



OECD Economic Surveys LUXEMBOURG

JUNE 2017



OECD Economic Surveys: Luxembourg 2017

This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

Please cite this publication as:

OECD (2017), *OECD Economic Surveys: Luxembourg 2017*, OECD Publishing, Paris.
http://dx.doi.org/10.1787/eco_surveys-lux-2017-en

ISBN 978-92-64-27695-6 (print)
ISBN 978-92-64-27698-7 (PDF)
ISBN 978-92-64-27705-2 (epub)

Series: OECD Economic Surveys
ISSN 0376-6438 (print)
ISSN 1609-7513 (online)

OECD Economic Surveys: Luxembourg
ISSN 1995-3720 (print)
ISSN 1999-0782 (online)

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Photo credits: Cover © iStockphoto.com/Bogdan Lazar.

Corrigenda to OECD publications may be found on line at: www.oecd.org/about/publishing/corrigenda.htm.

© OECD 2017

You can copy, download or print OECD content for your own use, and you can include excerpts from OECD publications, databases and multimedia products in your own documents, presentations, blogs, websites and teaching materials, provided that suitable acknowledgment of the source and copyright owner is given. All requests for public or commercial use and translation rights should be submitted to rights@oecd.org. Requests for permission to photocopy portions of this material for public or commercial use shall be addressed directly to the Copyright Clearance Center (CCC) at info@copyright.com or the Centre français d'exploitation du droit de copie (CFC) at contact@cfcopies.com.

Table of contents

Basic statistics of Luxembourg, 2016	7
Executive summary	9
Assessment and recommendations	13
Macroeconomic developments	15
Green growth requires further investment	28
Better skills for more inclusive growth	31
Making better use of existing skills	40
Improving the labour market and social integration of immigrants	44
Bibliography	49
Annex. Progress in structural reform	53

Thematic chapters

Chapter 1. Harnessing skills for more inclusive growth	57
The importance of skills and main challenges	58
Policies ensuring flexible and continuously improving supply of skills	65
Policies ensuring better use of existing skills	74
<i>Recommendations to improve skills for more inclusive growth</i>	80
Bibliography	81
Chapter 2. Reaping the benefits of a diverse society through better integration of immigrants	85
Luxembourg benefits a lot from the large immigrant population, but integration could improve	86
Policies for better labour market and social integration	90
Improving the educational outcomes of the children of immigrants	99
<i>Recommendations to improve the integration of immigrants</i>	105
Bibliography	106

Boxes

1. Medium-term vulnerabilities of the Luxembourg's economy	19
2. Third industrial revolution is taking off in Luxembourg	32
1.1. The restructuring of Luxembourg's steel industry, 1975-1987	61
2.1. Luxembourg's diversity charter	91

Tables

1. Macroeconomic indicators and projections	16
2. Implementation of OECD recommendations on the financial sector	20
3. Implementation of OECD recommendations on fiscal and tax policies and on age-related spending	27
4. Comparison of installed capacity for renewable energy generation	30
5. Implementation of OECD recommendations on green growth	31
6. Implementation of OECD recommendations on education system	49

Figures

1. Life is good in Luxembourg	14
2. Macroeconomic developments are healthy	17
3. Evolution of macro-financial vulnerabilities since 2007	18
4. Financial services contribute strongly to GDP growth	19
5. Assets under management are at a record high	20
6. Tax revenues from the financial sector are volatile	21
7. Real house prices are growing strongly	21
8. Increasing price to rent ratio points to overvaluation	22
9. Household indebtedness is increasing	22
10. There is ample fiscal space	24
11. Public debt is low and sustainable	25
12. Tax revenues rely on corporate income taxes	25
13. Ageing costs are projected to rise	26
14. Net pension replacement rates are high	26
15. Average effective age of labour-market exit is low	27
16. Green growth indicators	29
17. Congestion times are among the highest in Europe	30
18. Labour market polarisation is changing the demand for skills	32
19. Some measures of skill mismatch are high	34
20. Unemployment rates are higher for low-skilled workers	35
21. Grade repetition rate is among the highest in the OECD	35
22. Better educated adults participate more in lifelong learning	37
23. The number of start-ups is lagging the best EU performers	38
24. Obstacles to doing business still exist in some areas	38
25. Insolvency costs are high	39
26. Gender gap in perception on access to entrepreneurial training is pronounced	40
27. Share of training in active labour market policy spending is low	41
28. Young workers often work on temporary contracts	42
29. Employment protection for permanent workers is above the OECD average	42
30. Most part-time workers are women	43
31. The large immigrant population has a high employment rate	45
32. Luxembourg has long attracted immigrants	45
33. Non-EU immigrants face higher unemployment	46
34. Children of immigrants underperform by a wide margin	46
35. Performance and immigrant background of students differ by secondary education tracks	49

1.1. High labour productivity reflects high level of skills	58
1.2. Language and computer skills are above average	59
1.3. Labour market polarisation is changing the demand for skills	60
1.4. Some measures of skill mismatch are high	62
1.5. The overall PISA results show a persistent gap	63
1.6. There is room for further improvement of skills	63
1.7. Upskilling of the labour force is lagging behind the best performers	64
1.8. Participation rates are low for the youngest and the oldest	64
1.9. Female unemployment rate exceeds male	65
1.10. Successful completion rates in secondary education are low	67
1.11. Enrolment in Vocational Education and Training is high	68
1.12. Perceived vocational education and training image and quality are modest	69
1.13. The share of tertiary-educated population is high	70
1.14. Students are not interested in science and engineering careers	71
1.15. Career guidance is widespread	71
1.16. For older workers studying is more costly than workplace training	72
1.17. Young workers often work on temporary contracts	75
1.18. High marginal tax rates create an inactivity trap	77
1.19. High participation tax rates create an unemployment trap	77
1.20. Work disincentives for second earners are high	78
2.1. Migration flows have long been substantial, leading to a large foreign-born population	86
2.2. Immigrants have mainly come from Europe	87
2.3. Immigrants have a high overall employment rate	87
2.4. Immigrants have a higher proportion of prime-age workers	88
2.5. Non-EU prime-age immigrants have an employment rate disadvantage	89
2.6. The risk of poverty is high among non-EU immigrants	90
2.7. Immigrants are strongly under-represented in public sector jobs	94
2.8. Very few immigrants take Luxembourgish citizenship	96
2.9. Citizenship indicators, 2016	97
2.10. The processing time for immigration of highly-skilled workers is high	98
2.11. Children of immigrants underperform by a wide margin	99
2.12. Socio-economic status has a large impact on student performance	100
2.13. Performance and immigrant background of students differ by secondary education tracks	102
2.14. Grade repetition is high, especially among immigrant students	103
2.15. Disadvantaged schools face greater shortages of educational resources	104

This Survey is published on the responsibility of the Economic and Development Review Committee of the OECD, which is charged with the examination of the economic situation of member countries.

The economic situation and policies of Luxembourg were reviewed by the Committee on 2 May 2017. The draft report was then revised in the light of the discussions and given final approval as the agreed report of the whole Committee on 17 May 2017. The Secretariat's draft report was prepared for the Committee by Jan Stráský and Álvaro Pina under the supervision of Pierre Beynet. Research assistance was provided by Corinne Chanteloup and editorial assistance was provided by Claude-Annie Manga-Collard.

The previous Survey of Luxembourg was issued in March 2015.

Follow OECD Publications on:



http://twitter.com/OECD_Pubs



<http://www.facebook.com/OECDPublications>



<http://www.linkedin.com/groups/OECD-Publications-4645871>



<http://www.youtube.com/oeccdlibrary>



<http://www.oecd.org/oeccdirect/>

This book has...

StatLinks 

A service that delivers Excel® files from the printed page!

Look for the **StatLinks**  at the bottom of the tables or graphs in this book. To download the matching Excel® spreadsheet, just type the link into your Internet browser, starting with the <http://dx.doi.org> prefix, or click on the link from the e-book edition.

BASIC STATISTICS OF LUXEMBOURG, 2016

(Numbers in parentheses refer to the OECD average)*

LAND, PEOPLE AND ELECTORAL CYCLE				
Population (million)	0.5		Population density per km ²	222.8 (37.2)
Under 15 (%)	17.0	(17.9)	Life expectancy (years, 2014)	82.3 (80.6)
Over 65 (%)	15.7	(16.6)	Men	79.4 (77.9)
Foreign-born (% , 2010)	40.5		Women	85.2 (83.3)
Latest 5-year average growth (%)	-0.5	(0.6)	Latest general election	October 2013
ECONOMY				
Gross domestic product (GDP)			Value added shares (%)	
In current prices (billion USD)	59.9		Primary sector	0.2 (2.5)
In current prices (billion EUR)	54.2		Industry including construction	12.3 (26.8)
Latest 5-year average real growth (%)	3.5	(1.8)	Services	87.4 (70.8)
Per capita (000 USD PPP)	108.3	(41.0)		
GENERAL GOVERNMENT				
Per cent of GDP				
Expenditure	41.2	(40.9)	Gross financial debt	27.6 (111.8)
Revenue	42.7	(38.9)	Net financial debt	-50.4 (72.8)
EXTERNAL ACCOUNTS				
Exchange rate (EUR per USD)	0.904		Main exports (% of total merchandise exports)	
PPP exchange rate (USA = 1)	0.858		Manufactured goods	37.8
In per cent of GDP			Machinery and transport equipment	27.0
Exports of goods and services	228.1	(53.9)	Chemicals and related products, n.e.s.	10.4
Imports of goods and services	191.5	(49.3)	Main imports (% of total merchandise imports)	
Current account balance	4.7	(0.3)	Machinery and transport equipment	34.2
Net international investment position (2014)	32.6		Manufactured goods	15.7
			Chemicals and related products, n.e.s.	11.4
LABOUR MARKET, SKILLS AND INNOVATION				
Employment rate for 15-64 year-olds (%)	65.6	(67.0)	Unemployment rate, Labour Force Survey (age 15 and over) (%)	6.3 (6.3)
Men	70.5	(74.7)	Youth (age 15-24, %)	18.7 (13.0)
Women	60.4	(59.3)	Long-term unemployed (1 year and over, %)	1.9 (2.2)
Participation rate for 15-64 year-olds (% , 2015)	70.9	(71.3)	Tertiary educational attainment 25-64 year-olds (% , 2015)	39.8 (35.0)
Average hours worked per year (2015)	1 507	(1 766)	Gross domestic expenditure on R&D (% of GDP, 2015)	1.3 (2.4)
ENVIRONMENT				
Total primary energy supply per capita (toe, 2015)	7.4	(4.1)	CO ₂ emissions from fuel combustion per capita (tonnes, 2014)	18.6 (9.4)
Renewables (% , 2014)	5.2	(9.6)	Water abstractions per capita (1 000 m ³ , 2014)	0.1
Exposure to air pollution (more than 10 µg/m ³ of PM _{2.5} , % of population, 2015)	99.4	(75.2)	Municipal waste per capita (tonnes, 2015)	0.7 (0.5)
SOCIETY				
Income inequality (Gini coefficient, 2013)	0.281	(0.311)	Education outcomes (PISA score, 2015)	
Relative poverty rate (% , 2013)	8.4	(11.1)	Reading	481 (493)
Median disposable household income (000 USD PPP, 2013)	38.5	(22.0)	Mathematics	486 (490)
Public and private spending (% of GDP)			Science	483 (493)
Health care (2015)	7.2	(9.0)	Share of women in parliament (%)	28.3 (28.7)
Pensions (2013)	8.5	(9.1)	Net official development assistance (% of GNI)	1.00 (0.39)
Education (primary, secondary, post sec. non tertiary, 2013)	2.9	(3.7)		

Better life index: www.oecdbetterlifeindex.org

* Where the OECD aggregate is not provided in the source database, a simple OECD average of latest available data is calculated where data exist for at least 29 member countries.

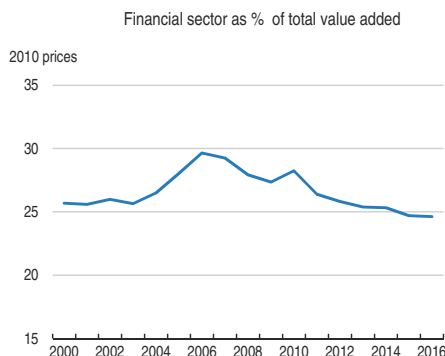
Source: Calculations based on data extracted from the databases of the following organisations: OECD, International Energy Agency, World Bank, International Monetary Fund and Inter-Parliamentary Union.

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



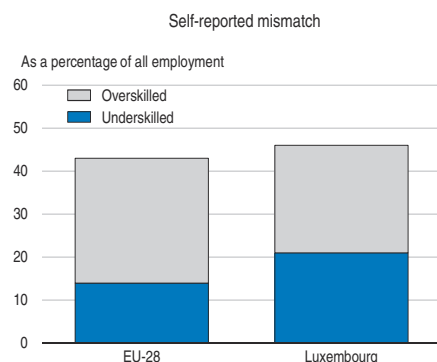
Source: OECD National Accounts Statistics.

StatLink <http://dx.doi.org/10.1787/888933495735>

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.

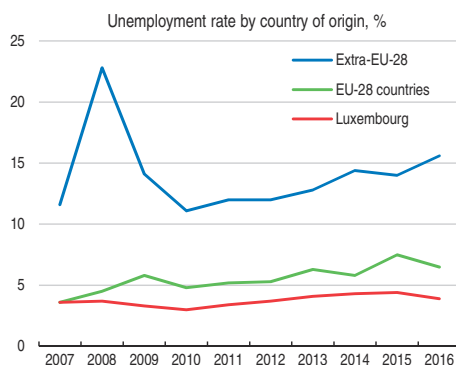
Source: Sixth European Working Conditions Survey, 2015.

StatLink <http://dx.doi.org/10.1787/888933495745>

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.

StatLink <http://dx.doi.org/10.1787/888933496073>

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.	Develop further the capacity to undertake regularly system-wide stress tests of fund-bank linkages and consider publishing their results. Introduce additional macro prudential measures, such as limits to loan-to-value or loan-to-income ratios. Improve access to credit for SMEs by introducing a central credit registry.
The supply of housing does not meet the increasing demand, mainly due to weak incentives to use land available for construction.	Reform land planning and introduce time-limited building permits. Increase taxation of non-used constructible land. Limit further mortgage interest deductibility to reduce housing demand.
Short-term fiscal stance is adequate, but Luxembourg faces high age-related costs that may, in the absence of further changes, become unsustainable.	Align the legal age of pension entitlement with increases in life expectancy. Link more closely the level of pensions to the level of contributions.
Taxes and excise duties on transport fuel in Luxembourg are lower than in neighbouring countries, adding to traffic congestion and air pollution.	Increase taxes and excise duties on transport fuel. Explore the introduction of a system of congestion charges. Improve cross-border railway connections and transport infrastructure.
Better skills for more inclusive growth	
Secondary education involves grouping pupils by ability at an early age and high rates of grade repetition.	Provide earlier individualised support to students falling behind. Improve the mobility between education programmes via curriculum alignment and differentiated teaching.
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.	Improve the availability of high-quality child care Provide incentives for fathers to share parental leave.
Learning several languages is a key precondition for successful integration in Luxembourg's multilingual society.	Continue to increase public supply of language courses. Diversify language training to take better account of workplace needs.
Asylum seekers face long periods of inactivity.	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.
Immigrants are under-represented in public employment.	Ease immigrants' access to public sector jobs.

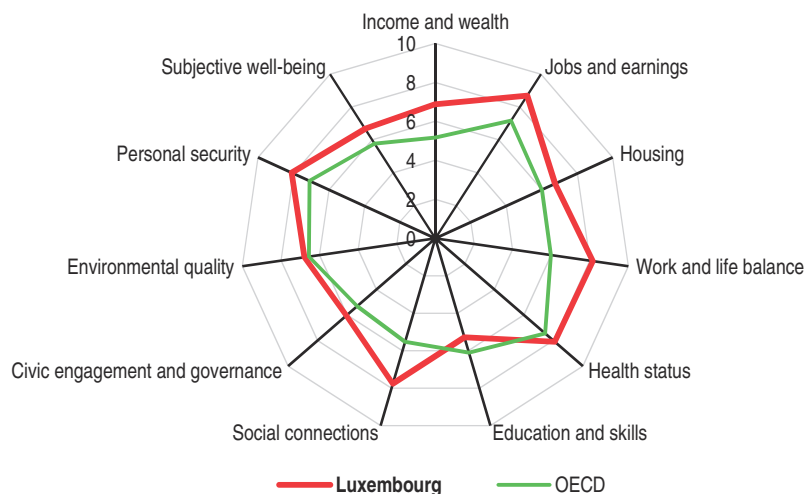
Assessment and recommendations

- *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.

StatLink  <http://dx.doi.org/10.1787/888933495750>

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

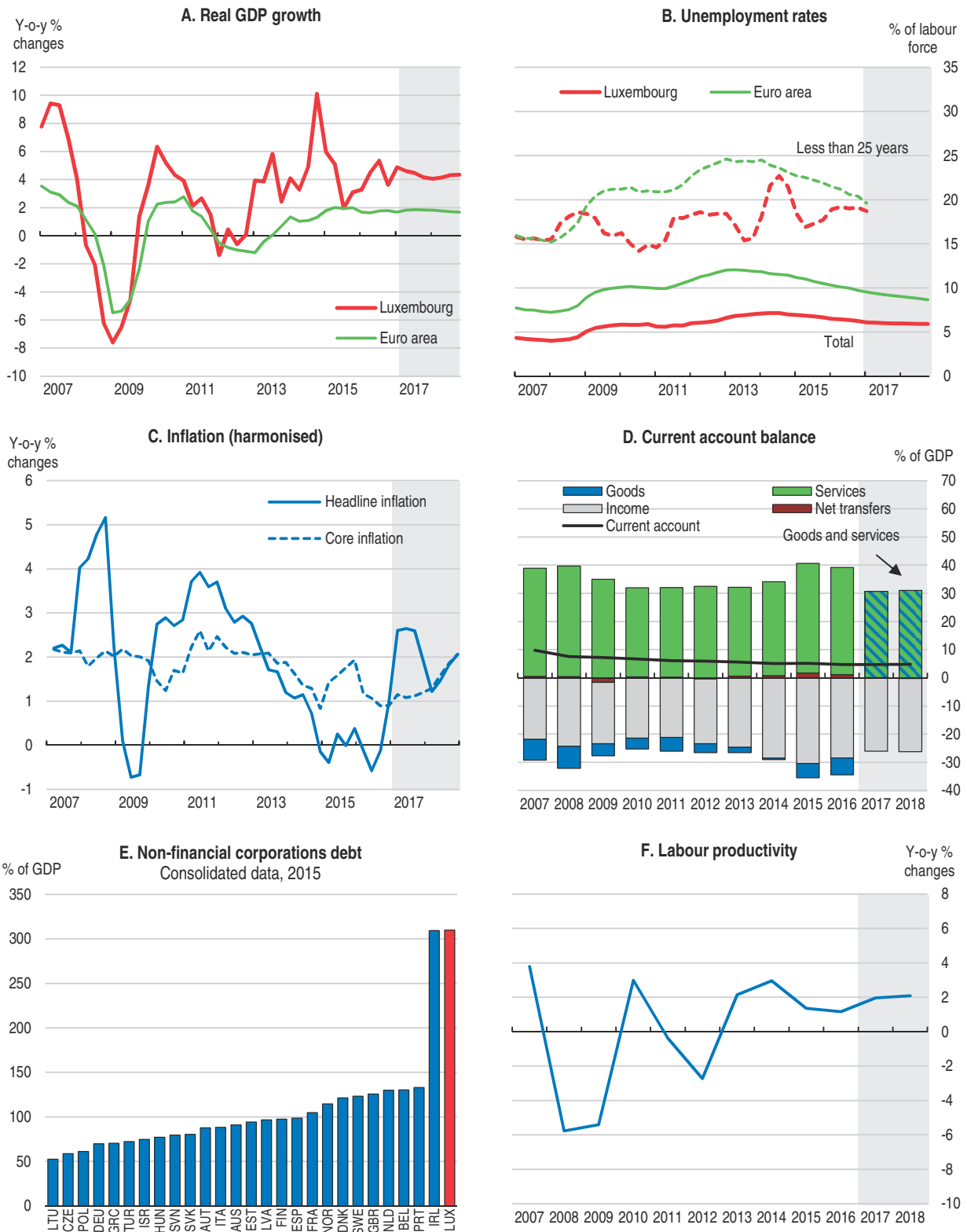
1. Contribution to changes in real GDP.
2. As a percentage of potential GDP.
3. As a percentage of household disposable income.
4. As a percentage of GDP.

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**

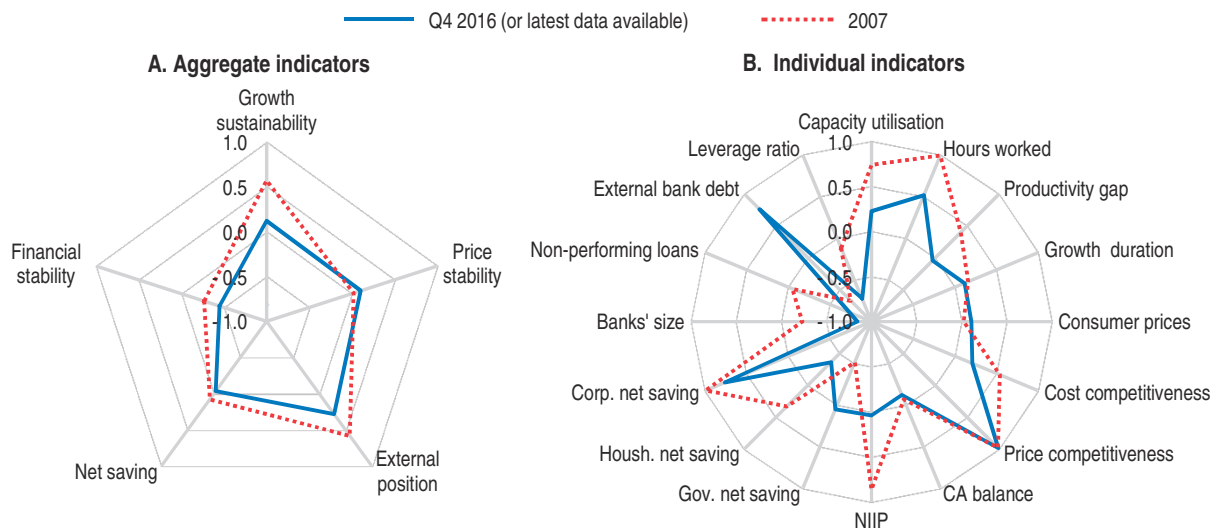


Source: OECD Economic Outlook 101 Database; Eurostat, Employment and Unemployment (Labour Force Survey) Statistics; OECD National Accounts Statistics.

StatLink <http://dx.doi.org/10.1787/888933495760>

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.

StatLink  <http://dx.doi.org/10.1787/888933495778>

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

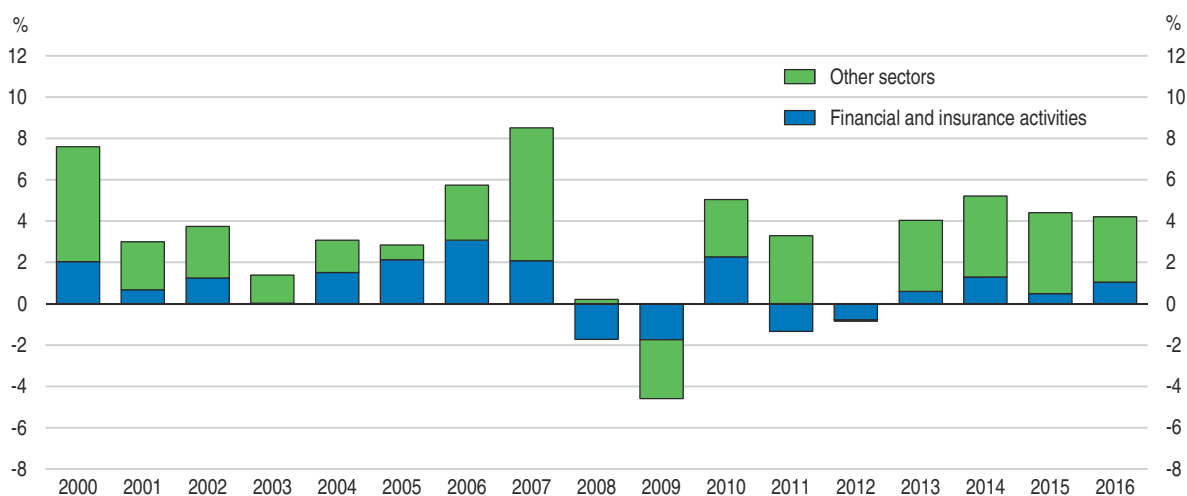
The financial sector remains the driver of economic growth, representing 28% of gross value added and 10% of employment in 2015 (Figure 4). Only a handful of banks in Luxembourg have domestic ownership and focus on the domestic market. The bulk of the financial sector consists of banks with foreign ownership 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



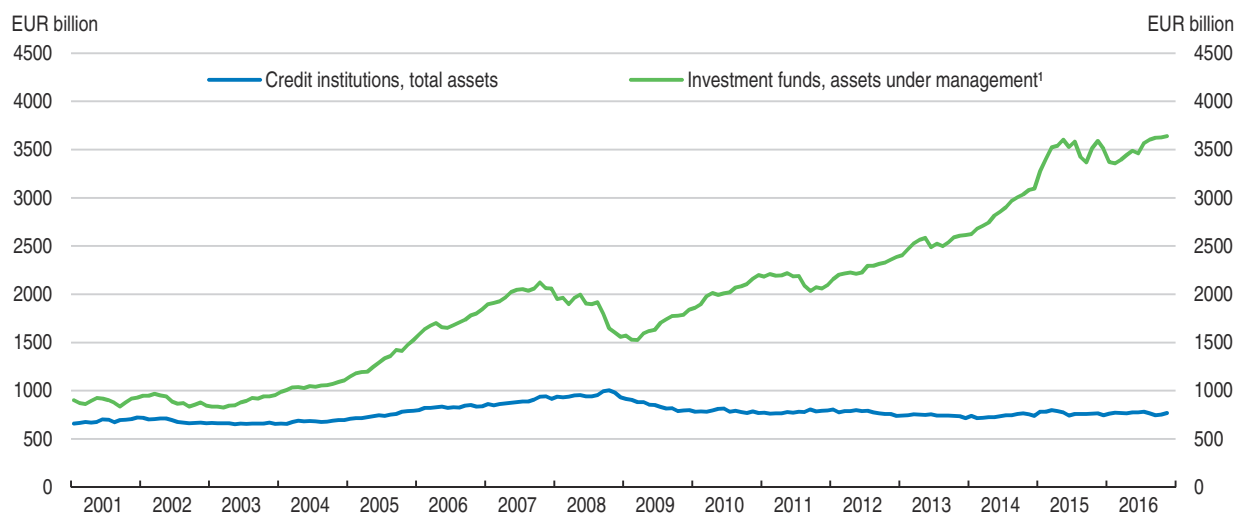
Source: OECD National Accounts database.

StatLink  <http://dx.doi.org/10.1787/888933495782>

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.


StatLink  <http://dx.doi.org/10.1787/888933495791>

Table 2. **Implementation of OECD recommendations on the financial sector**

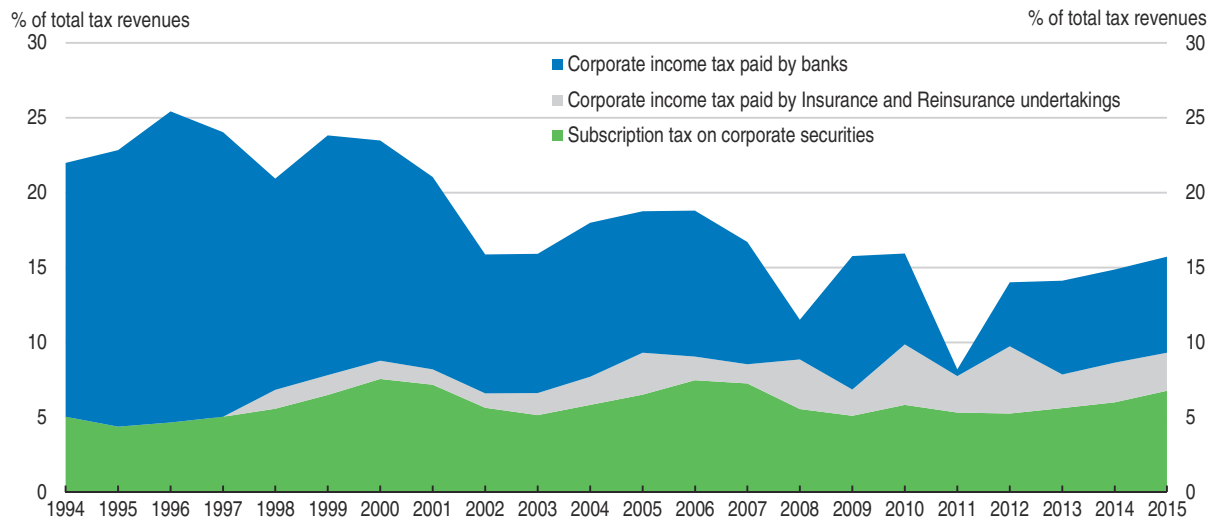
Earlier OECD recommendations	Actions taken
Continue to monitor financial market risk while using a comprehensive approach to risk assessment that accounts for financial linkages between banks and non-bank financial intermediaries, notably investment funds.	A systemic risk committee comprising the central 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.


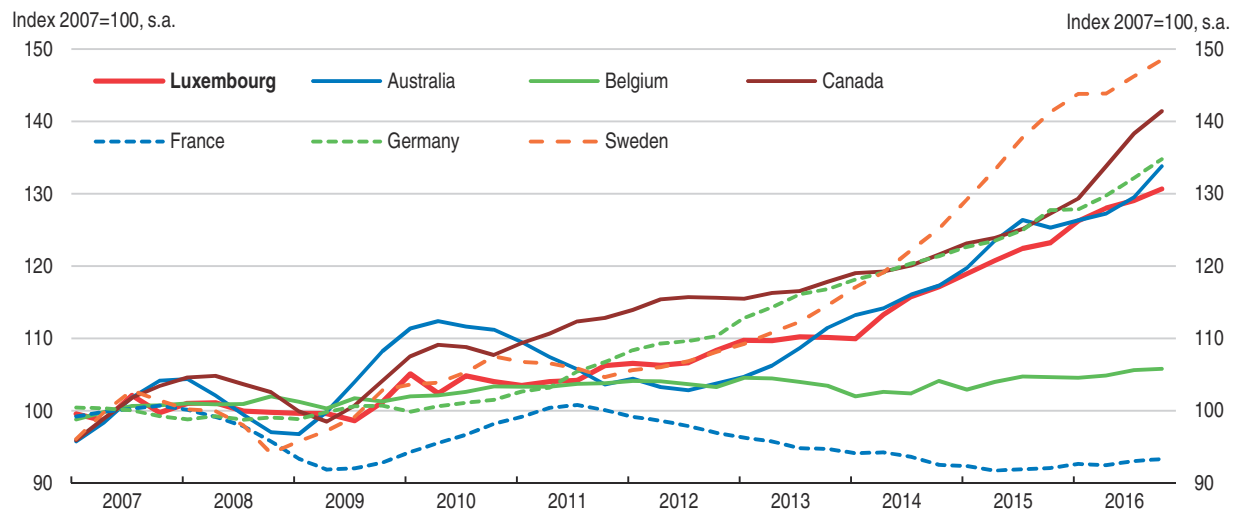

StatLink  <http://dx.doi.org/10.1787/888933495803>

Figure 7. Real house prices are growing strongly

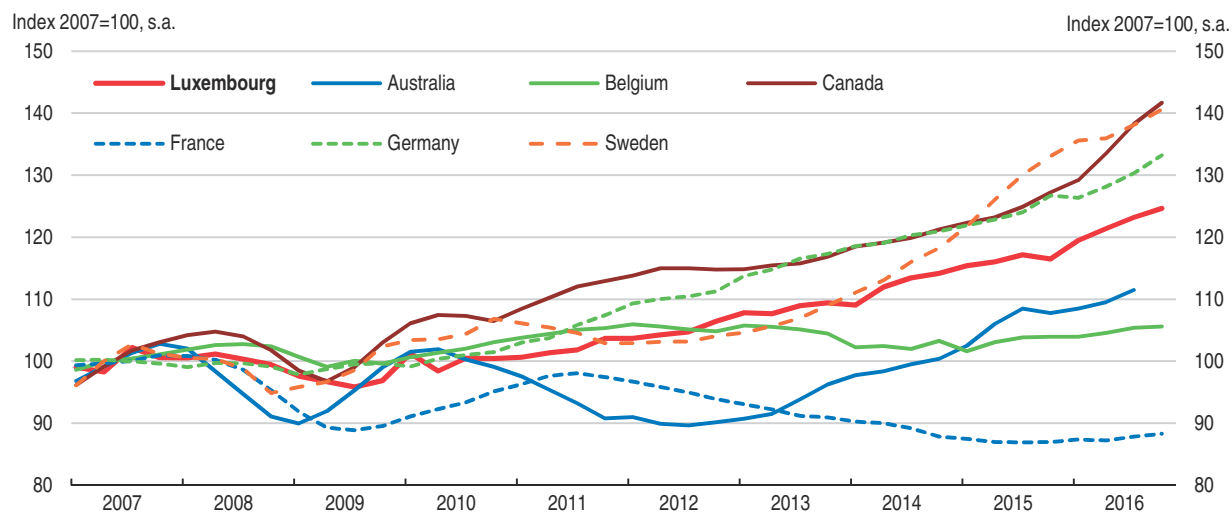


Source: OECD, Analytical house prices indicators database.

StatLink  <http://dx.doi.org/10.1787/888933495814>

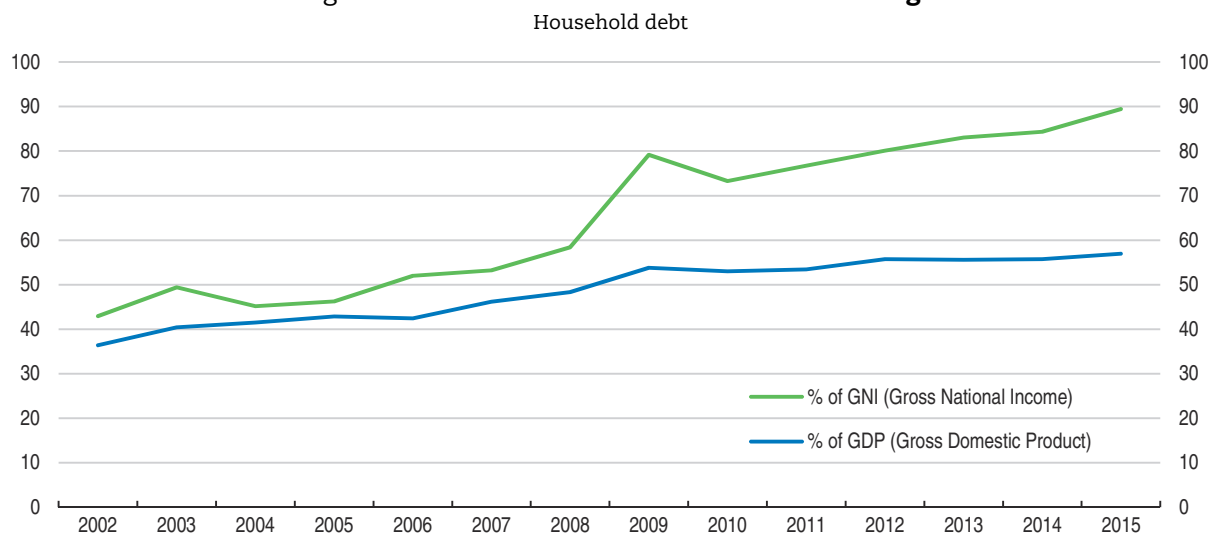
fundamentals, but such assessment comes with high uncertainty (*Banque centrale du Luxembourg, 2016*).

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.

StatLink <http://dx.doi.org/10.1787/888933495827>

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.

StatLink <http://dx.doi.org/10.1787/888933495832>

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).

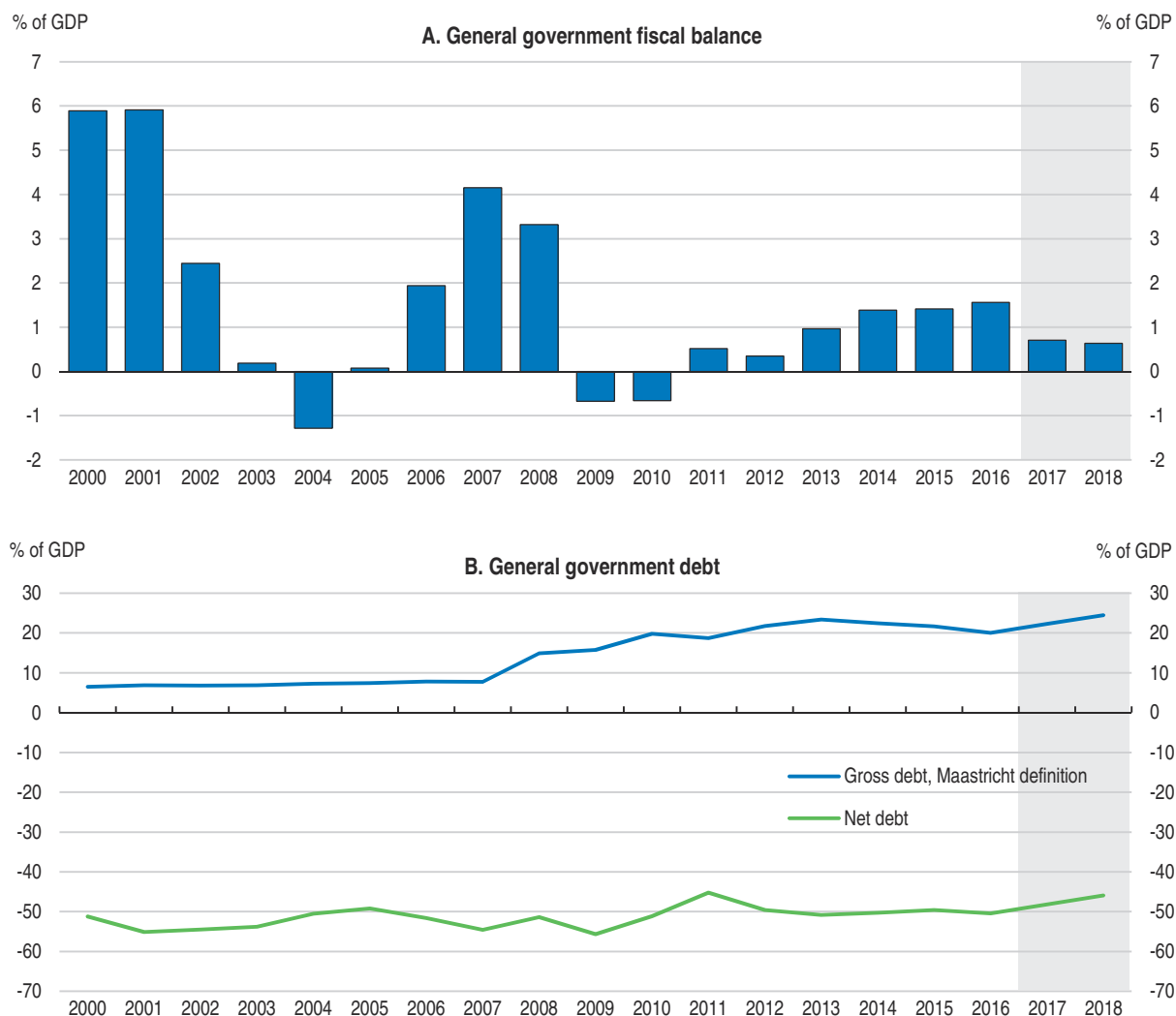
The short-term fiscal space is being used for a tax reform

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**

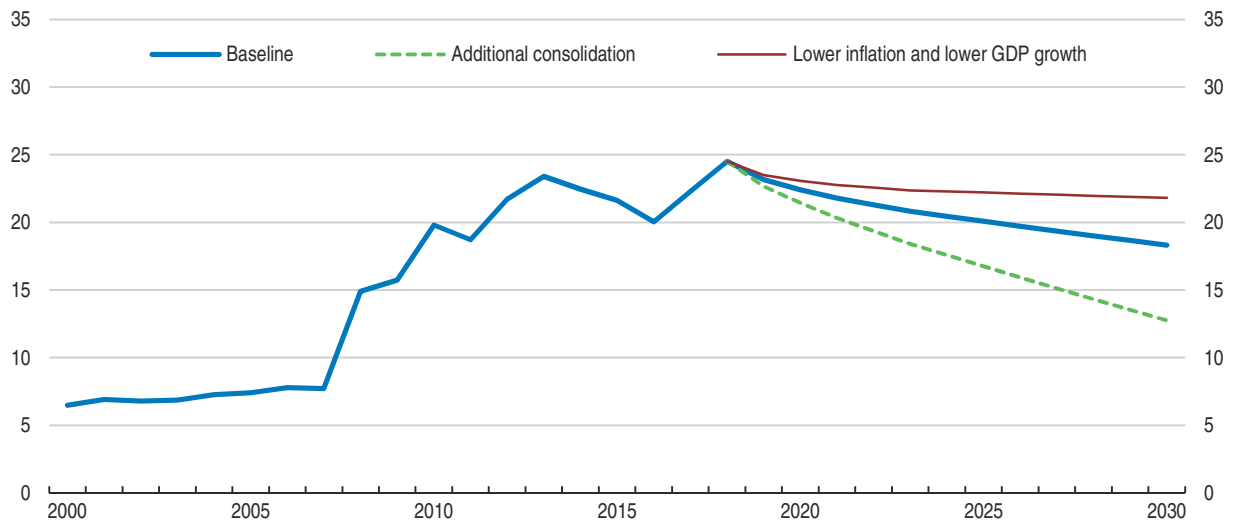
Source: OECD Economic Outlook 101 Database.

StatLink  <http://dx.doi.org/10.1787/888933495840>

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).


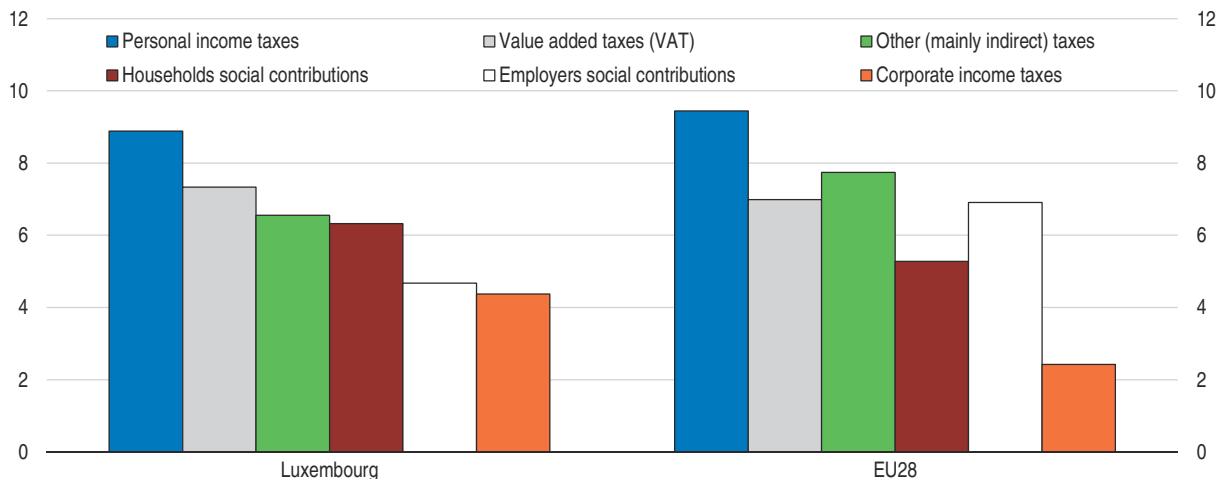

StatLink  <http://dx.doi.org/10.1787/888933495855>

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*.

StatLink  <http://dx.doi.org/10.1787/888933495863>

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

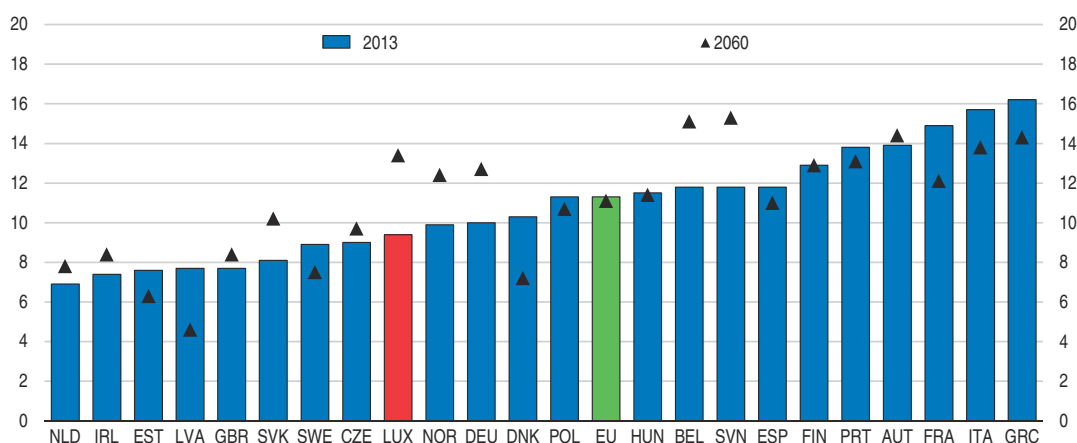
strict standards of responsible business conduct as defined by the OECD could benefit Luxembourg by emphasising its competitive advantages, including political stability, business-friendly environment and a highly qualified labour force.

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

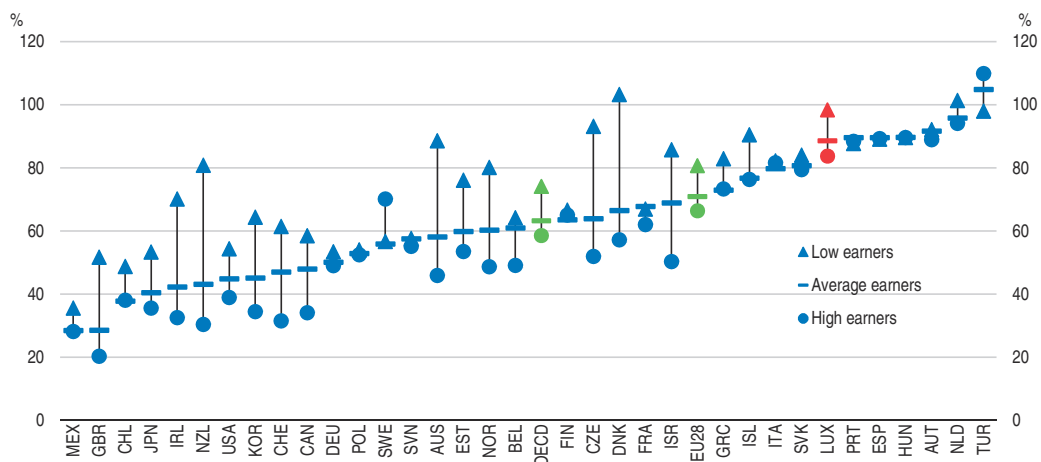


Source: European Commission (2015), The 2015 Ageing Report: Economic and budgetary projections for the 28 EU Member States (2013-60).

StatLink <http://dx.doi.org/10.1787/888933495878>

Figure 14. Net pension replacement rates are high

2014



Note: Data refer to men.

Source: OECD, Pensions at a glance 2015.

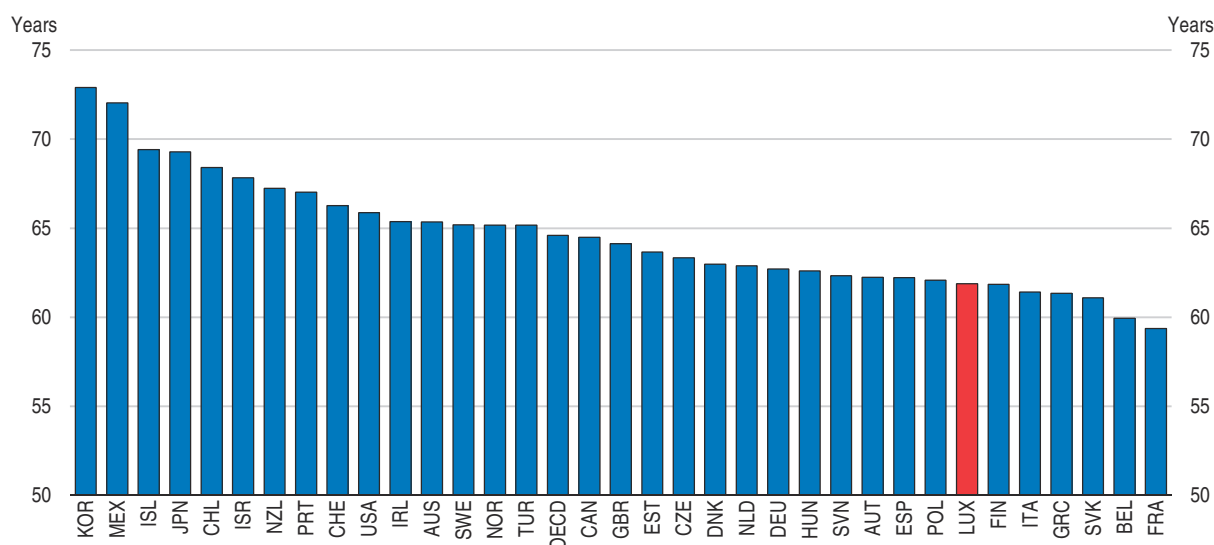
StatLink <http://dx.doi.org/10.1787/888933495887>

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*.

StatLink  <http://dx.doi.org/10.1787/888933495897>

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.

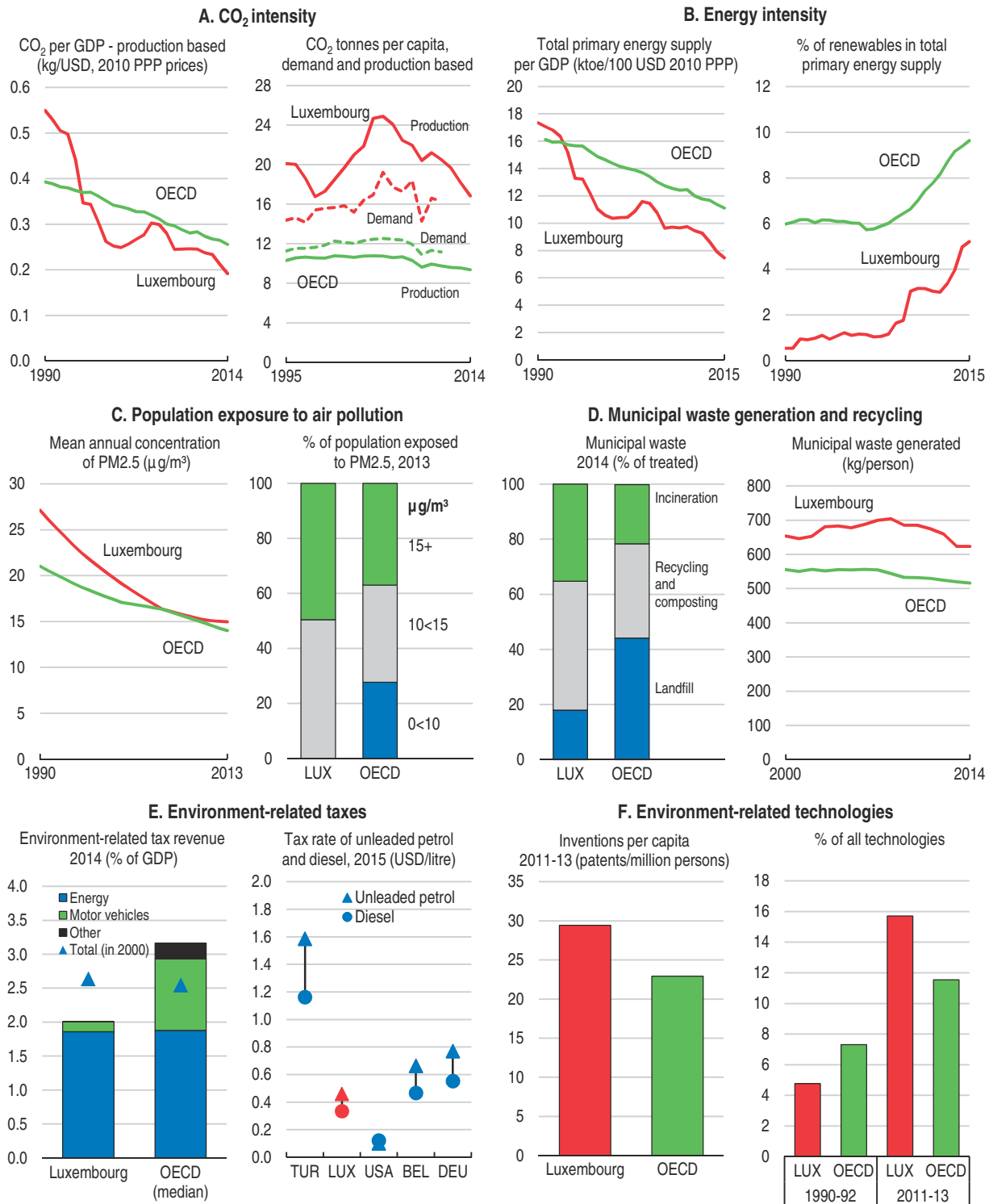
Installed renewable energy capacity in Luxembourg is mainly photovoltaic, as in Saarland, whereas the other neighbouring regions tend to put more emphasis on wind energy (Rheinland-Palatinate) or biomass (Wallonia). However, the total renewable capacity measured both per inhabitant and per square kilometre 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.

StatLink <http://dx.doi.org/10.1787/888933495903>

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

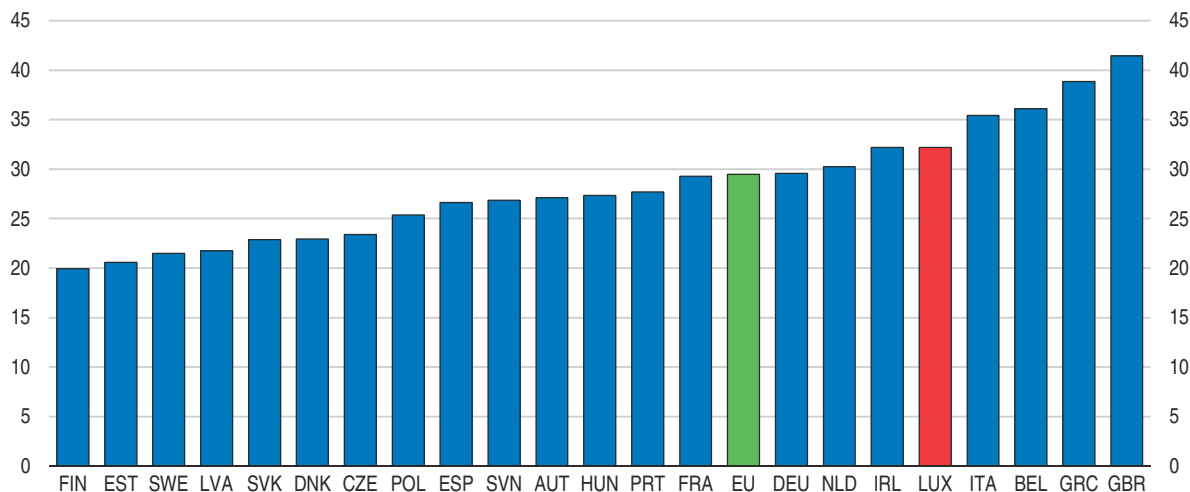
1. 2015 data (2013 for Lorraine).

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.

StatLink  <http://dx.doi.org/10.1787/888933495914>

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**

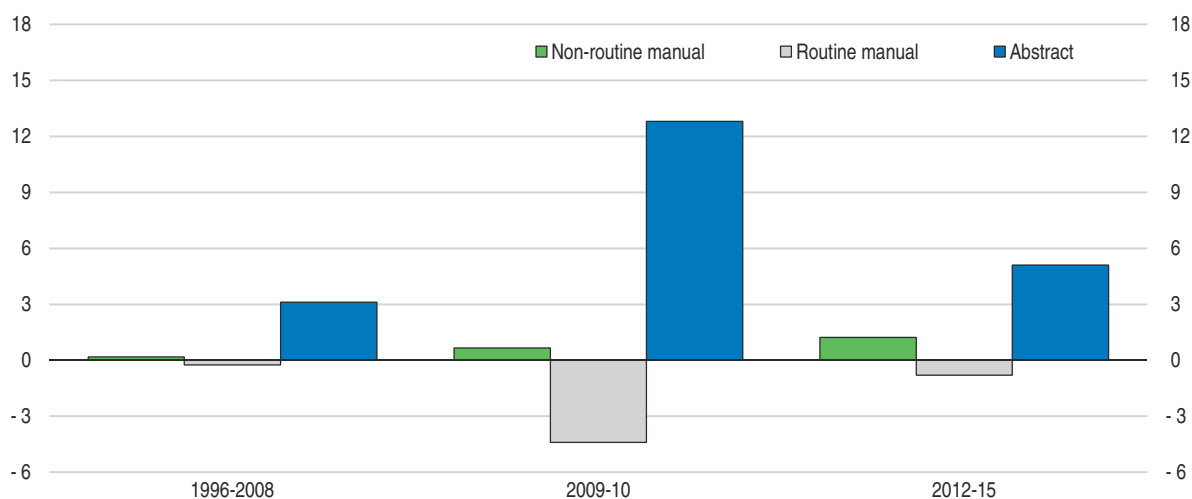
Earlier OECD recommendations	Actions taken
To reduce carbon emission, continue substantial investment in public transport infrastructure, using the receipts from fuel taxation for this purpose. Explore the introduction of a system of congestion charges.	Transport infrastructure projects, such as the 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.

StatLink  <http://dx.doi.org/10.1787/888933495921>

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).

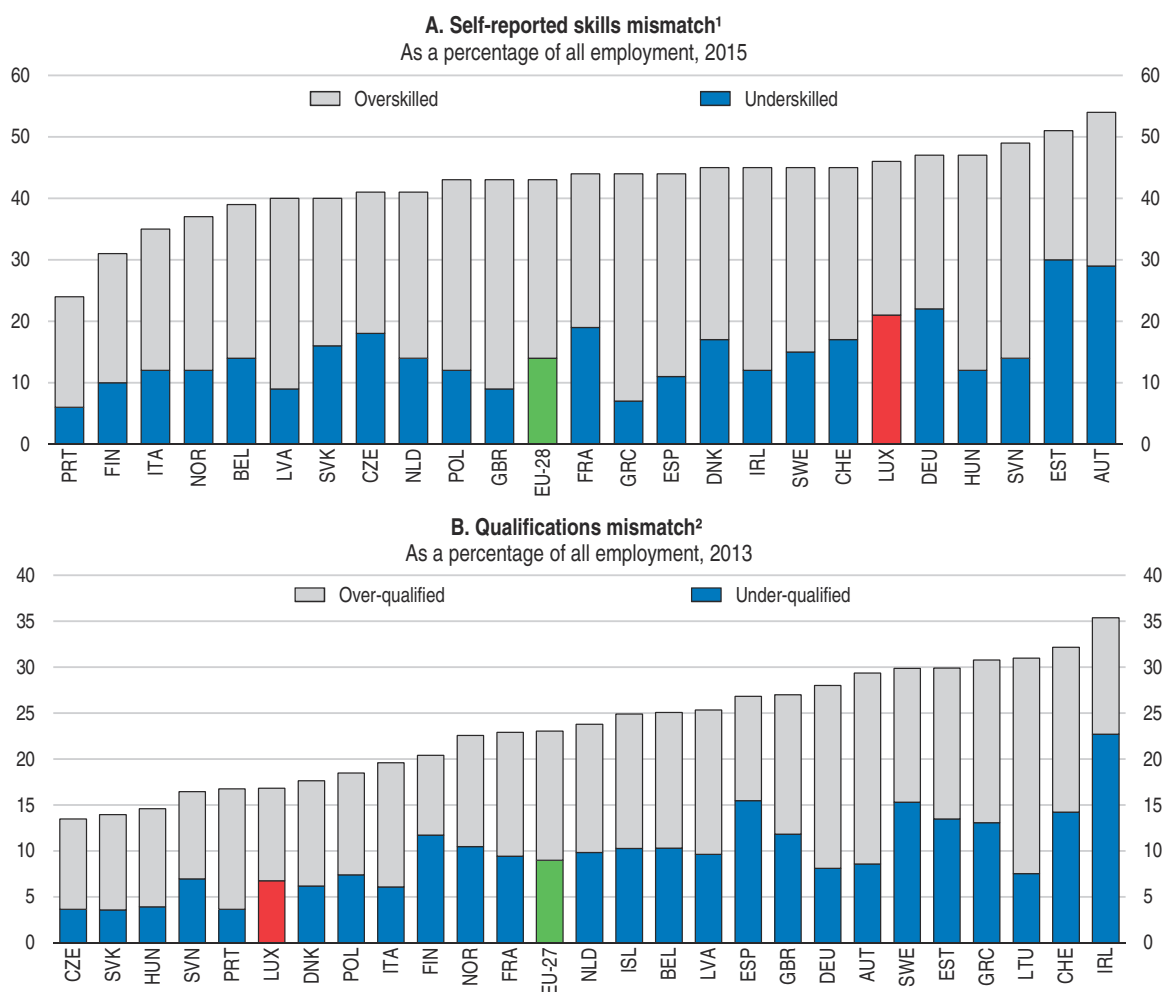
qualification mismatch, suggest less of a skill mismatch problem in Luxembourg (Figure 19, Panel B).

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*.

StatLink  <http://dx.doi.org/10.1787/888933495937>

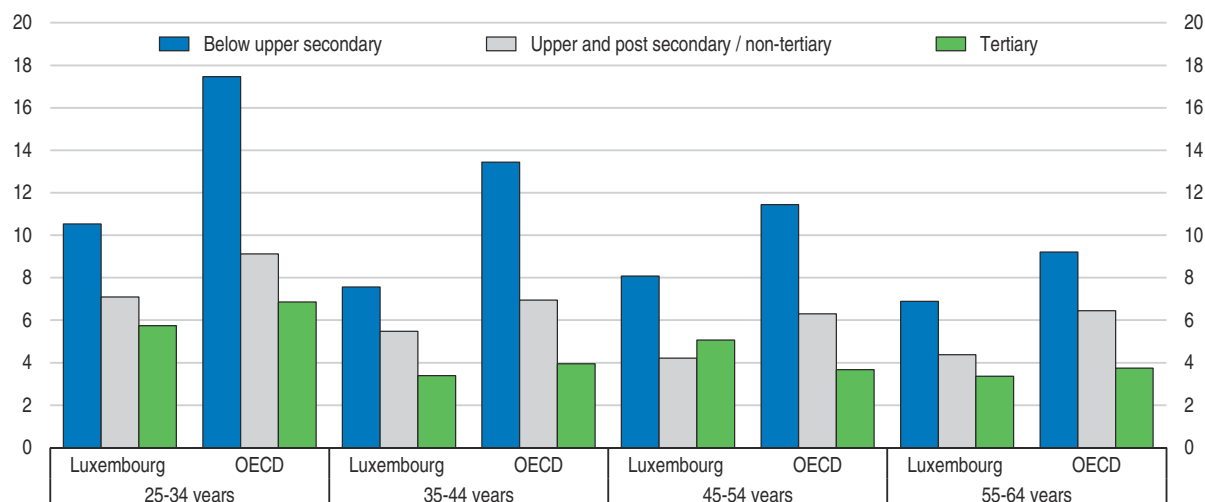
European Centre for the Development of Vocational Training (CEDEFOP) indicates that by 2025 about 49% of jobs in Luxembourg could require higher skills, compared to 39% in 2013 (CEDEFOP, 2015a). Other instruments, such as lists of shortage occupations for assessing migration, exist but are not used in 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.

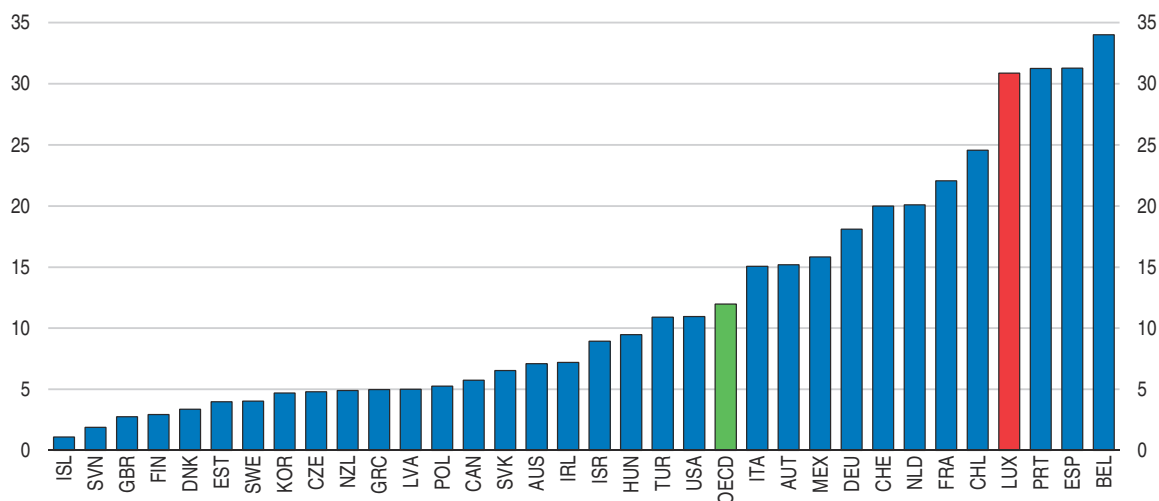
StatLink  <http://dx.doi.org/10.1787/888933495941>

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.

StatLink  <http://dx.doi.org/10.1787/888933495952>

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).

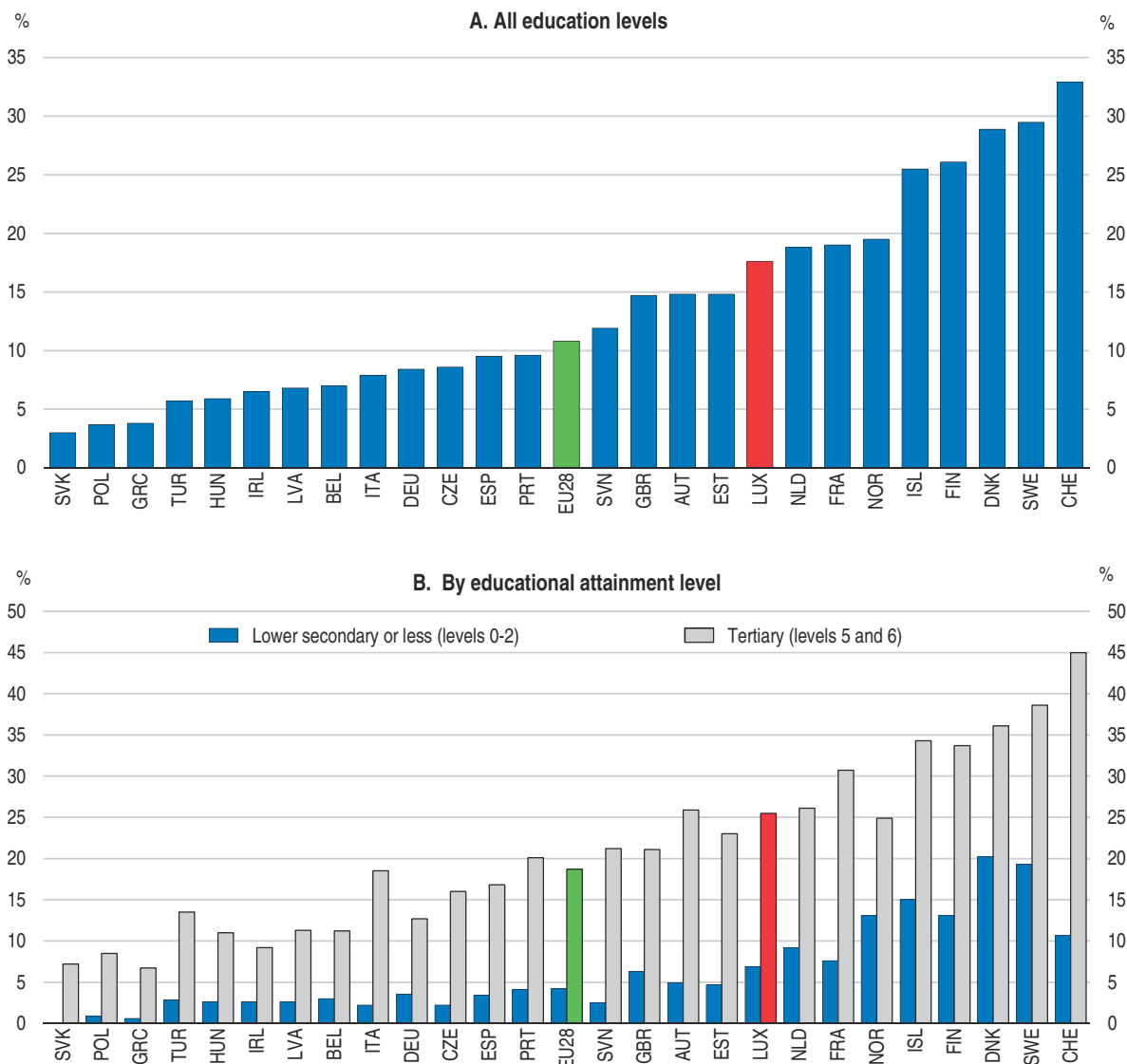
Other measures, such as extending the individual study leave (*congé individuel de formation*) to enable taking part in longer and more demanding courses and introduction of individual learning accounts and subsidies, such as vouchers and refundable tax credits, could improve access to lifelong learning 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.

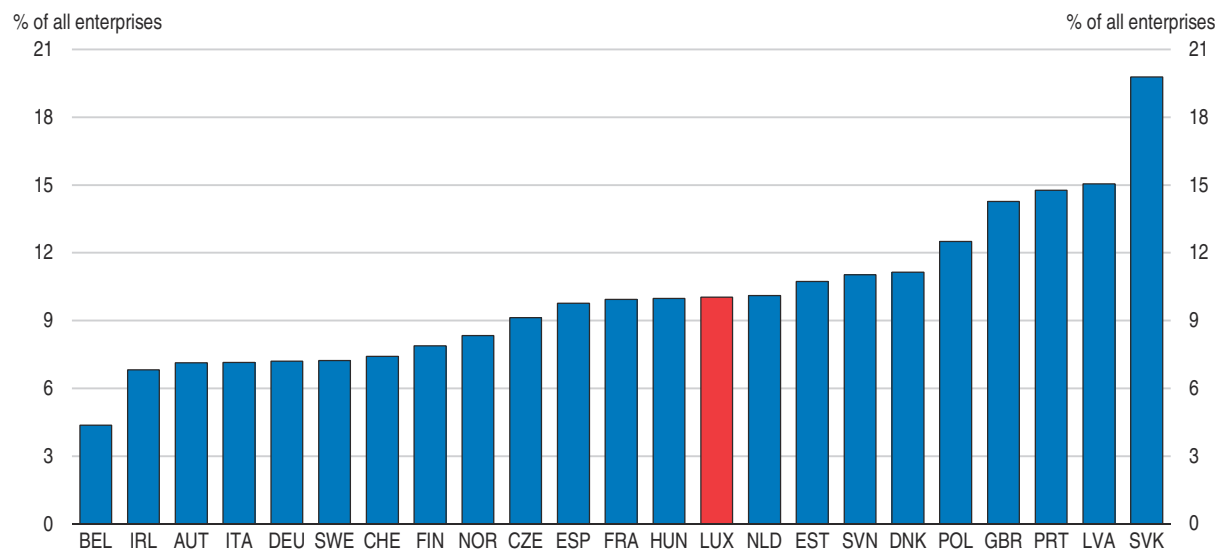
StatLink  <http://dx.doi.org/10.1787/888933495963>

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.

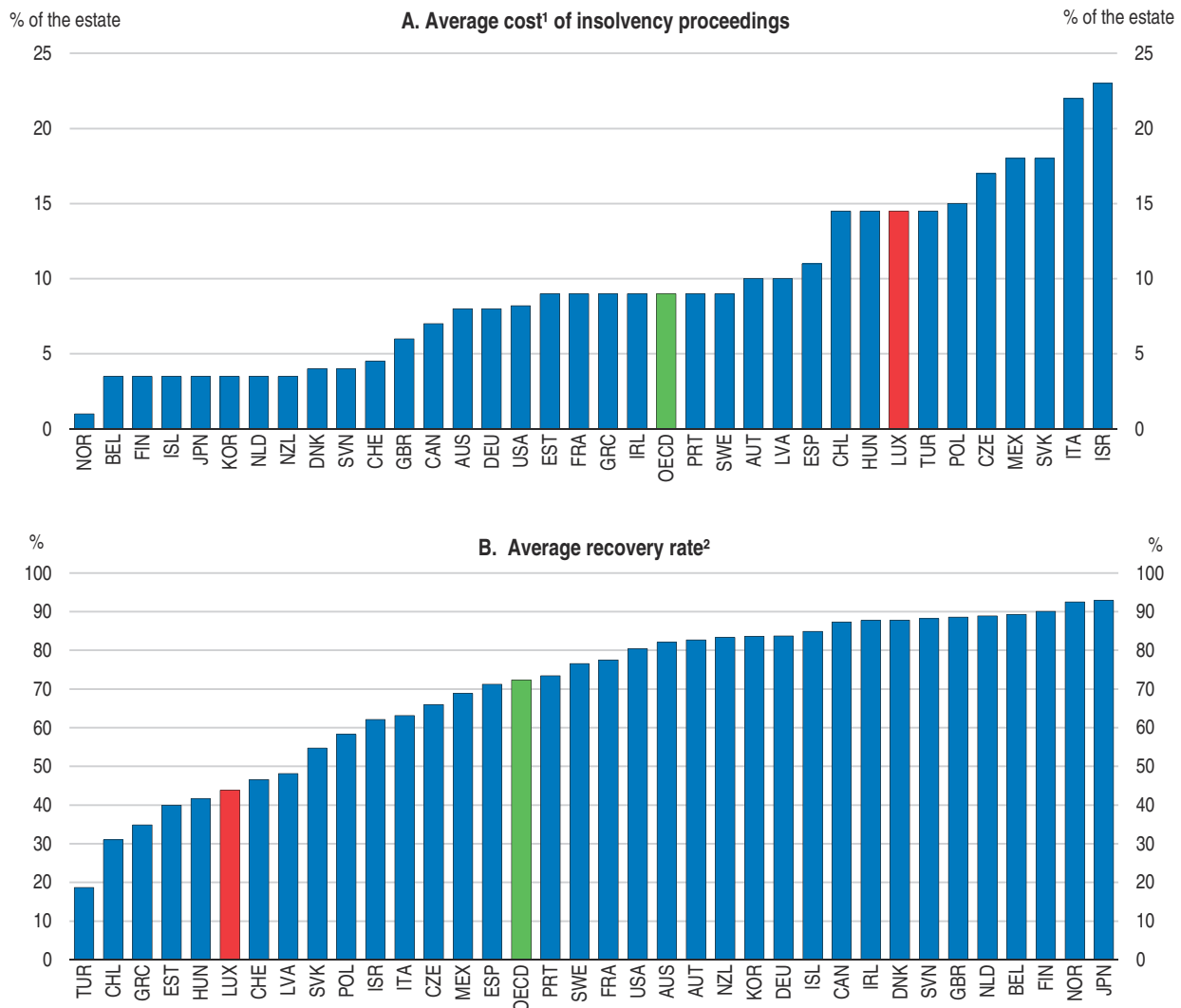
StatLink <http://dx.doi.org/10.1787/888933495979>

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*.

StatLink  <http://dx.doi.org/10.1787/888933495992>

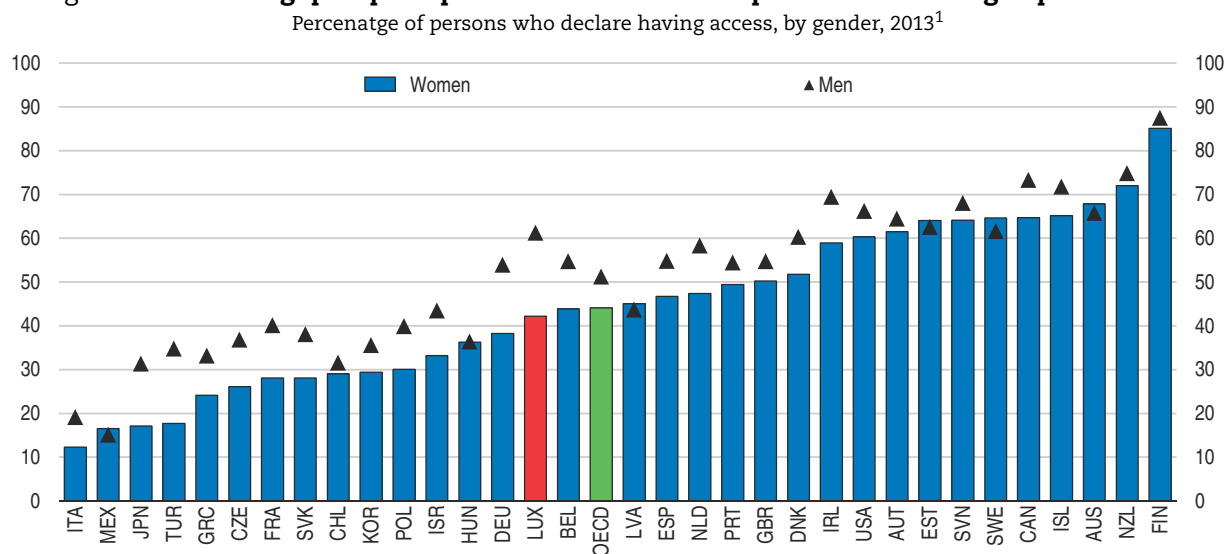
points lower than the OECD average. The implementation of cross-border insolvency procedures will improve with the new European Regulation that defines the country of company's main interest as the jurisdiction responsible for insolvency proceedings. However, the draft legislation on modernisation of 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*.

StatLink <http://dx.doi.org/10.1787/888933496001>

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).

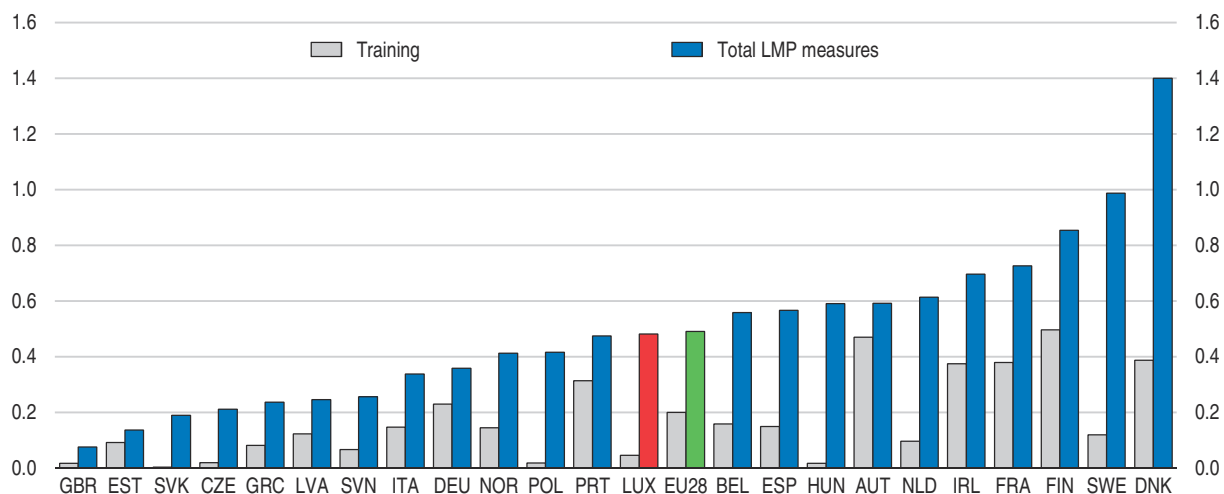
Improving the job matching

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.

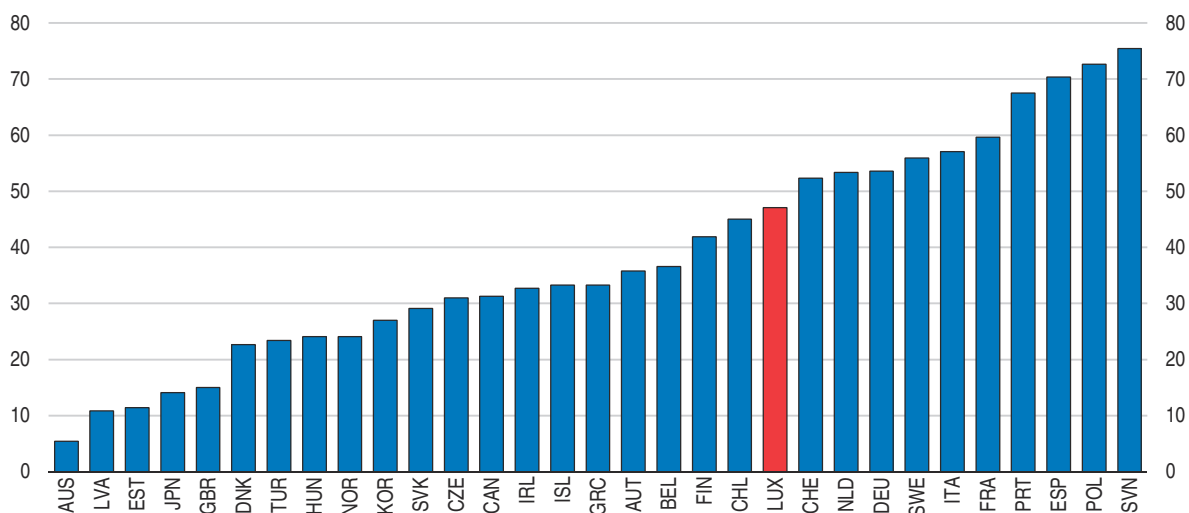
StatLink  <http://dx.doi.org/10.1787/888933496019>

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

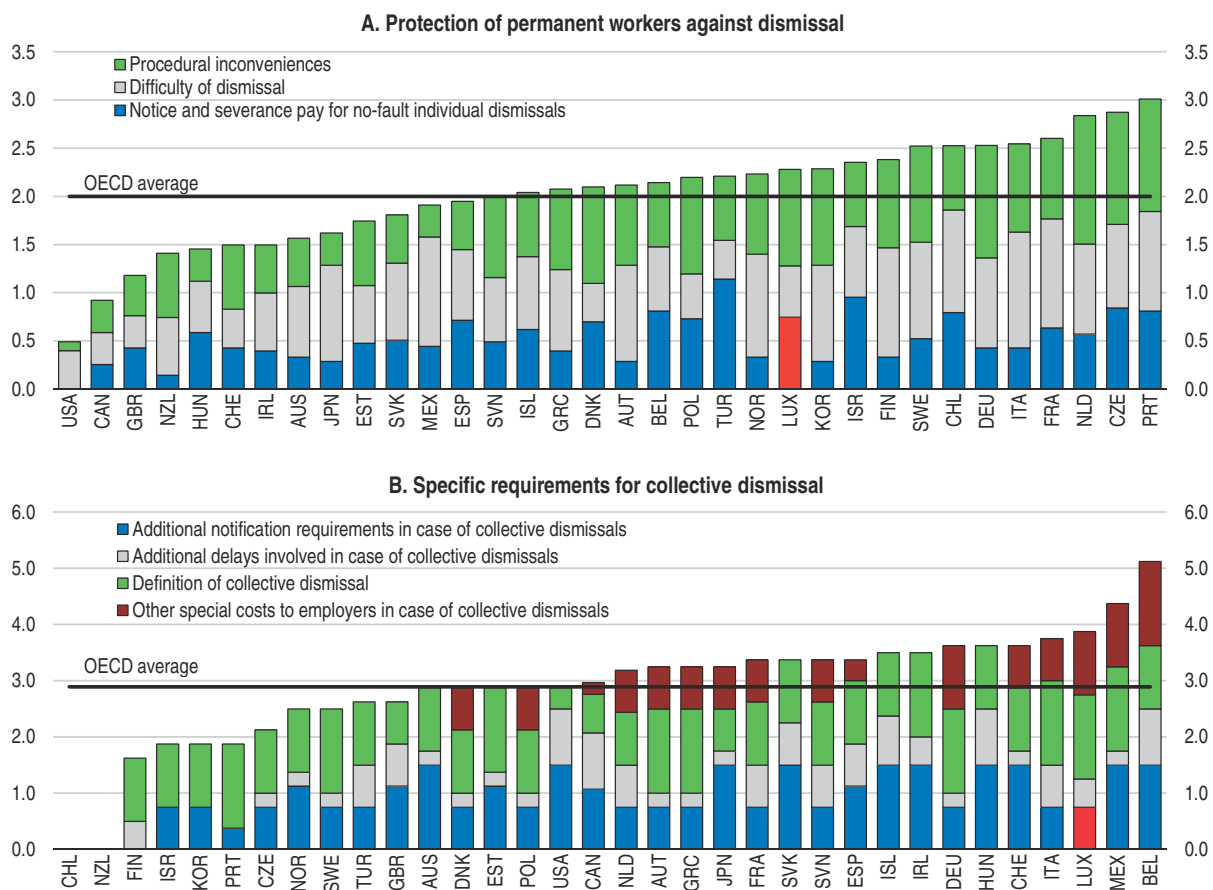


Source: OECD Employment and Labour Market Statistics Database.

StatLink <http://dx.doi.org/10.1787/888933496029>

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.

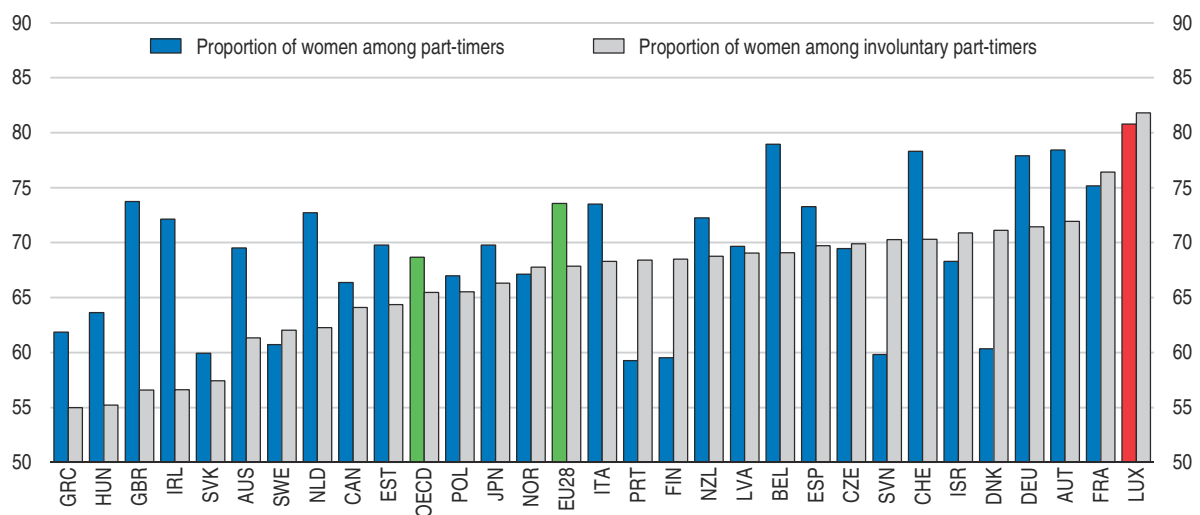
StatLink <http://dx.doi.org/10.1787/888933496039>

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*.

StatLink  <http://dx.doi.org/10.1787/888933496048>

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

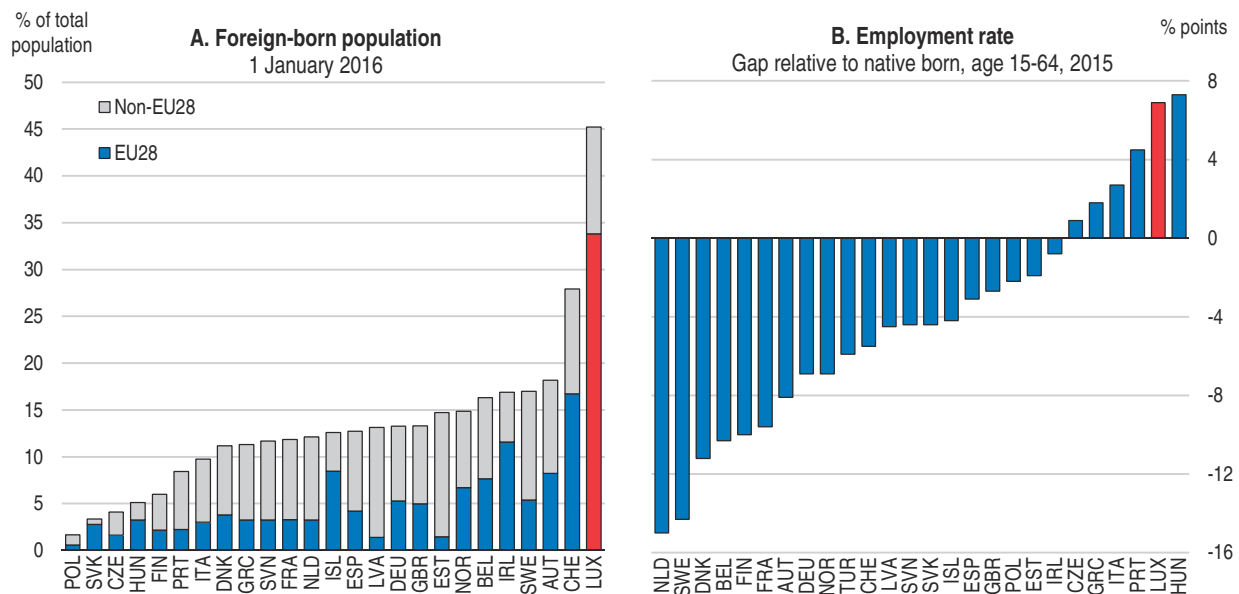
Luxembourg has benefited a lot from immigrants, but their integration could improve

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

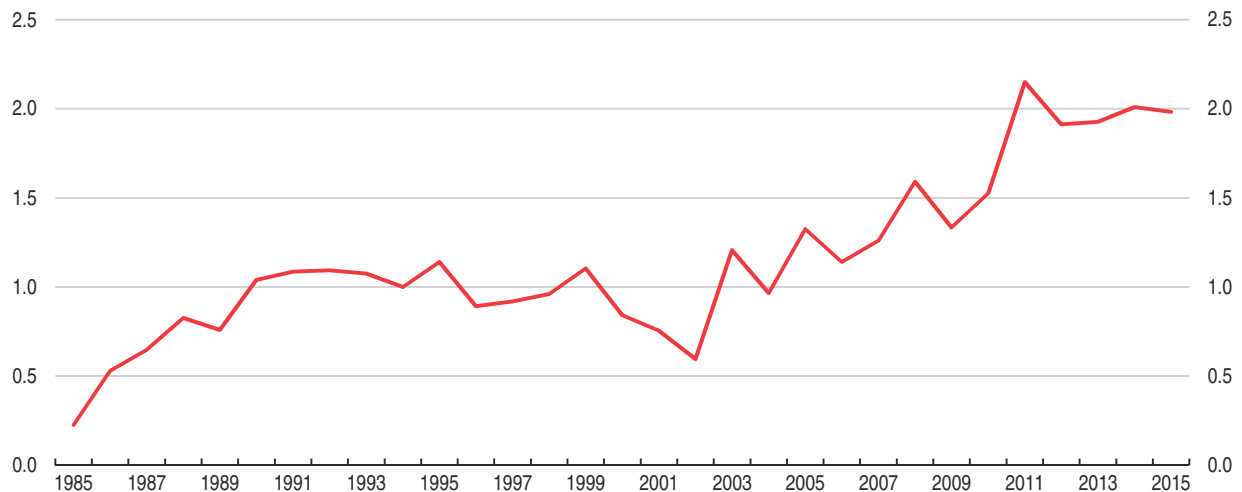
Figure 31. **The large immigrant population has a high employment rate**

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

StatLink <http://dx.doi.org/10.1787/888933496059>

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

Net migration flows, % of total population



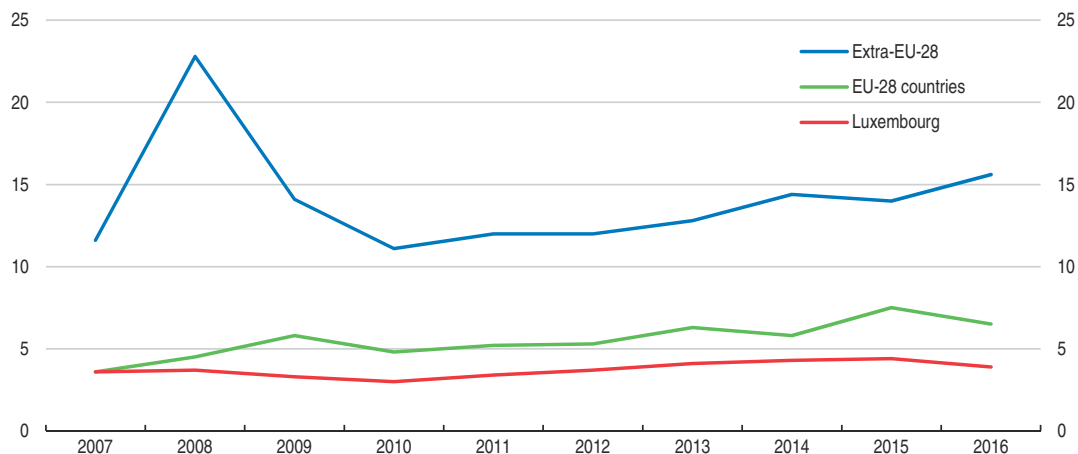
Source: STATEC.

StatLink <http://dx.doi.org/10.1787/888933496066>

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



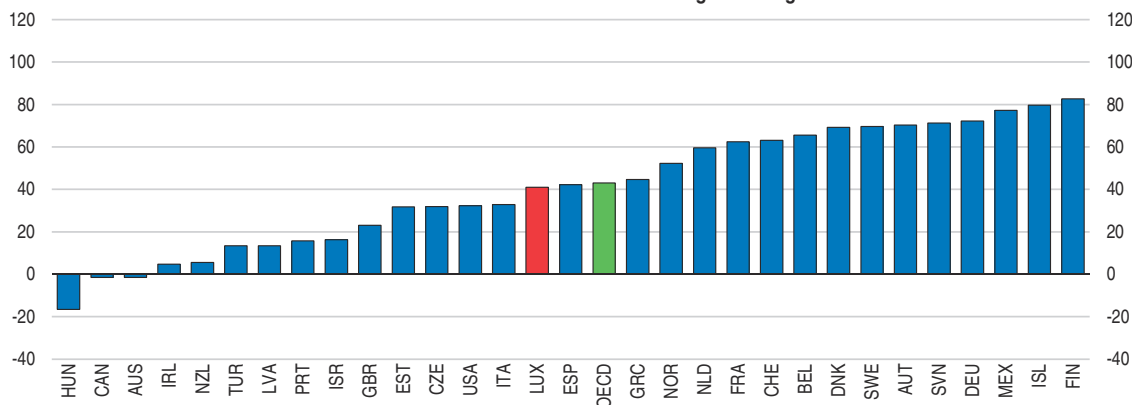
Source: Eurostat (2016), "Employment and Unemployment (Labour Force Survey)", Eurostat Database.

StatLink <http://dx.doi.org/10.1787/888933496073>

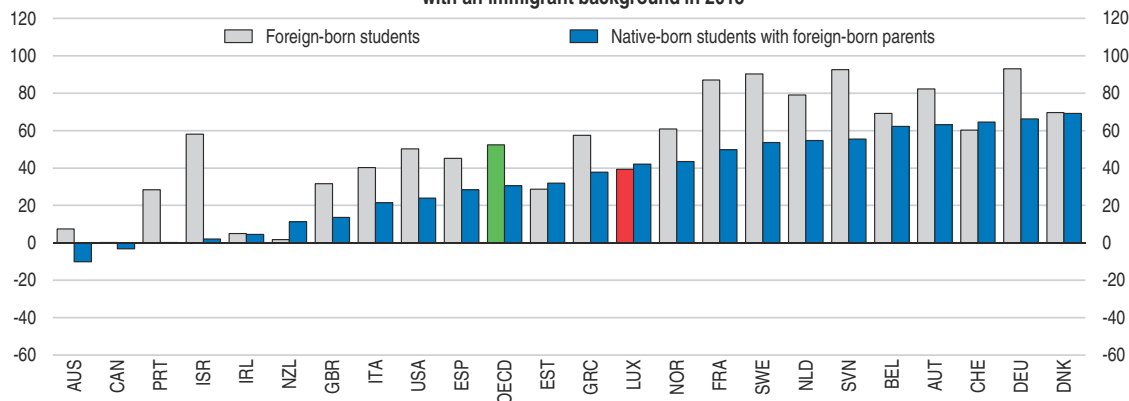
Figure 34. Children of immigrants underperform by a wide margin

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.

StatLink <http://dx.doi.org/10.1787/888933496080>

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.

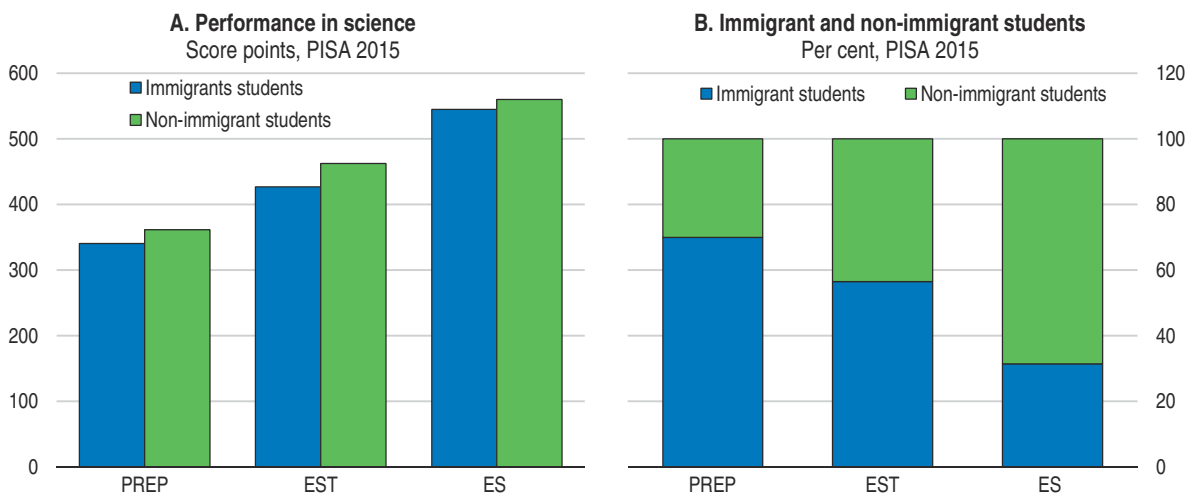
In 2016, the authorities launched an ambitious reform to improve the affordability and quality of ECEC, and should now proceed with implementation. All providers need to comply with national quality standards (e.g. for staff training) and, from September 2017, those wishing to be eligible for the public 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.

StatLink  <http://dx.doi.org/10.1787/888933496091>

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.

Bibliography

- Adalet McGowan, M. and D. Andrews (2015), "Labour market mismatch and labour productivity: Evidence from PIAAC data", *OECD Economics Department Working Paper No. 1209*, OECD Publishing, Paris.
- Arthur, W., W. Bennet, P. Stanush and T. McNelly (1998), "Factors that influence skill decay and retention: A quantitative review and analysis", *Human Performance*, Vol. 11, Issue 1, pp. 57-101.
- Bacon, D. and K. Stewart (2006), "How fast do students forget what they learn in a consumer behaviour course? A longitudinal study", *Journal of Marketing Education*, Vol. 28, Issue 3, pp. 181-192.
- Banque centrale du Luxembourg (2016), *Revue de stabilité financière*, June 2016.
- Besch, S., L. Bodson, C. Hartmann-Hirsch, M. Legrand and N. Dubajic (2005), *Discrimination à l'emploi, Rapport au Commissariat du Gouvernement aux Etrangers, version synthétique*, Octobre.

- Caldera Sánchez, A. (2012), "Building Blocks for a Better Functioning Housing Market in Chile", *OECD Economics Department Working Papers*, No. 943, OECD Publishing, Paris.
- CEDEFOP (2015a), *Luxembourg: Skill supply and demand up to 2025*, European Centre for the Development of Vocational Training, Luxembourg, 2015.
- CEDEFOP (2015b), *Vocational education and training in Luxembourg: A short description*, European Centre for the Development of Vocational Training, Luxembourg, 2015.
- CSL (2016), *La formation professionnelle continue*, Chambre des Salariées du Luxembourg, Luxembourg 2016.
- Deloitte (2016), "Augmentation through automation: The future of automation in the UK Business Services sector", July.
- ESRB (2016), *Vulnerabilities in the EU residential real estate sector*, European Systemic Risk Board, Frankfurt am Main, 2016.
- European Commission (2016a), *Country Report Luxembourg 2016*, SWD(2016) 84 final, European Commission, Brussels, 2016.
- European Commission (2016b), *EU Transport Scoreboard*, European Commission, Brussels.
- European Commission (2016c), *European Network of Public Employment Services Annual report July 2015-December 2016*, European Commission, Brussels.
- European Commission (2015), *The 2015 Ageing Report*, European Commission, Brussels, 2015.
- Eurofound (2016), *Luxembourg: Reform of Employee representation in companies*, European Foundation for the Improvement of Living and Working Conditions, Brussels. Available at www.eurofound.europa.eu/observatories/eurwork/articles/industrial-relations/luxembourg-reform-of-employee-representation-in-companies.
- Ewringmann, D. (2016), *Ermittlung und Bewertung der positiven und negativen Wirkungen des Treibstoffverkaufs unter besonderer Berücksichtigung negativer externer Umwelt- und Gesundheitseffekte – Status quo 2012 und maßnahmeninduzierte Veränderungen*, Bericht für das Ministerium für Nachhaltige Entwicklung und Infrastrukturen des Großherzogtums Luxemburg, Königswinter 2016.
- GEM (2016), *Global Entrepreneurship Monitor*, Luxembourg.
- Glock, S., S. Krolak-Schwerdt, F. Klapproth and M. Boehmer (2013), "Beyond judgment bias: How students' ethnicity and academic profile consistency influence teachers' tracking judgments", *Social Psychology of Education*, 16:555-573.
- Hoffman, R., P. Ward, P. Feltovich, L. DiBello, S. Fiore and D. Andrews (2014), *Accelerated Expertise: Training for High Proficiency in a Complex World*, Psychology Press, New York.
- IBA/OIE (2016), *Rapport sur la situation économique et sociale de la Grande Région 2015/2016*, Publications de la Grande Région, Tome 21, Haus der Großregion, Esch sur Alzette.
- IEA (2015), *Technology Roadmap How2Guide for Smart Grids in Distribution Networks: Roadmap Development and Implementation*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264236073-en>.
- IMF (2016), *Luxembourg: Selected Issues*, International Monetary Fund, Washington, 2016.
- Manço, A. (2014), "Présence des travailleurs étrangers au Luxembourg et l'éthnostratification de l'emploi", *Sozialalmanach 2014*, Caritas Luxembourg.
- McKinsey (2015), "Four fundamentals of workplace automation", *McKinsey Quarterly*, November.
- Ministère de l'Éducation Nationale, de l'Enfance et de la Jeunesse (2016), *Rapport d'Activités 2015*.
- Montt, G. (2015), "The causes and consequences of field-of-study mismatch", *OECD Social, Employment and Migration Working Papers* No. 167, OECD Publishing, Paris.
- OECD (2016a), *OECD Affordable Housing Database*, OECD Publishing, Paris.
- OECD (2016b), *OECD Business and Finance Outlook*, Chapter 3, OECD Publishing, Paris.
- OECD (2016c), *Getting Skills Right: Assessing and Anticipating Changing Skills Needs*, OECD Publishing, Paris, 2016.
- OECD (2016d), *Financing SMEs and Entrepreneurs 2016: An OECD Scoreboard*, OECD Publishing, Paris.
- OECD (2015a), *OECD Economic Surveys: Luxembourg 2015*, OECD Publishing, Paris, http://dx.doi.org/10.1787/eco_surveys-lux-2015-en.
- OECD (2015b), *Pensions at a Glance*, OECD Publishing, Paris.

- OECD (2015c), *All on Board: Making Inclusive Growth Happen*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264218512-en>.
- OECD (2015d), *OECD Employment Outlook*, OECD Publishing, Paris, 2015.
- OECD (2014), “Learning Begets Learning: Adult Participation in Lifelong Education”, *Education Indicators in Focus*, No. 26, OECD Publishing, Paris, <http://dx.doi.org/10.1787/5jxsuvmr9z8n-en>.
- OECD (2013a), *Skilled for Life? Key findings from the Survey of Adult Skills*, OECD Publishing, Paris.
- OECD (2013b), “The fiscal impact of immigration in OECD countries”, Chapter 3 in *International Migration Outlook 2013*, OECD Publishing, Paris.
- OECD (2012a), *Equity and Quality in Education: Supporting Disadvantaged Students and Schools*, OECD Publishing, Paris.
- OECD (2012b), *Closing the Gender Gap: Act Now*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264179370-en>.
- OECD (2012c), *Education Today 2013: The OECD Perspective*, OECD Publishing, Paris, http://dx.doi.org/10.1787/edu_today-2013-en.
- OECD (2011), *Towards an OECD Skills Strategy*, OECD Publishing, Paris.
- OECD (2010a), “Facilitating access to Finance”, *Discussion Paper on Credit Information Sharing*, OECD Publishing, Paris, available at: www.oecd.org/globalrelations/45370071.pdf.
- OECD (2010b), *International Migration Outlook: SOPEMI 2010*.
- OECD (2008), *OECD Employment Outlook 2008*, OECD Publishing, Paris, http://dx.doi.org/10.1787/empl_outlook-2008-en.
- OECD (2007), *OECD Territorial Review of Luxembourg*, OECD Publishing, Paris.
- OECD (2005a), *Promoting Adult Learning*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264010932-en>.
- OECD (2005b), *OECD Employment Outlook 2005*, Chapter 5, OECD Publishing, Paris, http://dx.doi.org/10.1787/empl_outlook-2005-en.
- Pigeron-Piroth, I. and F. Fehlen (2015), *Les langues dans les offres d'emploi au Luxembourg (1984-2014)*, Working Paper, Université du Luxembourg, June.
- PricewaterhouseCoopers (2016), *Luxembourg FinTech Report 2016*, PricewaterhouseCoopers, Luxembourg.
- Postel-Vinay, F. and H. Turon (2014), “The impact of firing restrictions on labour market equilibrium in the presence of on-the job search”, *Economic Journal*, Vol. 124, Issue 575, pp. 31-61.
- Rifkin, J. et al. (2016), *The third industrial revolution strategy study for the Grand Duchy of Luxembourg*, Luxembourg, 2016.
- Schmitz, F. and P. Gerber (2011), *Voiture ou transports en commun? Comment les frontaliers se rendent-ils au travail en 2010? Vivre au Luxembourg No. 78*, CEPS/INSTEAD, Luxembourg, 2011.
- SIG/GIS (2016), *Annual Report 2015*, GeoPortal de la Grande Région, Luxembourg, 2016.
- STATEC (2016a), *Note de conjuncture No. 2016-01*, Institute national de la statistique et des études économiques, Luxembourg, 2016.
- STATEC (2016b), *La journée d'un résident*, Bulletin No. 2/2016, Institute national de la statistique et des études économiques, Luxembourg, 2016.
- World Bank (2017), “Economic Profile – Luxembourg” in: *Doing Business 2017: Equal Opportunity for All*, World Bank, Washington, DC.

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.

Thematic chapters

Chapter 1

Harnessing skills for more inclusive growth

Digitalisation, automation and future technological changes are changing the world of work, affecting the skills needed to perform them. The future of jobs will not look like the present situation: increasingly, workers will have to adapt to fast technological change, accept more mobility during their career, and regularly upgrade their skills to remain employable. Luxembourg's workforce is highly skilled, reflecting the concentration in the country of sophisticated firms in the financial sector and other top-end international services. However, some middle-skilled routine jobs – especially back office, custodian and legal services in the financial sector – may disappear as a result of automation. Workers with strong and adaptable skills will be well prepared to thrive in this new environment. While many individuals working in Luxembourg already possess such characteristics, many others do not, resulting in a relatively high level of skills mismatch. Further improvements in the education system are needed to address this challenge, provide the young with learning-to-learn as well as technical capabilities and avoid that large groups of people are left behind. As skill sets will need to be updated during working careers, the system of initial education must be complemented by a flexible system of lifelong learning, tailored to the special needs of individuals with limited education attainment and older workers.

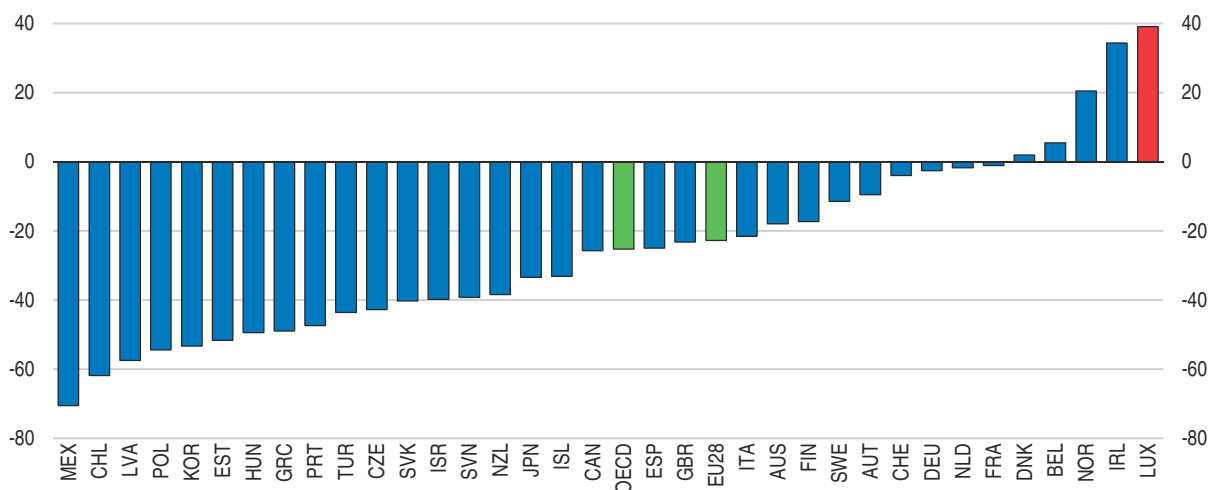
Better use of existing skills would entail reorienting labour market policies from supporting job creation towards high-quality training programmes with substantial on-the-job learning component and reflecting future labour market needs. The tax and benefit system needs to be adjusted to increase incentives to work for low-skilled youth, older workers and second earners. Fully individualised taxation would increase incentives to work of second earners and make the tax system more gender neutral, while an additional parental leave entitlement for fathers may result in more gender-balanced use of part-time work.

The importance of skills and main challenges

Luxembourg is a high-income, high-wage economy that has consistently managed to keep a positive productivity differential vis-à-vis other OECD countries (Figure 1.1) by attracting top-end firms specialised in international services and workers with strong and adaptable skills. As Luxembourg prepares for a future of fast technological change, it will be crucial to adjust policy settings towards remaining attractive to such firms and highly-skilled workers. It will also be crucial to avoid leaving behind large groups of people currently lacking the necessary capacities to thrive in the digital economy. As a multilingual country, Luxembourg has a natural advantage in language skills, while substantial public investment into information and communication technologies infrastructure, including high speed internet, facilitates the development of computer skills (Figure 1.2)


Figure 1.1. **High labour productivity reflects high level of skills**

Gap with respect to the United States, per cent, 2015¹

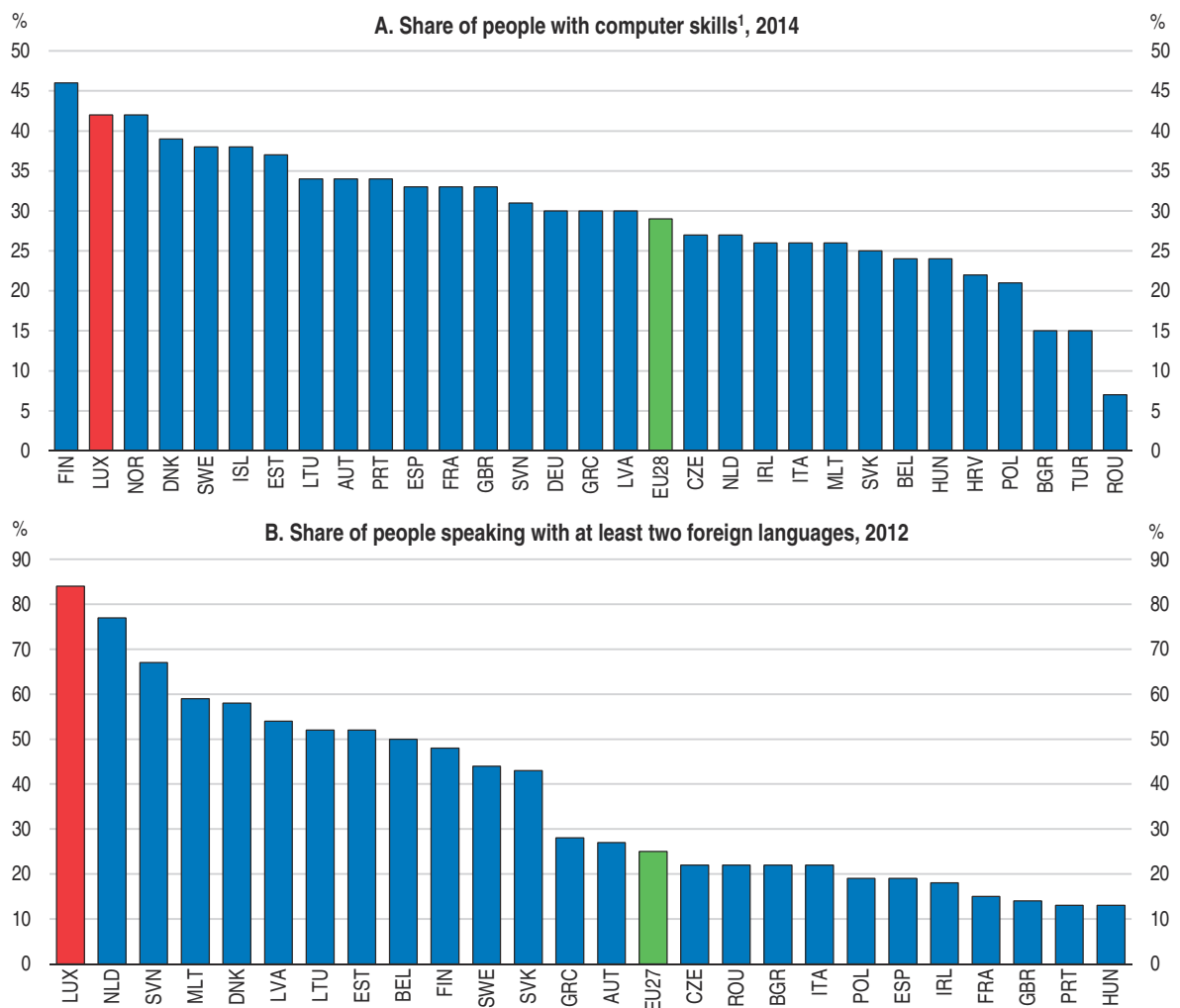


1. Labour productivity is measured by GDP per hour worked.

Source: OECD (2017), "GDP per capita and productivity levels", OECD Productivity Statistics (database).


StatLink  <http://dx.doi.org/10.1787/888933496102>

The world of work is rapidly changing as a result of the development of the digital economy, with automation and digitalisation penetrating the domain of tasks that were until recently considered genuinely human and creating technological unemployment (Mokyr et al., 2015). Disruptive technological change is affecting both jobs and the skill sets needed to perform them, leading to a potentially high likelihood of fast automation in some OECD countries (Arntz et al., 2016). Although the share of non-routine and low routine jobs is higher than in most OECD countries, somewhat limiting the risk of automation in Luxembourg (Marcolin et al., 2016), the labour market polarisation is underway. The demand for skills needed to perform abstract tasks (problem-solving, intuition, persuasion and

Figure 1.2. **Language and computer skills are above average**

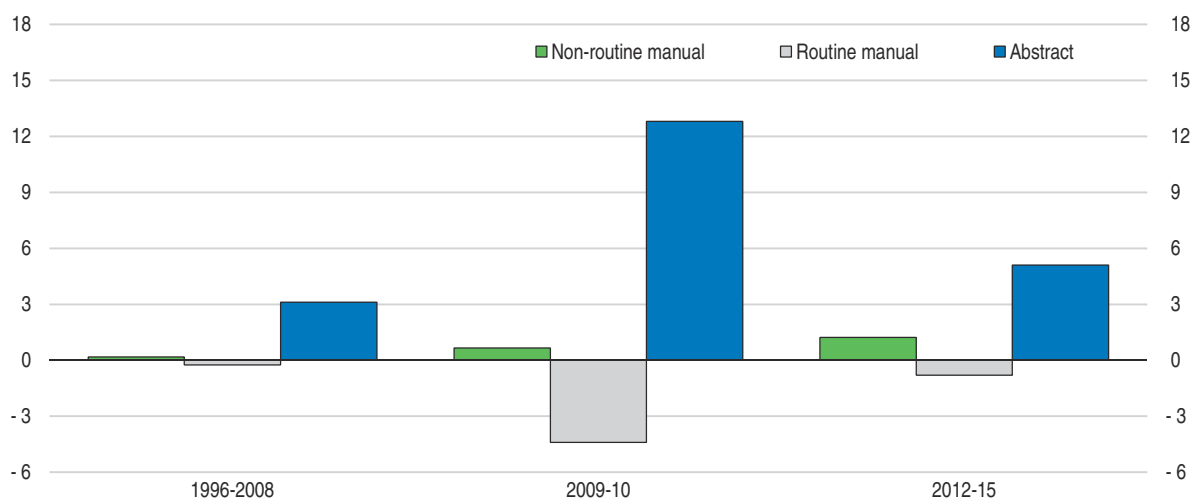
1. Share of individuals aged 16 to 74 reporting to have carried out five or six specific tasks related to computer use.

Source: Eurostat (2015), Individuals' level of computer skills; European Commission (2012), Special Eurobarometer 386: Europeans and their languages.

StatLink  <http://dx.doi.org/10.1787/888933496116>


creativity, in occupations such as law, medicine, science and engineering) and non-routine manual tasks (requiring adaptability, visual and language recognition and personal interactions in occupations such as personal health services and security) has increased strongly, while the demand for routine manual jobs (such as repetitive production or monitoring) declined only slightly (Figure 1.3).

New financial technology is reinforcing the automation pressure on the mid-skilled financial sector jobs, such as back-office and data verification. Recent survey evidence suggests that incumbent financial firms in Luxembourg expect some 26% of the traditional financial business to be taken over by Fintech in the next 5 years, especially in the area of asset and wealth management. At the same time, embracing Fintech innovations, such as low-cost analytics and big data, can lead to cost savings and other value chain improvements also for the traditional actors (PricewaterhouseCoopers, 2016). Although Luxembourg's financial sector withstood the 2008 financial crisis rather well, the experience from the

Figure 1.3. **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.

StatLink  <http://dx.doi.org/10.1787/888933495921>

restructuring of iron and steel industry suggests that without preventive measures Luxembourg may eventually suffer again the social consequences of a major restructuring (Box 1.1).

The recent medium-term strategy of the government identified ambitious goals in the areas of sustainable energy consumption, mobility, industry and finance, outlining a vision centred on circular economy, openness to disruptive technological change and the diminishing distinction between production and consumption (Rifkin et al., 2016). The strategic study assessing the skills gap in the information and communication technology sector recently called for changes in the pedagogical framework and strengthening of online and computer-assisted learning approaches in closing the gap (Ant et al., 2016).

These strategic visions are welcome, as they position Luxembourg at the forefront of technology adopters. At the same time, the implications for education and lifelong learning to ensure meeting future skill needs should be elaborated. Legislation and regulations will have to be adjusted and new technical standards developed to enable the radical technological change, especially in the areas of green and circular growth. The effective impact of these strategic initiatives will depend on making the economy more open to new talents and this chapter develops policy recommendations on how to further expand and make better use of existing skills.

Perceived mismatch in Luxembourg is, at more than 45%, 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 1.4, Panel A). However,

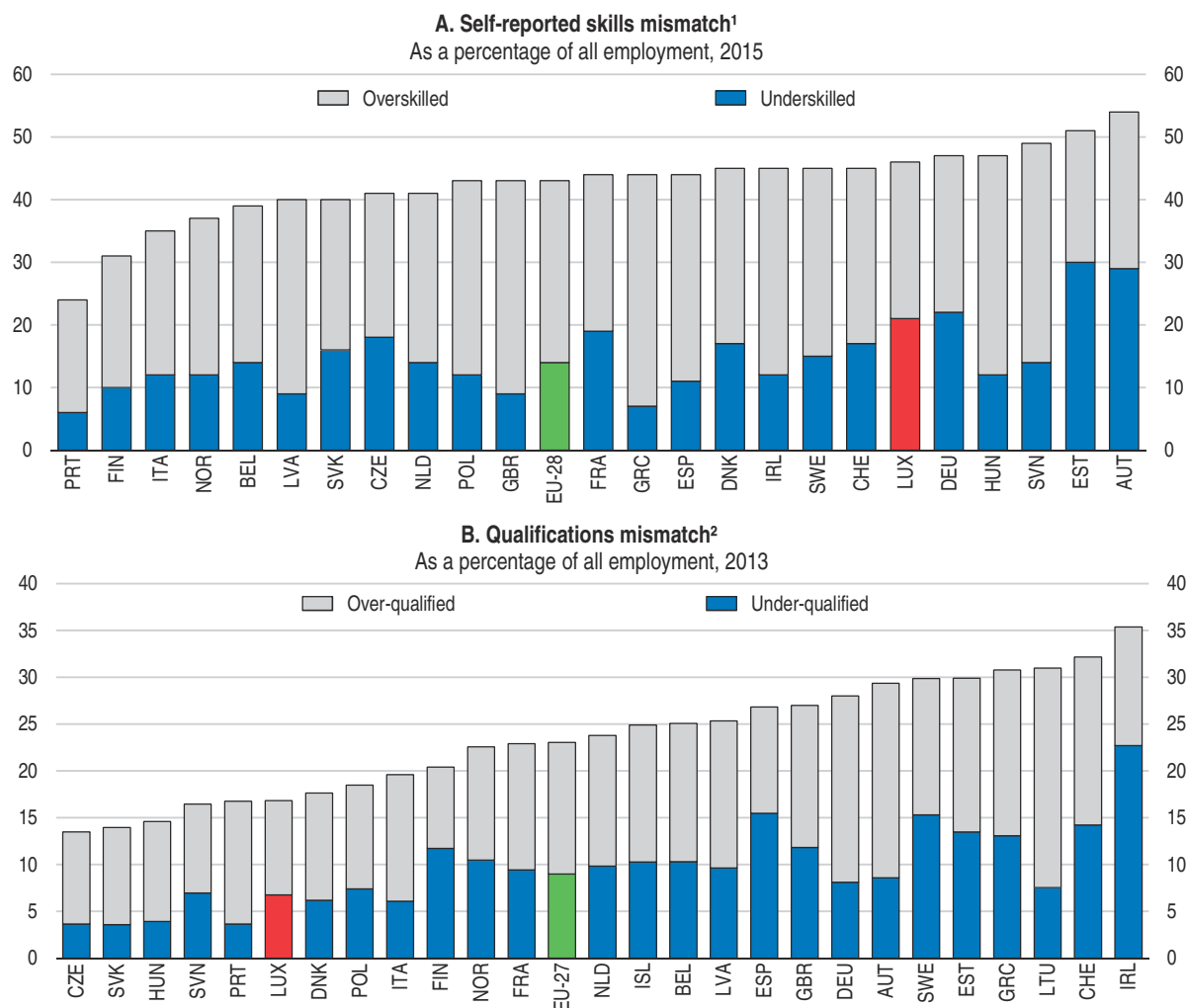
Box 1.1. The restructuring of Luxembourg's steel industry, 1975-1987

The world steel market collapsed in late 1974 and early 1975 with Luxembourg's steel output and prices falling by more than one third compared to 1974 averages. The government put in place policies for supporting employment and activity, which included subsidies to firms for compensating workers on short time working schemes, special public services projects to reduce unemployment and substantial aid to the Luxembourg railways (OECD, 1975). In addition, early retirement legislation enabling steel workers to bring forward their retirement was adopted in 1977. Almost 30% of workers that left the steel industry between 1975 and 1986 benefited from the early retirement scheme, which was extended to the whole private sector in 1987 (Government of Luxembourg, 2007). The number of people employed in the steel industry declined until 1978, mainly due to the fall in the labour market participation rate brought about by the early retirement programme. In 1979, thanks to strong growth in the construction and service sectors, the total number of persons in dependent employment increased slightly for the first time since 1975 (OECD, 1979).


At the institutional level, the crisis led to the creation of the tripartite system involving representatives of employers, workforce and public authorities. The original Economic Committee (Comité de conjuncture) developed into the Tripartite Steel Conference that in 1979 prepared a plan for and reached consensus on the restructuring and modernisation of the steel industry. The government also established the National Credit and Investment Company (Société nationale de crédit et d'investissement) that gradually invested into the main steel company ARBED (the united steelworks of Burbach, Eich and Dudelange), holding more than 40% of its total capital in the process. The costs of saving the steel industry in Luxembourg amounted to about 5% of the average budget expenditure from 1975 to 1987, while the share of steel production in total value added declined from 28% in 1970 to 9.8% in 1985 (STATEC, 1987).

other measures, such as qualification mismatch, suggest less of a mismatch problem (Figure 1.4, Panel B). Persistent skills shortages can constrain the ability of firms to innovate, while skills mismatches reduce labour productivity due to misallocation of workers to jobs. Better skills, especially basic numeracy and literacy skills, also increase the chance of succeeding at school and finding a job, while the youth without a strong skills foundation are more likely to drop out of school and face difficulties finding jobs, resulting in greater risk of poverty. The need to foster better skills for all obliges governments to adapt education and training systems, to meet changes in the demand for skills, and to improve learning environments in schools and workplaces (OECD, 2015a).

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 (Figure 1.5). After two full cycles of the PISA assessments, there seems to be no clear trend and 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. Similarly, the level of educational attainment in the working population is lower than the OECD average (Figure 1.6) and the upskilling of the labour force is lagging behind the best OECD performers (Figure 1.7).

Figure 1.4. **Some measures of skill mismatch are high**

- 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.
- 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.

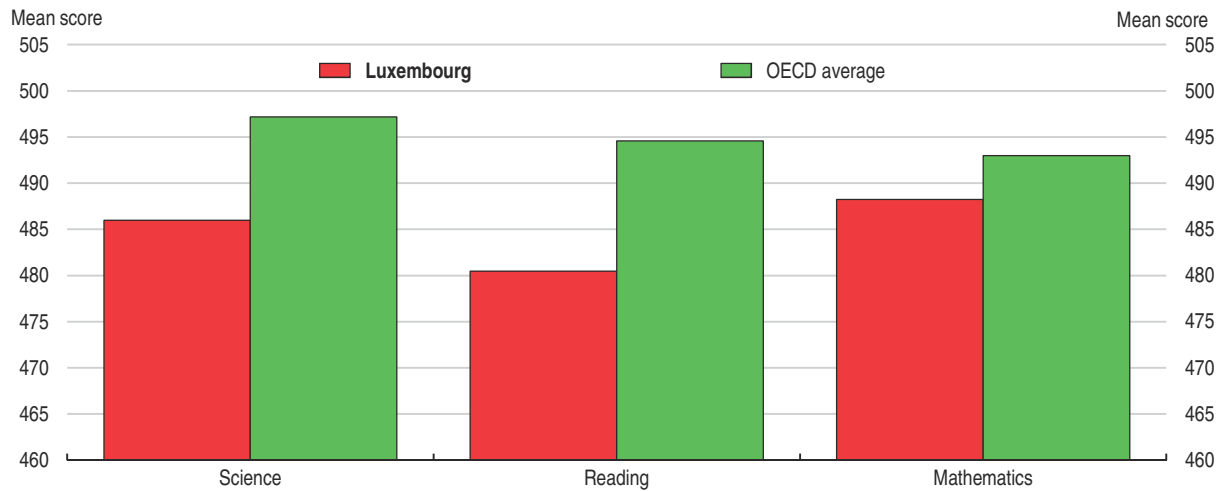
Source: Sixth European Working Conditions Survey 2015; OECD (2016), *Getting Skills Right: Assessing and Anticipating Changing Skill Needs*.
StatLink  <http://dx.doi.org/10.1787/888933495937>

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 EU-28 average of 17.2%, but above that of the Greater Region, the cross-border region comprising the adjacent areas of Belgium, Germany and France, at 15.6%, or in any of the neighbouring countries (IBA/OIE, 2016).

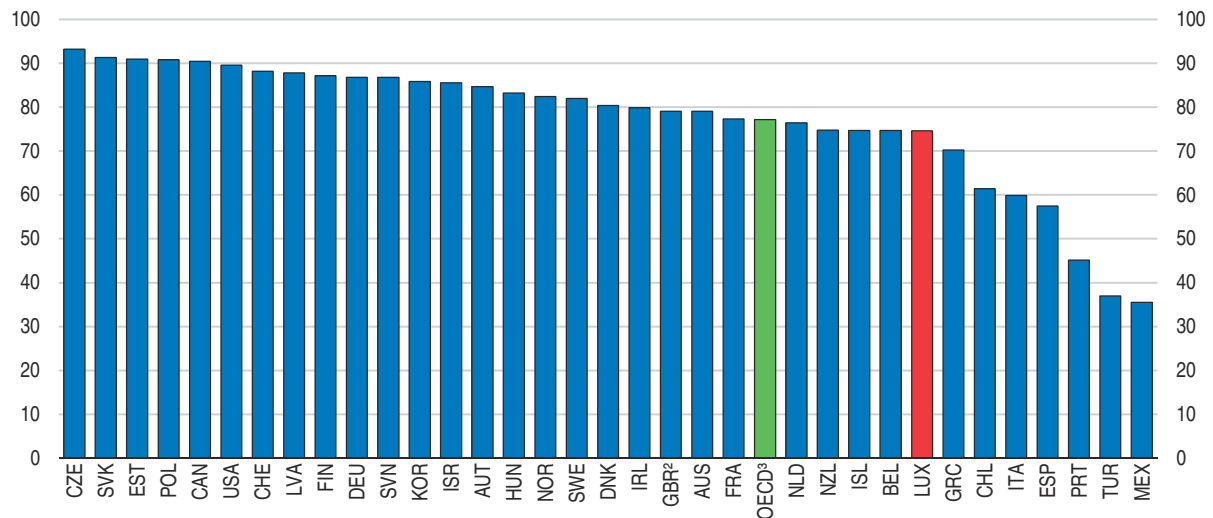
Low labour force participation of the youth and older workers suggests that existing skills are underused in Luxembourg (Figure 1.8). Low conditionality and generous social transfers may contribute to this outcome by reducing incentives to work. Weak labour

Figure 1.5. **The overall PISA results show a persistent gap**

Average PISA scores, 2009-15



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

StatLink <http://dx.doi.org/10.1787/888933496129>Figure 1.6. **There is room for further improvement of skills**Percentage of working age population having attained at least upper secondary education, 2015¹

1. Working age population: 25-64 year-olds. 2013 for Chile and 2014 for France.

2. Includes completion of a sufficient volume and standard of programmes that would be classified individually as completion of intermediate upper secondary programmes (18% of the adults are under this group).

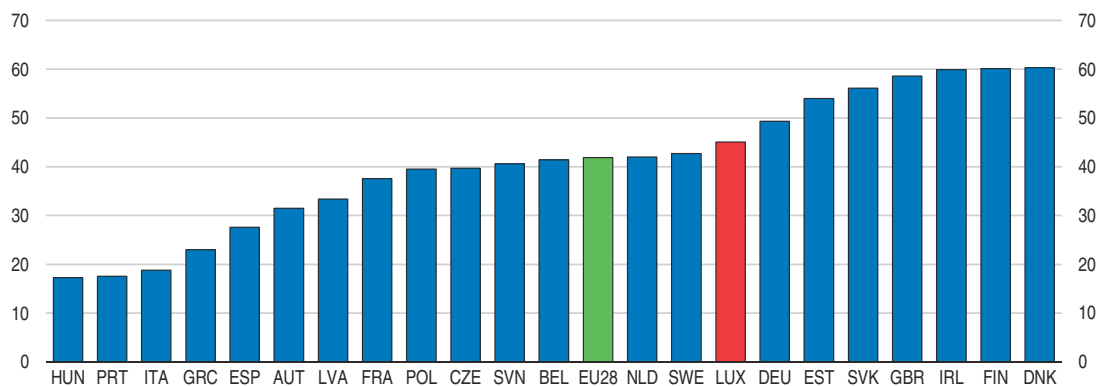
3. Unweighted average of data shown including Latvia.

Source: OECD (2016), Education at a Glance 2016: OECD Indicators.

StatLink <http://dx.doi.org/10.1787/888933496130>

market attachment of certain groups of workers, evidenced by female unemployment rate exceeding male (Figure 1.9), high share of women in part-time work and the prevalence of temporary contracts among the youth, also limits the incentive to upskill through lifelong learning and professional training.

Figure 1.7. Upskilling of the labour force is lagging behind the best performers
 Per cent of persons who have received on-the-job training in the past year¹

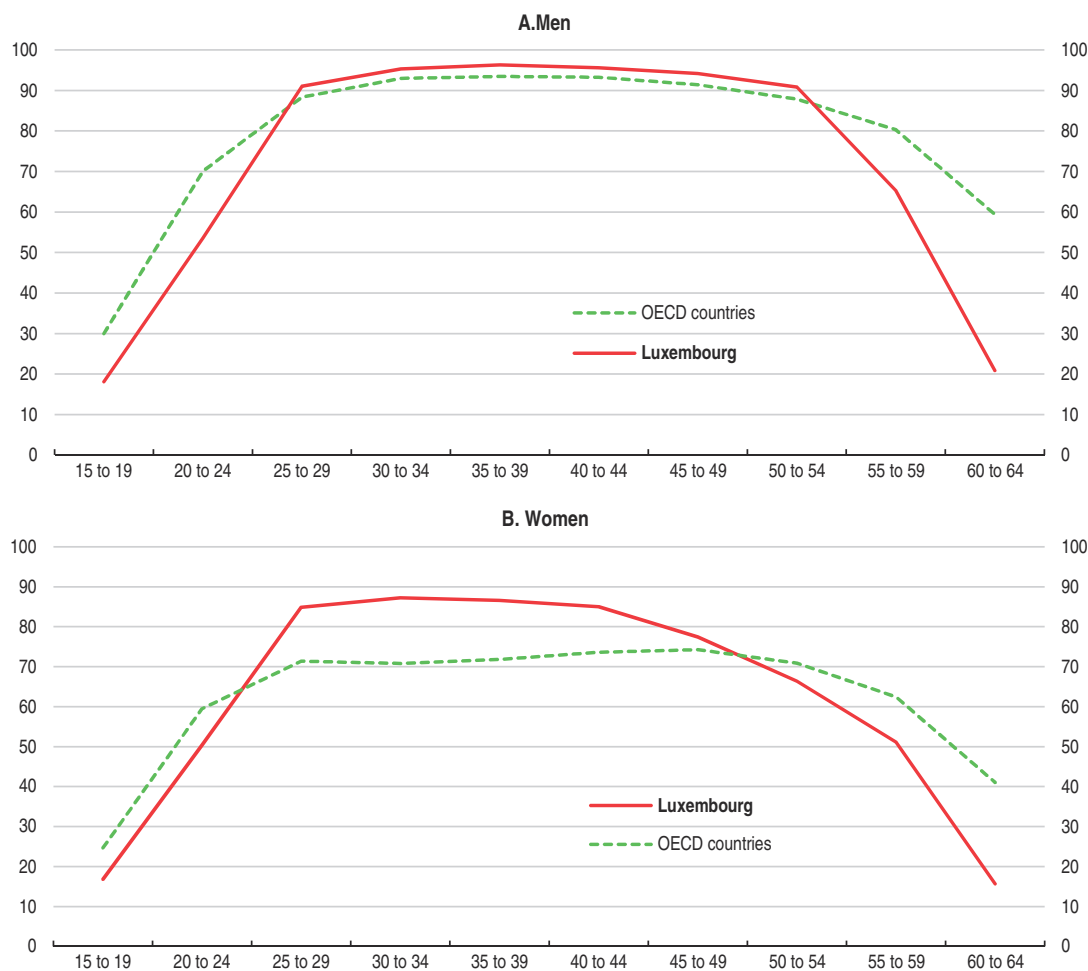


1. Share of persons responding positively to the question “Have you had on-the-job training in the past year?”.

Source: Eurofound (2015), “Sixth European Working Conditions Survey: 2015”, European Foundation for the Improvement of Living and Working Conditions.

StatLink <http://dx.doi.org/10.1787/888933496145>

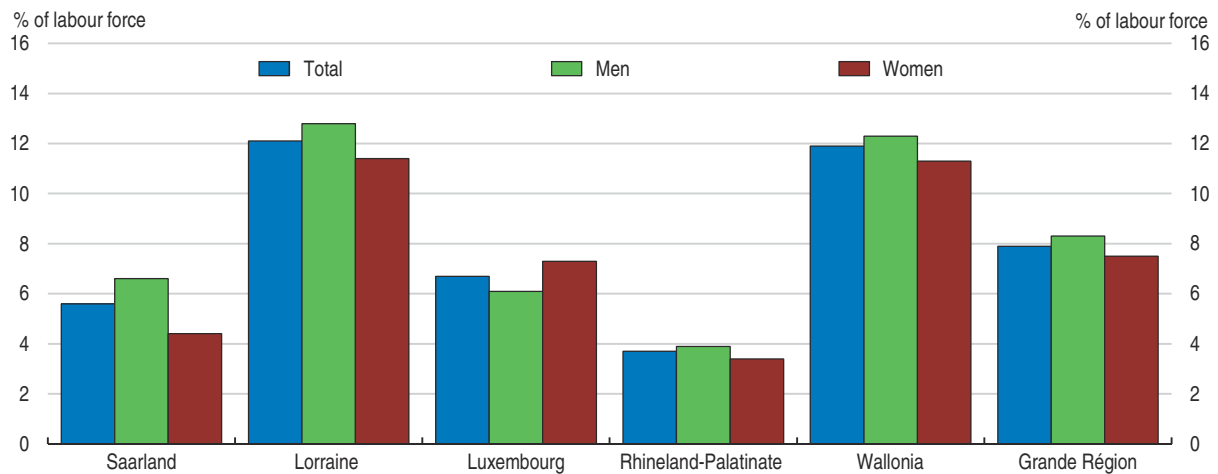
Figure 1.8. Participation rates are low for the youngest and the oldest
 Labour participation rate by age groups, per cent, 2015




Source: OECD (2015), OECD Labour Force Statistics (database).

StatLink <http://dx.doi.org/10.1787/888933496151>

Figure 1.9. **Female unemployment rate exceeds male**
2015, age 15+



Source: IBA/OIE, *Situation du marché de l'emploi dans la Grande Région*, November 2016.

StatLink  <http://dx.doi.org/10.1787/888933496165>

Policies ensuring flexible and continuously improving supply of skills

Analysing and anticipating changing skill needs

Skill assessment and anticipation exercises, such as skill needs assessments and forecasts, even though imperfect, are used in many OECD countries, providing information to stakeholders for better planning of education and training programmes in initial education and lifelong learning and for individuals to decide on their future careers and work, education and training paths (OECD 2016a). Skill assessment and anticipation instruments in Luxembourg are limited and confined to the medium term projections at sectoral level. Luxembourg's multi-sectoral business federation (FEDIL) has run biennial surveys of hiring intentions in the information and communication technologies (ICT) sector, in selected manufacturing sectors and in construction. The survey's results suggest employers' preference for upper-secondary qualifications.

At the EU level, the European Centre for the Development of Vocational Training (CEDEFOP) produces regular 10 year projections of trends in demand for skill, together with intermittent assessments of occupation mismatch. The 2016 report lists financial and administration professionals and ICT professionals as high shortage occupations for Luxembourg, mainly owing to growing demand and the difficulties of companies to find medium or highly qualified workers willing to come to Luxembourg. The shortage of qualified ICT workers is reflected in a high proportion of companies reporting hard-to-fill vacancies for ICT specialists, at 61% of enterprises that recruited or tried to recruit, compared to the EU average of 41% in 2016 (Eurostat, 2017). Other shortage occupations include medical doctors, due to the retirement of personnel and insufficient supply, as medical students need to pursue their studies abroad, beyond the first year offered at the University of Luxembourg (CEDEFOP, 2016). The long-term projection suggests that between 2013 and 2025, some 44% of jobs opportunities will require high-level qualifications (ISCED 5-6), although replacement demand would also mean opportunities for medium-level qualifications (ISCED 3-4). In 2025, about 49% of jobs could require higher skills, compared to 39% in 2013 (CEDEFOP, 2015).

Skills assessments and anticipation exercises can be a valuable input into policy making in several policy domains and should be used regularly to inform immediate policy

interventions, such as migration opportunities, as well as long-term policy orientations, for example in the employment and education policy (OECD, 2016a). In migration policy, information on skill needs is used, for example in Australia and the United Kingdom, to fast track workers with skills that are in high demand. In employment policy, skills assessments are used in, Australia, Belgium and New Zealand, to update occupational standards and design apprenticeships, re-training courses and on-the-job training programmes. In education policy, skills needs information is used in Portugal and Finland in curriculum development and career guidance that informs students' choice. In Canada, France, Ireland and Italy skill needs information is used to help in the transition to a greener and digital economy. In Luxembourg, where employment and education policies have regional cross-border implications, coordination within the Greater Region is essential in areas such as vocational and continuing education and recognition of professional qualifications. The government's attention to skills development in the programme for the presidency of the Greater Region in 2017 and 2018 is thus welcome.

Addressing future skill shortages through improvements in the education and training system

The ways to improve early childhood education are discussed in detail in Chapter 2 and primary education is successful in imparting the basic skills. It is at the beginning of the secondary education that the weaknesses of the system become more apparent as tracking decisions are made and grade repetition increases. Secondary and post-secondary education is also crucial in responding to labour market demand.

Secondary education in Luxembourg involves three separate tracks and students are separated according to their abilities at the age of 12. Although early tracking is sometimes believed to lead to more efficient learning, this is not without risks because it deprives low-performing students from interacting with stronger students and receiving positive benefits from this exposure. In addition, students in vocational tracks are often subject to a very different curriculum that sets them on a learning trajectory from which it is subsequently hard to escape. Because students develop at different paces, early tracking entails the risk of misallocation of students, a particular problem if initial misallocation cannot be easily rectified. Given the negative impact on students assigned to lower tracks, exacerbated inequities without raising average performance, as evidenced by persistent gaps in PISA performance, early tracking should be postponed to upper secondary levels and students should be given second chance to change tracks and be promoted upward whenever possible (OECD, 2015b). Even if students are tracked early, it is possible to mitigate the negative effects by introducing policies that increase flexibility to change tracks, such as temporary groupings with the possibility of changing tracks or classrooms, provide instruction differentiated by ability and ensure more aligned curricula between tracks (OECD, 2012a).

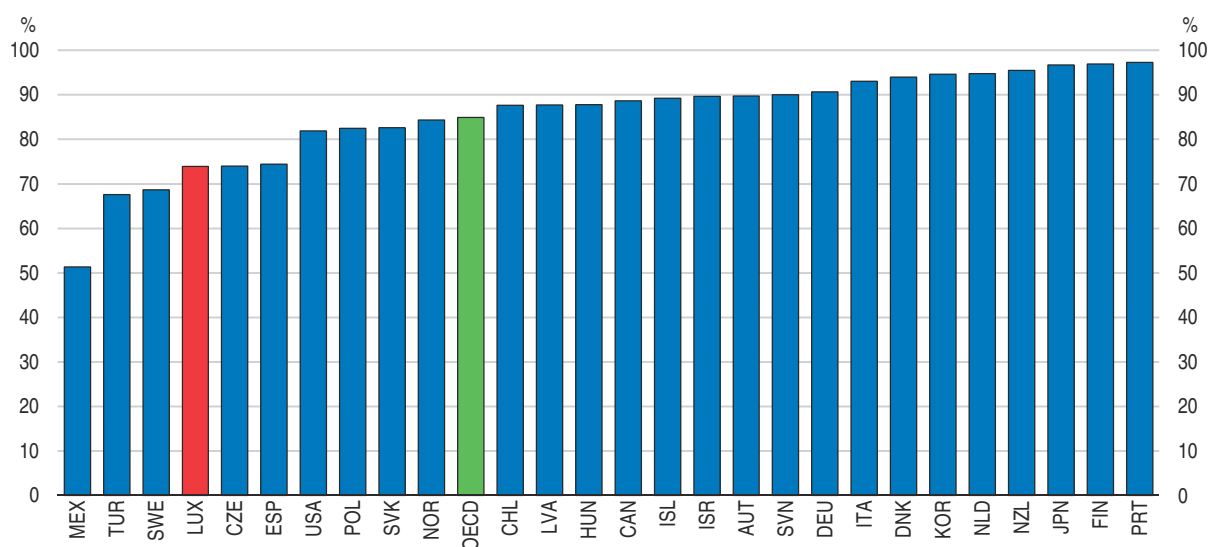
Grade repetition is widespread and concentrated in vocational secondary education, often reflecting language handicaps: while only 9% of 15 years old students in academic secondary education have repeated a year, the share is 36% in technical secondary education and 65% in the preparatory regime (*Ministère de l'Éducation Nationale, de l'Enfance et de la Jeunesse*, 2016). Despite its intention to provide more time to master the curriculum, grade repetition is costly and ineffective in raising educational outcomes. Students who repeat a year are more likely to drop out of school without qualification and they tend to hold more negative attitudes toward school than students who have not (OECD, 2016b). Some evidence even suggests that grade repetition in the earlier grades makes a student more likely to

perform poorly later, as teachers may form lower expectations for these students or the students may find it more difficult to integrate into peer and school cultures (Kaplan, Peck and Kaplan, 1997; Roderick, 1994). More productive strategies focus on providing early, regular and timely support, including addressing learning gaps during the school year and limiting repetition to subjects or modules failed. Decreasing grade repetition also requires raising awareness across schools and society about the costs and negative impact on students and setting objectives and aligning incentives for schools (OECD, 2012a).


Successful completion of secondary education usually gives individuals better employment prospects. More educated people are also less dependent on public aid and better prepared to adjust to future changes. However, Luxembourg has, probably also due to the system of early tracking and widespread grade repetition, low completion rates in secondary education compared to other OECD countries (Figure 1.10). The graduation rates in vocational education and training are particularly low: two years after the expected graduation time only 64% of vocational education and training students in Luxembourg finish their course, compared to the OECD average of 79% (OECD, 2016c). This is a serious concern given the high enrolment rate in vocational education and training at 60% in 2015, compared to the OECD average of 46% (Figure 1.11).

Figure 1.10. **Successful completion rates in secondary education are low**

First-time graduation rates, upper secondary, 2014

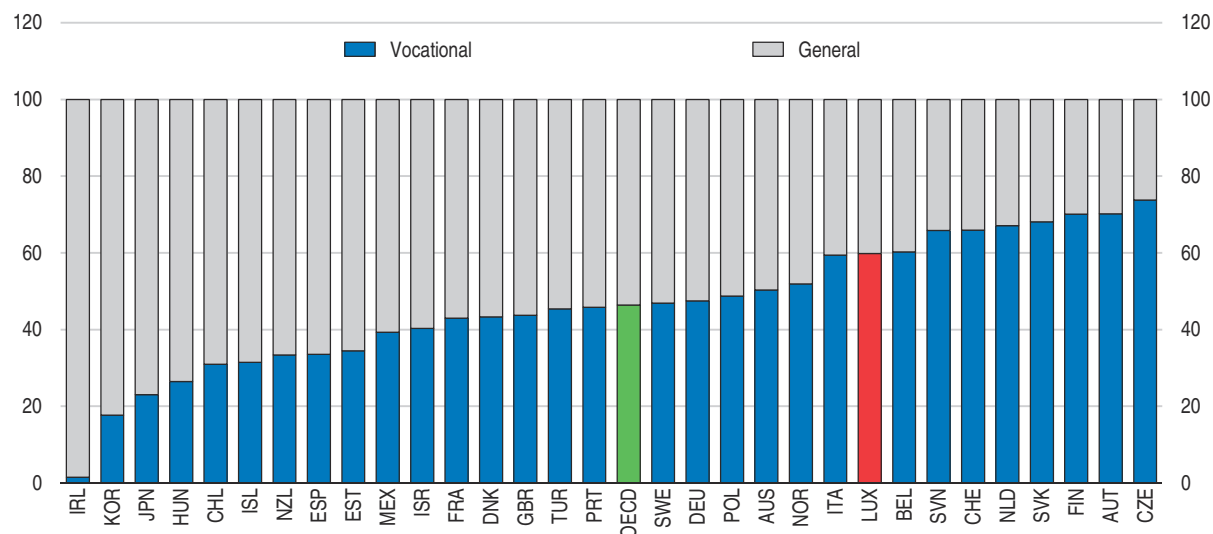


Source: OECD (2016), *Education at a Glance 2016: OECD Indicators*.


StatLink  <http://dx.doi.org/10.1787/888933496178>

Vocational education and training (VET) should equip young people with technical and professional skills which not only meet labour market needs, but also open opportunities for further learning (OECD, 2010). VET programmes of study with a strong work-based learning component developed in close co-operation with employers and other stakeholders can lead to acquisition of valuable skills, while ensuring quality through employers' participation (OECD, 2015a). In Luxembourg, initial VET comprises 4 programmes into which students are tracked at the end of technical lower secondary education. These programmes lead, in decreasing order of depth and access to further studies, to the technical secondary school leaving diploma (DFEST, which gives access, *inter alia*, to academic tertiary education),

Figure 1.11. **Enrolment in Vocational Education and Training is high**
Percentage of upper-secondary students enrolled in general vs. vocational programmes, 2013



Source: OECD (2015), *Education at a Glance 2015: OECD Indicators*.

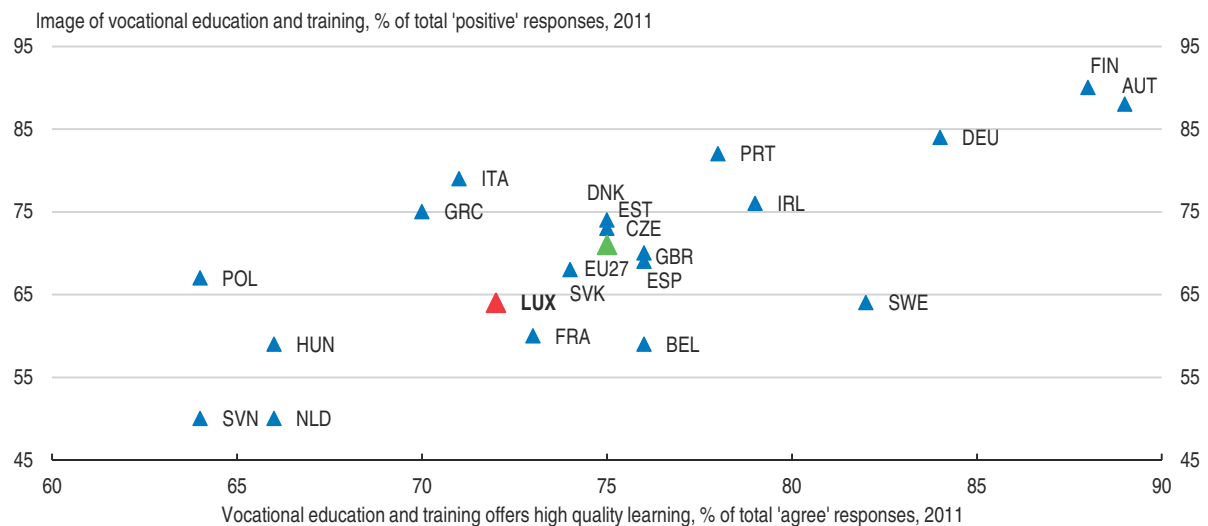
StatLink  <http://dx.doi.org/10.1787/888933496185>

the technician diploma (DT), the vocational aptitude diploma (DAP, often the minimum level required by firms) and the vocational capacity certificate (CCP, which only gives access to the DAP).

In 2008, an ambitious VET reform, largely inspired by the German and Swiss examples, attempted to introduce competence-based, modular learning with a stronger articulation between school and workplace training. However, this reform has faced major implementation difficulties, which are still being dealt with. Some difficulties have stemmed from insufficient preparation and stakeholder ownership, while others are rooted in more fundamental weaknesses of the education system. Legal texts were seen as complex and sometimes ambiguous, pedagogical documents for different trades had very unequal quality and teachers were often unprepared for the reform (*Université du Luxembourg*, 2015). Further, organising second opportunities for unachieved modules has in many schools proved difficult. The authorities have responded with successive adjustments, such as recently relaxing the principle that successful completion of all modules is required.

The social standing of vocational education and training is modest and could be improved (Figure 1.12). The weak general skills of many students and the meagre chances of upgrading to more advanced programmes pose even harder challenges. For instance, holders of a vocational capacity certificate often find it hard to join a vocational aptitude diploma programme, and holders of a vocational aptitude diploma may struggle in a technician diploma programme (*Université du Luxembourg*, 2015). Furthermore, students in a vocational capacity certificate programme sometimes cannot find an apprenticeship place (*Chambre des Salariés Luxembourg*, 2016), which threatens programme completion. Unsurprisingly, vocational capacity certificate students often face difficult school-to-work transitions, with long spells of unemployment or inactivity (*Observatoire de la Formation*, 2016).

In co-operation with the different stakeholders, the authorities should continue to improve the organisation and curricula of VET programmes, placing particular emphasis on better integration of related trades across programmes, so as to enable students to upgrade

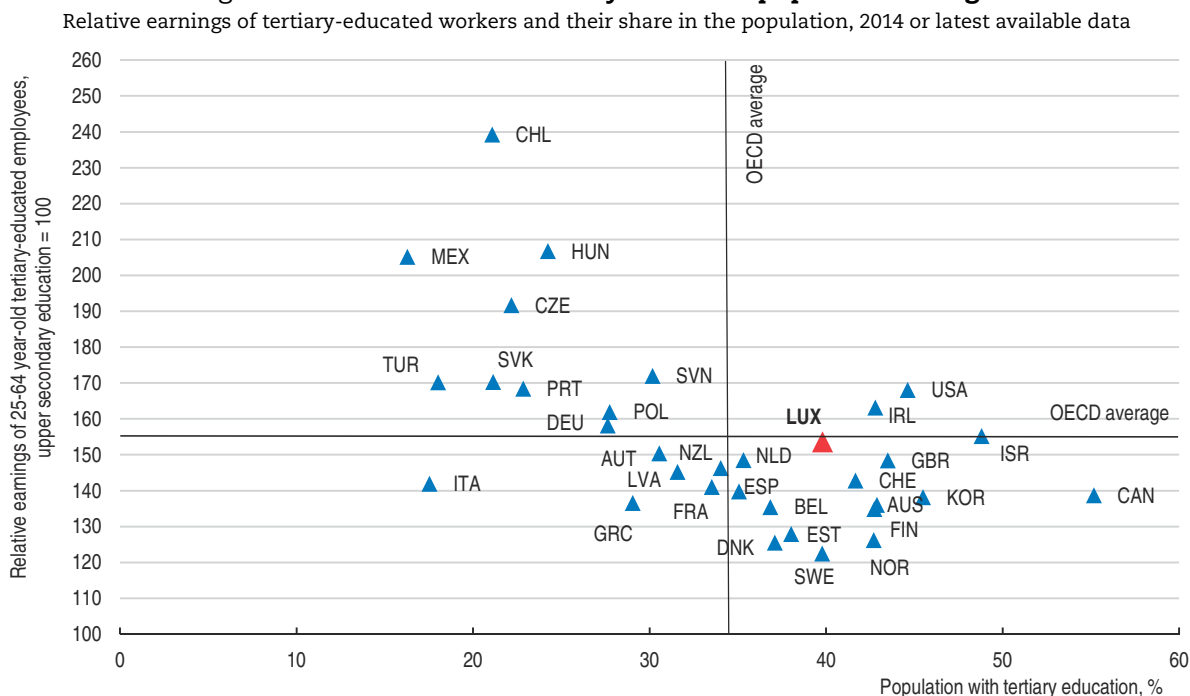
Figure 1.12. **Perceived vocational education and training image and quality are modest**

Source: European Commission (2011), "Attitudes towards vocational education and training", *Special Eurobarometer*, No. 369, September. StatLink <http://dx.doi.org/10.1787/888933496191>

to more advanced tracks. High-quality VET programmes, imparting similar generic skills as in more academic upper secondary programmes, better linked to the other parts of the education system, would help closing the gap between graduates of academic and vocational tracks, both in terms of skills and earnings. Further, building on current plans for secondary education reform, tracking decisions should be improved to reduce the stigma associated to some programmes and take a broader perspective of a student's strengths and weaknesses. For instance, decisions could allow greater tolerance of weaknesses in either French or German, if a student's performance is otherwise satisfactory. Stronger links between upper secondary VET and post-secondary programmes, both vocational and academic, would facilitate ongoing professional development, broadening of skills and lateral career moves (OECD, 2014a).


Tertiary education sector is crucial in providing flexible skills and the authorities have substantially increased public investment in tertiary education in recent years. Between 2013 and 2015, the public funding of the University of Luxembourg, comprising state endowment, seconded personnel and other public funding, increased from 129 to 155 million euro, mainly reflecting increases in staff and research activity, while the number of students remained virtually unchanged (OECD, 2016d; *Université du Luxembourg*, 2016). The level of tertiary education attainment is high by the OECD standards and the wage premia associated with a university degree close to the OECD average (Figure 1.13). The incentives to pursue tertiary education are strong in Luxembourg, including basically free tuition, an expanding amount of scholarships and child benefits for those in full-time education until the age of 26 years. Targeted grants to students and more information about graduate labour market outcomes could help align the choice of the field of study with market signals reflecting future skill needs and encourage students to complete their studies within foreseen time limits (OECD, 2017a).

Although skills such as creativity and entrepreneurial capacity may facilitate innovation, traditional education policies aimed at improving innovation focus on increasing the number of graduates in science, technology, engineering and mathematics (OECD, 2012b). Very few tertiary students in Luxembourg, 3.6 per 1 000 people aged 20 to 29 compared to the

Figure 1.13. **The share of tertiary-educated population is high**

Note: Tertiary education includes short cycle tertiary, bachelor's, master's, doctoral or equivalent degrees. Data on educational attainment refers to year 2015 or latest available year.

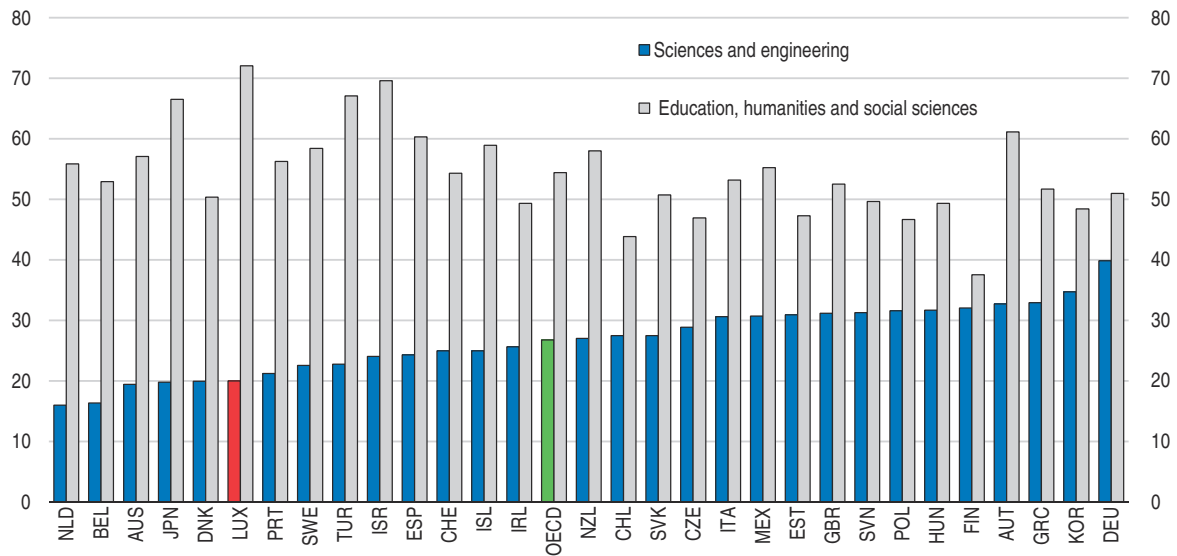
Source: OECD (2016), *Education at a Glance 2016*, Tables A1.3 and A6.1.

StatLink  <http://dx.doi.org/10.1787/888933496202>

EU average of 18, graduate in science, technology, engineering and mathematics, but the low number also reflects the fact that most students do their studies abroad and are not included in the statistics (Figure 1.14). As in most European countries, science, technology, engineering and mathematics professionals in Luxembourg tend to earn more than other groups, partly reflecting demand for their particular skills (Goos et al., 2013). Yet, there is a widespread perception that young people are not very interested in scientific careers and initiatives, such as Go4Science and ProScience, were set up to promote science among students of all ages (OECD, 2016e).

Counselling and career guidance can boost skills by improving the match between young people and their chosen path. It can strengthen social mobility by informing young people of career paths that their family and social networks may not suggest, and encouraging them to choose paths more likely to lead to stable employment. Career guidance is of special importance to young people who consider vocational education and training as they affect students' career prospects more directly than general secondary programmes. Employers and other stakeholders should be engaged in career guidance, through career fairs and employer workshops, to support effective school-to-work transitions and to provide individuals with timely information on the market returns of various career paths and indicators of labour market outcomes of alumni by institutions and programmes (OECD, 2014b). Internships can also help orienting students on the labour market by providing first work experience and building links with local employers and thus play a positive role in career guidance. The share of the youth exposed to some form of career guidance is above the OECD average, but the number of internships could be increased, potentially beyond vocational education tracks (Figure 1.15).

Figure 1.14. Students are not interested in science and engineering careers
As a percentage of first-time new entrants into bachelor's programmes by field of education, 2013¹



Source: OECD (2015), *Education at a Glance 2015*.


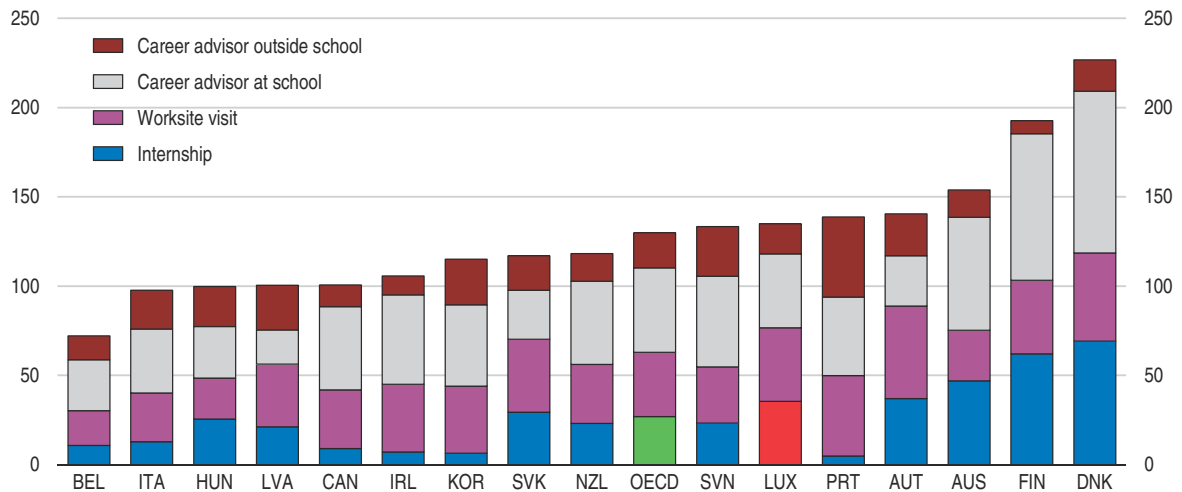

StatLink  <http://dx.doi.org/10.1787/888933496215>

Figure 1.15. Career guidance is widespread

Percentage of 15 year-olds who report having accessed different types of career guidance, 2012



Source: OECD (2016), *Society at a glance 2016*.

StatLink  <http://dx.doi.org/10.1787/888933496220>

Improvements in life-long learning

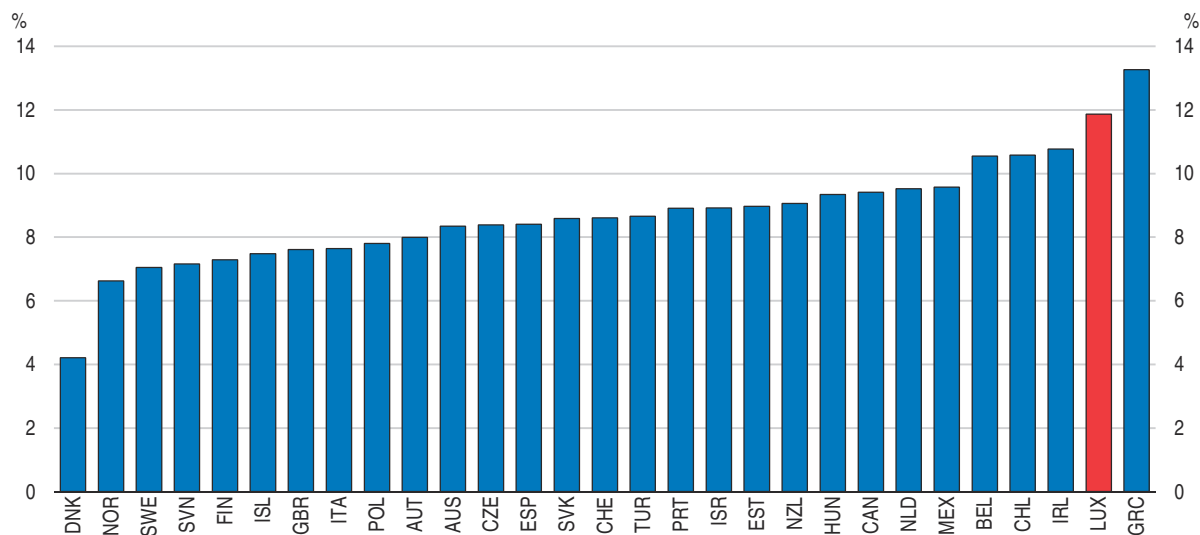
Lifelong learning has a key role in boosting productivity by providing workers with relevant skills, preventing skills deterioration and supporting social mobility and Luxembourg has a wide range of lifelong learning providers. In addition to the school system, there is also training provided by professional chambers, training offered by sectoral organisations, such as those in banking, construction and health service sectors, as well as training for jobseekers provided by ADEM, communes and trade unions. Most of lifelong learning providers, about 80%, are small private sector firms with less than five employees.

Nevertheless, maintaining human capital can be challenging for older workers as employers may be less likely to train those who may soon leave the labour market and the under-investment in skills can be strengthened by firms' fear of highly-skilled employees being poached by other firms. For many workers making significant skills investments in later life requires time off the labour market and high opportunity costs, in terms of foregone earnings. These externalities and possible under-investment in skills by firms and workers provide a rationale for government intervention (OECD, 2017b).

As in most countries, companies contribute a substantial share of the financial resources for lifelong learning, which they can then deduct from profits. However, such schemes may involve deadweight loss as public funds subsidise spending that firms would have undertaken anyway and encourage inefficiently low level of training in small and medium companies that are often less profitable than larger firms. Firms may also prefer to train their skilled workforce and neglect low-skilled staff, older and female workers (OECD, 2015b).


However, re-skilling later in life can be costly, especially if it requires a course of study, rather than workplace training. One reason may be that such course is not considered job-related and hence not eligible for most tax deductions for skills expenditures, putting a hidden burden on labour mobility. As a result, it can be more costly to finance such training that may involve changing careers than training that facilitates advances within careers. In addition, older workers have fewer years in which to work and recoup the cost of education through higher wages (OECD, 2017b). Required wage increase that cover the cost of studying at older age is among the highest in the OECD, at more than 10% per year, showing that it can be difficult for the government to provide sufficient financial incentives for older workers to invest in skills (Figure 1.16).

Figure 1.16. **For older workers studying is more costly than workplace training**
Breakeven earnings increments on lifelong learning (% of wage before education)



Note: Data are for a 50-year-old single taxpayer with no children, who undertakes a one-year course of non-job-related education, earning 25% of the average wage during schooling. This figure shows results that incorporate tax deductions and tax credits for direct costs, tax exemptions for scholarship income, and reduced taxes on student wage income. Tax incentives in the personal income tax system are incorporated, but not the social security contribution system. They do not incorporate STEs that subsidise firm spending on education. It is assumed that the skills investment is financed wholly with savings: students do not incur any debt to make a skills investment.

Source: OECD (2017), *Taxation and Skills*.

StatLink  <http://dx.doi.org/10.1787/888933496231>

Employees in Luxembourg have access to paid training leave that incentivises lifelong learning by compensating workers for the wage loss. However, the amount is limited to 20 days in two years and 80 days in total, which may not be enough to complete longer and more demanding qualifications and could, in justified cases, be extended or modified. For example in Spain, an individual training permit allows low-qualified workers to attend an officially-recognised training activity leading to a qualification, up to a maximum of 200 hours per year, while in Denmark a special allowance payable for up to 40 weeks exists, targeted at early school leavers (European Commission/EACEA/Eurydice, 2016). Targeted training allowances exist in Luxembourg for jobseekers (vouchers for non-formal education), low skilled workers (reimbursement of salary costs) and older employees (grants), provided they have worked in the company more than ten years. These instruments are useful as private income tax deductions for training may not benefit low-skilled workers and jobseekers that tend to pay little taxes. An alternative or complementary approach could be to create individual learning accounts that provide individuals with more responsibility and control, allowing for a better match between the individual needs and appropriate training. Experiences from other OECD countries, such as Canada and the Netherlands, suggest that individual learning accounts can be effective in facilitating lifelong learning (OECD, 2005).

To improve participation in lifelong learning, which is skewed towards those in employment and the better skilled, providers should offer a more flexible and user-friendly approach, such as wider use of online and distance learning, more part-time and modular courses. Flexibility is increasing in Luxembourg, where multilingual adults can use distance learning provision from neighbouring countries and an online personal skills register is being created, but more needs to be done. Incentives should be put in place for low-skilled workers to seek training more actively as part of unemployment activation measures and while employed to prevent future periods of unemployment.

Flexible teaching modules allowing for self-paced learning or online training can combine basic skills development and practical learning, while open education, such as massive open online courses, can help young people to deepen their skills or acquire new ones (OECD, 2015a). However, in this self-guided environment, digital skills will need to be complemented by the development of critical analysis and evaluation skills (Institute of Directors, 2016). Potential cost savings and flexibility of online learning should be used to create a self-guided environment that will allow learners to combine courses from several providers gradually at different times coupled with more systematic recognition of skills and competences acquired in both formal and informal learning.

Quality assurance and evaluation is an integral component of adult learning. All providers of general adult education are obliged to provide information and guidance regarding their education and training programmes, which is welcome. The government has also established a guidance centre (*Maison de l'orientation*) that brings together several public guidance services and makes information on provider quality available to users.

Developing entrepreneurial skills and innovation

Entrepreneurship is an important driver of innovation and job creation, but insufficient entrepreneurial skills could be a barrier in starting a business. The social perception of entrepreneurs in Luxembourg is below the EU average: only 45% of Luxembourg residents regard entrepreneurship as desirable career choice compared to 56% in the EU. As in other countries, migrants in Luxembourg report higher entrepreneurial activity and more positive perception of entrepreneurship than non-immigrants (STATEC, 2016).

Education to entrepreneurship often involves development of specific technical skills, such as business planning, through simulation of real business enterprises, before engaging in entrepreneurship education programmes in higher education. The empirical evidence suggests that entrepreneurship is best supported by developing implementation skills rather than theoretical knowledge, through interdisciplinary programmes or in partnership with existing businesses. Entrepreneurship education needs to be better integrated also into vocational education and training programmes, with particular emphasis on real-world experience in the workplace and more effective engagement with entrepreneurs (OECD, 2015a). Outside the formal education system, role models of successful entrepreneurs are often pivotal in supporting entrepreneurial intentions. As the perceived gender gap in access to entrepreneurial training between men and women is pronounced in Luxembourg, alternative approaches based on mentoring and alumni networks may be effective to encourage efforts to start and sustain a new business.

Entrepreneurial skills can also be developed in the context of career guidance and active labour market policies. Governments can partner with business organisations and other stakeholders to promote entrepreneurship by providing a first-hand look at the day-to-day operation of small firms and help new entrepreneurs acquire the skills for running small businesses through interaction with other entrepreneurs. Multiple programmes of support run by professional chambers together with ADEM exist in Luxembourg, including Fit4Entrepreneurship and Fit4Start, providing early-stage funding and coaching in the context of professional reintegration. These programmes should be regularly evaluated and their cost effectiveness assessed.

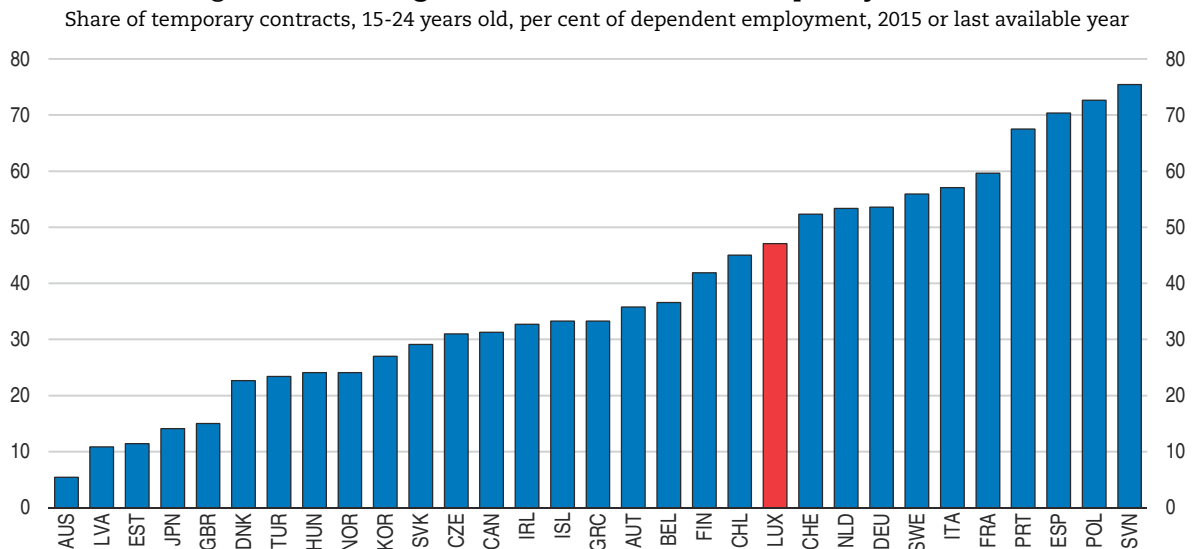
Policies ensuring better use of existing skills

Skills must be used to bring value. Unused skills become obsolete as the demand for skills changes and represent a waste of the initial investment in skills and retraining or upskilling may be needed before their holders may return to employment. On the other hand, the more individuals use their skills and engage in complex and demanding tasks, the more can the skills decline due to ageing be prevented.


Improving the job matching

Smooth transition from school to work limits the risk of skills depletion and the emergence of “scarring effects” that may be caused by the experience of unemployment at the beginning of a career. Arrangements to combine study and work through apprenticeships and internships may facilitate school-to-work transition, as countries with a long apprenticeship tradition and stakeholder engagement exhibit lower NEET rates and youth unemployment, and below average repeated unemployment spells than countries with a school-based system (Quintini and Manfredi, 2009). Although the NEET rate in Luxembourg is low by OECD standards, low skilled youth can still face difficult school-to-work transitions. While apprenticeships are relatively common in Luxembourg, student jobs and internships are less so, as only a small fraction of students aged 15-19 work part-time or full-time (OECD, 2010).

The share of young workers on temporary contracts is relatively high in Luxembourg (Figure 1.17), possibly reflecting the level of employment protection for permanent workers, especially the protection against collective dismissal, that is above the OECD average. Narrowing of the difference between permanent and temporary employment by lowering of employment protection could improve school to work transition (Mills and Präg, 2014) and

Figure 1.17. **Young workers often work on temporary contracts**

Source: OECD, *Employment and Labour Market Statistics Database*.

StatLink  <http://dx.doi.org/10.1787/888933496029>

make the transition from temporary to permanent work more common. Moreover, the Survey of Adult Skills data show that workers on temporary contracts use their cognitive skills less intensively than workers in permanent employment, exposing them to the risk of skills depreciation. The 2016 reform simplifying employee representation in companies with more than 150 employees is welcome, as it may further reduce the cost of collective dismissals, although additional costs for external counsel to staff delegates that will be borne by employers may negatively affect competitiveness (Eurofound, 2016).

Spending on active labour market policies (ALMP) is close to the OECD average, but only a small fraction, less than 10% of the total in 2014, is spent on training, compared to more than 20% in Belgium and more than 30% in France and Germany. Although the evidence on the effect of labour market training on employment tends to be positive mainly in the long term, the link is often found to be stronger for the youth and other disadvantaged jobseekers (Bredgaard, 2015). Other studies emphasize the right combination of measures, such as the effective job search assistance, wage subsidies in the private sector and labour market training (Martin and Grubb, 2001), showing that the mix of active labour market policies is as important as the size of the total ALMP spending (OECD, 2015c).

Well-targeted short trainings, quickly increasing employability and limiting lock-in effects, are crucial to prevent long-term unemployment and erosion of skills. Trainings focused on imparting problem-solving skills in technology-rich environments may be especially useful in increasing employability (OECD, 2015a). An effective activation regime should not only get people off benefits and into work, but help them access quality jobs. The public employment service (ADEM) should offer continued support to clients even after they have exited benefits into a job, ensuring that they enjoy some career progression (Martin, 2014).

The recent reform of ADEM involved increases in funding and the number of staff, allowing larger share of staff to be allocated to direct customer services. The number of counsellors trained in advising young jobseekers was increased in 2015 and concentrated in three specialised ADEM branches. Intensified job-search assistance and higher frequency of

jobseekers' meetings with caseworkers are welcome and may lower unemployment spells, particularly for the youth. In addition, the public employment service has recently introduced two new active labour market schemes for jobseekers older than 45, jobseekers with reduced working capacity and disabled: short-term professionalisation training and a long-term employment reinsertion contract (Clauwaert et al., 2016). These targeted measures that encourage employers to hire and retain older workers by subsidising the wage costs are combined with personalised support depending on the distance to employment.

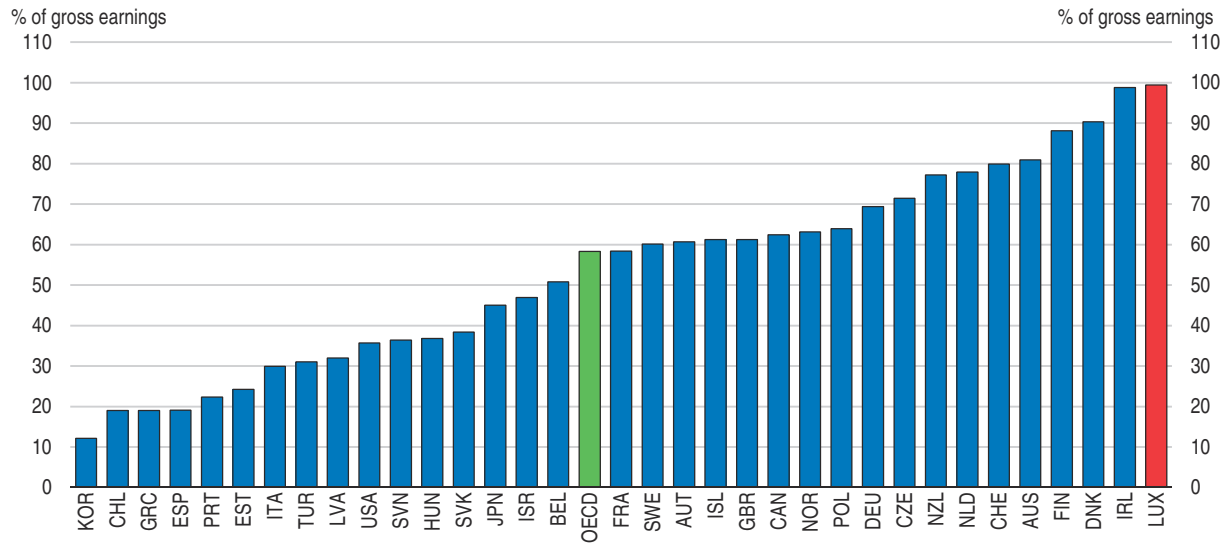
However, ALMP programmes in Luxembourg could benefit from more systematic impact assessment. Monitoring and evaluation are essential for ensuring cost-effectiveness, even more so since the evidence from countries where there are strong obligations associated with participation in ALMPs suggests that the positive effect of ALMPs on labour market outcomes may even come from the threat of entering the programme rather than from the programme itself (OECD, 2015a). Hence, the outcome measures of local public employment service offices should be monitored to improve performance and could partly be made public (OECD, 2005b).

Improving the incentives for labour market participation

Inactivity traps in Luxembourg are high, especially for part-time workers and low income earners, with detrimental effects such as skill erosion and lower self-confidence. The marginal effective tax rate associated with an increase in working hours from 33% to 67% of the average wage for one-earner married couple is almost 100% (Figure 1.18). In other words, the additional earnings associated with increased work effort are almost fully taxed away by the combined effect of increasing taxes and decreasing benefits. Similarly, a transition from unemployment to employment presents large financial disincentives to work for low-income workers. The participation tax rate, the part of earned income taxed away when taking up a job due to the combined effect of increasing taxes and decreasing benefits, for a job earning 67% of average wage for one-earner married couple is 97%, well above the OECD average (Figure 1.19).

Unemployment benefits are high compared to other OECD countries and particularly generous for younger and low-income workers. Net replacement rate for a single person at 67% and 150% of average wage in 2014 was 83% and 76%, compared to the OECD median of 65% and 45%. Luxembourg is also one of the few OECD countries where young people with no employment record can receive unemployment benefits, after a waiting period of six months. In most OECD countries, unemployed youth who lack a sufficient employment history are entitled to social assistance or housing benefits that are usually means-tested at household level and, although available for unlimited period in most countries, less generous than unemployment benefits (OECD, 2016f). Moreover, older jobseekers can, under a temporary measure adopted during the financial crisis and recently prolonged until the end of 2017, draw on unemployment benefits for six months longer than other workers, provided that they have paid 20 years of unemployment insurance contribution. While this measure will help some vulnerable jobseekers who have difficulties finding employment, for other older unemployed workers it may just bridge them into generous early retirement schemes that still await reform, pending the outcome of negotiations with social partners.

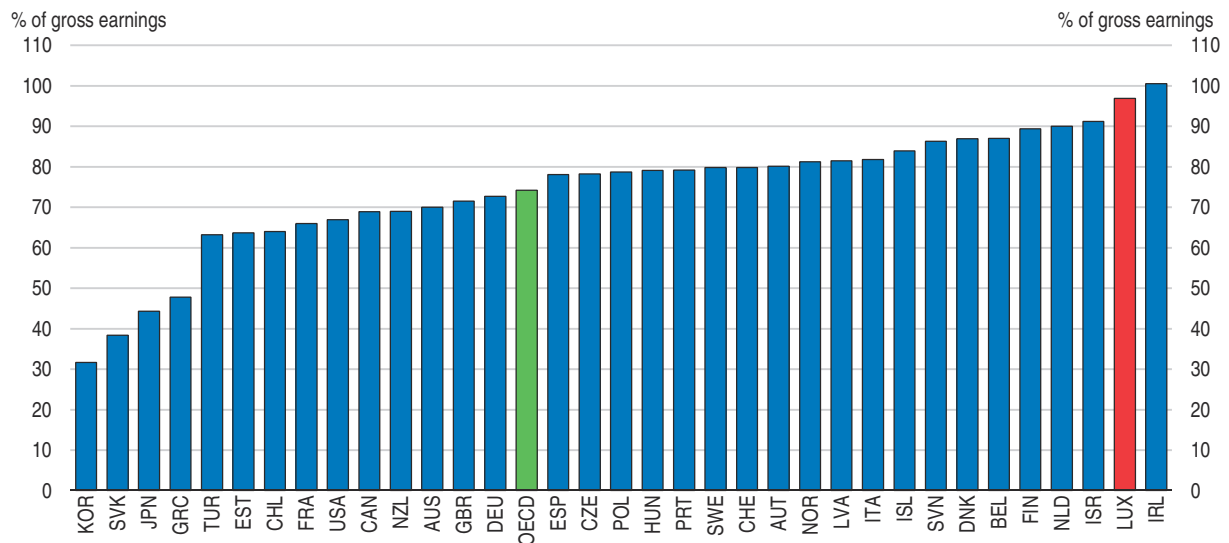
The minimum income scheme (*Revenue Minimum Garanti*, RMG) aims to ensure that all individuals and households attain a predefined minimum income, regularly adjusted for inflation. Gross income from all sources is taken into account for determining eligibility, while 30% of the gross income is disregarded in the income test and the minimum income

Figure 1.18. **High marginal tax rates create an inactivity trap**Marginal Effective Tax Rates on increasing working hours,¹ 2014

1. From 33% to 67% of average wage, supplements included, one-earner married couple, no children.

Source: OECD, Tax-Benefit Models.

StatLink <http://dx.doi.org/10.1787/888933496246>

Figure 1.19. **High participation tax rates create an unemployment trap**Participation Tax Rates on moving from unemployment into full-time work,¹ 2014

1. At 67% of average wage, supplements included, one-earner married couple, no children.

Source: OECD, Tax-Benefit Models.

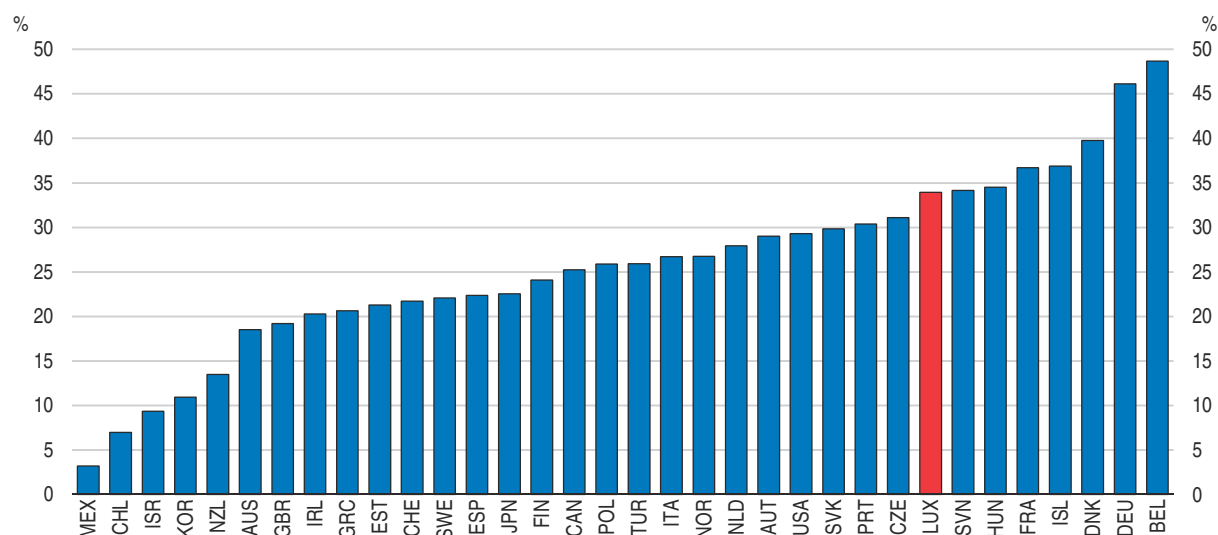
StatLink <http://dx.doi.org/10.1787/888933496254>

can thus be paid as a top-up to income from other sources to a maximum level of 130% of the guaranteed minimum income. All benefit recipients are required to be resident in Luxembourg. Non-EU citizens who are not recognised refugees are required to have lived in Luxembourg for at least five out of last 20 years, while EU citizens without Luxembourg nationality are not eligible for the minimum income scheme during the first 3 months of stay or during their job search if they came to Luxembourg to seek employment (Königs, 2012).

While the minimum income scheme is successful in preventing extreme poverty, it does so at the costs of high persistence of receipts, with 38% of spells between 2001 and 2009 lasting longer than 2 years (Königs, 2012), and by reducing incentives for low income workers. Since any additional income above 30% of the guaranteed income is withdrawn one-for-one until reaching the minimum income scheme eligibility threshold, the scheme provides incentive to work at maximum 10 hours per week, remunerated at the minimum wage level, and imposes marginal effective tax rate of 100% on additional work (OECD 2012b). The draft bill replacing the minimum income scheme with new social inclusion income (REVIS) is welcome, as it replaces one-for-one withdrawal of income from work with a 25% rate, at which work income can be retained, up to the new eligibility threshold, while introducing stronger conditionality for recipients, who must actively search for employment.

Married couples and registered partners will, starting from 2018, be allowed to choose between joint and individual taxation and revise their choice for every subsequent tax year. In the case of individual taxation, most tax deductions will be equally split between partners. Since the policy is optional, allowing spouses to continue with joint taxation, its potential effect on work incentives of second earners may be limited. Although participation decisions of second earners are also influenced by factors beyond taxation, such as the availability and cost of childcare and paid maternity leave provisions, a system of fully individual taxation would maximise the incentives for second earners to enter employment and make the tax system more gender neutral (Figure 1.20).

Figure 1.20. **Work disincentives for second earners are high**
Net personal average tax rates on second earners,¹ 2015



1. Second earner at 67% of the average wage (primary earner at the average wage level), no children. The net personal average tax rate is calculated as the increase in income tax and employee SSCs (net of inwork benefits) paid by the family as a result of the second earner entering workforce divided by the increase in family gross income as a result of the second earner entering in the workforce.
Source: Thomas and O'Reilly (2016).

StatLink  <http://dx.doi.org/10.1787/888933496263>

Empirical evidence suggests that individual taxation in Luxembourg would incentivise married women to take on work, albeit mainly part-time work. Based on the 2009 income data and the Euromod tax-benefit system model, the overall female participation rate in Luxembourg is projected to increase by about 1 percentage point following the introduction of full individual taxation, while the number of hours worked should decrease, mainly due

to increase in part-time work. On the other hand, the reform is projected to have a negligible impact on married men, who tend to have a very inelastic labour supply and are mostly already working full-time (Doorley, 2016).

The 2016 reform of parental leave extended the eligibility, increased the replacement income and provided more flexibility by introducing part-time leave. The new rules also enable both parents to take the leave at the same time. Parental leave is granted as non-transferable leave entitlement to both parents, which is welcome as it may promote fathers' take-up and more balanced sharing of leave entitlements. However, in order not to lose the entitlement, one parent still has to take parental leave immediately after the maternity leave, which may be overly restrictive. In order to increase take-up among fathers, some countries, such as Germany and Portugal, offer bonus parental leave if fathers take up a minimum amount. The experience from both countries where the proportion of fathers taking parental leave more than doubled, shows that such policies may be effective in raising fathers' participation in parental leave (OECD, 2012c).

Along with attitudes, the other important factor in fathers' low take-up rates is that they often earn more than their partners, so household income loss is smaller when parental leave is taken by mothers. Although the overall gender wage gap in Luxembourg in 2014 was only about 4%, the gap increases with age and during childbearing, being largest among the top earners (OECD, 2012c). Parental leave payment rates tend to be lower for individuals on higher wages and the differences in payment rates were especially high in Luxembourg where in 2014 a person on 150% of average earnings would receive a benefit covering less than 40% of previous gross earnings (OECD, 2016g). The 2016 reform has increased the coverage rate as the new replacement income, previously set as a fixed allowance, will be linked to the level of applicants' gross earnings, limiting the opportunity costs for the family. However, the allowance remained capped at EUR 3.200, which may be low to make the parental leave attractive to high earners.

Older workers require more flexible workplace practices, such as part-time work, flexible working times and distance working, in order to remain in employment or take up new employment opportunities. The need for flexible working time arrangements may stem from the caring obligations of older workers, if they have to care for their older parents (Duell, 2015). Empirical evidence on the impact of reduced working hours on remaining in employment is mixed as part-time jobs may result in less training and less interesting job tasks (Hermansen, 2015; Earl and Taylor, 2015). Flexible work should be further developed and adapted to different sectors and life phases, as less standard working hours arrangements could have implications for communication and co-operation among employees and additional technology support could require new knowledge and training (OECD, 2015d). The social partners could co-operate in shaping working conditions under new working schemes and developing guidelines and sector-specific instructions to employers on promoting a better working life for older workers, but effective schemes for responding to an ageing workforce can also be set up at the company level (Tishman et al., 2012).

The conditions for return to work of people with limited disabilities have been reformed to strengthen the possibilities for reintegration, giving priority to redeployment within companies. The procedure has become faster and the role of the occupational health practitioner in the assessment strengthened. The decision on redeployment will be periodically reviewed and the sanctions for non-compliance, both of employers and employees, have increased. This reform is welcome, as it is likely to increase the labour

market attachment of workers with limited disabilities and reduce the number of people dependent on the guaranteed minimum income scheme or entering early retirement. However, the impact of the reform needs to be assessed soon and the cost efficiency monitored, as some expenses associated with the reintegration framework, such as the compensatory allowance and tide-over allowance, have more than doubled between 2010 and 2015, to 180 million EUR (*Ministère du Travail, de l'Emploi et de l'Économie sociale et solidaire*, 2016).

To improve inclusiveness, reforms of disability benefit systems should be complemented by measures to improve employability of disabled people. The introduction of compulsory retraining or rehabilitation with the possibility for a disabled worker who refuses such a measure of losing the disabled status is a step in the right direction, as it integrates employment and health services. More could be done in the area of prevention of disability going beyond the work safety and injury prevention (Moes and Dominique, 2010) towards introduction of policies increasing awareness about the nature of disabilities, how they can be overcome and at what costs (Klein and Aggerstrøm Hansen, 2016).

Recommendations to improve skills for more inclusive growth

Ensuring flexible and continuously improving supply of skills

Key recommendations

- Reduce grade repetition by providing earlier individualised support to students falling behind.
- Improve the mobility between secondary tracks via curriculum alignment and differentiated teaching.
- Create individual learning accounts and expand the individual study leave to enhance access to lifelong learning.

Additional recommendations

- Make systematic use of the tools for assessing and anticipating skills needs in policy making, especially in education policy and immigration policy.
- Strengthen career guidance and counselling to improve responsiveness of tertiary education to labour market needs.
- Improve the organization and curricula of vocational education and training and ease upward mobility of VET students to tertiary education programmes.
- Tailor lifelong learning programmes to the needs of the low skilled and older workers.

Ensuring better use of existing skills

Key recommendations

- Provide incentives for fathers to share parental leave. Consider introducing bonus parental leave if fathers take up a minimum amount and remove the cap on parental leave allowance.
- Adjust the tax and benefit system to increase incentives to work for low-skilled youth, older workers and second earners. For example, limit the access to unemployment benefits for young people with no employment record.

Additional recommendations

- Improve the evaluation of existing active labour market policies and set and partly publish output measures for local PES offices.

Recommendations to improve skills for more inclusive growth (cont.)

- Move to a system of fully individual taxation to make the tax system more gender neutral.
- Close off various routes into early retirement and support more flexible workplace practices to strengthen labour market attachment of older workers.
- Assess the impact of the recent reform of support for return to work of people with partial disability and complement it with measures to improve their employability.

Bibliography

- Ant, M., P. Goetzinger and N. Binsfeld (2016), *E-Skills Study: Strategies for the creation of a Virtual e-Skills Training Centre in Luxembourg*, Luxembourg.
- Arntz, M., T. Gregory and U. Zierahn (2016), “The risk of automation for jobs in OECD countries: A comparative analysis”, *OECD Social, Employment and Migration Working Paper No. 189*, OECD Publishing, Paris.
- Bredgaard, T. (2015), “Evaluating what works for whom in active labour market policies”, *European Journal of Social Security*, Vol. 17, No. 4, pp. 436-452.
- Chambre des Salariés Luxembourg (2016), *Prise de position de la Chambre des salariés sur le dispositif de la formation professionnelle quant à la situation actuelle et aux défis futurs. 16 propositions pour former mieux*. October.
- CEDEFOP (2016), *Luxembourg: Mismatch Priority Occupations*, Skills Panorama, European Centre for the Development of Vocational Training, Brussels.
- CEDEFOP (2015), *Skill supply and demand up to 2025: Country forecast Luxembourg*, European Centre for the Development of Vocational Training, Brussels.
- Clauwaert, S., I. Schönmann, N. Buetten and Z. Rasna a (2016), “The crisis and national labour law reforms: A mapping exercise”, *Country report: Luxembourg*, European Trade Union Institute, Brussels.
- Doorley, K. (2016), “Making the switch: The employment and fiscal effects of introducing individual income taxation in Luxembourg”, a paper presented at the conference ‘Imposition individuelle et emploi’, organised by the Ministry of Labour, Luxembourg.
- Duell, N. (2015), “Local economic strategies for ageing labour markets: Management practices for productivity gains of older workers”, *OECD Employment Policy Papers*, No. 11, OECD Publishing, Paris.
- Earl, C. and P. Taylor (2015), “Is Workplace Flexibility Good Policy? Evaluating the Efficacy of Age Management Strategies for Older Women Workers”, *Work, Aging and Retirement*.
- Eurofound (2016), *Luxembourg: Reform of Employee representation in companies*, European Foundation for the Improvement of Living and Working Conditions, Brussels. Available at www.eurofound.europa.eu/observatories/eurwork/articles/industrial-relations/luxembourg-reform-of-employee-representation-incompanies.
- Eurostat (2017), “*Digital Economy and Society Database*”, Eurostat, Luxembourg.
- European Commission (2016), “*Europe’s Digital Progress Report 2016: Luxembourg*”, European Commission, Brussels.
- European Commission/EACEA/Eurydice (2016), *National Student Fee and Support Systems in European Higher Education – 2016/17*, Eurydice Facts and Figures, Luxembourg, Publications Office of the European Union.
- Goos, M., I. Hathaway, J. Konings and M. Vandeweyer (2013), “High-technology employment in the European Union”, *VIVES Discussion Paper No. 41*, KU Leuven.
- Government of Luxembourg (2007), “*The Luxembourg Economy: An eventful history*”, Luxembourg.
- Hermansen, Å. (2015), “Retaining Older Workers: The Effect of Phased Retirement on Delaying Early Retirement”, *Nordic Journal of Social Research*, Vol. 6.
- IBA/OIE (2016), *Rapport sur la situation économique et sociale de la Grande Région 2015/2016*, Publications de la Grande Région, Tome 21, Haus der Großregion, Esch sur Alzette.

- Institute of Directors (2016), “Lifelong Learning: Reforming education for an age of technological and demographic change”, *IoD Policy Report*, March.
- Kaplan, D.S., B.M. Peck and H.B. Kaplan (1997), “Decomposing the academic failure-dropout relationship: A longitudinal analysis”, *The Journal of Educational Research*, Vol. 90/6, pp. 331-343.
- Klein, C. and L. Aggerstrøm Hansen (2016), “Balancing inclusiveness, work incentives and sustainability in Denmark”, *OECD Economics Department Working Papers*, No. 1338, OECD Publishing, Paris.
- Königs, S. (2012), “The dynamics of social assistance benefit receipt in Luxembourg – A descriptive analysis”, *INET Working Paper*, Institute of New Economic Thinking, Oxford Martin School, Oxford.
- Marcolin, L., S. Miroudot and M. Squicciarini (2016), “Routine jobs, employment and technological innovation in global value chains”, *OECD Science, Technology and Industry Working Papers*, 2016/01, OECD Publishing, Paris, <http://dx.doi.org/10.1787/5jm5dcz2d26j-en>.
- Martin, J.P. (2014), “Activation and active labour market policies in OECD countries: Stylized facts and evidence on their effectiveness”, *IZA Policy Paper No. 84*, Institute for the Study of Labor, Bonn.
- Martin, J.P. and D. Grubb (2001), “What Works and for Whom: A Review of OECD Countries’ Experiences with Active Labour Market Policies”, *Swedish Economic Policy Review* 8 (2), pp. 9-56.
- Mills, M. and P. Präg (2014), “Gender inequalities in the school-to-work transition in Europe”, *Short Statistical Report No. 4*, RAND Europe and the European Commission, Brussels.
- Ministère de l’Éducation nationale, de l’Enfance et de la Jeunesse (2016), *PISA Nationaler Bericht Luxembourg*, Luxembourg.
- Ministère du Travail, de l’Emploi et de l’Économie sociale et solidaire (2016), *Rapport d’Activité 2015*, Luxembourg.
- Moes, R. and T. Dominique (2010), “Luxembourg experience on preventing work incapacity”, *Peer Review on modernising measures relating to work incapacity*, European Commission, Brussels.
- Mokyr, J., C. Vickers and N.L. Ziebarth (2015), “The history of technological anxiety and the future of economic growth”, *Journal of Economic Perspectives*, 29(3), pp. 31-50.
- Observatoire de la Formation (2016), *L’effort de formation des entreprises du secteur privé en 2014*, FORMABREF – Pratiques de Formation, Institut National pour le Développement de la Formation Professionnelle Continue, July.
- OECD (2017a), *In-depth analysis of the labour market relevance and outcomes of higher education systems: Analytical framework and country practices report*, Enhancing Higher Education System Performance, OECD, Paris.
- OECD (2017b), *Taxation and Skills*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264269385-en>.
- OECD (2016a), *Getting Skills Right: Assessing and Anticipating Changing Skill Needs*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264252073-en>.
- OECD (2016b), “Student Background and Low Performance”, in *Low-Performing Students: Why They Fall Behind and How To Help Them Succeed*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264250246-5-en>.
- OECD (2016c), *Education Policy Outlook: Luxembourg*, OECD Publishing, Paris.
- OECD (2016d), *OECD Reviews of Innovation Policy: Luxembourg 2016*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264232297-en>.
- OECD (2016e), “Luxembourg”, in *OECD Science, Technology and Innovation Outlook 2016*, OECD Publishing, Paris.
- OECD (2016f), *Society at a Glance 2016: OECD Social Indicators*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264261488-en>.
- OECD (2016g), *OECD Family Database*, available at www.oecd.org/els/family/database.htm.
- OECD (2015a), *OECD Skills Outlook 2015: Youth, Skills and Employability*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264234178-en>.
- OECD (2015b), *All on Board: Making Inclusive Growth Happen*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264218512-en>.
- OECD (2015c), *OECD Employment Outlook 2015*, OECD Publishing, Paris, http://dx.doi.org/10.1787/empl_outlook-2015-en.
- OECD (2015d), *Ageing and Employment Policies: Denmark*, Chapter 5, OECD Publishing, Paris.

- OECD (2014a), *Skills beyond School: Synthesis Report*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264214682-en>.
- OECD (2014b), *Education at a Glance 2014: OECD Indicators*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/eag-2014-en>.
- OECD (2012a), *Equity and Quality in Education: Supporting Disadvantaged Students and Schools*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264130852-en>.
- OECD (2012b), *OECD Science, Technology and Industry Outlook 2012*, OECD Publishing, Paris.
- OECD (2012c), *Closing the Gender Gap: Act Now*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264179370-en>.
- OECD (2010), *Learning for Jobs*, OECD Publishing, Paris.
- OECD (2005a), *Promoting Adult Learning*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264010932-en>.
- OECD (2005b), *OECD Employment Outlook 2005*, Chapter 5, OECD Publishing, Paris, http://dx.doi.org/10.1787/empl_outlook-2005-en.
- OECD (1979), Belgium, Luxembourg, *OECD Economic Surveys*, December.
- OECD (1975), Belgium and Luxembourg Economic Union, *OECD Economic Surveys*, July.
- PricewaterhouseCoopers (2016), *Luxembourg FinTech Report 2016*, PricewaterhouseCoopers, Luxembourg.
- Quintini, G. and T. Manfredi (2009), "Going Separate Ways? School-to-Work Transitions in the United States and Europe", *OECD Social, Employment and Migration Working Papers*, No. 90, OECD Publishing, Paris, <http://dx.doi.org/10.1787/221717700447>.
- Rifkin, J. et al. (2016), *The third industrial revolution strategy study for the Grand Duchy of Luxembourg*, Luxembourg.
- Roderick, M. (1994), "Grade retention and school dropout: Investigating the association", *American Educational Research Journal*, Vol. 31/4, pp. 729-759.
- STATEC (2016), *Global Entrepreneurship Monitor Luxembourg 2015/2016*, Institut national de la statistique et des études économiques, Luxembourg.
- STATEC (1987), *Cahiers économiques du Statec*, No. 73, Luxembourg, 1987.
- Thomas, A. and P. O'Reilly (2016), "The Impact of Tax and Benefit Systems on the Workforce Participation Incentives of Women", *OECD Taxation Working Papers*, No. 29, OECD Publishing, Paris.
- Tishman, F., S. Van Looy and S. Bruyère (2012), "Employer strategies for responding to an ageing workforce", *The NTAR Leadership Center Report*, New Brunswick.
- Université du Luxembourg (2015), *Éléments pour une évaluation de la réforme de la formation professionnelle : les principales critiques*, Institute for LifeLong Learning and Guidance, September.
- Université du Luxembourg (2016), *Annual Report 2015*, Luxembourg, July.

Chapter 2

Reaping the benefits of a diverse society through better integration of immigrants

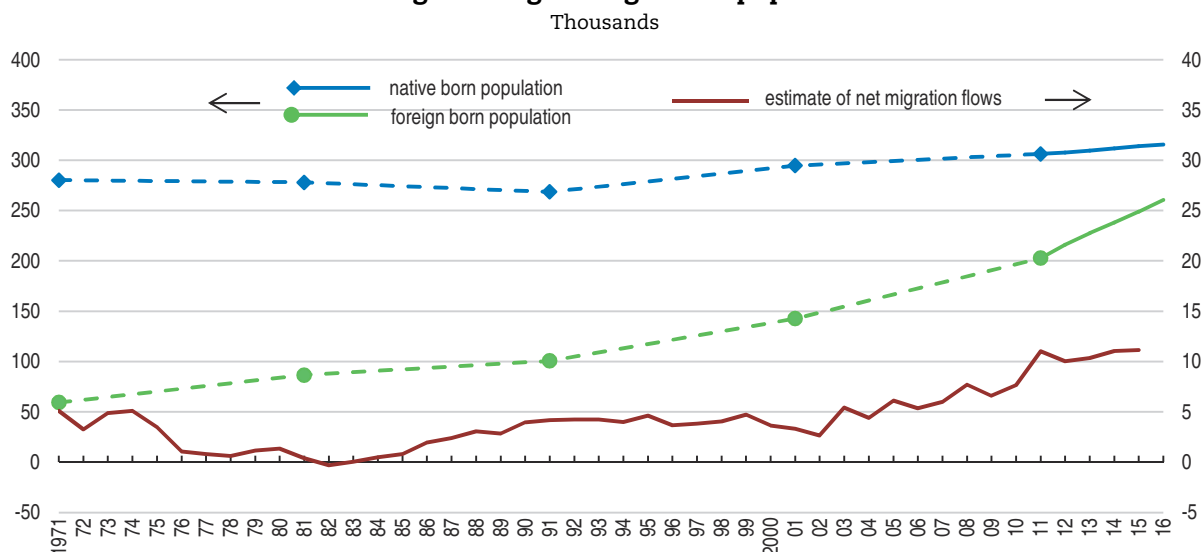
Luxembourg's large foreign-born population is a pillar of the country's prosperity: they have brought skills and knowledge to many sectors of the economy. They also tend to successfully find jobs, with a higher employment rate than natives. However, not all immigrants have done well. The minority from non-EU origin (about 10% of the country's population) suffers from high unemployment, large gender gaps in activity and below-average incomes. Refugees are particularly vulnerable. Other integration shortcomings go beyond disadvantaged minorities. Pervasive labour market segmentation is well illustrated by the marked under-representation of the foreign-born in public sector jobs. Political participation of immigrants at local level is modest. At school, their children are often put at a disadvantage by an education system which tends to perpetuate socio-economic inequality.

The diversity of Luxembourg's society contributed by immigrants should be seen as an asset for economic growth and well-being. Initiatives such as the diversity charter can help private and public organisations to reap the benefit of diversity through the inclusion of outsiders and the strengthening of social cohesion. Learning the languages of Luxembourg, developing social capital and having foreign qualifications validated are key preconditions for successful integration. Education requires both general equity-enhancing reforms, starting at early childhood, and targeted support to disadvantaged students, including upgraded vocational studies. Furthermore, job matching and social cohesion would benefit from greater immigrant participation in public sector employment and civic life. Avoiding that asylum seekers undergo protracted inactivity is also a concern.

Luxembourg benefits a lot from the large immigrant population, but integration could improve


Luxembourg is the OECD country where immigrants, defined as those born abroad whatever their nationality, account for the largest share of total resident population (45% in 2015). Immigration has long been substantial and has mainly come from the three neighbouring countries and Italy and Portugal, which together account for roughly two-thirds of the total foreign-born population (Figures 2.1 and 2.2, Panel A). Strong economic growth and job creation help explain large net migration flows (arrivals minus departures) in recent years (Figure 2.1). Furthermore, immigrants are becoming more diverse, as flows from outside the EU, though still outnumbered by those from traditional origin countries, have gained importance (Figure 2.2, Panel B). Sizeable arrivals of asylum seekers (close to one-tenth of total arrivals in 2011-15) are part of the explanation.

Figure 2.1. **Migration flows have long been substantial, leading to a large foreign-born population**



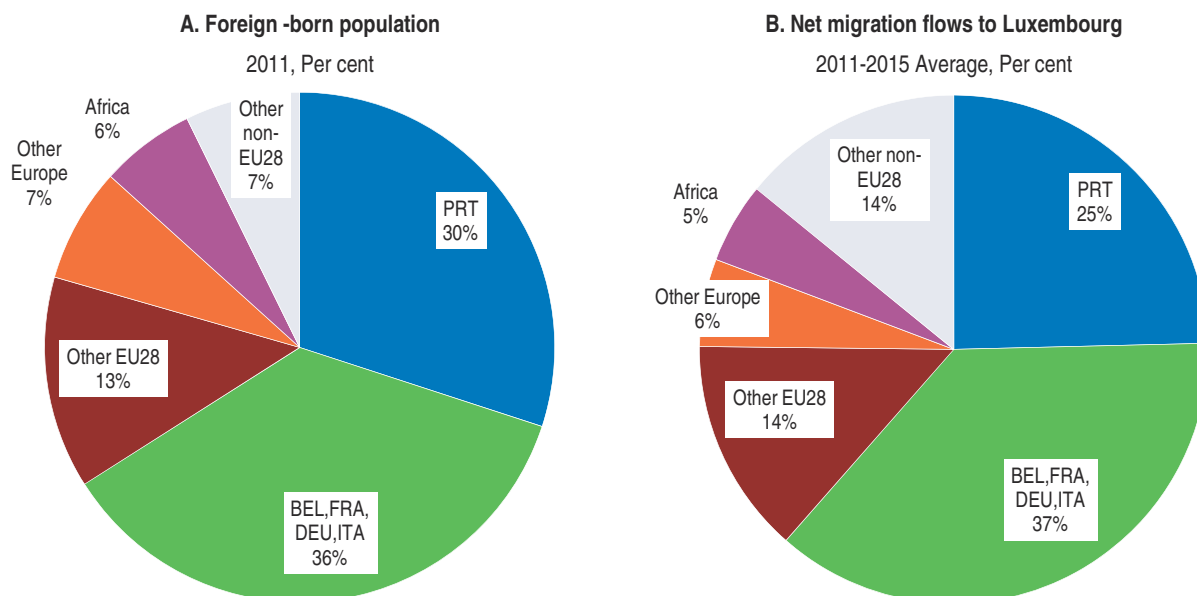
Note: The dashed line shows a linear interpolation between decennial census data points.

Source: STATEC.

StatLink  <http://dx.doi.org/10.1787/888933496276>

Immigrants are also an essential pillar of the Luxembourgish labour force. Their share in domestic jobs is second only to cross-border workers from neighbouring countries. Immigrants outnumber natives in employment, both because they are more numerous among the working age resident population and because of their higher overall employment rate (Figure 2.3, Panel A), which is *prima facie* evidence of successful labour market integration of the foreign-born in international comparison. High employment among immigrants is key to the strongly positive estimated fiscal impact of immigration. On the

Figure 2.2. Immigrants have mainly come from Europe



Note: Other non-EU28 consists of countries from continents other than Europe and Africa.

Source: STATEC.

StatLink <http://dx.doi.org/10.1787/888933496283>

Figure 2.3. Immigrants have a high overall employment rate

Employment status by country of origin and gender, age group 15-64, per cent, 2016¹



1. Numbers may not add up to 100 due to rounding. The rates are the number of persons aged 15 to 64 in each status to the total population of the same age group.

Source: Eurostat (2017), "Employment and Unemployment (Labour Force Survey)", Eurostat Database.

StatLink <http://dx.doi.org/10.1787/888933496294>

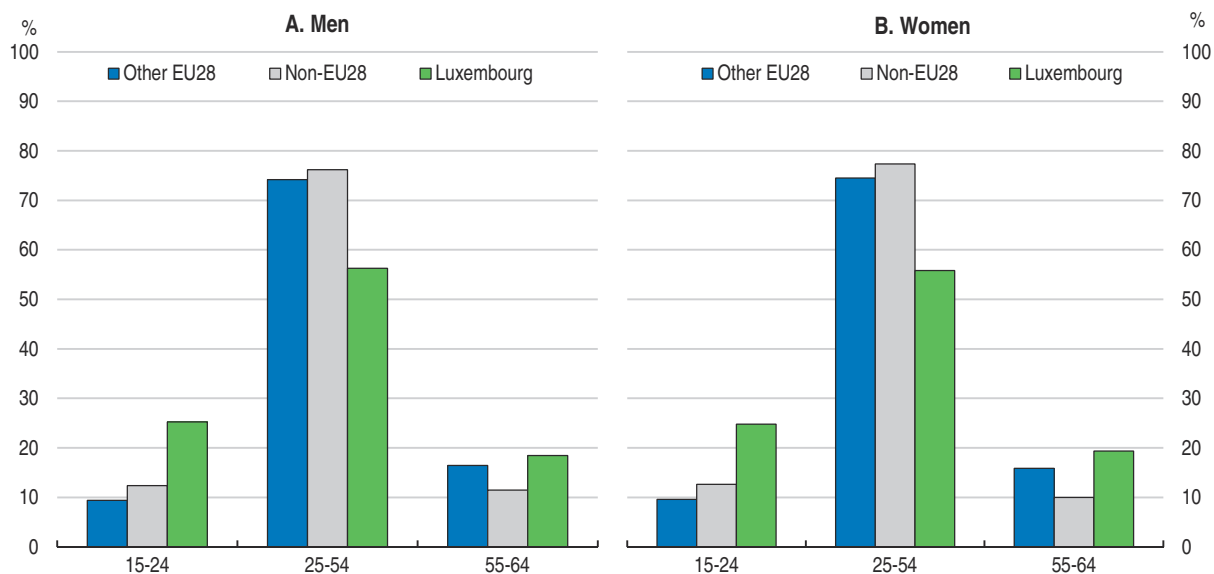
basis of a static accounting framework, which considers taxes and social contributions paid minus social transfers received and the use of public services, Luxembourg is one of the few countries where immigrant households display a better fiscal position than the native-born (OECD, 2013). The ensuing overall benefit to the budget provided by immigrants was estimated at about 2% of GDP, the highest across the OECD. In net present value terms, the

fiscal impact could worsen by taking account of acquired pension rights, but a dynamic, general equilibrium framework would also capture other channels for fiscal benefits, such as immigration-induced productivity gains (Jaumotte et al., 2016).

Demographic factors make an important contribution to the successful outcomes described above. Largely due to steady and upward-trending migration inflows (Figure 2.1), the immigrant population has a different age structure than natives, with fewer old people and, among the working-age group, a higher proportion of prime-age workers (Figure 2.4). Though for these workers the employment rates of immigrants do not generally exceed those of natives (Figure 2.5), their lower share among natives drives the overall employment rate advantage of the foreign-born. Adjusting for age structure and educational attainment, the employment rates of immigrants and natives become virtually identical (OECD/European Union, 2015).

Figure 2.4. **Immigrants have a higher proportion of prime-age workers**

Shares in the working age population (15-64), 1 January 2016



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

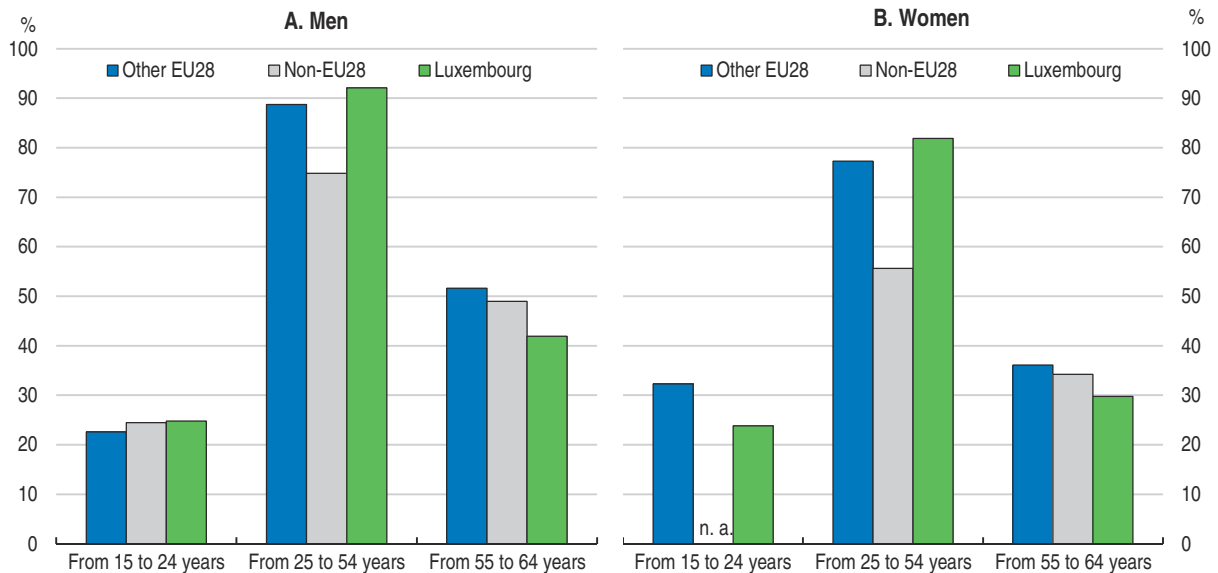
StatLink  <http://dx.doi.org/10.1787/888933496303>

Behind the positive aggregate outcomes for employment rates, however, there are important gaps between different groups of immigrants. Those born in the EU generally display high employment and low inactivity, though their exposure to unemployment is higher than natives' (Figure 2.3). In contrast, immigrants of non-EU origin have a far less successful labour market integration, with high unemployment, significant employment rate disadvantage for prime-age workers (Figure 2.5) and high female inactivity. Though a minority among immigrants, the weight of this group in total population, at about 10%, is large in the European context. Within non-EU immigrants, refugees are a particularly vulnerable subgroup.


Other dimensions of labour market performance also suggest less successful integration. Though open-ended contracts prevail, even among immigrants, there is deep sectoral segmentation according to countries of origin (Manço, 2014). For instance, natives are over-represented in the civil service, immigrants from Portugal and the Balkans have a

Figure 2.5. **Non-EU prime-age immigrants have an employment rate disadvantage**

Employment rates, 2016



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

StatLink  <http://dx.doi.org/10.1787/888933496313>

strong presence in construction, and residents born outside Europe often take jobs in restaurants and hotels. Much more than differences in human capital, sectoral and other differences in job characteristics (e.g. the fact that natives tend to work in larger firms and have longer job tenure) help explain sizeable private sector wage differentials in favour of native workers (Van Kerm et al., 2014). The pay disadvantage of immigrants is more marked in the middle of the wage distribution (rather than in the tails), where it can exceed 30%, and goes beyond what can be accounted for by job characteristics, suggesting that factors such as less bargaining power, discrimination or worse job matching capabilities may also play a role.

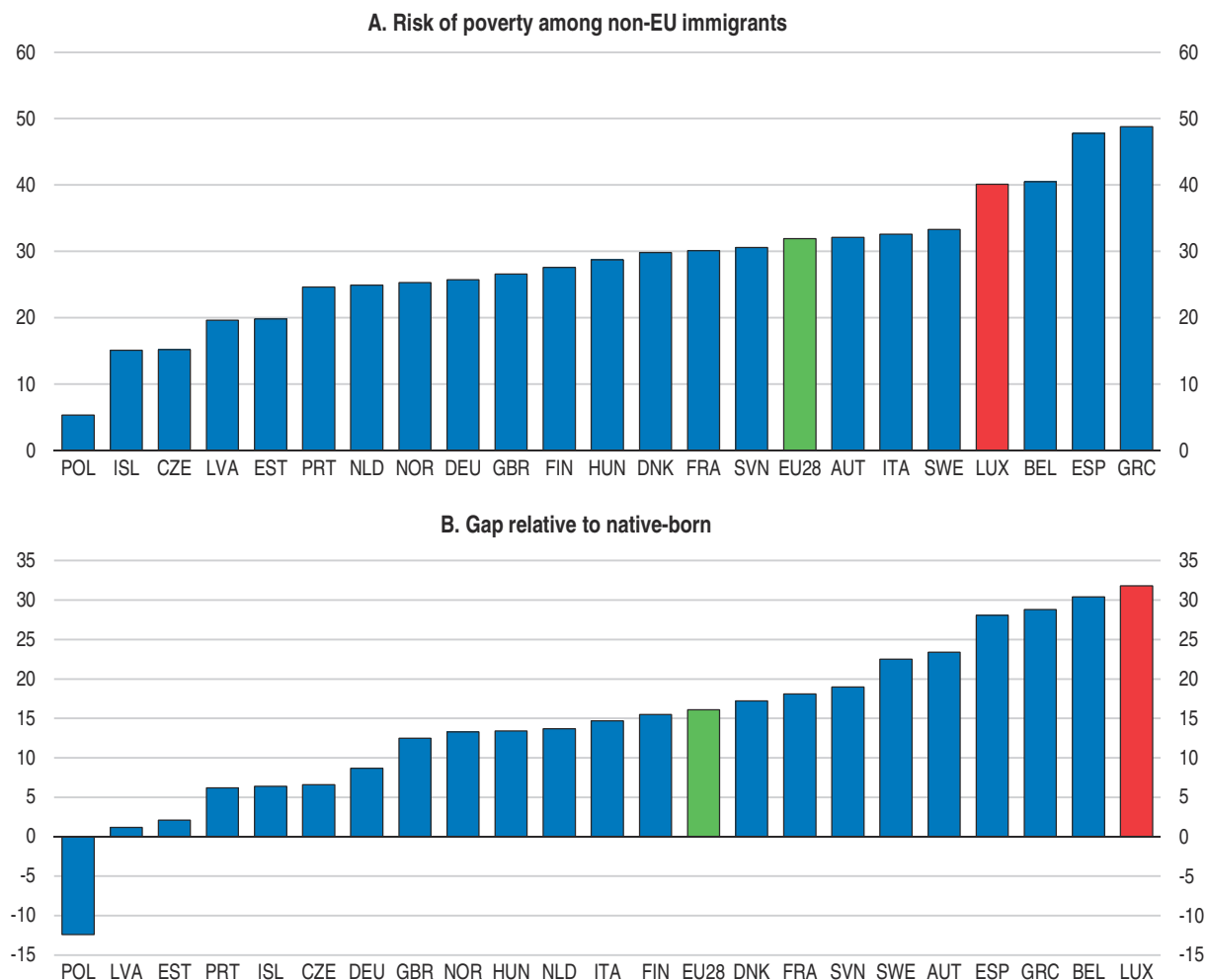
Non-EU immigrants tend to have lower incomes than average, which exacerbates inequalities (Figure 2.6). For several non-EU nationalities, median wages are only about half of those earned by Luxembourgish workers (Manço, 2014), leading to in-work poverty rates above 30%. Due to high average income levels and a well-developed social safety net, severe material deprivation is relatively rare. However, the very large income gap between natives and non-EU immigrants vividly illustrates integration shortcomings and threatens social cohesion.

The school system could play a role in perpetuating inequalities and segmentation, as educational attainment depends strongly on socio-economic background. Features such as early tracking, widespread grade repetition, trilingual education and inequitable resource allocation among schools, could explain why the children of immigrants, even when already born in Luxembourg, tend to underperform. Their poorer language knowledge and harder access to tertiary education are potent drivers of labour market segmentation, *inter alia* by creating hurdles to public sector employment. Given that about half of students have a migration background, their lower school attainment weighs heavily on educational indicators for the country as a whole.

This chapter proposes multiple strands of action to enhance the integration of immigrants, and thus their contribution to the economy and society. The foreign-born

Figure 2.6. **The risk of poverty is high among non-EU immigrants**

Age 18 to 64, 2015



Source: Eurostat (2015), "Living conditions and welfare: Income distribution and monetary poverty", Eurostat Database, October.

StatLink <http://dx.doi.org/10.1787/888933496324>

need opportunities to learn the languages of Luxembourg, develop social capital and validate qualifications acquired abroad. Increasing immigrants' political participation and representation in public employment will help tackle labour market and social segmentation. Efforts are also needed to attract talent to Luxembourg and speed up access to jobs for asylum seekers with good prospects of being allowed to stay. A key challenge is to make education more equitable. To a large extent, policies examined in this chapter will thus contribute, as regards immigrants, to the twin goals of improving the supply of skills and making better use of existing ones, addressed in Chapter 1 of this Survey.

Policies for better labour market and social integration

Integration policies are important stepping stones in helping immigrants adapt to the host country's society and labour market. Immigrants may initially have lower productivity than natives with similar levels of education, due to factors such as lack of host-country-specific human capital and weaker worker-to-job matching capabilities (Causa and

Jean, 2007). To address this disadvantage, immigrants need opportunities to learn the languages of the host country, a need made more pressing by Luxembourg's multilingual society, and develop social capital, where interactions at the local level and a diversity-friendly environment at the workplace are key. The foreign-born also need to have the education and skills acquired abroad validated, to preserve existing human capital and provide a basis for future learning.

Once the above preconditions are in place, reducing other barriers that prevent immigrants from taking up public sector jobs would reduce labour market segmentation, improve job matching and potentially foster social cohesion. Less segmentation and better matching would also stem from more active promotion and management of diversity by firms, while social cohesion would benefit from greater political participation and civic engagement among immigrants. In turn, migration and asylum policies can support competitiveness and inclusiveness by helping to attract talented workers to Luxembourg, better responding to skill shortages and avoiding that asylum seekers undergo long periods of inactivity.

Foundations for successful integration: social capital, languages and recognition of skills

The authorities and the private sector have launched new integration initiatives in recent years, but there is a need for stronger outreach towards immigrants and greater awareness by firms of the challenges and opportunities posed by a diverse workforce. To help employers on this count, 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 areas like recruiting, career management and training (Box 2.1). Take-up so far has been strongest among large firms. Efforts to further expand the universe of signatories should continue, and greater use of indicative numerical targets, scantily set so far, considered.

Box 2.1. Luxembourg's diversity charter

The Luxembourgish private sector employs very large numbers of immigrants and cross-border workers, but segmentation along ethnic or linguistic lines is widespread, both across sectors and inside firms, which tend to form relatively homogeneous work teams (Besch et al., 2005; Manço, 2014). The diversity charter aims to help employers go beyond legal anti-discrimination obligations and actively promote and manage workforce diversity. The ensuing benefits, already reaped by many charter signatories, include more creative and innovative work teams, increased respect between colleagues, an improved ability to service diverse customers, and better corporate image and reputation (Comité pour la Charte de la Diversité Lëtzebuerg and LISER, 2016).

Gender and work-life balance have been the dimensions of diversity most emphasised so far. A very high share of signatories (around 90%) have accordingly adopted steps like flexible work schedules or the possibility of working part-time. Between half and two thirds of signatories have also focussed on dimensions pertaining to age, handicap, race or nationality, likely to benefit from often implemented actions such as competence-based hiring and coaching for new staff. There is nonetheless scope for further progress in immigration-related diversity management, as only about 20% of participating organisations have reported an impact on immigrant employment.

Box 2.1. Luxembourg's diversity charter (cont.)

Increasing the number of signatories and the use of quantified objective-setting and impact assessment are also important avenues for the future. The current 170 signatories represent 15% of the labour force but less than 1% of employers, due to much higher take-up (about 30%) among large firms (Comité pour la Charte de la Diversité Lëtzebuerg and LISER, 2016). Stronger take-up is also needed among public sector organisations, whose participation in the charter has so far been much below that of large companies. Furthermore, to date, only about one third of signatories has assessed progress made in diversity policy, and a modest 11% has set quantified objectives.

A prominent public programme, started in 2011, is the nation-wide Welcome and Integration Contract (*Contrat d'Accueil et d'Intégration*, CAI). Participants, who can be newcomers or long-time residents, commit to attending, over a 2-year period, an orientation day to get acquainted with public services, a free civic instruction course on Luxembourgish history, culture and institutions, and 1 to 3 reduced-price courses of Luxembourg's languages (French, German and Luxembourgish). In turn, local governments can adopt a municipal integration plan (*Plan Communal Intégration*, PCI), launched in pilot phase in 2014, setting out actions in a broad range of areas, such as political participation, language tuition, education, health care or housing (SYVICOL and OLAI, 2016).

Though participants tend to have a positive view of the CAI programme, relatively few immigrants have signed up so far (only about 1000 per year), suggesting the need for better communication and more systematic follow-up of signatories after their admission interview (Baumann et al., 2015). At local level, about 20 municipalities, out of a total of 106, have already set up a PCI or are in the process of doing so. A more widespread commitment to integration among local governments would be desirable, as in some cases the engagement of local authorities has been weak (Besch et al., 2012). It is also important to explore the synergies between both initiatives – CAI and PCI – in areas such as language courses and access to public services.

Knowledge of several, and ideally all, of Luxembourg's three languages is essential for successful integration. Labour market language requirements have been steadily increasing over the past three decades, with about half of job announcements nowadays asking for at least 3 languages, most often French, German and Luxembourgish (Pigeron-Piroth and Fehlen, 2015). Knowledge of just one of Luxembourg's languages (often French, given the origins of many immigrant and cross-border workers) will effectively restrict job opportunities to low-skill sectors, such as construction, retail trade and hospitality. A working knowledge of Luxembourg's three languages also greatly helps social integration and political participation.

Public supply of language courses has been vigorously expanded over the past decade but is still insufficient to fully meet demand (*Ministère de l'Éducation Nationale, de l'Enfance et de la Jeunesse*, 2016a). Further, some offers of language courses do not provide a sufficiently high level of proficiency. This is notably the case of CAI courses, which aim at only the most basic level of knowledge (level A1.1 of the Common European Framework of Reference for Languages), corresponding to an estimated 60-100 hours of study (though CAI participants with prior knowledge can take more advanced courses). In contrast, higher levels of Luxembourgish language proficiency are required for naturalisation (A2 in oral expression

and B1 in listening comprehension), and neighbouring countries offer much longer language training in their integration programmes (e.g. up to 400 hours in France). The authorities should continue to increase the provision of language courses and, in the context of the CAI, substantially increase the target level of proficiency. Requirements for naturalisation are a plausible reference for that target. Besides increasing supply, the authorities should also consider diversifying it, with greater emphasis on training addressing labour market needs, a gap pointed out by CAI participants (Baumann et al., 2015). Despite the availability of public co-financing, private sector firms seldom organise language training (*Observatoire de la Formation*, 2016).

Timely recognition of qualifications acquired abroad is essential for the preservation and efficient use of human capital, by reducing transitional periods of inactivity, job mismatches and over-qualification. It is also key to establish the right starting point for further learning and skill development. The recognition of higher education degrees – a necessary but often not sufficient condition for access to professions – has been simplified, which is welcome. Two alternative procedures have traditionally been in place: registration and homologation. Registration, the most common procedure, is needed for access to a variety of professions; it usually takes 1 to 4 weeks and essentially requires that the diploma complies with the relevant regulations of the issuing country. In turn, homologation has been required for access to certain professions in the fields of education (professor of letters or sciences), law and medicine (in this case, non-EU diplomas only). It takes longer than registration (about 3 months) and is more demanding, implying *inter alia* prior recognition of secondary studies done abroad and detailed checking of subjects studied. Recent legislation has abolished the homologation procedure (except for the field of law), which may be helpful especially for applicants with non-EU diplomas, since the available evidence points to much higher rejection rates for their requests (for homologation in 2015, almost 50%, against less than 5% for EU diplomas).

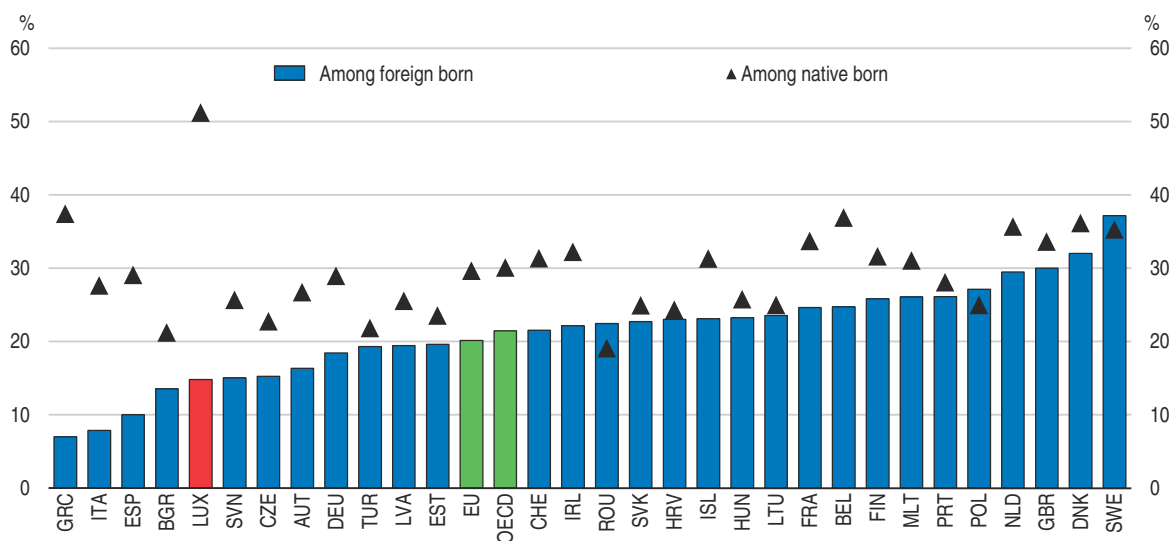
However, immigrants from outside the EU still often face considerable difficulties to obtain recognition of studies and qualifications. For instance, for secondary education diplomas delivered in most non-European countries (non-signatories of the Paris or Lisbon conventions), recognition requires *inter alia* attendance or completion of higher education. Recognition of professional qualifications falling outside the scope of Directive 2005/36/EC (essentially qualifications of EU citizens obtained in an EU country) is often impossible. The authorities should take steps to strike a balance between their legitimate concerns of preventing abuse and fraud, and the risk of not recognising legitimate qualifications. One avenue is to intensify contacts with educational authorities of non-EU countries to improve diploma readability and streamline recognition procedures. Another possibility to facilitate recognition is to make greater use of interviews with professionals of the relevant field (IMF, 2016), a method already applied in the cases of a few asylum seekers.

Fostering civic and public sector participation


A stronger presence in public employment and greater political participation are major levers to support the integration of immigrants. They increase the visibility of immigrants in everyday life and the ability of public services to address the needs of the foreign-born population. Those levers also contribute to social cohesion by avoiding that a large share of the population is not involved in the policy debate, decision and implementation (*Chambre de Commerce*, 2012; Manço et al., 2015). Public sector and political participation would benefit from easier access to citizenship, but also from a host of other reforms.

Like in other European countries, immigrants are under-represented in public sector jobs: in Luxembourg, less than one-sixth of the foreign born find employment in the public services sector, while among natives the corresponding share exceeds one-half (Figure 2.7). Non-EU nationals are in general excluded from public employment, except in very restrictive cases where positions cannot be filled by a Luxembourgish or EU candidate (such as teachers of some foreign languages). In turn, immigrants from the EU are excluded from posts involving the exercise of public authority or the safeguard of the general interest. These posts are reserved for Luxembourgish nationals and tend to be defined in a broad way (*Chambre de Commerce*, 2012): in the tax administration and the Treasury, for instance, they go well beyond management positions. Furthermore, knowledge of all three administrative languages (French, German and Luxembourgish) is in general required, and candidates who have not passed the final exam of their secondary education in Luxembourg need to sit language tests, although dispensation of the knowledge of one or more languages may be granted to highly specialised staff. These barriers reinforce labour market segmentation and make it more likely that well-qualified natives take up public sector jobs, to the detriment of the private sector and of entrepreneurship.

Figure 2.7. **Immigrants are strongly under-represented in public sector jobs**
Share of employment in the public services sector, aged 15 to 64, 2012-13



Source: OECD/European Union (2015).

StatLink  <http://dx.doi.org/10.1787/888933496331>

The authorities should ease immigrants' access to public sector jobs. One avenue to do so would be to narrow the scope of public sector jobs that require Luxembourgish citizenship, and to substantially expand positions open to non-EU citizens. Further, since naturalised immigrants are also underrepresented (OECD, 2010), more pro-active steps to increase diversity in the public sector workforce are advisable. One possibility would be to set indicative targets for immigrant employment or recruitment, as done by the Flemish government in neighbouring Belgium (OECD, 2015a). This requires *inter alia* to collect data on the ethnic origin of staff, with appropriate data privacy safeguards. Extending this data collection to job applicants would help to clarify whether underrepresentation is mostly due to a small number of immigrant candidates or to their low success in recruitment

processes. As for language knowledge, trilingual requirements should be relaxed for jobs without significant interaction with the public, and naturalised immigrants, already tested for Luxembourgish language when applying for citizenship (see below), should be able to waive further testing in this language when applying for public employment, with only carefully defined exceptions.

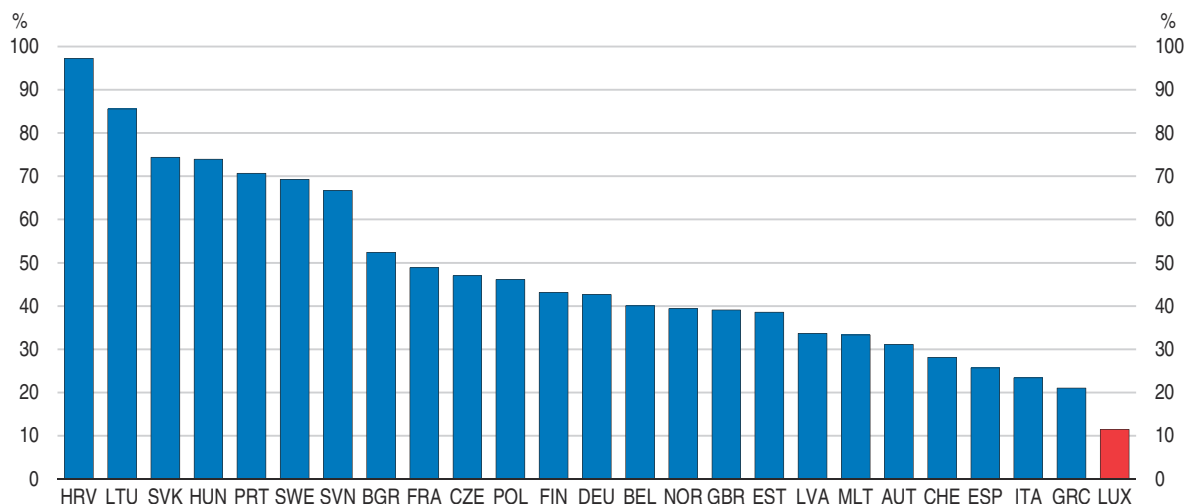
Political participation among immigrants is modest. A 2015 referendum rejected granting voting rights to foreign residents in legislative elections. Citizens from EU countries have been able to vote in European elections since 1994, with a gradual easing of participation conditions (e.g. length of residence). Registration rates have gradually increased but were still only 12% in 2014 (Manço et al., 2015). Subject to residence requirements, local elections have been open to EU and non-EU citizens since 1999 and 2005 respectively. In 2011, registration rates reached an overall 17%, and 18% among EU nationals, not out of line with rates in other EU countries without automatic registration of residents (European Commission, 2012). Restrictions to the right of standing as a candidate in local elections have been gradually lifted.

Given the importance of local policies and institutions for successful integration, there is a strong case for fostering political participation of foreigners at the municipal level. To this end, persistent outreach towards immigrant residents is often the most effective lever, especially if the supply of information and the political debate take account of linguistic diversity (Manço et al., 2015). In this respect, it is important to ensure translation or interpretation of municipal documents and debates into all three administrative languages (*Chambre de Commerce*, 2012), at least in large and medium-sized municipalities. At national level, the authorities have recently organised courses aiming to train 100 “multipliers” – people committed to persuading immigrants to register to vote in the forthcoming 2017 municipal elections. These steps need to be accompanied by stronger efforts at local level, notably by ensuring that municipal integration plans give prominence to the promotion of social and political participation. Nurturing a sense of belonging at local level and civic awareness also tend to increase political participation at the regional and national levels (Bevelander and Pendakur, 2009).

Naturalisation is an alternative route for improving access to public sector jobs (as well as, more broadly, labour market outcomes) and political participation (OECD, 2010; Bevelander and Pendakur, 2011). Luxembourg, however, stands out for its very low share of naturalised immigrants (Figure 2.8). Dual citizenship has been allowed since the 2008 citizenship law reform, which left Luxembourg with mildly liberal overall provisions for ordinary residence-based naturalisation (Figure 2.9, Panel A). Specific dimensions of these provisions, such as language requirements, have been nonetheless comparatively restrictive (Eudo Citizenship Observatory, 2016), as have conditions for special forms of naturalisation, such as family-based ones (Figure 2.9, Panel B). Annual naturalisation rates, previously very small, increased substantially with the 2008 reform, but remain modest in international comparison (OECD/European Union, 2015). This likely reflects both the aspects of restrictive regulation mentioned above and the predominance of immigrants from EU countries, for whom incentives for naturalisation tend to be smaller (OECD, 2010).

A new reform, which came into force in 2017, makes citizenship acquisition somewhat easier, which is welcome. Changes include lowering the required residence period from 7 to 5 years (without interruption in the last year before the application) and, as regards the mandatory oral Luxembourgish language test, allowing that a weaker score in expression

Figure 2.8. Very few immigrants take Luxembourgish citizenship
Share of nationals among the foreign-born population, aged 15 to 64, 2014



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

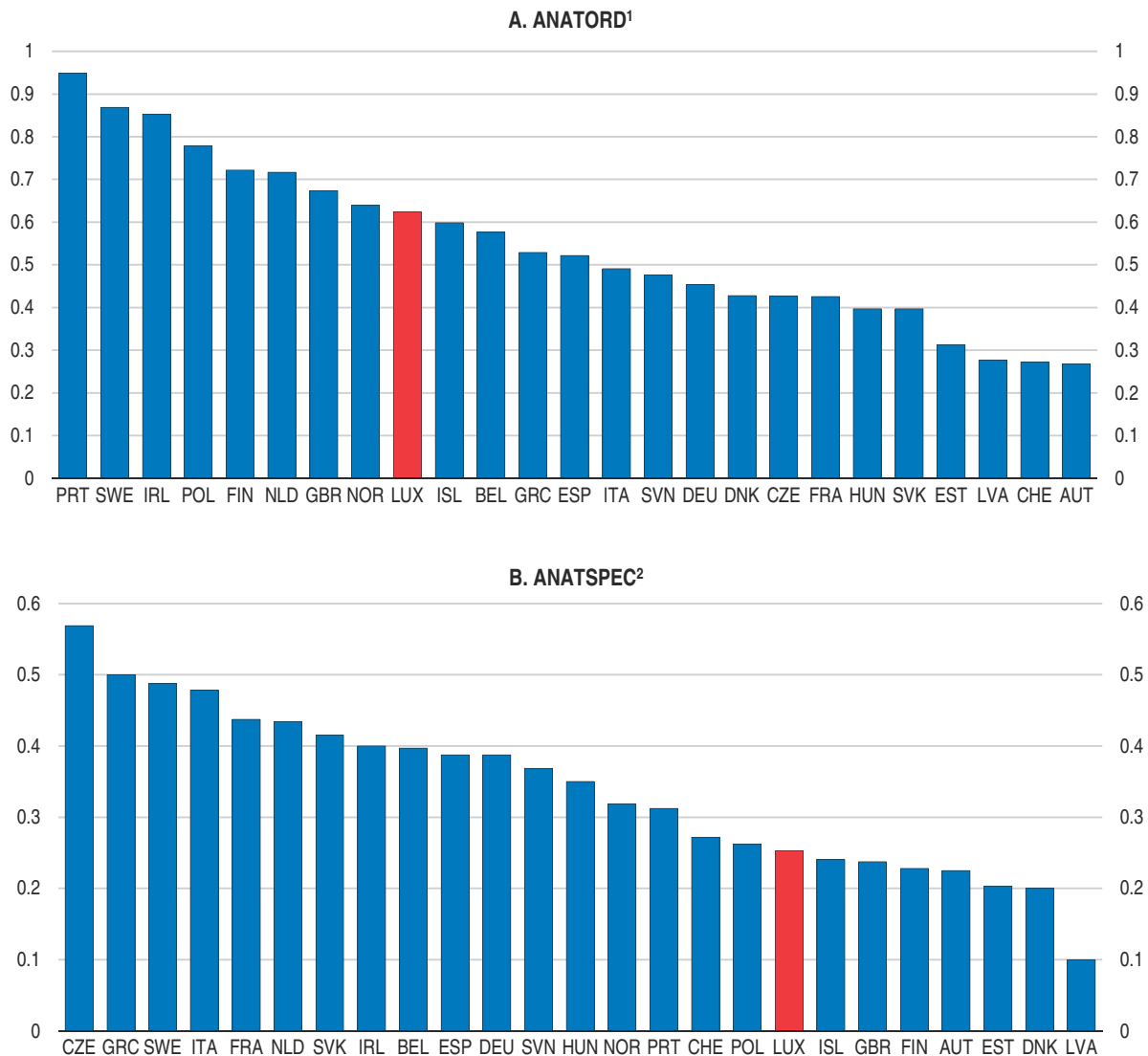
StatLink  <http://dx.doi.org/10.1787/888933496343>

be compensated with the score obtained in comprehension (the required overall standard does not change). Foreign children born in Luxembourg will automatically receive Luxembourgish citizenship on their 18th birthday (provided they meet certain condition of residence for themselves and, for those born after 1 July 2013, for one parent). Furthermore, the new law reintroduces the option system, a simplified procedure abolished in the 2008 reform, which inter alia will ease family-based naturalisation in some cases. For instance, a foreigner married to a Luxembourgish national will be able to waive residence requirements (though a certain prior duration of marriage may be needed).

Migration and asylum policies: attracting talent and removing barriers to employment

Migration policies should strengthen further the role of immigrants in addressing labour market needs. EU citizens have free access to the Luxembourgish labour market, but immigrants from third countries generally need to apply for a work and residence permit, which can be burdensome compared to other countries. The authorities are aware of the importance of immigrants in addressing skill shortages, and in 2015 relaxed admission conditions for the IT sector, where a shortage had been identified. However, more thorough reforms would be desirable. Alleviating restrictions to the movement of non-EU citizens would also ease trade in services, further improving the country's regulatory framework in this area (OECD, 2015b).


Obtaining a work and residence permit can be a lengthy process, which is detrimental to applicants and firms wishing to hire them, and should hence be sped up. In a two-step procedure, candidates must first apply for a temporary authorization to stay before entering the country and then, once in the country, request a residence permit (which includes the work permit) and perform a number of other formalities. For high-skilled workers (defined as meeting certain conditions, such as a salary offer in general equivalent to at least 1.5 times the average wage), step one can take up to three months, a very long time in international comparison (Figure 2.10). Processing time is even longer for other workers (4 months), who must in addition undergo a preliminary labour market test (to certify that the job offer

Figure 2.9. **Citizenship indicators, 2016**

1. ANATORD measures how easy access to ordinary, residence-based naturalisation is. It varies between 0 and 1, higher values indicating easier naturalisation. It is a weighted average of indicators for residence, renunciation, language skills, civic knowledge, criminal record and economic resources.

2. ANATSPEC measures how easy access to special naturalisation is. It varies between 0 and 1, higher values indicating easier naturalisation. It is a weighted average of family-based naturalisation and other special naturalisation indicators, such as for cultural affinity, refugees and special achievement.

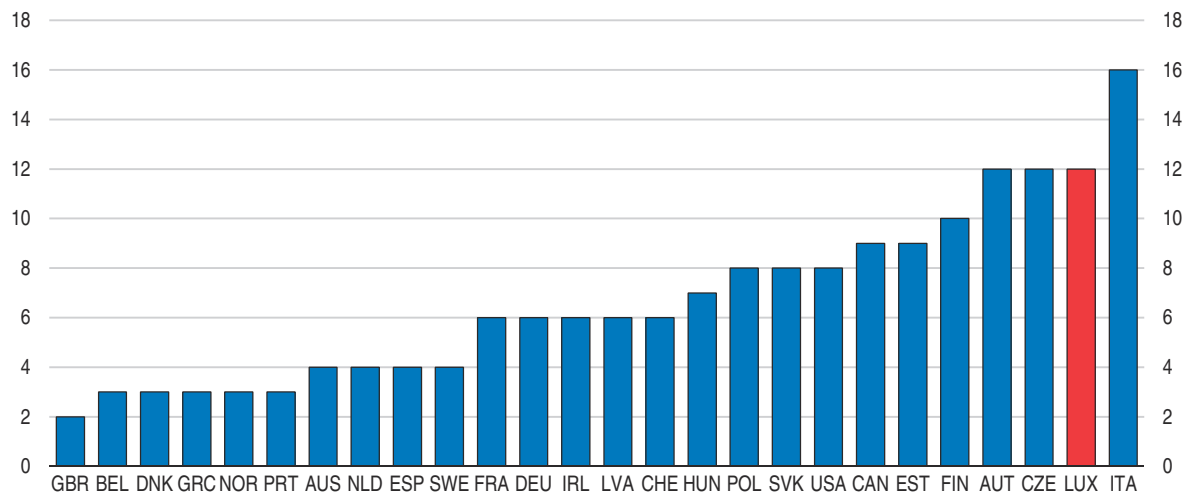
Source: Kristen Jeffers, Iseult Honohan and Rainer Bauböck (2016), How to Measure the Purposes of citizenship Laws: Explanatory Report for the CITLAW Indicators (Version 2.0), EUDO CITIZENSHIP Observatory, San Domenico di Fiesole: European University Institute.

StatLink  <http://dx.doi.org/10.1787/888933496356>

cannot be filled with a local candidate). The lengthy two-step procedure also applies to non-EU intra-corporate transferees coming from a branch located outside the EU to work in Luxembourg for more than 3 months. For transferees coming from a branch located in another EU country, the recent transposition of the relevant EU Directive (2014/66/EU) has simplified and sped up the procedure.

There is also a need to improve labour market access for asylum seekers, made more urgent by the recent surge in their numbers. Unlike other third-country nationals, asylum seekers enjoy unrestricted access to private sector jobs once granted international

Figure 2.10. **The processing time for immigration of highly-skilled workers is high**
Time in weeks



Source: Deloitte (2016), Global Immigration Study.

StatLink  <http://dx.doi.org/10.1787/888933496365>

protection. However, they often face a long initial period of forced inactivity, which tends to depreciate human capital and compound future difficulties in finding a job. In recent years, the average time for deciding on applications for international protection has been high in cross-country comparison (OECD, 2016a), reaching 10.5 months in 2015 and almost 17 months in 2016, though absconded applicants contribute heavily to these long delays. Evidence from other OECD countries shows that the sooner migrants have access to the labour market, the better are their integration prospects in the long run (OECD, 2016a and OECD, 2017). Notwithstanding the need to improve transitional arrangements (discussed below), faster decisions are key to give clarity to applicants and their prospective employers, and would complement the considerable efforts made by the authorities to provide asylum seekers with accommodation, language classes and schooling to children (IMF, 2016).

Transitional arrangements while waiting for a decision also need improvement. As from January 2016, asylum seekers are barred from working for 6 months after applying for protection, a welcome reduction from the previous waiting period of 9 months, but still a longer time span than in several OECD countries (OECD, 2015c). If after 6 months a decision has not yet been made, the applicant may request a specific work permit (*authorisation d'occupation temporaire, AOT*). However, this permit is highly restrictive (valid only for 6 months and for one single employer and profession), seldom requested and even more rarely granted (e.g. only 3 first issues and 4 renewals in 2015). Reasons include the reluctance of firms to hire someone who may not be able to stay in the country, the absence of job search support by the public employment service (support only starts once international protection is granted) and the need for a labour market test (often with a negative outcome).

The authorities should ease transitional labour market access for asylum seekers with a high probability of being allowed to stay (such as those from countries with high recognition rates). The initial waiting period for these asylum seekers should be further reduced. Additionally, in these cases, given the vulnerable position of applicants and the need to avoid that they take up informal jobs, obtaining a work permit could be made easier by waiving the requirement of a labour market test (a search for a suitable local candidate) and providing

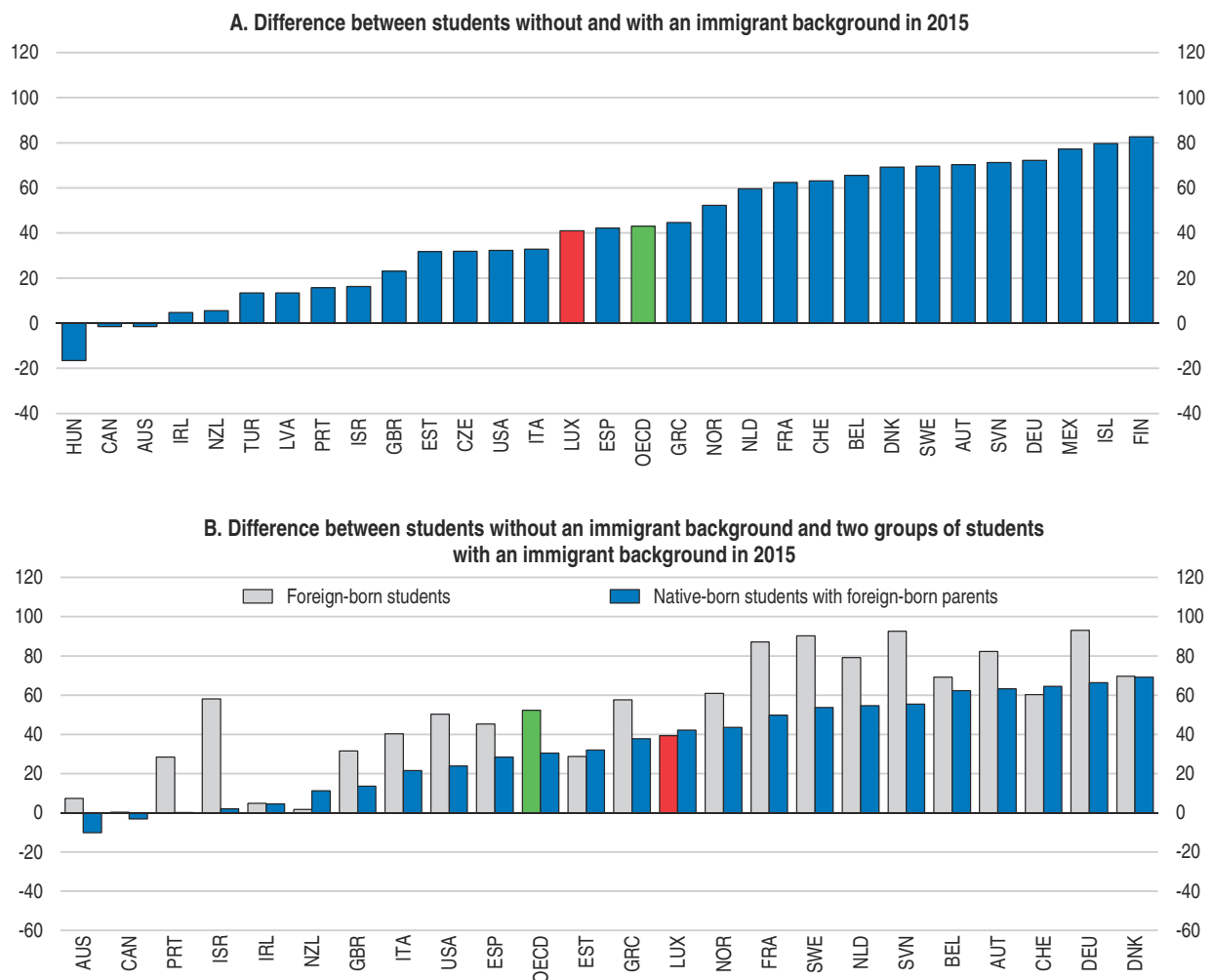
access to some active labour market measures, such as job search assistance and suitable training. For screening and profiling purposes, the public employment service should have access to the data on asylum seekers collected by the welcome and integration agency (*Office Luxembourgeois de l'Accueil et de l'Intégration, OLAI*).

Improving the educational outcomes of the children of immigrants

As often across the OECD, the children of immigrants tend to underperform their colleagues without a migration background by a wide margin (Figure 2.11, Panel A), despite significant progress in closing this gap since 2006. Performance gaps increase substantially (from 41 to 60 points) if attention is restricted to schools following the national curricula, thus excluding international schools, where children of immigrants often come from a more advantaged background. Furthermore, unlike in many other countries, there is no progress from foreign-born students to native-born students whose parents were both


Figure 2.11. **Children of immigrants underperform by a wide margin**

PISA Score-point difference in science relative to immigrant background¹



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.

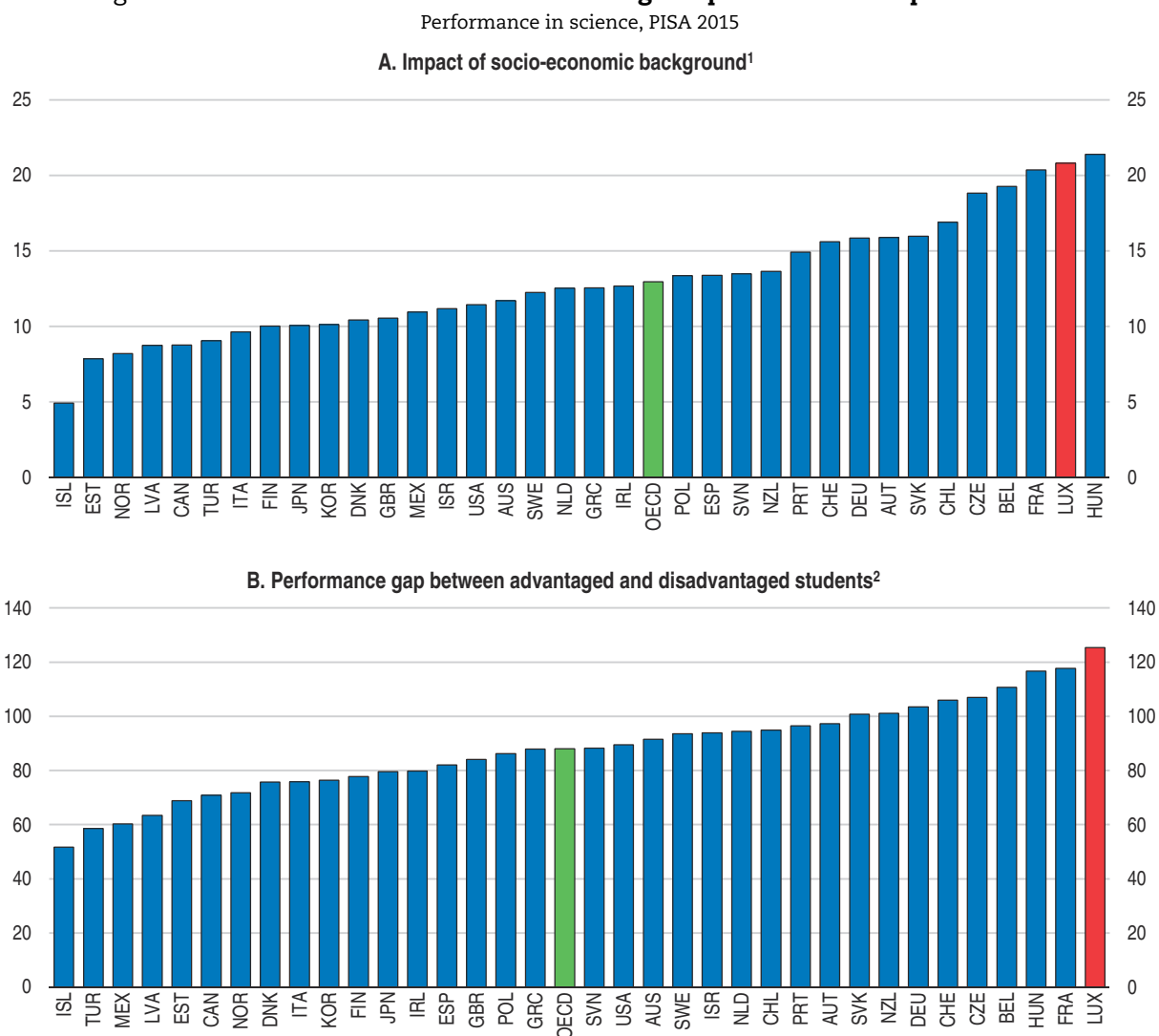
Source: OECD (2016), *PISA 2015 Results (Volume I): Excellence and Equity in Education*.

StatLink  <http://dx.doi.org/10.1787/888933496080>

born abroad (Figure 2.11, Panel B). Given the very large share of children of immigrants in Luxembourg (52% of PISA 2015 participants, against 12.5% on average across the OECD), improving their school achievement is key to upgrading the educational performance of the country as a whole.

The weaker performance of immigrant students is largely due to low equity in the educational system. Socio-economic family status exerts a large impact on student performance, which contributes to huge differences in results between advantaged and disadvantaged students (Figure 2.12). Speaking Luxembourgish at home comes a distant second in explaining better performance, also outweighing migration status *per se* (Ministère de l'Éducation Nationale, de l'Enfance et de la Jeunesse and University of Luxembourg, 2016). Resilient students – children of modest origins who perform at a high level – are relatively


Figure 2.12. **Socio-economic status has a large impact on student performance**



1. Percentage of variance in student performance in science explained by ESCS, which refers to the PISA index of economic, social and cultural status.

2. Difference in science performance between students in the top quarter and students in the bottom quarter of ESCS.

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

StatLink  <http://dx.doi.org/10.1787/888933496370>

few, both among natives and immigrants (OECD, 2016b). Controlling for socio-economic status, the PISA performance gap of the children of immigrants is reduced by two thirds (which compares with a reduction by about one quarter across the OECD). Given that the impact of family background on student performance has remained broadly unchanged over the past decade, the reduction in the performance gap of immigrant students vis-à-vis natives in that period is likely explained by the larger share of immigrant students with educated parents (OECD, 2016b).

Improving educational outcomes for disadvantaged children, among whom many have a migration background, requires two inter-related strands of policy action. First, there is a need for general equity-friendly reforms in the education system, such as increasing the attendance of high-quality early education and care and tackling early tracking and widespread grade repetition. Second, the authorities should also carry out more targeted actions to increase the amount and quality of resources allocated to disadvantaged schools, support students facing difficulties and upgrade educational tracks with large attendance by disadvantaged students, such as vocational studies.

The place to start: more and better early childhood education and care

High-quality early childhood education and care (ECEC) helps to lay the foundations for better educational outcomes at later ages (OECD, 2011). It also tends to make education more equitable by giving better chances of future success to children from disadvantaged backgrounds, as is often the case of the offspring of immigrants. In addition, better ECEC availability and affordability will help to increase the labour market participation of mothers. In Luxembourg, compulsory formal education starts at age 4, and is preceded by one optional year (*education précoce*). Attendance rates for this year (age 3), at 69% in 2014, are broadly in line with the OECD average (OECD, 2016c). Young children can also attend non-formal education in a variety of structures (e.g. kindergarten and day care in private homes); available places have strongly increased over the past decade and are mainly at centres operating on a commercial basis (*Ministère de l'Éducation Nationale, de l'Enfance et de la Jeunesse*, 2016a). Though systematic evidence is lacking, children of immigrants are generally perceived to be under-represented in ECEC, partly for cost reasons.

An ambitious reform was voted in 2016 to ease access to ECEC and improve its quality, with particular emphasis on language learning. A national quality framework, including staff training requirements and systematic monitoring, applies to all providers since September 2016. Further, from September 2017, all kindergarten wishing to be eligible for public co-financing (see below) will need to familiarise children aged 1-4 with both Luxembourgish and French, and every child in that age group will be entitled to 20 hours per week of free education and care in eligible providers. On top of these 20 hours, the public co-financing scheme (*cheque-service accueil*) has been revised to offer more free hours to low-income families, and it has also been extended to children of cross-border workers. The increase in free ECEC provision and the bilingual emphasis are welcome, as are the higher quality standards (OECD, 2015d), and the authorities should therefore proceed with implementation. Early exposure to several languages will likely improve later performance in the trilingual education system, where language requirements can be challenging to students from disadvantaged backgrounds (Carey and Ernst, 2006).

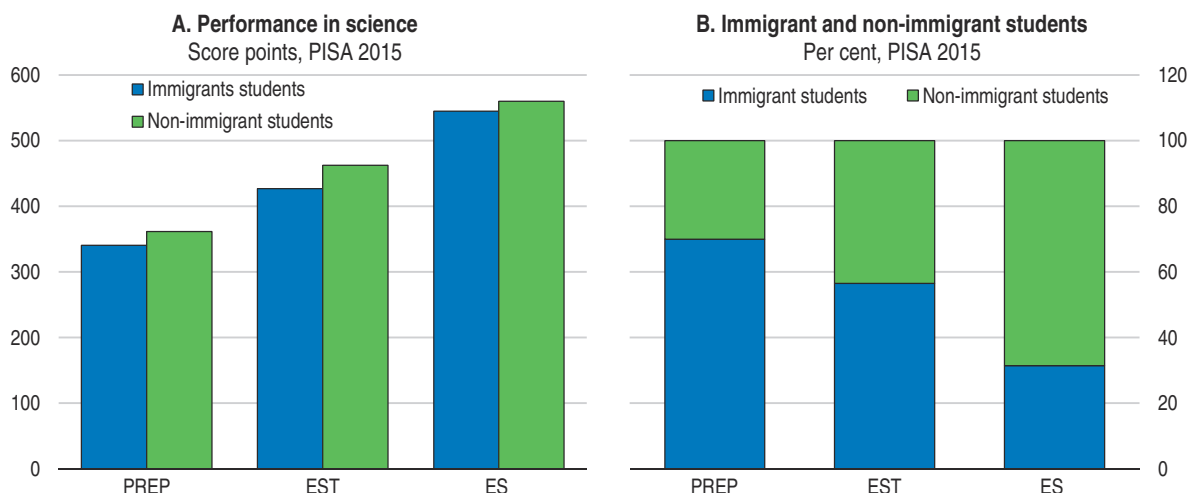
There is also a need for better data collection on ECEC attendance, including information on the migration background of children (or at least on their nationality), to identify patterns of lower participation among certain groups. These may call for increased efforts

at parental and community engagement. A useful measure already in place is free assistance to parents by intercultural mediators, who can provide translation services and, more generally, advice on school matters.

Tackling early tracking and grade repetition


Early tracking and high grade repetition have been long-standing but generally ineffective responses of the educational system to the large heterogeneity of the student population (Ministère de l'Éducation Nationale, de l'Enfance et de la Jeunesse and University of Luxembourg, 2016). At the end of primary school (age 12), children are assigned to different programmes of secondary education: academic (*enseignement secondaire*, ES), technical (*enseignement secondaire technique*, EST) and preparatory (*regime préparatoire*, PREP), the latter being a variant of the technical programme for the weakest students. A second moment of tracking takes place at the end of lower secondary education (age 15), when students of non-academic programmes are selected into different technical and vocational streams. The performance differences between programmes are very large (Figure 2.13, Panel A) and have persisted over time (Alieva et al., 2015).

Figure 2.13. **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.

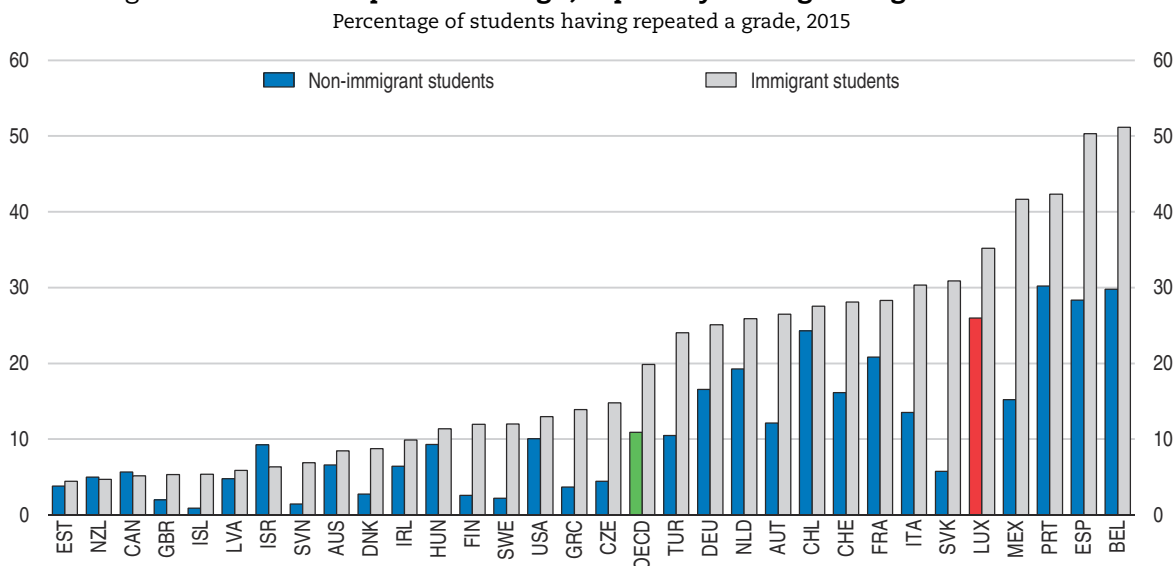
StatLink  <http://dx.doi.org/10.1787/888933496091>

Sorting students into tracks at an early age makes the education system more inequitable and tends to harm immigrant students the most (OECD, 2016b). In Luxembourg, both instances of tracking (ages 12 and 15) rely heavily on test results in maths and languages, and the children of immigrants often face handicaps in the latter. Unsurprisingly, immigrant students, especially those from Portuguese, former Yugoslavian and non-European origins, are over-represented in technical and preparatory programmes (Figure 2.13, Panel B and Alieva et al., 2015). In some years of these programmes, courses are taught at different levels, and assignment of a student to a less demanding level in a given subject (e.g. German) implies that same level in other subjects (e.g. maths), even if the student is not a weak performer in the latter. Further, some evidence for Luxembourg

suggests that, other things being equal, track assignment decisions by teachers tend to be less favourable for students with a migration background (Glock et al., 2013).

High grade repetition interacts with early tracking in widening inequities. Retention practices are internationally high, and affect the children of immigrants more than their native peers (Figure 2.14). Students in non-academic tracks are much more likely to have already repeated a grade (Ministère de l'Éducation Nationale, de l'Enfance et de la Jeunesse and University of Luxembourg, 2016), which is often due to language handicaps and, in turn, an input into tracking decisions. Grade repetition is financially costly and mostly ineffective in improving the performance of students concerned (OECD, 2012a), but, for cultural reasons, is still often regarded as an assurance of school quality and demanding standards.

Figure 2.14. **Grade repetition is high, especially among immigrant students**



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

StatLink  <http://dx.doi.org/10.1787/888933496384>

Recent and planned reforms go some way to improve tracking decisions, but will require careful implementation. The procedure of assignment to secondary education programmes used to take place in the final year of primary school, the decision being made in every case by a committee of teaching staff where parents did not sit (though they had the occasion to express their views). As from the 2016-17 school year, a new procedure is being implemented. It starts one year earlier, with more provision of information and a preliminary tracking perspective, and, in the final year, the student's parents and teacher jointly reach a decision. If they cannot agree, a committee where parents sit (in minority) will have a final say. These changes are welcome, and should be accompanied by enhanced support to less-educated parents, especially if language is a barrier. Furthermore, committee decisions should be carefully monitored to prevent possible biases regarding particular groups of students, for instance through systematic outvoting of their parents. In the longer run, the authorities should consider a more far-reaching reform, with tracking postponed to a later age.

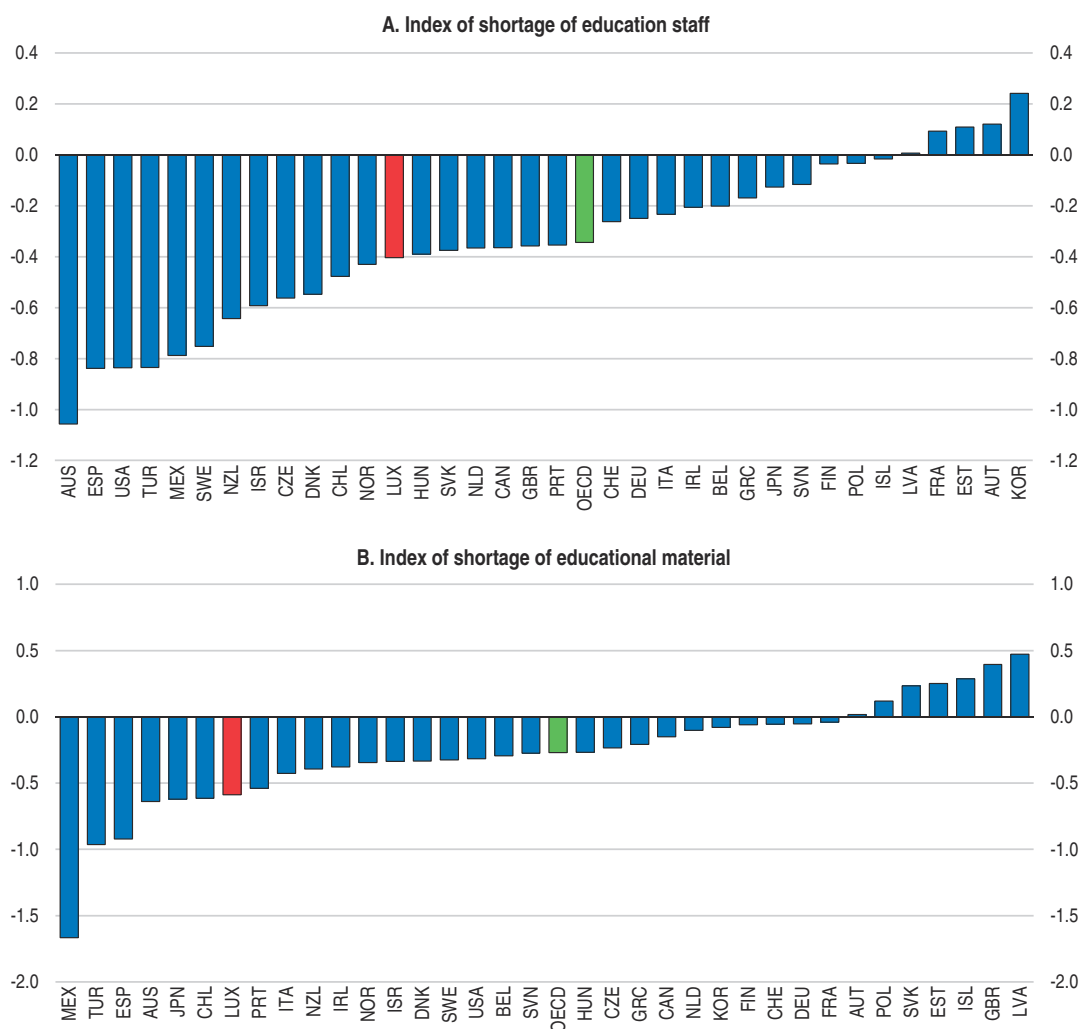
Reforms to tracking in technical lower secondary education are also being discussed. Proposals include enabling students to take different subjects at different levels (e.g. basic French and advanced maths) and providing earlier and more systematic information and advice about the tracking decision at the end of the cycle (Ministère de l'Éducation Nationale,

de l'Enfance et de la Jeunesse, 2016b), which leads to vocational education and training (discussed in Chapter 1). These positive steps should be implemented, together with support to parents, as discussed above. Further, reforms under consideration would make each secondary school formulate a specific approach to tracking as part of its development plan (see below). At both primary and secondary levels, these plans should also set out a strategy to reduce grade repetition.

Improving the performance of disadvantaged schools and students


Resources devoted to education are abundant, but equity in their allocation has room for improvement. Expenditure per student is the highest across the OECD, and so are teachers' wages (OECD, 2016c). However, reported shortages, in quantitative and qualitative terms, of education staff, physical infrastructure and equipment continue to tend to be stronger in disadvantaged schools (Figure 2.15), as was the case in the last decade (OECD, 2012b). This

Figure 2.15. **Disadvantaged schools face greater shortages of educational resources**
Difference between schools in top and bottom quarters of socio-economic profile, PISA 2015



Note: Higher values in the indices indicate a greater shortage of educational resources. The socio-economic profile is measured by the PISA index of economic, social and cultural status.

Source: OECD (2016), PISA 2015 Results (Volume II): Resources Invested In Education.

StatLink  <http://dx.doi.org/10.1787/888933496397>

suggests that mechanisms in place since 2004 to promote greater equity in resource allocation across secondary schools have been ineffective or, at best, insufficient. It is the case, notably, of the corrective factor (*facteur correcteur*) supposed to take account of the socio-economic background of students when allocating hours of tuition (and associated financial resources) to schools. The authorities should take advantage of the forthcoming reform of secondary education to make resource allocation more equitable. In a similar vein, they should assess the equity impact of the formula for allocating hours of tuition to primary schools, which is being gradually implemented over 2010-19.

Equity also depends on the quality of resources, a prime example being well-qualified and experienced teachers. Both initial and on-the-job teacher training have been recently reinforced. As from 2016, a 3-year traineeship (*stage d'insertion professionnelle*) has been introduced for all new teachers, both in primary education (where a similar traineeship did not exist) and in secondary education (by reorganising a previous 2-year programme). Furthermore, at both levels, on-the-job training requirements have recently been doubled to 48 hours every 3 years. Courses offered include training on how to address a multilingual and multicultural classroom. However, more difficult teaching conditions do not affect teachers' pay (OECD, 2016c), and the most senior professionals tend to work in advantaged schools. The authorities should introduce incentives, such as higher pay or faster career progression, to attract more qualified and experienced teachers to less-favoured school environments.

Beyond resources, the promotion of equity requires designing and implementing medium-term strategies for inclusive educational achievement at the level of each school. Since 2009, primary schools have had the obligation to adopt plans for school success (*plans de réussite scolaire*), recently renamed as plans for school development. A similar obligation is now being envisaged for secondary schools, some of which have already adopted related plans on a voluntary basis. The generalisation of these plans is welcome, as is the authorities' intention to increase school autonomy. At the same time, it is important to ensure that the effectiveness of plans is systematically assessed, and that the progress made by schools is measured and, to the extent possible, compared. An independent national observatory for school quality, which recent draft legislation proposes to set up, may play a useful role in this domain. The results and associated student and parents questionnaires of the yearly standardised tests (*ÉpStan*) held since 2008 at different points of primary and secondary education provide valuable information for the formulation and assessment of school development plans (Dierendonck et al., 2015).

Recommendations to improve the integration of immigrants

Enhancing labour market and social integration

Key recommendations

- Ease immigrants' access to public sector jobs.
- Continue to increase public supply of language courses. Diversify language training to take better account of workplace needs.
- 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.

Additional recommendations

- Increase awareness among firms of the benefits of a diverse workforce, and support efficient diversity management.

Recommendations to improve the integration of immigrants (cont.)

- Improve communication on the Welcome and Integration Contract, and increase the target level of proficiency of its language training.
- Promote social integration and political participation of immigrants by persistent outreach at the local level, taking account of linguistic diversity.
- Facilitate well-informed decisions on the recognition of academic and professional qualifications obtained in non-EU countries. For this purpose, foster contacts with authorities in those countries, and consider making greater use of applicant interviews with relevant professionals.
- Consider setting indicative targets for the share of immigrants in public sector employment or new hiring.
- To attract talent and better respond to skill shortages, reduce the time needed for non-EU citizens to obtain a work and residence permit.

Promoting better educational outcomes for the children of immigrants

Key recommendations

- As planned, increase the provision and affordability of early childhood education and care, and familiarise children aged 1-4 with both Luxembourgish and French. Ensure that all providers comply with quality standards.
- Make resource allocation across schools more equitable, and introduce incentives to attract more qualified and experienced teachers to disadvantaged schools.

Additional recommendations

- Support parents in their involvement in tracking at the end of primary education. When parents and teacher disagree, ensure that final tracking decisions are unbiased. In the longer run, consider postponing tracking to a later age.
- Emphasise equity-enhancing strategies in school development plans, such as support to weaker students to reduce grade repetition. Systematically assess the effectiveness of those plans.
- Improve tracking at the end of technical lower secondary education by providing earlier and better information and advice to students and parents and avoiding over-reliance on maths and languages tests.

Bibliography

- Alieva, A., J. Bertemes and A. Kafai (2015), PISA 2003-2012: persistence, changes and challenges. An overview of immigrant students and their performance. Luxembourg Institute of Socio-Economic Research (LISER), November.
- Baumann, M. et al. (2015), *Diagnostic des Besoins et des Demandes Spécifiques des Bénéficiaires de Pays Tiers du Contrat d'Accueil et d'Intégration*, University of Luxembourg, Integrative Research Unit on Social and Individual Development (INSIDE), May.
- Besch, S., N. Dubajic, A. Manço and M. Schmidt (2012), Les élections communales d'octobre 2011, RED No. 17, Luxembourg, CEFIS.
- Besch, S., L. Bodson, C. Hartmann-Hirsch, M. Legrand and N. Dubajic (2005), *Discrimination à l'emploi*, Rapport au Commissariat du Gouvernement aux Etrangers, version synthétique, Octobre.
- Bevelander, P. and R. Pendakur (2011), *Voting and Social Inclusion in Sweden*, *International Migration*, Vol. 49(4), pp. 67-92.
- Bevelander, P. and R. Pendakur (2009), "Social capital and voting participation of immigrants and minorities in Canada", *Ethnic and Racial Studies*, 32:8, 1406-1430, <http://dx.10.1080/01419870802298447>.

- Carey, D. and E. Ernst (2006), "Improving Education Achievement and Attainment in Luxembourg", OECD Economics Department Working Papers, No. 508, OECD Publishing, Paris, <http://dx.doi.org/10.1787/431707836184>.
- Causa, O. and S. Jean (2007), "Integration of Immigrants in OECD Countries: Do Policies Matter?", OECD Economics Department Working Papers, No. 564, OECD Publishing.
- Chambre de Commerce (2012), "Le rayonnement transfrontalier de l'économie luxembourgeoise : la diversité règne, l'intégration piétine", *Actualité & tendances*, Bulletin économique de la Chambre de Commerce, No. 12, March.
- Comité pour la Charte de la Diversité Lëtzebuerg and LISER (2016), *Baromètre Diversité & Entreprise Lëtzebuerg*, Édition 2016.
- Deloitte (2016), *Global Immigration Study*, June.
- Dierendonck, C., A. Kafai, A. Fischbach, R. Martin and S. Ugen (2015), LES ÉPREUVES STANDARDISÉES. Élément-clé du pilotage du système éducatif luxembourgeois, ÉDUCATION & FORMATIONS N° 86-87 MAI 2015.
- EUDO CITIZENSHIP Observatory (2016). CITLAW Indicators. Version 2.0, San Domenico di Fiesole: European University Institute.
- European Commission (2012), REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL on the application of Directive 94/80/EC on the right to vote and to stand as a candidate in municipal elections by citizens of the Union residing in a Member State of which they are not nationals, COM(2012) 99 final.
- Glock, S., S. Krolak-Schwerdt, F. Klapproth and M. Boehmer (2013), "Beyond judgment bias: How students' ethnicity and academic profile consistency influence teachers' tracking judgments", *Social Psychology of Education*, 16:555-573.
- IMF (2016), "Luxembourg. Selected Issues", IMF Country Report No. 16/119, International Monetary Fund.
- Jaumotte, F., K. Koloskova and S. Saxena (2016), "Impact of migration on income levels in advanced economies", *Spillover Notes*, 8, International Monetary Fund, Spillover Task Force (revised December 2016).
- Manço, A., L. Gillen, F. Mertz and S. Besch (2015), *La participation politique des étrangers au Luxembourg – Recherche Migralux 2014*, RED No. 19, Luxembourg, CEFIS.
- Manço, A. (2014), « Présence des travailleurs étrangers au Luxembourg et l'éthnostratification de l'emploi », *Sozialalmanach 2014*, Caritas Luxembourg.
- Ministère de l'Éducation Nationale, de l'Enfance et de la Jeunesse (2016a), *Rapport d'Activités 2015*.
- Ministère de l'Éducation Nationale, de l'Enfance et de la Jeunesse (2016b), *Modernisation du Lycée. ënnerschiddlech Schoule fir ënnerschiddlech Schüler*.
- Ministère de l'Éducation Nationale, de l'Enfance et de la Jeunesse and University of Luxembourg (2016), *PISA 2015 : Rapport National Luxembourg*.
- Observatoire de la Formation (2016), *L'effort de formation des entreprises du secteur privé en 2014*, FORMABREF – Pratiques de Formation, Institut National pour le Développement de la Formation Professionnelle Continue, July.
- OECD (2017), *Finding their way. Labour Market Integration of Refugees in Germany*.
- OECD (2016a), *Making Integration Work: Refugees and others in need of protection*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264251236-en>.
- OECD (2016b), *PISA 2015 Results (Volume I): Excellence and Equity in Education*, PISA, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264266490-en>.
- OECD (2016c), *Education at a Glance 2016: OECD Indicators*, OECD Publishing, Paris, <http://dx.doi.org/10.187/eag-2016-en>.
- OECD (2015a), *OECD Economic Surveys: Belgium 2015*, OECD Publishing, http://dx.doi.org/10.1787/eco_surveys-bel-2015-en.
- OECD (2015b), *OECD Services Trade Restrictiveness Index (STRI): Luxembourg*, December, available at www.oecd.org/tad/services-trade/country-notes-services-trade-restrictiveness-index.htm.
- OECD (2015c), "How will the refugee surge affect the European economy?", *Migration Policy Debates*, No. 8, November.

- OECD (2015d), *Starting Strong IV: Monitoring Quality in Early Childhood Education and Care*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264233515-en>.
- OECD (2013), "The fiscal impact of immigration in OECD countries", in *International Migration Outlook 2013*, OECD Publishing, Paris, http://dx.doi.org/10.1787/migr_outlook-2013-6-en.
- OECD (2012a), *Equity and Quality in Education: Supporting Disadvantaged Students and Schools*, OECD Publishing, <http://dx.doi.org/10.1787/9789264130852-en>.
- OECD (2012b), *OECD Economic Surveys: Luxembourg 2012*, OECD Publishing, Paris, http://dx.doi.org/10.1787/eco_surveys-lux-2012-en.
- OECD (2011), *Starting Strong III: A Quality Toolbox for Early Childhood Education and Care*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264123564-en>.
- OECD (2010), *International Migration Outlook: SOPEMI 2010*, http://dx.doi.org/10.1787/migr_outlook-2010-en.
- OECD/European Union (2015), *Indicators of Immigrant Integration 2015: Settling In*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264234024-en>.
- Pigeron-Piroth, I. and F. Fehlen (2015), *Les langues dans les offres d'emploi au Luxembourg (1984-2014)*, Working Paper, Université du Luxembourg, June.
- Syvicol and OLAI (2016), *Plan Communal Intégration. Guide Pratique*. Syndicat des Villes et Communes Luxembourgeoises et Office luxembourgeois de l'accueil et de l'intégration.
- Van Kerm, P., S. Yu and C. Choe (2014), *Wage differentials between native, immigrant and cross-border workers: Evidence and model comparisons*, CEPS/INSTEAD, Working Paper No. 2014-05, Luxembourg.

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

The OECD is a unique forum where governments work together to address the economic, social and environmental challenges of globalisation. The OECD is also at the forefront of efforts to understand and to help governments respond to new developments and concerns, such as corporate governance, the information economy and the challenges of an ageing population. The Organisation provides a setting where governments can compare policy experiences, seek answers to common problems, identify good practice and work to co-ordinate domestic and international policies.

The OECD member countries are: Australia, Austria, Belgium, Canada, Chile, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The European Union takes part in the work of the OECD.

OECD Publishing disseminates widely the results of the Organisation's statistics gathering and research on economic, social and environmental issues, as well as the conventions, guidelines and standards agreed by its members.

OECD Economic Surveys

LUXEMBOURG

OECD Economic Surveys are periodic reviews of member and non-member economies. Reviews of member and some non-member economies are on a two-year cycle; other selected non-member economies are also reviewed from time to time. Each Economic Survey provides a comprehensive analysis of economic developments, with chapters covering key economic challenges and policy recommendations addressing these challenges.

Luxembourg's economic performance is robust thanks to its dynamic services sector, 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 to reduce reliance on the financial industry the government should further develop its long-term strategy focusing on new digital technologies and renewable energy.

Supplying the skills needed in these new sectors will require further improvements in the education system, with a focus on lifelong learning. Better alignment of skills with labour market needs would entail reorienting labour market policies from supporting job creating towards funding training programmes to facilitate the reallocation of labour. Luxembourg benefits from immigrants who play a successful role in the economy. Integration challenges remain, though, especially regarding people from non-EU countries, who suffer from high unemployment. As language proficiency is a key precondition for successful integration, public supply of language courses should be stepped up further. Education reforms seek to make schools more equitable, also for the children of immigrants, and equality between men and women is being promoted by easing access to childcare and making taxation more gender neutral.

SPECIAL FEATURES: BOOSTING SKILLS; IMPROVING THE INTEGRATION OF IMMIGRANTS

Consult this publication on line at http://dx.doi.org/10.1787/eco_surveys-lux-2017-en.

This work is published on the OECD iLibrary, which gathers all OECD books, periodicals and statistical databases. Visit www.oecd-ilibrary.org for more information.

Volume 2017/11
June 2017

OECD *publishing*
www.oecd.org/publishing



ISSN 0376-6438
2017 SUBSCRIPTION
(18 ISSUES)

ISBN 978-92-64-27695-6
10 2017 11 1 P



9 789264 276956