basic skills will have to be met.


Secondary education in Luxembourg involves early tracking and high rates of grade repetition (Figure 21). Grade repetition is internationally high and affects the children of immigrants more than their native peers, often due to language handicaps. It is financially costly and mostly ineffective in improving the performance of students (OECD, 2012a), but, for cultural reasons, grade repetition is still often regarded as an assurance of school quality and demanding standards. More productive strategies focus on providing early

Figure 21. **Grade repetition rate is among the highest in the OECD**

Share of 15-years old who repeated a year at least once, per cent



Source: OECD (2016), PISA 2015 Results (Volume I): Excellence and Equity in Education.

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support, limiting repetition to subjects or modules failed and setting objectives and aligning incentives for schools (OECD, 2012a).

Tertiary education in Luxembourg is characterised by high attainment rates and high international student mobility. Better information for students about the labour market prospects of different occupations based on skills assessment and anticipation exercises, common in many OECD countries, could provide useful career guidance (OECD, 2016c).

Vocational education and training should improve the match between young people skills and the needs of the labour market, while focusing on the youth with low education levels (CEDEFOP, 2015b). The ambitious 2008 vocational education and training reform continues to be hampered by the weak general skills of many students and insufficiently integrated curricula of related trades in different programmes. In collaboration with professional chambers, the authorities are putting emphasis on the implementation of quality assurance in work-based learning and better aligning workplace and school based training, which is welcome.

Improving lifelong learning

The overall rate of adult participation in lifelong learning was 18% in 2015, above the EU average of 10.7%. Similarly to other EU countries, it is the better educated who profit most from lifelong learning in Luxembourg and the participation rate for adults with lower educational attainment is only 7.3% (Figure 22). OECD evidence, such as from the Survey of Adult Skills, suggests that a lack of interest in lifelong education, together with low awareness, lack of incentives or perceived lack of returns is more strongly related to low levels of participation than structural barriers, such as lacking childcare or difficulties of combining often inflexible learning opportunities with overloaded work schedules and work-family time patterns (OECD 2012, pp.71-80; OECD 2014). Part-time learning and distance learning programmes employing information and communication technologies can be successful in raising participation rates, if coupled with effective quality assurance and evaluation that makes information on provider quality available to users (OECD, 2005a).

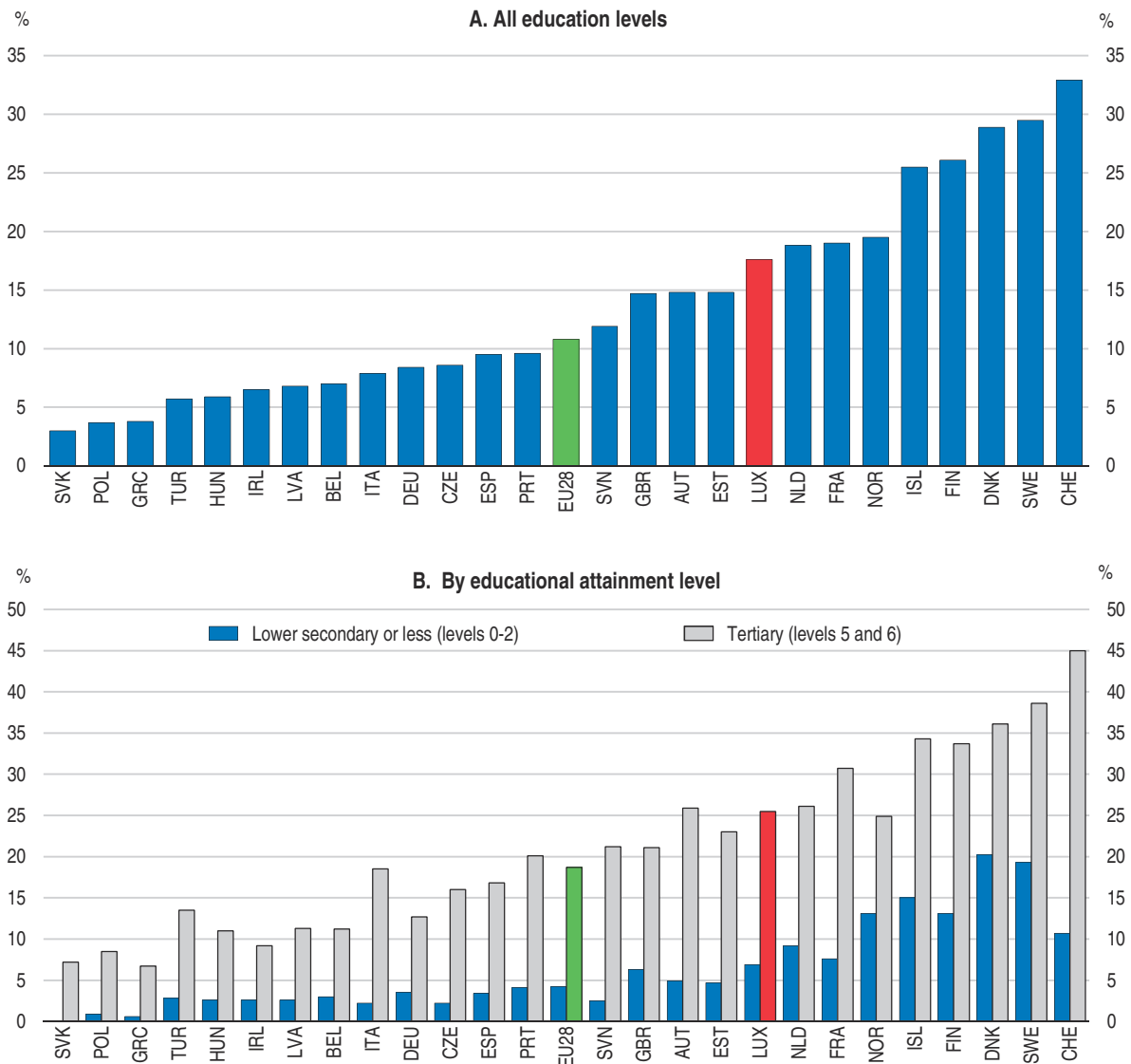
Other measures, such as extending the individual study leave (*congé individuel de formation*) to enable taking part in longer and more demanding courses and introduction of individual learning accounts and subsidies, such as vouchers and refundable tax credits, could improve access to lifelong learning for low-skilled adults. The system of financing, with its collective access and complex control of spending, also seems to favour medium and large firms and should be reformed to enhance the participation of small firms (CSL, 2016). Funding mechanisms to co-finance adult learning, such as profit tax deductions, grant schemes and payback clauses, should give small firms and disadvantaged individuals an opportunity to participate (OECD, 2005a).

Developing entrepreneurial skills for innovation


Entrepreneurship is an important driver of innovation and job creation, as the proportion of young firms expecting to increase employment is often higher than the corresponding proportion for older firms. Labour productivity also appears to be higher in countries with higher start-up and churn rates, as new, typically small firms enter with new technologies and stimulate productivity-enhancing changes in incumbents (OECD, 2016d).

The social perception of entrepreneurs in Luxembourg is relatively low: compared to EU average of 56%, only 45% of Luxembourg residents regard entrepreneurship as a desirable career choice (GEM, 2016). The share of entrepreneurs and the positive perception

Figure 22. **Better educated adults participate more in lifelong learning**
Per cent of the population aged 25 to 64 participating in education and training (last 4 weeks)



Source: Eurostat, Main indicators of lifelong learning database.

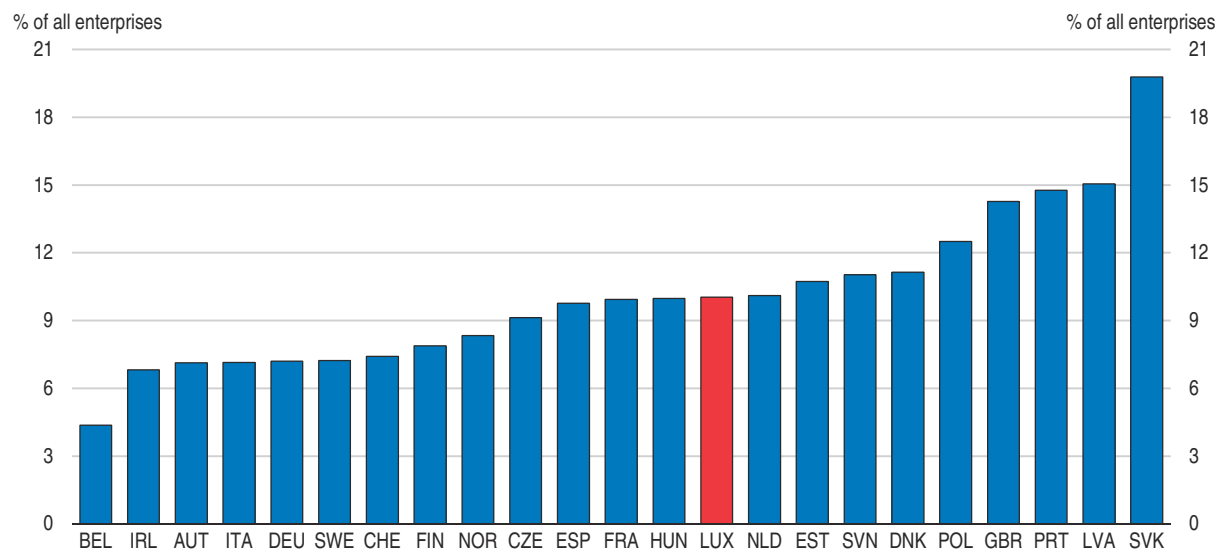
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of entrepreneurship are higher among immigrants, especially first-generation immigrants. Entrepreneurship is not the preferred career choice in Luxembourg, as can be seen from the low share of self-employed and the enterprise birth rate that is lagging the best EU performers (Figure 23).

The recent introduction in Luxembourg law of a simplified limited liability company with the minimum capital of 1 euro and simplified incorporation requirements are welcome and may provide a needed boost for businesses with low capital needs, such as IT start-ups. Programmes promoting entrepreneurial culture and providing advice on starting a business, such as the Hands Up and Fit4Entrepreneurship, and new initiatives supporting entrepreneurial networks and mentoring, such as the House of Entrepreneurship, are steps in the right direction, but more needs to be done.

Figure 23. **The number of start-ups is lagging the best EU performers**

Business sector start-ups, 2014



Source: Eurostat, Structural business statistics.

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Despite ongoing efforts to improve the entrepreneurial culture in Luxembourg, structural bottlenecks and obstacles still exist in some areas, including insolvency procedures, access to credit and protection of minority investors (Figure 24). While the protection of minority investors recently improved with the reform of company law, the costs of resolving insolvency remain high, at 15% of estate compared to 9% on average in the OECD mainly due to high attorney's and administrator fees (Figure 25). Although the time to resolve a bankruptcy is close to the OECD average, the average recovery rate is low, at 44%, reflecting a high probability of piecemeal sale, rather than restructuring, and is 30 percentage

Figure 24. **Obstacles to doing business still exist in some areas**

Distance to frontier scores, scale from 0 (worst performance) to 100 (best performance)

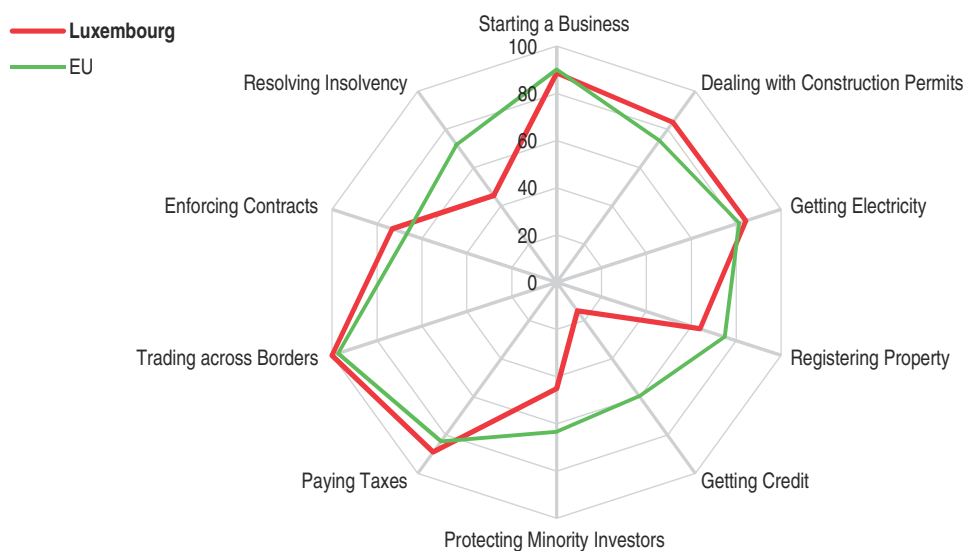
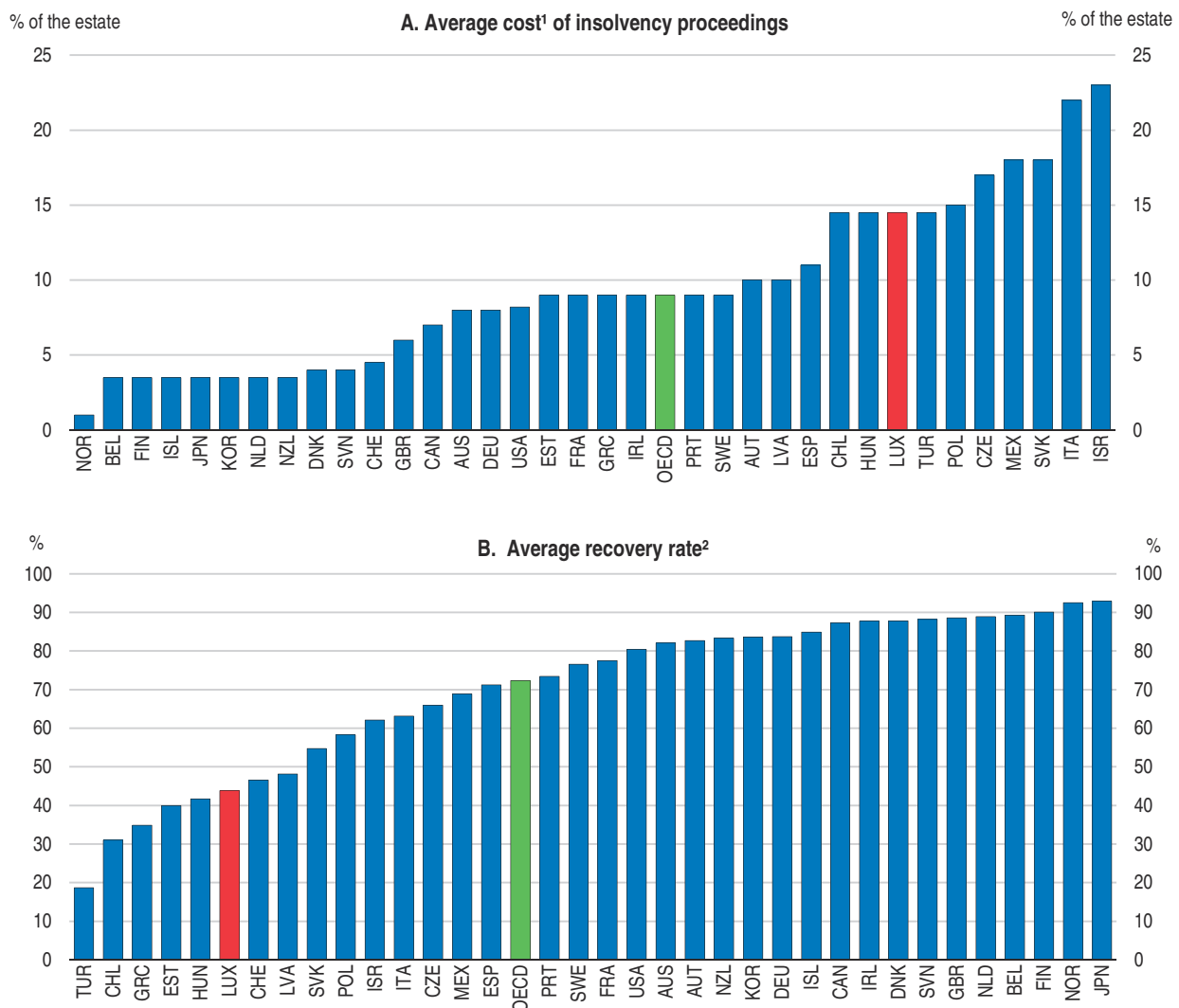

Source: World Bank, *Doing Business* 2017.StatLink <http://dx.doi.org/10.1787/888933495983>

Figure 25. **Insolvency costs are high**

1. The cost of the proceedings is recorded as a percentage of the value of the debtor's estate. The cost is calculated on the basis of questionnaire responses and includes court fees and government levies; fees of insolvency administrators, auctioneers, assessors and lawyers; and all other fees and costs.
2. The recovery rate is calculated based on the time, cost and outcome of insolvency proceedings involving domestic legal entities and is recorded as cents on the dollar recovered by secured creditors. The calculation takes into account the outcome: whether the business emerges from the proceedings as a going concern or the assets are sold piecemeal. Then the costs of the proceedings are deducted. Finally, the value lost as a result of the time the money remains tied up in insolvency proceedings is taken into account. The recovery rate is the present value of the remaining proceeds, based on end-2015 lending rates.

Source: World Bank, *Doing Business 2017*.

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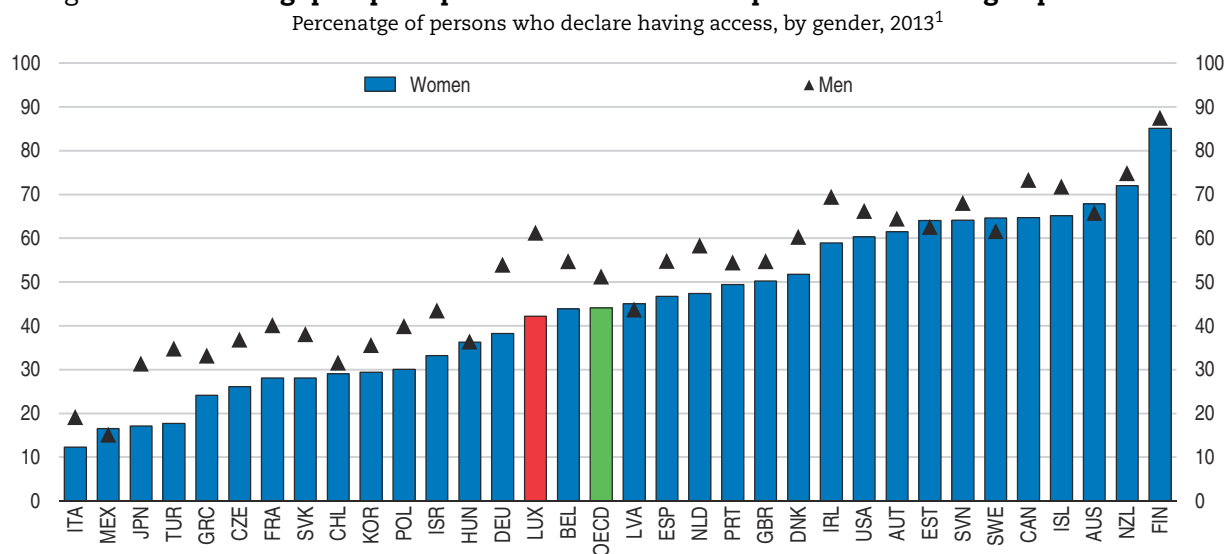
points lower than the OECD average. The implementation of cross-border insolvency procedures will improve with the new European Regulation that defines the country of company's main interest as the jurisdiction responsible for insolvency proceedings. However, the draft legislation on modernisation of the bankruptcy law strengthening the role of out-of-court agreement and reorganisation, so as to avoid, in justified cases, formal insolvency proceedings has been under discussion since 2013.

As Luxembourg does not operate a central credit registry, a credit bureau or a collateral registry, access to credit is hampered by limited information on creditors and weak legal

rights for borrowers and lenders (World Bank, 2017). However, existing evidence suggests that information asymmetries constitute a longstanding stumbling block in access to finance and the credit reporting systems and credit registries, private or public, can help overcome some of these failures (OECD, 2010a; OECD, 2016d). Although the interest rate spreads between loans below and above EUR 1 million are limited in Luxembourg, the funding of new businesses often relies on alternative sources. Close family and friends provide more than 60% of the start-ups funding, suggesting remaining difficulties in access to bank financing (GEM, 2016).

Gender gaps in factors that are important for entrepreneurship, including access to finance and training, are present in many OECD countries. In Luxembourg, the perceived gap in access to entrepreneurial training between men and women is one of the most pronounced in the OECD (Figure 26).

Figure 26. **Gender gap in perception on access to entrepreneurial training is pronounced**



1. Do you have access to training on how to start or grow a business? Data show percentage of positive answers, by gender.

Source: OECD (2016), *Entrepreneurship at a Glance 2016*.

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Making better use of existing skills

Under-utilisation of skills, either due to skills mismatch or labour market inactivity, represents a waste of the resources originally invested in nurturing these skills (OECD, 2011). Moreover, research shows that skills must be used in order to be maintained. Although most skills are never completely forgotten and the research on skills retention often involves relatively simple skills (Hoffman et al., 2014), skills deterioration induced by non-use is a robust phenomenon, similar to the loss of unused knowledge acquired in academic courses (Arthur et al., 1998; Bacon and Stewart, 2006).

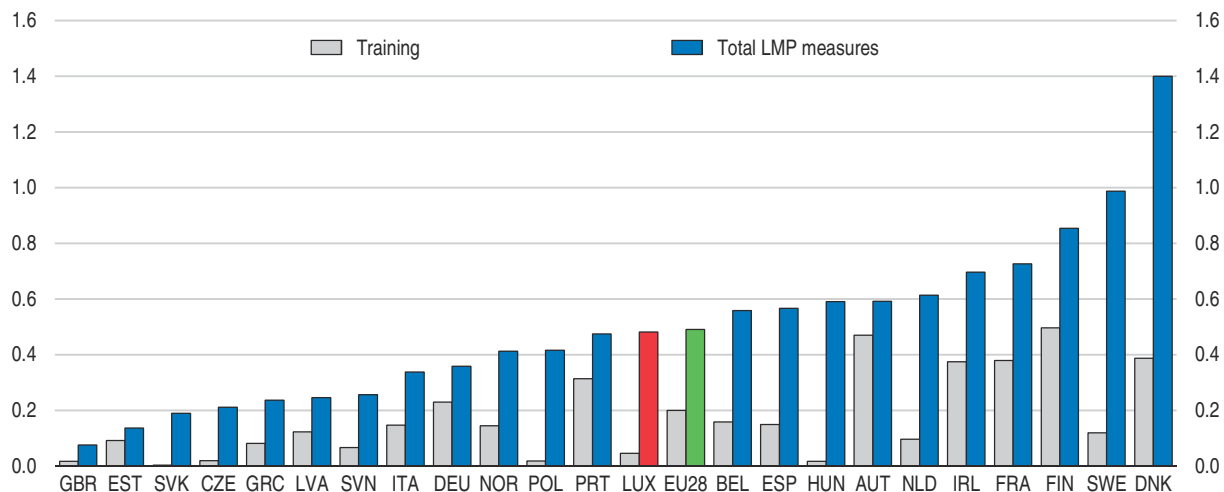
Improving the job matching

Spending on active labour market policies (ALMP) is close to the OECD average, but it needs to be adjusted away from direct job creation and subsidised employment towards training. Spending on training represented in 2011 less than 10% of the total spending on ALMP in Luxembourg, which is considerably less than in the EU28 or in Belgium, France


and Germany (Figure 27). The existing evidence suggests that well-designed and targeted measures can increase employment opportunities of jobseekers in a cost-effective manner. Multiple evaluations have tracked employment outcomes, for as long as five years after entry, to training programmes, showing a long-term positive impact on participants' employment and earnings, especially for programmes focused on identified employer needs. These results show that an appropriate mix of ALMPs is as important as the size of the total ALMP spending (OECD, 2015d).

Figure 27. **Share of training in active labour market policy spending is low**

Per cent of GDP, average 2010-15 (or last available year)



Source: European Commission, Labour market policy (LMP) database.

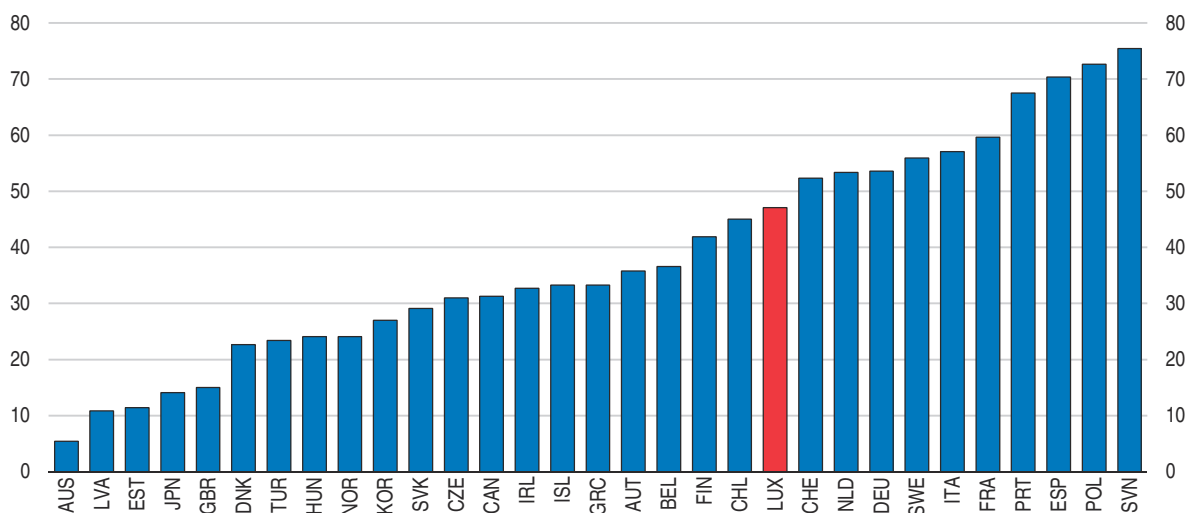
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The recent increase in the funding available and the number of staff in the public employment service are welcome, as larger share of staff can be allocated to direct customer services tailored to the needs of registered jobseekers (European Commission, 2016c). The effectiveness of employment services should be monitored through performance management and evaluations to ensure cost-effectiveness of ALMP interventions, whose results could be partly made public (OECD, 2005b).

The share of young workers on temporary contracts is relatively high in Luxembourg (Figure 28), possibly reflecting the level of employment protection for permanent workers. While the protection against individual dismissal is only slightly above the OECD average (Figure 29, Panel A), the protection against collective dismissal is one of the highest in the OECD (Figure 29, Panel B). Overly stringent employment protection legislation (EPL) regarding permanent workers may reduce labour market flexibility and the efficient allocation of workers to jobs, increasing skills mismatch and leading to poor skills utilisation (Adalet McGowan and Andrews, 2015). Stringent EPL may also provide incentives to hire workers on temporary contracts to avoid high firing costs, increasing labour market segmentation, job-to-job turnover, duration of unemployment spells and the prevalence of undeclared work (OECD 2008; Postel-Vinay and Turon, 2014). The 2016 reform that simplifies employee representation in companies with more than 150 employees is welcome, although additional costs for external counsel to staff delegates that will be borne by employers may be a negative for competitiveness (Eurofound, 2016).

Figure 28. **Young workers often work on temporary contracts**

Share of temporary contracts, 15-24 years old, per cent of dependent employment, 2015 or last available year

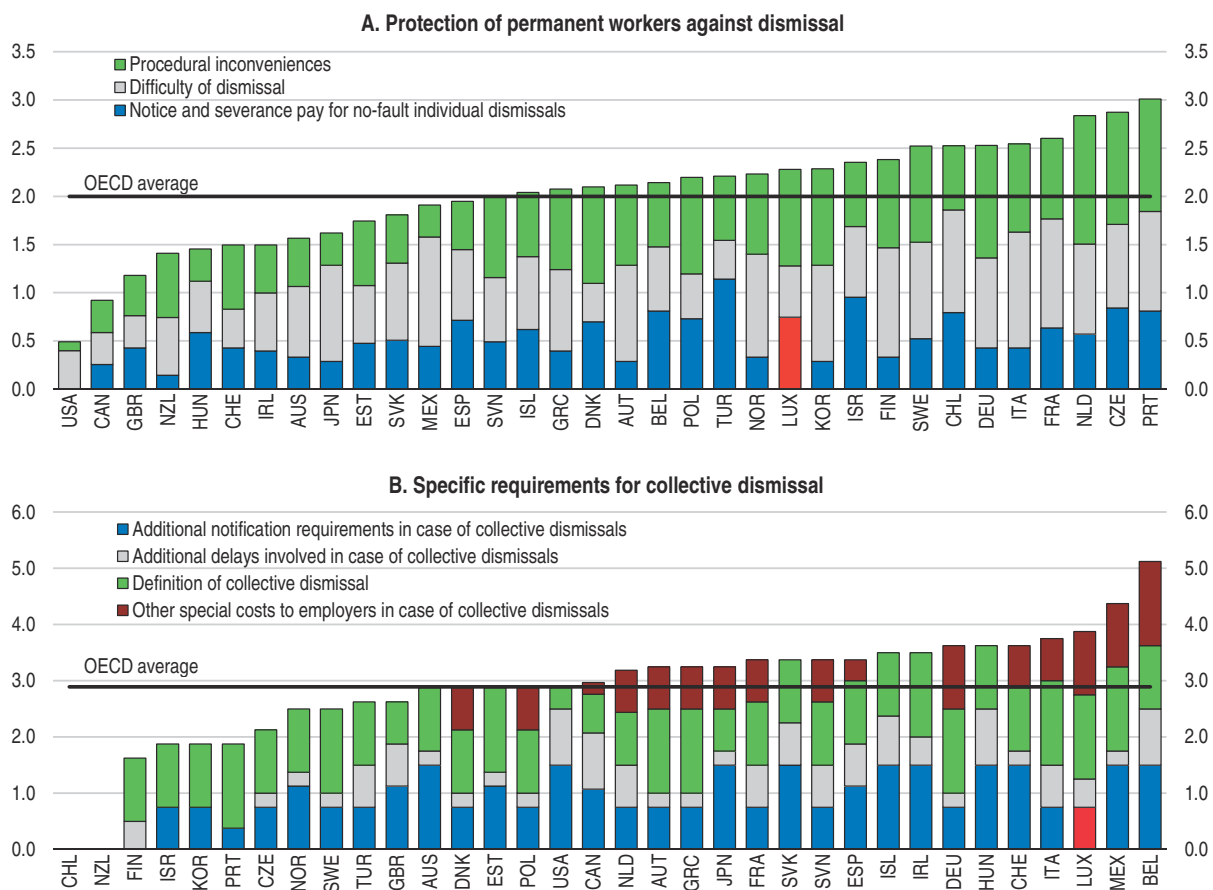


Source: OECD Employment and Labour Market Statistics Database.

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Figure 29. **Employment protection for permanent workers is above the OECD average**

Scale from 0 (least restrictions) to 6 (most restrictions), 2013



Source: OECD/IAB Employment Protection Database, 2013 update.

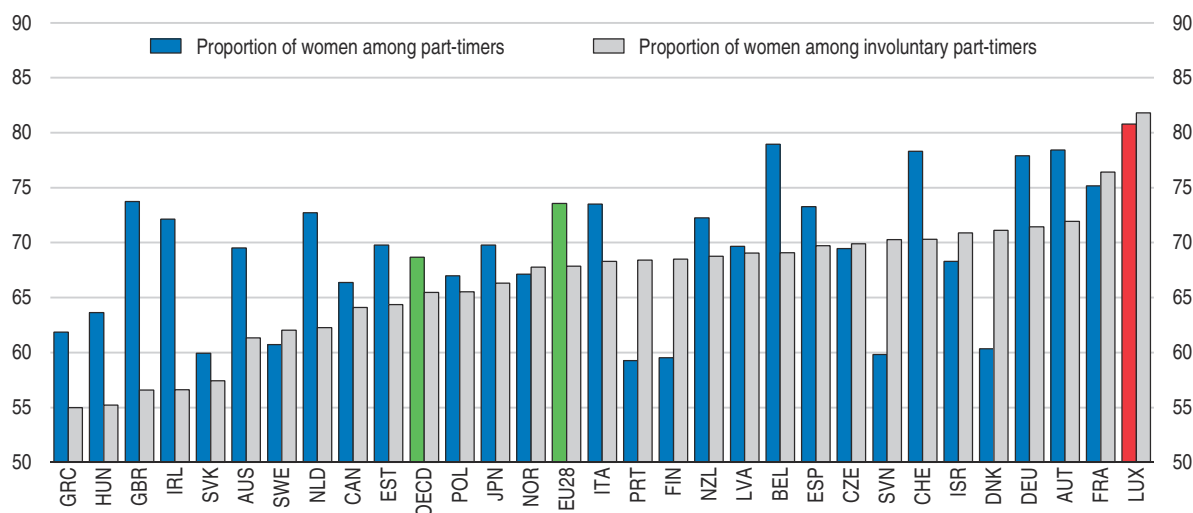
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Increasing incentives to work


Although the gender gap in labour market participation rates is close to the EU average for all age groups, the participation rates among youth and older workers lag behind the EU and OECD averages. Moreover, women represent more than 80% of all part-time workers in Luxembourg, the highest share of the neighbouring regions and the EU average (Figure 30). The incidence of part-time work points to the need to further improve the availability of high-quality child care and other policies to support women in the labour market and to increase work-life balance for fathers. The recent reform of parental leave rules provides more flexibility, including the possibility for both parents to take leave at the same time, and hence goes in the right direction. More equal sharing of parental leave could be achieved by offering bonus parental leave for fathers who take up a minimum amount of leave and by increasing the coverage rates for high earners (OECD, 2012b).

Figure 30. **Most part-time workers are women**

Per cent, 2015



Source: OECD, *Labour Force Statistics Database*.

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Low conditionality and generous social transfers could reduce incentives to work and lead to low labour market participation, and hence, underuse of skills, especially of the youth and low-skilled workers, older workers and second earners (who are often women). The minimum income scheme (*Revenue Minimum Garanti*, RMG) is successful in preventing extreme poverty, but it does so at the cost of sharply reducing incentives, especially of low income workers. Since any additional income above 30% of the minimum income is withdrawn one-for-one until reaching the minimum income eligibility threshold, the current scheme incentivises recipients to work, remunerated at the minimum wage level, at most 10 hours a week. Minimum income recipients who work more face a marginal effective tax rate of 100%, since the initial extra money earned will be offset by the loss of minimum income (OECD, 2012c).

The draft bill reforming the minimum income scheme replaces the one-for-one withdrawal of income from work with a 25% rate, at which work income can be retained, up to the eligibility threshold for the new social inclusion income (REVIS) scheme (*Projet de loi 7113*). In addition, it increases the subsidy amounts for single-parent households and for

dependent children, and introduces stronger conditionality for recipients, including the requirement to register with the public employment service, actively search for employment and participate in training or other insertion measures. The new proposal, with comparable budgetary costs as the old scheme, is welcome as it lowers the 100% marginal effective tax rate in the RMG scheme to 75%, providing an incentive to complement benefits from the REVIS scheme with employment income.

Policies that improve labour market attachment of older and vulnerable workers and make them work longer could improve skills use and minimise skills erosion. The introduction of optional individual taxation of spouses is similarly likely to provide more flexibility and improve the labour market participation of second earners. Recent reform of conditions for the reinsertion of older workers, jobseekers with reduced working capacity and disabled are a step in the right direction, but more is needed. The 2013 pension reform, as noted, should be followed-up with additional parametrical changes. For the youth, access to the tax-benefit support should involve means testing and strict eligibility periods, while ensuring access to training and improvements in education outcomes.

Improving the labour market and social integration of immigrants

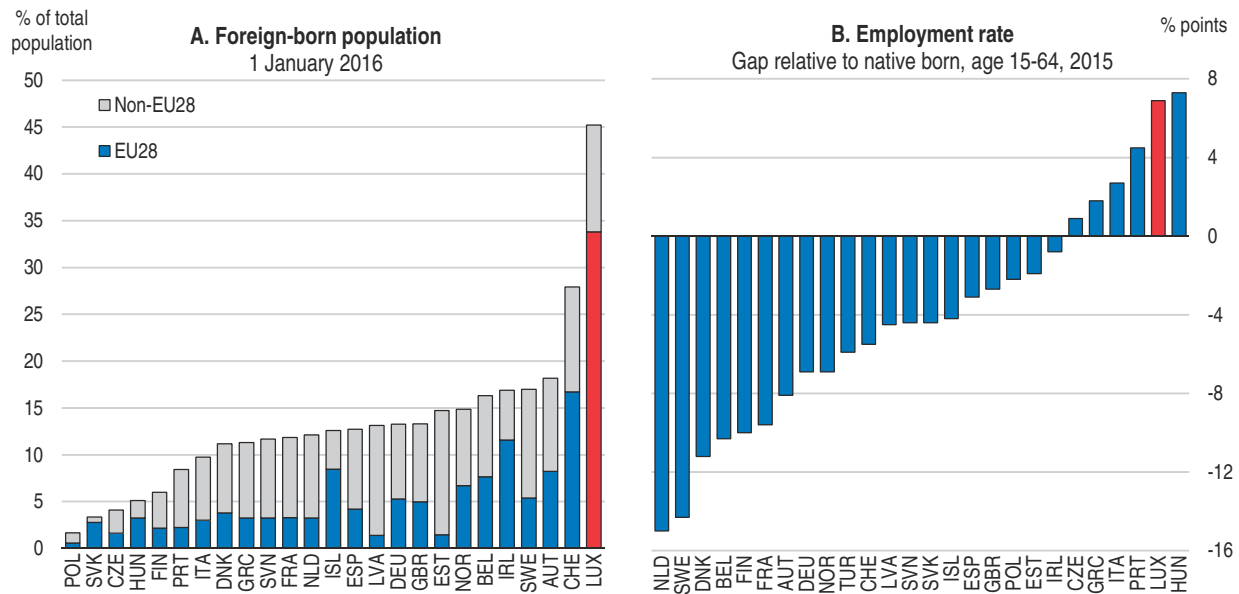
Luxembourg has benefited a lot from immigrants, but their integration could improve

Luxembourg is home to a large immigrant population, who in most cases succeeds in finding employment and therefore contributes to the country's prosperity. Across the OECD, it is in Luxembourg that immigrants, defined as the foreign-born, account for the largest share of the population (Figure 31, Panel A). Luxembourg also stands out as one of the few countries where the overall employment rate of immigrants exceeds that of natives (Figure 31, Panel B), which helps to explain a clearly positive estimated fiscal impact of immigration (OECD, 2013b). Immigrant households display a better fiscal position than the native born and the overall benefit to the budget provided by immigrants was estimated at about 2% of GDP, the highest across the OECD. The strong growth of the economy and its ability to create jobs help explain persistently high net migration flows (Figure 32), mainly from EU countries.

Against this overall benign picture, shortcomings in the labour market and social integration of immigrants weigh on well-being and are becoming more acute. Immigrants from outside the EU have a less successful labour market performance, with higher unemployment (Figure 33). Further, it is in this group that employment rate gaps between men and women are largest. Non-EU immigrants account for around one-tenth of total population, an internationally large share, and their weight has increased in recent years, not least due to sizeable arrivals of asylum seekers. Higher unemployment and lower wages – often only about half of those earned by natives (Manço, 2014) – lead to high poverty rates (about 40%) among non-EU immigrants, which weakens social cohesion.

Integration challenges of a more qualitative nature pertain to labour market segmentation and modest participation in the public life. Immigrants from different origins dominate employment in different sectors, and firms tend to form relatively homogeneous work teams (Besch et al., 2005; Manço, 2014), which likely lowers the quality of job matching. Few immigrants find jobs in the public sector, vote or are elected, and therefore a very large and growing share of the population does not take part in the policy debate.

Educational outcomes also illustrate the need for better integration, and the potential payoffs from achieving it. As often across the OECD, the children of immigrants still tend to

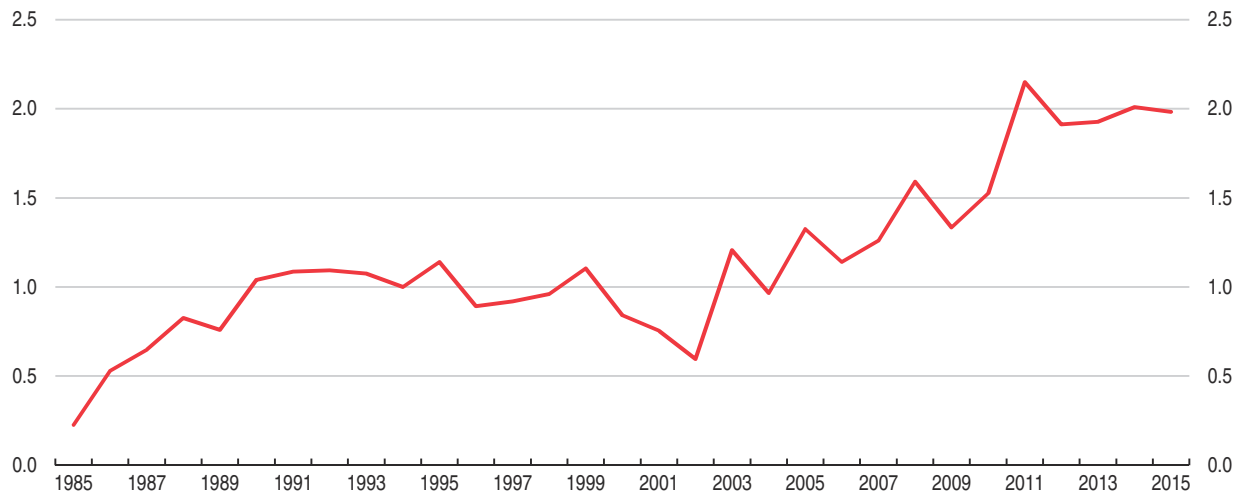
Figure 31. **The large immigrant population has a high employment rate**

Source: Eurostat (2016), Population Statistics and Employment and Unemployment (Labour Force Survey) Statistics.

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Figure 32. **Luxembourg has long attracted immigrants**

Net migration flows, % of total population



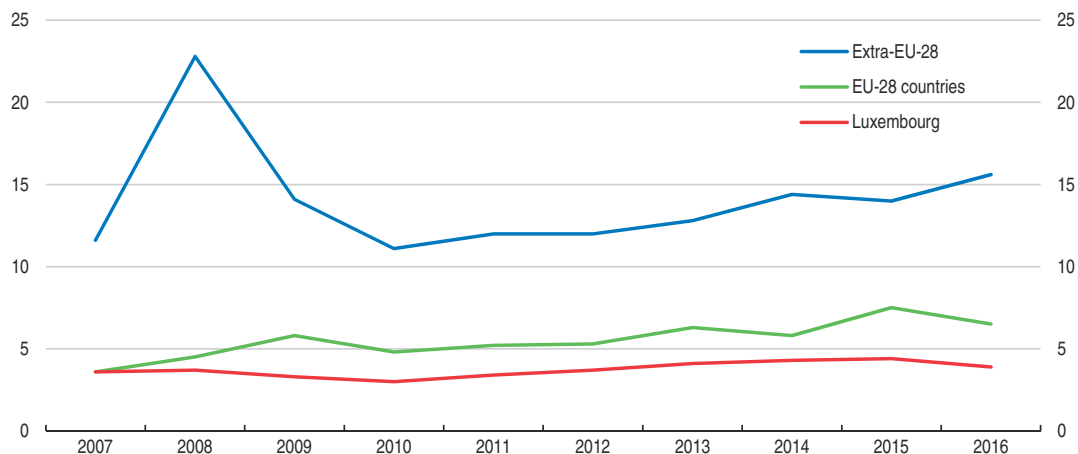
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underperform their peers without a migration background by a large margin (Figure 34), although it should be noted that significant progress has been made over the past decade in closing this gap. Furthermore, unlike in most countries, native-born students with both parents born abroad do not fare any better than their foreign-born colleagues. Educational gaps largely reflect differences in student socio-economic background, which the school system fails to compensate for. Improving the educational performance of the children of immigrants, who account for about half of all students, is key to tackling subsequent labour market disadvantage and segmentation and to improving education outcomes for the country as a whole.

Figure 33. Non-EU immigrants face higher unemployment

Unemployment rate by country of origin, age group 15-74, per cent



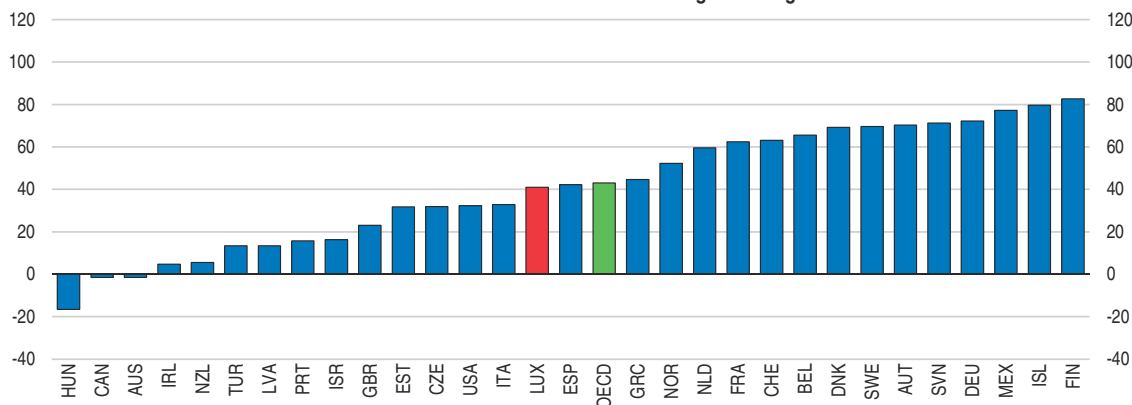
Source: Eurostat (2016), "Employment and Unemployment (Labour Force Survey)", Eurostat Database.

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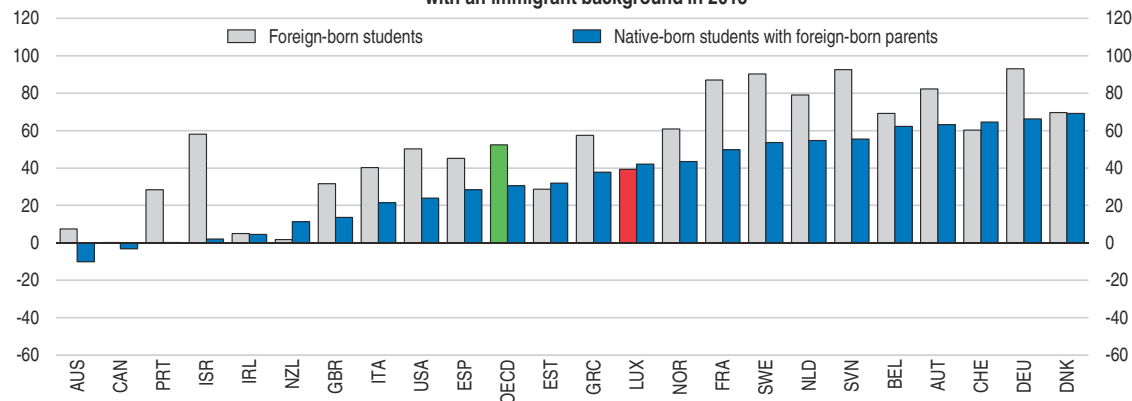
Figure 34. Children of immigrants underperform by a wide margin

PISA Score-point difference in science relative to immigrant background¹

A. Difference between students without and with an immigrant background in 2015



B. Difference between students without an immigrant background and two groups of students with an immigrant background in 2015



1. PISA: Programme for international student assessment. Students with an immigrant background are those whose parents were born in a country/economy other than the country/economy of assessment.

Source: OECD (2016), PISA 2015 Results (Volume I): Excellence and Equity in Education.

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Policies for better labour market and social integration

Learning several languages is a key precondition for successful integration in Luxembourg's multilingual society. The country has three administrative languages (French, German and Luxembourgish), and highly-skilled job vacancies often require knowledge of at least 3 languages (Pigeron-Piroth and Fehlen, 2015). Despite strong expansion in the past decade, public supply of language courses is still insufficient to fully meet demand (*Ministère de l'Éducation Nationale, de l'Enfance et de la Jeunesse*, 2016). The authorities should continue to increase the provision of language courses.

Integration also benefits from opportunities to develop social capital and to validate qualifications obtained abroad. The main integration programme is the Welcome and Integration Contract, which comprises an orientation day, a free civic instruction course and 1 to 3 reduced-price language courses. Take-up by immigrants has nonetheless been modest, suggesting a need for stronger outreach. Immigrants from outside the EU often face considerable difficulties to have their academic or professional qualifications recognized, which could be alleviated by more intense contacts between Luxembourgish educational authorities and their counterparts from the respective countries.

To help employers make better use of a diverse workforce, a group of private and public organisations launched in 2012 a diversity charter (*Charte de la Diversité Lëtzebuerg*) aiming at exchanging and spreading good practices in recruiting, career management and training. Take-up so far has been strongest among large firms and the actions taken have not mainly focused on immigrants. Efforts to further expand the universe of signatories should continue, and greater use of indicative numerical targets, scantily set so far, considered.

Like in other European countries, immigrants are under-represented in public employment. To some extent, this follows from tight citizenship requirements for civil servants' positions, coupled with a very low share of naturalised immigrants. Non-EU nationals are excluded from all public jobs (with only a few exceptions), and non-Luxembourgish EU nationals from the subset of posts involving the exercise of public authority or the safeguard of the general interest. This subset is defined very broadly: in the tax administration, for instance, it goes well beyond management positions. The scope of public sector jobs that require Luxembourgish citizenship could be narrowed. Recent reforms to the citizenship law to ease naturalization (e.g. shortening residence requirements and allowing that a weaker result in the Luxembourgish language oral expression test be compensated with the listening comprehension score) may also help to improve immigrants' access to the civil service.

However, since under-representation extends to naturalized immigrants (OECD, 2010b), other barriers also need to be tackled. Language demands are a case in point, as knowledge of all three administrative languages is in general required, and tested for candidates not having passed secondary education final exams in Luxembourg. Trilingual requirements should be relaxed in jobs without significant interaction with the public. Furthermore, naturalized immigrants, already tested for Luxembourgish to obtain citizenship, should be exempted from further testing in this language, with only carefully defined exceptions.

Action is needed to shorten inactivity periods of asylum seekers, who have accounted for close to 10% of total immigrant arrivals in recent years, and improve the ability of Luxembourg to attract skilled labour. Before being granted international protection, which can take more than one year, asylum seekers face a waiting period of interdiction to work

(6 months, recently reduced from 9), followed by very precarious labour market access (under a highly restrictive permit, seldom requested and issued). Faster decisions on asylum applications are the first-best solution, but provisional access to jobs for applicants with a high probability of being allowed to stay should also be improved, for instance by abolishing the waiting period and easing issuance of the relevant work permit. As regards labour migration, the authorities should reduce the time needed for high-skilled non-EU citizens to obtain a work and residence permit (currently up to three months, a long time in international comparison).

Improving the educational outcomes of the children of immigrants

To make the education system more equitable, increasing the supply and quality of early childhood education and care (ECEC) is the natural place to start. Attendance from an early age will tend to be highly beneficial to the offspring of immigrants, who often face language handicaps and a poorer learning environment at home. Better availability and affordability of childcare will also help to increase the labour market participation of mothers. Formal education in Luxembourg starts with an optional year at age 3. At this age or before, children can also attend non-formal education, where places are mainly available at structures operating on a commercial basis.

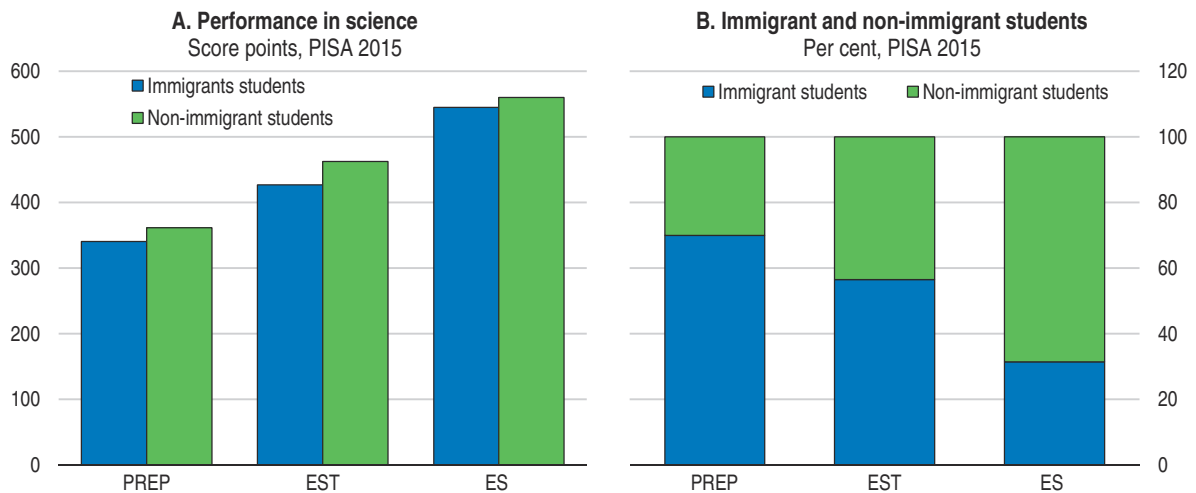
In 2016, the authorities launched an ambitious reform to improve the affordability and quality of ECEC, and should now proceed with implementation. All providers need to comply with national quality standards (e.g. for staff training) and, from September 2017, those wishing to be eligible for the public co-financing scheme (*chèque-service accueil*) will need to familiarise children aged 1-4 with both Luxembourgish and French. From that date, every child in this age group will be entitled to 20 free hours per week of education and care in eligible providers, with additional free hours for low-income families. As an accompanying measure, data collection on ECEC attendance should be improved, to identify possible patterns of lower participation among certain groups despite better affordability.

Reforms are also called for to make resource allocation across schools more equitable. Disadvantaged schools report a higher incidence of shortages of educational resources (staff, physical infrastructure and equipment), which suggests that current allocation mechanisms supposed to take account of the socio-economic background of students (such as the corrective factor – *facteur correcteur* – in secondary schools) need to be made more effective. Furthermore, well-qualified and experienced teachers tend to work in advantaged schools. Having recently upgraded initial and on-the-job teacher training, the authorities should now introduce incentives (e.g. as regards pay or career progression) to attract senior professionals to more challenging schools.

Early tracking makes the education system more inequitable and often harms immigrant students the most (OECD, 2016b). At the end of primary school (age 12), mostly on the basis of maths and languages tests, children are assigned to different programmes of secondary education: academic (*enseignement secondaire*, ES), technical (*enseignement secondaire technique*, EST) and preparatory (*régime préparatoire*, PREP), which is a variant of technical programmes for the weakest students. Performance differences between tracks are very large and the children of immigrants, often from a less favoured background or facing language handicaps, are over-represented in technical and preparatory programmes (Figure 35).


Ongoing reforms go some way to improve tracking decisions at primary school through earlier provision of information and greater parental involvement. When a

Figure 35. **Performance and immigrant background of students differ by secondary education tracks**



Note: At the end of primary school, children are assigned to different programmes of secondary education: academic (*enseignement secondaire, ES*), technical (*enseignement secondaire technique, EST*) and preparatory (*regime préparatoire, PREP*).

Source: OECD, PISA 2015 Database.

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student's parents and teacher fail to agree on which secondary education programme to attend, a committee where parents sit (in minority) will take the final decision. These decisions should be carefully monitored to prevent biases against particular groups of students: before this reform, tracking decisions for children of immigrants have tended to be less favourable (Glock et al., 2013). In the longer run, the authorities should consider postponing tracking to a later age, as is the case in most countries (Table 6).

Table 6. **Implementation of OECD recommendations on education system**

Recommendations from the previous Survey	Actions taken
In secondary education, reduce grade repetition, provide more school autonomy and better monitor education quality. Increase enrolment in early childhood education with emphasis on low-income and foreign-language families.	Secondary schools have started to adopt plans for school development aimed at increasing equity and school autonomy. A public co-financing scheme (<i>chèque service accueil</i>) provides additional free hours of early childhood education and care for low income families, including children of cross-border workers. National quality standards, including staff training requirements and systematic monitoring apply to all providers since September 2016.

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ANNEX

Progress in structural reform

This Annex reviews actions taken on recommendations from the previous Survey released in March 2015.

Macroeconomic policies

Recommendations from the previous <i>Survey</i>	Actions taken
Strengthen fiscal planning by introducing a spending review mechanism and link it to the medium-term budgeting framework. Consider introducing a spending ceiling for the general government.	A spending review has been conducted, but it is not planned to be repeated on a regular basis in its current form.
Continue to actively participate in international negotiations on co-ordinated action to combat tax base erosion and profit shifting of multinational enterprises including action to prevent double non-taxation. Change domestic laws as necessary.	Luxembourg has transposed directives implementing automatic exchange of information and introduced several OECD BEPS measures. The anti-tax avoidance directives are currently being transposed.
Increase the effective age of pension entitlement, either directly or indirectly via further reductions in the system's "proportional supplements".	The pension system review has been conducted and shall be followed by proposals for addressing existing challenges regarding pension sustainability.
Identify possible efficiency gains in the health care system.	No action taken.

Financial sector

Recommendations from the previous <i>Survey</i>	Actions taken
Continue to monitor financial market risk while using a comprehensive approach to risk assessment that accounts for financial linkages between banks and non-bank financial intermediaries, notably investment funds.	A systemic risk committee comprising the central bank, regulators of the banking and insurance sectors and the Ministry of Finance has been established to co-ordinate the implementation of the macro-prudential policy and safeguard the financial system stability. Dedicated working groups have been set up to analyse and quantify linkages between banks and non-bank financial intermediaries.
Continue efforts to develop resolution plans and to undertake resolvability assessments so that important banks could be resolved effectively across borders. For this end, continue to co-operate with regulatory authorities in other jurisdictions outside the EU.	The resolvability assessments and resolution plans for Luxembourg banks were prepared by the domestic regulator (CSSF) and the EU Single Resolution Board in 2016.

Raising human capital and enhancing resource allocation

Recommendations from the previous <i>Survey</i>	Actions taken
Better evaluate the effectiveness of public R&D spending and cluster policies.	No action taken.
Strengthen the co-operation between enterprises, University of Luxembourg and research institutes in Luxembourg and abroad.	An external appraisal of the University of Luxembourg finalised and findings published.
In secondary education, reduce grade repetition, provide more school autonomy and better monitor education quality.	Secondary schools have started to adopt plans for school development aimed at increasing equity and school autonomy.
To reduce carbon emission, continue substantial investment in public transport infrastructure, using the receipts from fuel taxation for this purpose. Explore the introduction of a system of congestion charges.	Transport infrastructure projects, such as the first phase of LuxTram and the second railway track to Bettembourg, are enhancing the public transportation system.
Increase excise taxes on gasoline and diesel to gradually narrow price differentials with neighbouring countries.	No action taken.
Reduce disincentives for labour force participation of women by charging health care contributions for each spouse individually and introducing separate income tax assessment of spouses.	Optional individual taxation of spouses from 2018.
Speed up procedures for granting construction permits. Raise property taxes by updating property values used as a tax base.	The process of granting building permits was streamlined by the Omnibus law (<i>loi</i> 6704) that simplified procedures related to the adoption of general and partial development plans by the communes.
Increase enrolment in early childhood education with emphasis on low-income and foreign-language families.	A public co-financing scheme (<i>chèque service accueil</i>) provides additional free hours of early childhood education and care for low income families, including children of cross-border workers. National quality standards, including staff training requirements and systematic monitoring, apply to all providers since September 2016.
Consider opening the telecommunications sector to private ownership and investment.	No action taken.