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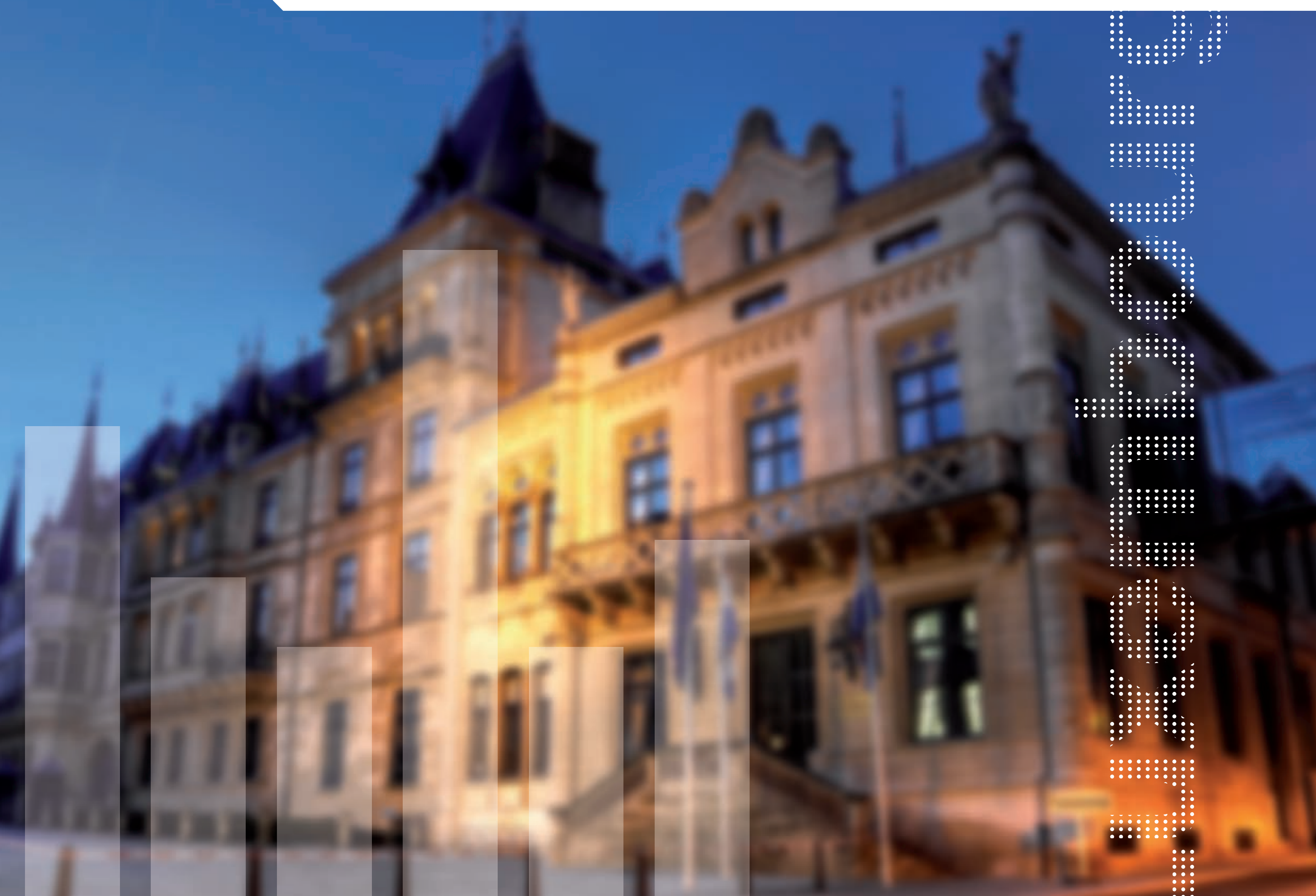

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OECD Economic Surveys: Luxembourg 2012

BETTER POLICIES FOR BETTER LIVES

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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 7 November 2012. 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 19 November 2012.

The Secretariat's draft report was prepared for the Committee by Jean-Marc Fournier, Nicola Brandt, and Sebastian Barnes with a contribution from Clara Garcia under the supervision of Piritta Sorsa. Research assistance was provided by Valery Dugain.

The previous Survey of Luxembourg *was issued in May 2010.*

BASIC STATISTICS OF LUXEMBOURG, 2011

(The numbers in parentheses refer to the OECD average)

LAND, PEOPLE AND ELECTORAL CYCLE

Population (1 000 000):	0.5		Population density per km²	197.8	(34.3)
Under 15 (%)	16.6	(18.4)	Life expectancy (years, 2010):	80.7	(79.7)
Over 65 (%)	13.9	(14.9)	Males	77.9	(76.9)
Foreign-born (%)	45.5		Females	83.5	(82.5)
Latest 5-year average growth (%)	1.8	(0.5)	Last general election:	June	2009

ECONOMY

GDP, current prices (billion USD)	59.3		Value added shares (%, 2011):		
GDP, current prices (billion, local currency)	42.6		Primary	0.3	(2.6)
Latest 5-year average real growth (%)	1.2	(0.8)	Industry incl. construction	13.4	(27.8)
GDP per capita, PPP (thousand USD)	90.4	(35.4)	Services	86.8	(69.5)

GENERAL GOVERNMENT

Expenditure (% of GDP)	42.0	(44.0)	Gross financial debt (% of GDP)	25.8	(98.9)
Revenue (% of GDP)	41.6	(36.1)	Net financial debt (% of GDP)	-44.9	(60.0)

EXTERNAL ACCOUNTS

Exchange rate (EUR per USD)	0.719		Main exports (% of total merchandise exports):		
PPP exchange rate (USA = 1)	0.920		Manufactured goods	44.5	
Exports of goods and services (% of GDP)	176.5	(52.7)	Machinery and transport equipment	23.2	
Imports of goods and services (% of GDP)	145.7	(49.7)	Chemicals and related products, n.e.s.	7.0	
Current account balance (% of GDP)	7.1	(-0.7)	Main imports (% of total merchandise imports):		
Net international investment position (% of GDP, 2010)	103.1		Manufactured goods	16.4	
			Machinery and transport equipment	28.0	
			Crude materials, inedible, except fuels	9.6	

LABOUR MARKET, SKILLS AND INNOVATION

Employment rate (%) for 15-64 year olds:	64.6	(64.9)	Unemployment rate (%):	4.9	(7.9)
Males	72.1	(73.0)	Youth (%)	16.9	(16.2)
Females	56.9	(56.8)	Long-term unemployed (%)	1.4	(2.6)
Average worked hours per year	1601.0	(1776.0)	Tertiary educational attainment 25-64 year-olds (%, 2010)	35.5	(30.7)
Gross domestic expenditure on R&D (% of GDP, 2010)	1.6	(2.4)			

ENVIRONMENT

Total primary energy supply per capita (toe):	8.1	(4.3)	CO_2 emissions from fuel combustion per capita (tonnes, 2009)	20.2	(9.8)
Renewables (%)	3.0	(8.2)	Water abstractions per capita (dam^3, 2010)	0.1	
Fine particulate matter concentration (urban, PM10, ug/m^3, 2008)	12.6	(22.0)	Municipal waste per capita (tonnes, 2010)	0.7	(0.5)

SOCIETY

Income inequality (Gini coefficient, late 2000s)	0.288	(0.314)	Education outcomes (PISA score, 2009):		
Relative poverty rate	15.6	(17.7)	Reading	472	(493)
Public and private spending (% of GDP):			Mathematics	489	(496)
Health care (2009)	7.8	(8.8)	Science	484	(501)
Pensions (2007)	6.6	(8.6)	Share of women in parliament (%, July 2012)	25.0	(24.4)
Education (excluding tertiary education, 2008)	2.9	(3.7)	Net official development assistance (% of GNI)	1.0	(0.4)

Better Life Index: *www.oecdbetterlifeindex.org/*

Note: An unweighted average of latest available data is used for the OECD average, calculated when data for at least 29 countries are available.

Source: OECD.STAT (*http://stats.oecd.org*); *OECD Economic Outlook Database*.

Executive summary

Luxembourg enjoys the highest per capita income in the OECD and has emerged from the economic and financial crisis in relatively good shape. The important financial centre rode out the global financial crisis, banks are well capitalised, public finances are robust compared to most other OECD countries, and unemployment is relatively low. In particular, employment in the financial sector has continued to grow, benefitting from inflows to asset management, which has sustained domestic demand. However, the weak recovery and downside risks to global and European growth imply an uncertain short-term outlook.

Luxembourg will nevertheless face a number of challenges to its economic growth and social model in the years ahead. Despite high social spending, inequality and relative poverty have risen over recent decades. Population ageing poses challenges for the sustainability of public finances especially as regards the pension system. And urban sprawl calls for greener growth. Sustainability of the Luxembourg economic and social model can be strengthened by improving policies that enhance public finances, growth, social cohesion and the environment.

Strengthening the public finances. *The budget deficit is expected to widen in 2012, as growth of spending continues to outpace revenue growth. Consolidation measures should be put in place, focussing on controlling current spending within a stronger medium-term framework. Future pension costs are the main fiscal challenge. Current reform proposals are a significant step forward, although further action is needed to reduce benefits to a sustainable and fair level and to reduce incentives for early retirement.*

Sustaining growth in the longer term. *While many growth factors are external, policy reforms can improve underlying economic performance, competitiveness and help the economy to adapt to change. Product market regulations remain restrictive weakening competition, although welcome reforms were made to the oversight of competition policy. On-going reforms of the employment service are welcome.*

Strengthening social cohesion. *The social system plays a powerful role in narrowing inequalities in disposable income, but inequality and relative poverty have increased. The insufficient work incentives created by the minimum guaranteed income should be addressed by expanding in-work benefits, continued reinforcement of activation policies and enhanced training. The sustainability of current social system would be improved by better targeting benefits, while ensuring that their design does not create new incentive problems. Social housing supports should be reformed to make them more effective at helping those in need, while lowering their cost. Inefficient and regressive tax expenditures should be scaled back.*

Improving educational outcomes for the most vulnerable. *Social cohesion is also influenced by the education system, which performs poorly according to PISA tests, despite high levels of spending. Poor performance reflects in part wide socio-economic disparities among students. Spending should be refocused on areas of greatest need, and more effective policies put in place to deal with language issues.*

Achieving sustainable and greener growth. *Rapid employment and population growth have led to urban sprawl and large-scale commuting dominated by the car. Continuing to invest in public transport, while gradually increasing comparatively low fuel prices, would help reduce transport-related* CO_2 *emissions and pollution. Effective planning policies and reform of housing taxation would help reduce urban sprawl, while promoting walking, bicycling and public transport. Water supply and sanitation infrastructures need to be upgraded by means of additional investment.*

Box 1. **Key Recommendations**

Providing a sound framework for sustainable long term growth

- Implement the fiscal consolidation plan in the Stability Programme. Update, set out and monitor a detailed and credible medium-term consolidation plan. Ensure that expenditure rises no faster than nominal GNP growth, focusing on controlling current spending.
- Implement proposed reforms to the pension system and make further progress towards long-run sustainability, including by linking the effective retirement age to longevity, reducing incentives for early retirement, moderating increases in pensions, and limiting credits for years of inactivity.
- Encourage competition by removing unnecessary administrative burdens, including for professional services, notaries, pharmacies, the retail trade and taxis.

Reinforcing social cohesion

- Improve targeting of education resources to schools with disadvantaged students. Increase resources available for language support and remedial classes.
- Push the planned reform of secondary education, aiming at reducing grade repetition, delaying institutional tracking from the age of 12 until 16, strengthening the autonomy and local management capacity of schools, and improving the monitoring of education quality.
- Consider greater targeting of social transfers to increase their effectiveness in reducing relative poverty, while limiting their overall cost, and tapering benefits to minimise the impact on work incentives. These measures should aim particularly to help single parent families.
- Improve the design of the minimum income guarantee (RMG) to avoid situations in which additional work does not provide additional income, while enhancing activation policies and training.

Making green growth happen

- Continue substantial investment in public transport to offer an alternative to the automobile. To reduce Luxembourg's carbon emissions, increase taxes on petrol and diesel by gradually eliminating the price differential with neighbouring countries. Consider introducing a system of congestion charges. Further enhance co-operation with adjacent regions to increase the capacity of the public transport system.
- Speed up procedures for granting construction permits. Raise property taxes by updating property values used as a tax base. Widen the application of the surtax on vacant houses and land applied in some municipalities to other areas. Move forward with plans to impose deadlines for starting and finalising development on land that is zoned as a construction area.

Assessment and recommendations

Over the decades, Luxembourg has evolved from an agricultural to a steel-based industrial economy, and subsequently to a successful financial services centre. Today, Luxembourg has the highest per capita income in the OECD, after decades of robust growth, of more than two percentage points above the euro area average over the past 30 years. This growth has been led by the large and successful financial sector. Collective investment funds registered in Luxembourg hold assets of more than EUR 2 trillion, about one-third of investment funds' assets in the euro area. Private banking is also an important source of activity. The financial sector has also been a significant purchaser of services activities such as legal services and real estate. This booming economy has attracted many European Union migrants and cross-border workers: the labour force has increased by 1.8% annually, one percentage point more than in the euro area on average. The budget has benefited from strong tax revenues, so that the government has been able to offer a high level of public services, including social spending, while keeping the level of public debt low by any standard.

Luxembourg weathered the global financial and economic crisis well. Despite some decline in measured activity, the financial system has continued to attract capital: the market share of the investment fund industry has increased by roughly 2 percentage points during the crisis. Its employment has risen, sustaining domestic demand. Luxembourgers not only benefit from a wealthy economy, but also from stable and well trusted institutions built on a culture of consensual decision making.

Nevertheless, Luxembourg's economic growth and social model is facing many interrelated challenges. Since the financial crisis, the traditional tri-partite decision making process involving unions, employers and government has stalled. Strong growth of financial services has meant that labour income is distributed increasingly unequally. High inequality in market incomes has been partly offset by a well developed, but costly, social transfer system. The 2009 crisis led to a reduction in output and underlined the strong dependence both on the large, and potentially volatile financial sector, which accounts for one-third of GDP, and on economic conditions within the euro area, which now faces low growth prospects. In a lower growth environment, it may be harder to sustain the current social model. Diversification notably toward high value added emerging activities remains a major challenge for the sustainability and further development of such a small economy. Furthermore, public finances are under pressure in the near term from the rising costs of the transfer system, and over time from the pension system, which in the absence of major reform would create serious fiscal pressures.

Despite high social spending, inequality and relative poverty have risen over recent decades. On a range of other measures of well-being, such as life expectancy and job and life satisfaction, Luxembourg ranks above the OECD average, but lower than other countries with high income levels. Long-term joblessness continues to rise, especially of less skilled workers, reflecting strong competition from cross-border workers and due to weak work incentives in the social system. Strong inequality in educational outcomes perpetuates some of these difficulties.

There are important environmental challenges too: Luxembourg has the highest per capita CO_2 emissions in the OECD, although some of this reflects people from neighbouring countries and traffic in transit taking advantage of comparatively low fuel prices to fill up. Its rapid economic growth and development into a regional economic centre have led to significant urban sprawl and large-scale commuting mainly by car. There is significant scope to improve policy settings to create more inclusive, sustainable and greener growth.

The economy has slowed and faces a number of risks

Growth slowed in the second half of 2011 as the euro area sovereign debt crisis led to a decline in financial services activities and a fall in exports of industrial goods. By contrast, domestic demand remained firm with consumption continuing to expand and investment fluctuating around a steady level since early 2009. This divergent picture partly reflects the robustness of employment. At the same time, households, the domestic non-financial corporate sector and the government have stronger balance sheet positions than many other OECD countries, implying little deleveraging and more room for consumption. In the industrial sector, short-working time schemes helped to preserve jobs.

While activity in financial services remains below the pre-crisis peak, much of this is the result of a change in the value of these activities measured in the national accounts (see Box 1.2 of 2008 *Economic Survey of Luxembourg,* OECD 2008): the number of jobs in this sector increased by roughly 4% between 2007 and 2010. Luxembourg is benefitting from the growth of the investment fund industry and of its reputation as a safe haven.

Exiting from the downturn during the second half of 2012 will be challenging as conditions in the European economy weaken, with the euro area sovereign debt crisis remaining a major downside risk to economic and financial sector activity in the near future (OECD, 2012a). Despite the broadly solid underlying overall economic performance during the crisis and Luxembourg's dependence on external developments, three sources of domestic weakness might affect the growth outlook in the near term.

Firstly, the unemployment rate of Luxembourg residents has continued to rise moderately, despite the overall increase in employment, to reach 6.1% in September, up from 5.7% a year earlier. This continues a trend rise over the past decade. This deterioration in the labour market is due to the interaction of the secular decline of some economic activities, poorly designed and ineffective labour market institutions that blunt work incentives, and the availability of cross-border workers willing to take jobs at lower wages than domestic residents. The share of long-term unemployed has risen: those out of work for more than a year now account for 40% of the unemployed and 25% of the unemployed have been so for more than two years. This is reflected in the rising share of unemployed not covered by unemployment insurance, which therefore earn the minimum guaranteed income (*revenue minimum garanti*, RMG). All in all, there is a strong risk that these workers fall into an inactivity trap given the weak work incentives in the RMG scheme and ultimately leave the labour market.

Table 1. **Key macroeconomic developments**

	2008	2009	2010	2011	2012	2013	2014
	Current prices EUR billion	Percentage changes, volume (2005 prices)					
GDP at market prices	37.4	-4.1	2.9	1.7	0.6	1.2	2.0
Private consumption	12.3	-1.7	2.1	2.4	2.1	0.5	1.4
Government consumption	5.8	4.5	3.1	1.5	3.0	0.2	0.8
Gross fixed capital formation	8.0	-15.5	6.8	10.2	4.8	1.6	3.7
Final domestic demand	26.1	-4.5	3.7	4.3	3.1	0.7	1.9
Stockbuilding[1]	0.0	-2.6	4.0	1.4	-0.6	-0.4	0.0
Total domestic demand	26.1	-9.5	9.5	6.2	2.4	0.3	1.8
Exports of goods and services	67.6	-10.5	6.8	6.0	-4.1	0.9	2.3
Imports of goods and services	56.4	-14.1	12.1	8.6	-4.0	0.8	2.3
Net exports[1]	11.2	2.3	-4.8	-1.7	-1.4	0.4	0.7
Memorandum items							
GDP deflator	_	0.5	7.6	5.1	4.1	1.5	0.6
Harmonised index of consumer prices	_	0.0	2.8	3.7	2.8	2.0	1.9
Private consumption deflator	_	0.9	1.7	2.6	2.2	1.6	1.4
Unemployment rate	_	5.4	5.8	5.6	6.1	6.6	6.7
General government financial balance[2]	_	-0.8	-0.8	-0.3	-2.0	-1.7	-0.9
General government gross debt[2]	_	19.0	25.8	25.8	29.8	32.6	34.4
General government debt, Maastricht definition[2]	_	15.3	19.2	18.3	22.3	25.1	26.9
Current account balance[2]	_	6.5	7.7	7.1	5.8	7.8	9.3

Note: National accounts are based on official chain-linked data. This introduces a discrepancy in the identity between real demand components and GDP. For further details see OECD Economic Outlook Sources and Methods (*http://www.oecd.org/eco/sources-and-methods*).

1. Contributions to changes in real GDP (percentage of real GDP in previous year), actual amount in the first column.
2. As a percentage of GDP.

Source: OECD Economic Outlook 92 Database.

Secondly, inflationary pressures have strengthened, raising competitiveness concerns. Headline inflation has been running at above 2% for the past two years, peaking at 4.0% (Harmonised Consumer Price Index year on year change), and somewhat above the euro area average. To the extent that this reflects stronger demand conditions than in other countries, such inflation would be relatively benign. However, it reflects more a rise in unit labour costs, which can affect competitiveness, especially of non-financial activities. The system of automatic, legislated wage indexation may have contributed to this outcome, as indexation has been triggered four times between March 2009 and October 2012, increasing wages by almost 8% over this period. A temporary moderation of this mechanism has been put in place from 2012 to 2014, limiting up-rating to no more than 2.5% per year, so that the inflation peaks are not passed through to wages. The wage indexation system and minimum wage should be reviewed to ensure that they do not present risks to competitiveness, notably by removing downward rigidities.

Thirdly, house prices rose much faster than incomes up to 2007, alongside a build up in household debt. These trends have moderated since the start of the crisis, with income growth remaining solid and house prices rising only modestly, despite very low interest rates. However, some measures suggest a degree of over-valuation in current house prices (BCL, 2012). A correction in house prices would lead to downward pressures on demand and losses for the domestically oriented banks. The impact of any negative domestic developments would be much more severe in the context of a weak external environment or a marked change in the prospects for Luxembourg's key industries. These developments should be monitored closely, while over time housing supply could be increased by tightening tax treatment of land, as the extremely low property taxes tend to foster land hoarding as discussed in the 2010 *Economic Survey of Luxembourg* (OECD, 2010a), and tackling barriers to housing supply.

As discussed extensively in the 2010 *Economic Survey of Luxembourg* (OECD, 2010a), long-term growth prospects remain uncertain. Luxembourg is heavily reliant on a small number of activities, especially its financial sector, which is itself largely dependent on international developments and competition from other financial centres. Prospects for the European Union as a whole, the main export market, are for growth materially below the average rate over the past two decades and even such projections could be too optimistic given the trend deceleration in labour productivity (see the 2012 *Economic Survey of the Euro Area*, OECD, 2012c). This will constrain growth in Luxembourg, although as a small and highly specialised economy it is possible for it to grow at a very different pace from its export markets if there is relative shift towards sectors where it has a comparative advantage. Relatively high labour and product market regulations limit growth potential in many domestic sectors, especially service activities.

The financial sector is weathering the crisis

The Luxembourg financial system has continued to weather the international and European financial crisis. Bank balance sheets have contracted by around 15% since the start of the crisis and the value of assets under management has slightly decreased in real terms (Table 2). However, overall financial stability has been maintained. Luxembourg banks may be benefitting from a flight to quality during the euro area crisis, which could reverse if conditions improve. The domestic banking system continues to be well capitalised by international standards, including the large state-owned *Banque et Caisse d'Épargne de l'État*. The restructuring of Dexia in 2011 led to separating the *Banque Internationale à Luxembourg* from other parts of Dexia. Luxembourg has committed to guarantee selected obligations of up to EUR 2.55 billion (8.5% of GNP) in co-operation with Belgium and France, of which 1.7 billion has been approved by the European Commission. This illustrates the size of the risk from the financial activities operating in Luxembourg. Nevertheless, the supply of credit to the domestic economy does not appear to have been significantly constrained by the crisis.

Effective financial supervision is critical, both for financial stability and to protect the reputation of the financial centre. On-going changes in the European and international supervisory environment should contribute to making the banking and financial system, as well as those it interacts with, more resilient. In particular, as a highly connected financial centre, the creation of the European Supervisory Authorities (ESAs) has placed the domestic regulators in a much better position to assess the position of parent companies of local entities and the overall group position.

Luxembourg has scaled up on-site inspections since 2010 and increased the resources of the Commission for Financial Sector Surveillance (CSSF) and the Banque Centrale du Luxembourg (BCL). To deal with risks from large intra-group exposures, the regulator has put in place a system of capital add-ons based on the strength of the parent group. While co-operation between the central bank and the financial regulator appears to function at a practical level, there is no Memorandum of Understanding setting out the role and responsibilities of each institution as recommended in the 2010 *Economic Survey of Luxembourg* (OECD, 2010a). In particular, establishing a single entry point would alleviate the burden for banks that currently have to deal with two different administrations.

Table 2. **Key financial developments**

Balance sheets for financial institutions

Euro billions	2007	2008	2009	2010	2011	2012[1]
Banks						
Assets	915	932	797	769	797	790
Loans	651	677	563	555	600	603
of which: interbank loans	456	471	374	364	406	419
Securities other than shares	216	199	194	173	149	141
of which: Claims on banks	99	92	91	78	71	66
Other assets	48	56	41	41	48	45
Liabilities	915	932	797	769	797	790
Debts	749	766	637	614	642	635
of which: owed to banks	444	479	371	348	369	352
of which: deposits	297	277	261	256	265	274
Other liabilities	166	166	160	155	155	154
Investment funds						
Assets	2 059	1 560	1 841	2 199	2 097	2 224
of which: money market funds	254	340	321	285	303	251
Net flows	188	-77	84	162	5	43
Memorandum items						
GDP	37	39	37	40	43	43
GNI	30	30	25	29	30	30
Central bank assets	59	101	77	80	127	140
of which: TARGET2	18	42	53	68	110	125

1. End of June.

Source: Banque centrale du Luxembourg and Commission de Surveillance du Secteur Financier.

The 29 June 2012 agreement by the euro area leaders to establish an integrated system of EU banking supervisors would help to achieve more coherent oversight of cross-border banks. Any parallel moves to establish an integrated EU framework for bank resolution and to provide cross-border deposit protection or financial safety nets would profoundly alter and most likely reduce the fiscal and financial risks faced by Luxembourg. In particular, the balance sheets of Luxembourg's main financial institutions are very large compared to GDP, making it difficult to handle potential financial shocks, which would be mitigated within an EU/euro area support mechanism.

Changes in international regulation will shape the development of the financial sector

Developments in the global financial system and the regulatory architecture create both opportunities and risks for the Luxembourg financial sector model. Significant reforms of financial regulation and oversight are on-going, including putting in place the new Capital Requirements Directive (CRD-IV) for the European Union. Luxembourg banks are already required to meet a standard of 9% of core tier-1 capital and no change is proposed to the regime allowing large intra-group exposures, which are a key part of the financial centre's banking model of channelling funds back to non-resident parent banks (OECD, 2012a). Changes to liquidity regulations could affect this model: initial evaluations suggest that most banks would need to make changes to comply with the new standards, although the scale of these adjustments appears manageable and details of the requirements have yet to be finalised.

On the asset management side, growth in the number of funds and fund units has resumed since a pause around 2009, albeit at a slower pace than prior to the crisis. The fund industry concentrates in a few major centres within Europe, and Luxembourg benefits from this momentum. This reflects first-mover advantages, specialised skills in Luxembourg and an attractive regulatory and legal environment. This may also reflect a structural move from bank intermediation to the funds industry. The future EU Directive on Alternative Investment Fund Managers could deepen the EU market for these funds and hence provide further opportunities for financial centres that are attractive locations for these activities.

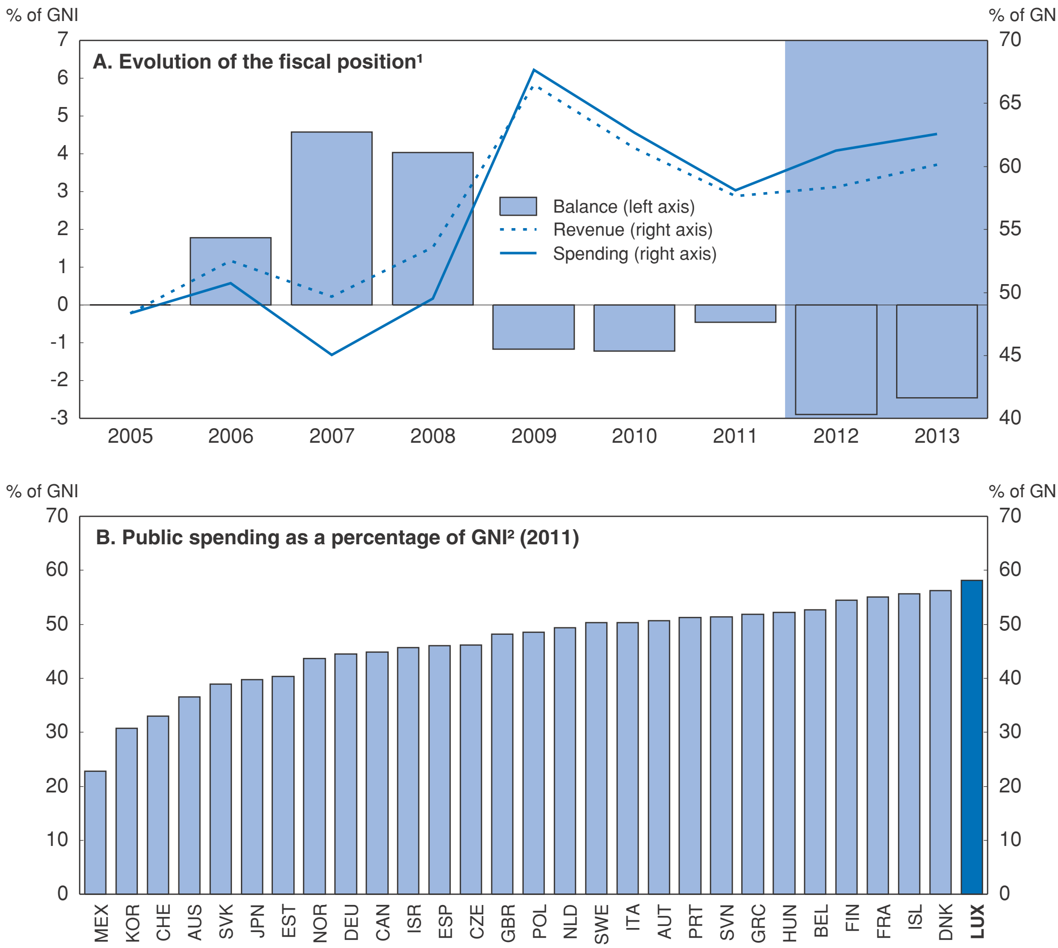
As a financial centre, it is important for Luxembourg to be part of efforts to make the international financial system work better, both to contribute to global governance and to maintain its position in the financial system. It has been very quick and active in negotiating a large number of bilateral information exchange mechanisms for tax purposes since its commitment to the international standard in March 2009. Furthermore, a new law was adopted in 2010 to override domestic bank secrecy and give effect to new treaties specifically providing for exchange of bank information.

Some gaps in the framework nevertheless remain, notably inadequate ownership information for bearer shares (OECD, 2011a). The impact of the EU withholding tax under the Savings Directive of 35% needs to be carefully evaluated compared with moving to automatic exchange of information. This evaluation is all the more needed as the current environment is changing fast, in particular through the implementation of the US FATCA legislation which will require some form of automatic exchange of information. So far, recent changes in the regime for information exchange for tax purposes do not appear to have had a large negative effect on overall financial-sector activity. However, a strategic approach to the upcoming changes in the global environment seems necessary.

Government expenditure is not on a sustainable path

The budget deficit, while relatively low by international standards, is high by historical standards and is expected to have widened in 2012 as current spending continues to outpace the growth of revenues. Following large surpluses at the height of the global financial cycle, the budget has registered small deficits since 2009 as the result of a weakening in revenues brought about by the crisis and some fiscal stimulus measures. Budgetary consolidation measures for 2011, amounting *ex ante* to an estimated 1.5% of GDP, contributed to narrowing the deficit to 0.6% of GDP (0.8% of GNP). However, the underlying problem is the excessive increase in current spending (Figure 1), which has outpaced the expansion of the economy and tax revenues. Much of the rise in spending is related to expenditure items growing autonomously due to indexation or other non-discretionary adjustments (such as social welfare benefits or public sector wages). No consolidation measures were included in the 2012 budget and a deterioration in the budget balance is therefore anticipated as current spending continues to rise and as revenues remain soft, in part because of the reduction in the value of financial services activity and carry-forward provisions for corporate taxes. The ending of the current EU VAT regime on online-commerce services in 2015 is likely to lead to a predictable steep fall in tax receipts estimated at more than 1.2% of GDP in the 2012 Stability Programme Update (Gouvernement du Luxembourg, 2012).

Figure 1. **The fiscal deficit reflects a high level of public spending**



1. The large increase of revenues and spending in 2009 partly reflects a large drop of the Gross National Income. The shaded area represents the forecast period.
2. Data for Australia, Canada, Japan and Mexico refer to 2010.

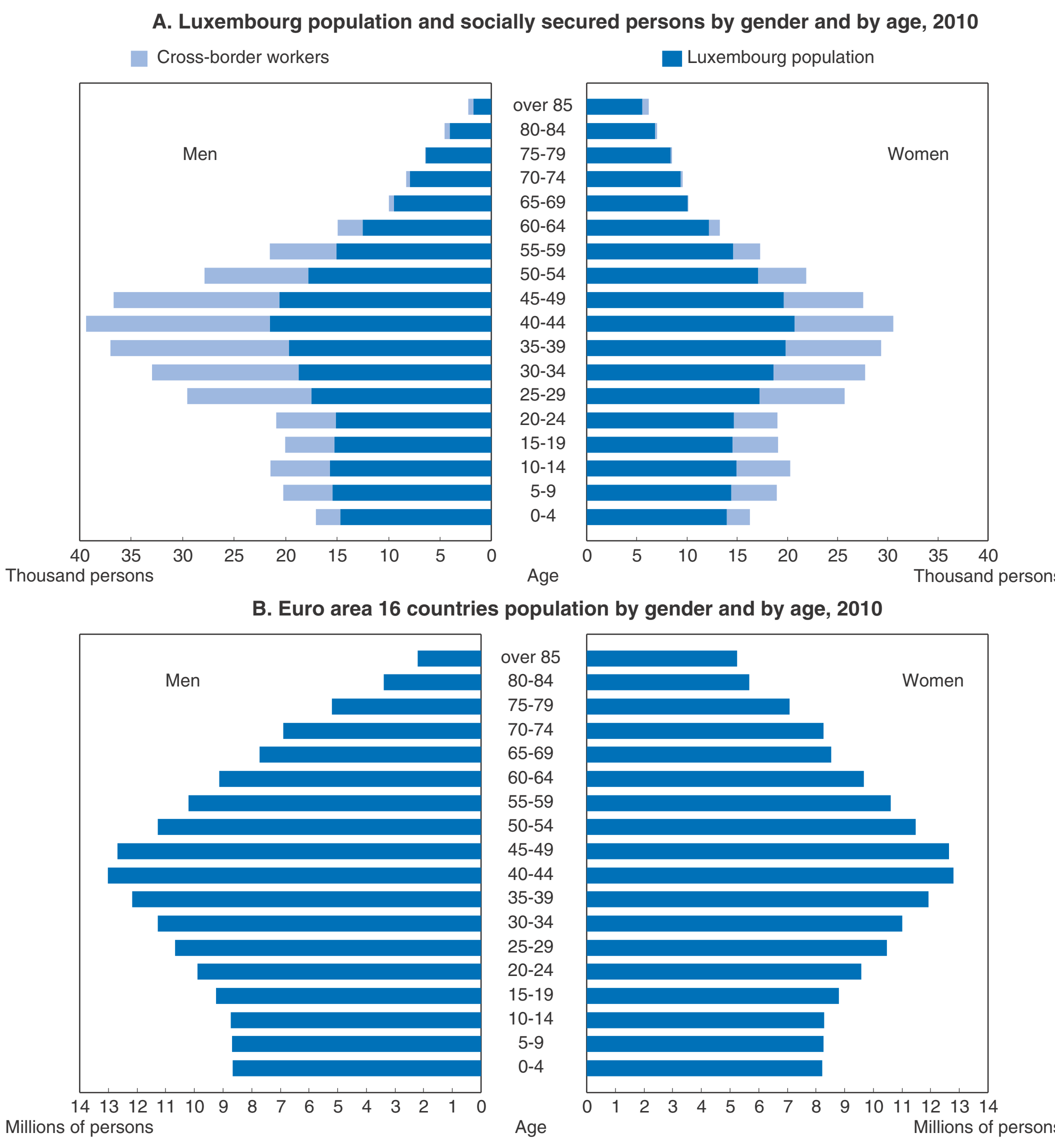
Source: OECD, *Economic Outlook 92 Database* and the World Bank.

StatLink http://dx.doi.org/10.1787/888932748973

The inherent uncertainty around the growth of potential output following the economic and financial crisis, as well as Luxembourg's sensitivity to developments in the euro area, are important risks to public finances. These call for more attention to medium-term budget targets. While the level of government debt is low, the momentum of current spending needs to be brought under control, both to maintain sustainability and to ensure that the costs of achieving social objectives are at a reasonable level. Official projections in the Stability Programme Update show that Luxembourg will not meet its commitments under the EU Stability and Growth Pact of making progress of at least 0.5 percentage points per year towards its Medium-Term Objective (MTO) of a surplus of 0.5% of GDP. It could therefore be liable to financial sanctions under the Stability and Growth Pact. For this reason, the government has taken consolidation measures for 2013 that go beyond the Stability Programme Update. Explicit multi-year expenditure ceilings, at the aggregate level, would help to keep spending under control.

The main public finance challenge, however, is the longer-run sustainability of the budget and social security system due to high anticipated future ageing costs of residents related to the demographic profile and cross-border workers. Without reform, the projected increase in ageing costs from 2010 to 2060 amounts to 17.1% of GDP, which is the highest gap in the EU (Gouvernement du Luxembourg, 2012). This reflects ageing of the population, as in other countries, which in Luxembourg is reinforced by the skewed demographic profile of cross-border workers, who are enrolled in the Luxembourg pension system. The generosity of the pension system is made possible by the fact that the number of retired cross-border workers entitled to earn Luxembourg pensions, is still very low, reflecting the small cross-border population before the 1980s (Figure 2). Pension payments will rise as the resident population ages and the share of retired cross-border workers increases among the retired population. Apart from long-run fiscal sustainability, there is

Figure 2. **The demographic structure of the workforce implies rapid aging**



Source: Inspection générale de la sécurité sociale, Luxembourg and Eurostat.

StatLink http://dx.doi.org/10.1787/888932748992

an important question of intergenerational equity as current pensioners benefit from being small in number relative to those paying into the system but current policies would create very large pressures on future cohorts, who would be unlikely to enjoy such good benefits as their predecessors. It has long been clear that these pressures warrant a fundamental reform of the pension system (OECD, 2010) to address this, as well as providing a reason to run a consistent budget surplus in anticipation of future needs.

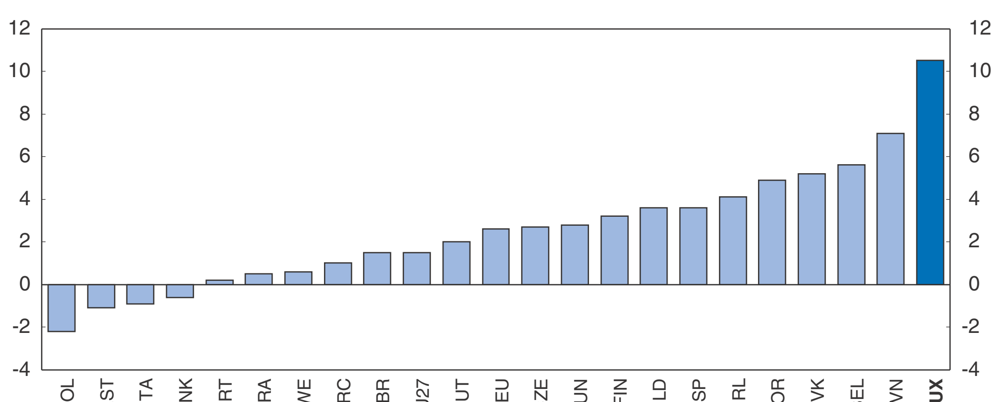
A draft pension reform bill was proposed in January 2012. It is based on three main elements:

- A gradual increase of the number of years of contributions to 43 years to achieve the same level of benefits, or a reduction of benefits for those making only 40 years of contributions.
- Indexing pension payments to inflation only, rather than to nominal wages, in the event that the retirement insurance reserve is insufficient.
- A gradual increase in the rate of pension contributions from 24% to 30% of gross wages and other income subject to contributions over a 40 year period in the event that the retirement insurance reserve is insufficient.

This proposal is welcome, but will not be enough to restore long-run fiscal sustainability. It is estimated that these measures, which are already incorporated in EU estimates (European Commission, 2012), would reduce the future expected increase in pension costs by around 6.6% of GDP compared with a scenario where no reform was undertaken (Government of Luxembourg, 2012), leaving the gap at 10.5% (Figure 3). While the reform assumes a rather high real growth rate of 3%, it would be implemented more rapidly if growth were lower than anticipated. Given the already high level of pension contributions, there is a risk that relying on such increases would damage labour supply incentives and harm Luxembourg's competitiveness. While the changes to required years of contributions and indexing in the pension reform proposal should be passed, this should only be the start of the process towards returning the public finances and the pension system to a sustainable footing. Delaying reform only serves to increase its ultimate costs and unfairness.

Figure 3. **Pension expenditures projections are large (2010-60)**

Change in gross public pension expenditure in percentage point of GDP



Source: European Commission, The 2012 Ageing Report – Economic and budgetary projections for the 27 EU member States (2010-60) and 13th Update of the Luxembourg Stability and Growth Programme 2012-15 for Luxembourg.

StatLink http://dx.doi.org/10.1787/888932749011

Pension benefits are extremely generous (OECD, 2010). While the system ensures that pensioner relative poverty is very low, it transfers huge resources to retirees, irrespective of their needs. Further reforms will have to start to reduce pension benefits to the extent needed to make the system sustainable, including by starting to index only to prices right away and by reducing time credited in the pension system for years not actually worked. The effective retirement age is likely to rise from the current 58 under the current reform, but further measures are likely to be needed for the effective retirement age to rise as fast as life expectancy. Early retirement mechanisms and long-duration of unemployment benefits, which contribute to the low effective retirement age, should also be addressed.

Enhancing the efficiency of public spending would improve the sustainability of the social system

Maintaining good fiscal outcomes is made more difficult because of the low efficiency of public spending, in the absence of a renewed budgetary framework. While spending on health and education is high, the quality of outcomes does not match the available inputs, even taking into account the high level of prices in general in Luxembourg (Joumard, *et al.*, 2010, OECD, 2010b). The same or better outcomes could be achieved with lower overall spending if Luxembourg applied best practices. The introduction of a global budget for hospitals is a welcome measure to establish a genuine budget constraint, and it should be rigorously implemented. Empowering hospital managers and improving the flow of information would help to strengthen the control of costs. Developing preventive care as discussed in the 2008 *Economic Survey of Luxembourg* (OECD, 2008) and making greater use of health facilities in neighbouring countries would also help to raise the efficiency of the health system.

Box 2. **Main recommendations on fiscal sustainability and financial regulation**

- Implement the fiscal consolidation plan in the Stability Programme. Update, set out and monitor a detailed and credible medium-term consolidation plan. Ensure that expenditure rises no faster than nominal GNP growth, focusing on controlling current spending.
- Implement proposed reforms to the pension system and make further progress towards long-run sustainability, including by linking the effective retirement age to longevity, reducing incentives for early retirement, moderating increases in pensions, and limiting credits for years of inactivity.
- Strengthen budgetary institutions and procedures to facilitate the consolidation process. There should be multi-annual plans and a binding expenditure ceiling, at least at the aggregate level.
- Modernise the public sector to focus on outputs through performance budgeting and cost-benefit analysis.
- Raise the efficiency of the health system by strengthening the control of costs, empowering hospital managers, improving the flow of information and making greater use of health facilities in neighbouring countries
- Continue to upgrade financial regulation and supervision in line with EU and international initiatives with a special emphasis on intra-group and liquidity risks.
- Strengthen co-operation between the CSSF and the BCL through a memorandum of understanding clearly setting out the responsibilities and requirements for the two institutions.

More broadly, the recommendations of the OECD review of budgeting in Luxembourg should be implemented (OECD, 2012b), including: using performance budgeting to target resources better and increase the efficiency of the provision of public services; improving auditing and statistical information; a comprehensive review of the efficiency and effectiveness of government programmes; reducing the large range of extra-budgetary funds (OECD, 2010a); and stronger governance of agencies. The introduction of cost-benefit analysis, at least for large projects, could substantially improve the efficient use of public funds, particularly given large infrastructure investment needs and a relatively high share of public investment in GDP. As argued in the previous *Economic Survey of Luxembourg* (OECD, 2010a), greater flexibility in human resource management would further enhance public sector efficiency, including greater openness to non-nationals in the public service.

Better structural policies to sustain living standards, growth and sectoral diversification

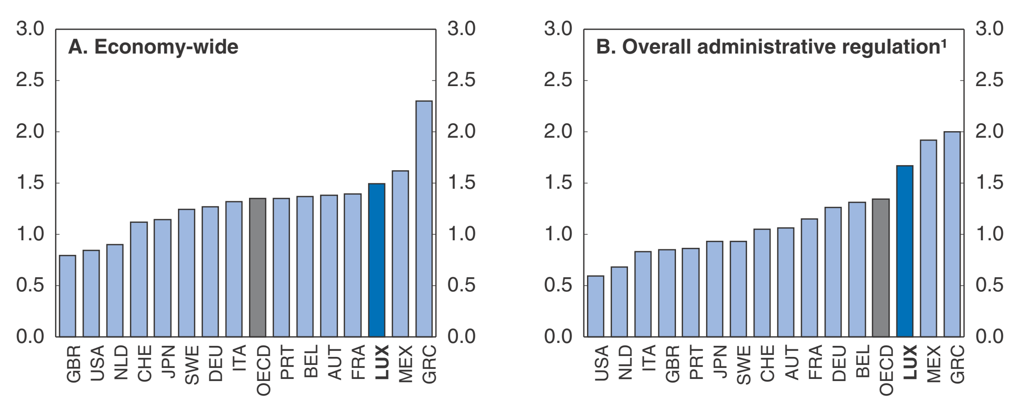
While many growth factors are external to Luxembourg, the sustainability of current living standards and more broad based and sustainable future growth can be enhanced by policies to foster competitive domestic markets (OECD 2011b), improve the functioning of the labour market and raise the performance of the education system towards the OECD best performers as argued in the 2010 *Economic Survey of Luxembourg* (OECD 2010a).

Competition can be strengthened further, although competition oversight is improving

Better framework conditions for business and competition would strengthen domestic activities and help to ensure competitiveness. Product market regulations remain restrictive by OECD and EU norms in many areas, including the retail sector and professional services (Figure 4). However, the transposition of the EU Services Directive in 2011 eased some restrictive regulations and practices, including through a new law on the Right of Establishment passed in 2011. Licensing requirements have been simplified and the application of the "silence is consent" rule in the areas covered by the Directive has been

Figure 4. **Product market regulation remains restrictive despite reforms (2008)**

Index scale of 0-6 from least to most restrictive



1. This is a simple average of two indicators (regulatory and administrative opacity and administrative burdens on start-ups) in the domain "barriers to entrepreneurship".

Source: OECD (2011), *Product Market Regulation Database*, and Woefl, A. *et al.* (2010), "Product Market Regulation: Extending the analysis beyond OECD countries", *OECD Economics Department Working Papers*, No. 799.

StatLink http://dx.doi.org/10.1787/888932749030

implemented. The granting of licenses is no longer subject to approval by a commission including representatives of the incumbent industry. Supermarkets with more than 400 square meters of floor space still require a specific authorisation, but are no longer subject to an economic needs test. Entry conditions for access to certain crafts and professions have been clarified and made more open: the transposition of the EU Services Directive bans discriminations based on nationality or residence.

Overall, the reforms have reduced the burden of red tape and improved the openness of local markets, but the extensive system of licensing remains a potential hindrance to competition. The objectives of regulations should be reviewed and their burden and complexity could be further eased, alongside improving their design, through the process of on-going "administrative simplification". Some progress has been made, for example in codifying rules in some areas into a single, simpler structure. However, more could be done to codify, simplify and, if necessary, cut existing rules (OECD, 2010c). Better *ex ante* rules would also help to make sure that the regulatory burden is appropriate. Strengthening the position and objectives of the Committee on Administrative Simplification would help to achieve these goals.

The weak enforcement of competition policy has held back the achievement of lower prices and greater efficiency. As recommended in the 2010 *Economic Survey of Luxembourg* (OECD, 2010a), weaknesses in the design and operation of the domestic competition policy have been addressed by the creation of a single authority with the power of initiative to bring new cases, replacing the previous split between two small institutions with investigative and enforcement powers. At the same time, the total resources allocated to the enforcement of competition policy have almost doubled. The new Competition Council has new powers to undertake sectoral investigations, which should help to shed light on the state of competition and barriers to entry in specific areas.

A more adaptable and competitive labour market

During the crisis, employment has grown at close to the average of the past decade, despite the fall in measured GDP. Demand for workers has continued to be accommodated by in-flows of cross-border workers and immigration. This good overall picture, however, masks some sustained weaknesses, including the lower employment rates of second-earners, younger or older workers and those from poorer socioeconomic backgrounds (2010 *Economic Survey of Luxembourg*, OECD, 2010a). Most strikingly, the unemployment rate has continued to rise to reach more than 6% of the resident workforce. There are more than three times as many unemployed Luxembourgers than a decade ago. The unemployed are typically low skilled, and their incentives to return to work are rather low. Generous unemployment benefits could be phased down during the course of the unemployment spell, as is done in a number of other OECD countries. Tightening eligibility for the young would also increase the incentive to start gaining experience.

The main problem with the functioning of the labour market is poor labour market outcomes for residents, against the background of strong overall employment growth and competition from cross-border workers. In particular, labour market attachment is weaker than in neighbouring countries for the young, the unskilled, second-earners and older workers with some deterioration over time for young, the unskilled and to some extent prime-aged males. While these problems can partly be dealt with through measures to promote labour demand at lower wage levels, poor incentives to work and lack of support to find appropriate jobs are the main obstacles to better labour market outcomes for these groups (OECD, 2010a).

The efficiency and adaptability of the labour market to changes in economic circumstances could be improved by aligning wage adjustments more closely to economic conditions. The system of automatic legislated indexation of wages to consumer prices in principle limits flexibility, both to respond to macroeconomic shocks and to allow the required adjustments in relative wages across firms and industries, as discussed in the 2010 *Economic Survey of Luxembourg* (OECD, 2010a). Past increases have resulted in a relatively high minimum wage (as share of average wage) compared to other European countries (Figure 5).

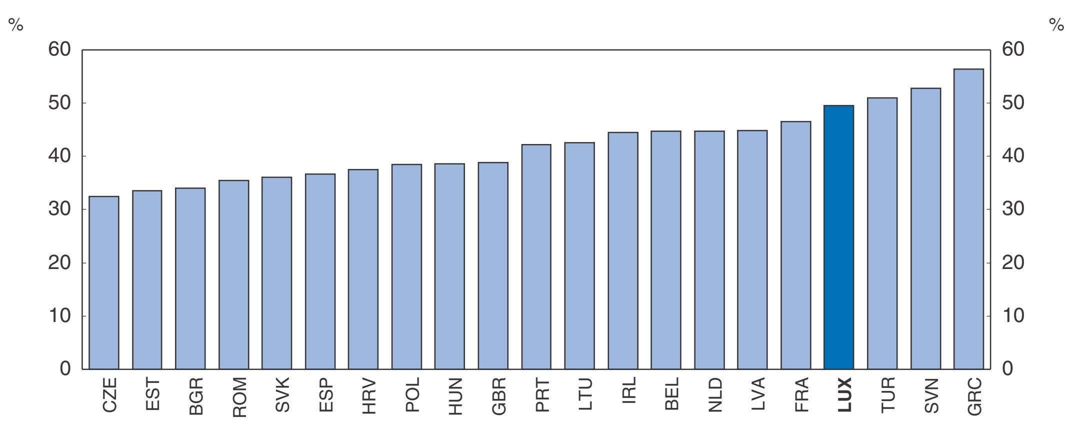
The effect of pass-through of higher energy prices, which worsen the terms of trade, has been tempered by the modulation of the indexation system for 2012, 2013 and 2014 by limiting the indexation in each year to 2.5%. While such flexibility has been appropriate, even greater flexibility may be needed in the future in wage-setting to ensure that the economy maintains its competitive position in the face of possible negative macroeconomic shocks or a greater need to adjust relative wages across sectors. The current automatic indexing system should, therefore, be replaced over time with a system of wage determination more closely linked to productivity to ensure the preservation of competitiveness. This could be achieved by maintaining wage coordination among social partners. An independent council could also be set up to advise on the minimum wage, or the minimum wage should not be allowed to rise as rapidly as average wages, as suggested in the 2010 *Economic Survey of Luxembourg* (OECD 2010a).

Softening the strong employment protection legislation would also help to make the labour market more adaptable and encourage job creation. This can be achieved by lifting the threshold for collective dismissals, currently set at 7 dismissals within a 30-day period or 15 within a 90-day period, reducing notice periods and severance payments and extending trial periods.

Good activation policies would help people find work. However, the Luxembourg employment service (ADEM) has long suffered from a lack of resources and inefficient operation, which have undermined its role in connecting people looking for jobs to vacancies. A major reform of ADEM has been put in place in 2012. This will increase the number of case workers, increase the number of local offices, make ADEM easier to

Figure 5. **The minimum wage as a percentage of average monthly earnings**

2011[1]



1. For Belgium, France, the Netherlands and Turkey, the data refer to 2010.

Source: Eurostat.

StatLink http://dx.doi.org/10.1787/888932749049

contact, introduce a new information system, establish a system of profiling, and intensify involvement with the unemployed. These are major steps forward, which will take time to have their full effect both with those looking for jobs and with employers. There remain some weaknesses in the design and application of the activation system, including too little early intervention before unemployment risks become entrenched as discussed in the 2010 *Economic Survey of Luxembourg* (OECD, 2010a), which need to be addressed.

Improving the business environment would help diversify the economy, potentially paving the way for a new revolution, after the agriculture, steel, and financial sector revolutions. For instance, e-commerce has recently grown fast, partly due to the current VAT regime. While the tax advantages will disappear in 2015, the sector would benefit from streamlining of the regulatory framework (as discussed above) and developing the logistics infrastructure, as currently envisaged by the government. Other high growing emerging activities, such as e-health, require innovation-friendly policies. Diversification would also benefit from improving the match between the education system and the demand for high-skilled workers, as recommended in the 2008 *Economic Survey of Luxembourg* (OECD, 2008). The adaptability of the economy would also be enhanced by raising the overall level of education of the population.

Box 3. **Main recommendations on raising productivity, labour market performance, and social cohesion**

- Encourage competition by removing unnecessary administrative burdens, including for professional services, notaries, pharmacies, the retail trade and taxis.
- Reform the system of wage setting while retaining wage co-ordination. Ultimately, replace automatic indexation with a system of wage determination more closely linked to productivity.
- Set up an independent council to advise on the minimum wage or do not allow the minimum wage to rise as fast as average wages.
- Continue on-going reforms to the public employment service (ADEM) and strengthen the activation system. Comprehensively review current active labour market programmes for their effectiveness.
- Reduce the strictness of employment protection legislation including: lifting thresholds for collective dismissals; reducing additional notice periods and severance payments following the negotiation of social plans; and extending trial periods for regular contracts.
- Phase down unemployment benefit replacement rates for workers during the course of the insured period and further tighten young people's eligibility for unemployment insurance.

Reforming education for those who need it most is central to maintaining high living standards and improving social cohesion

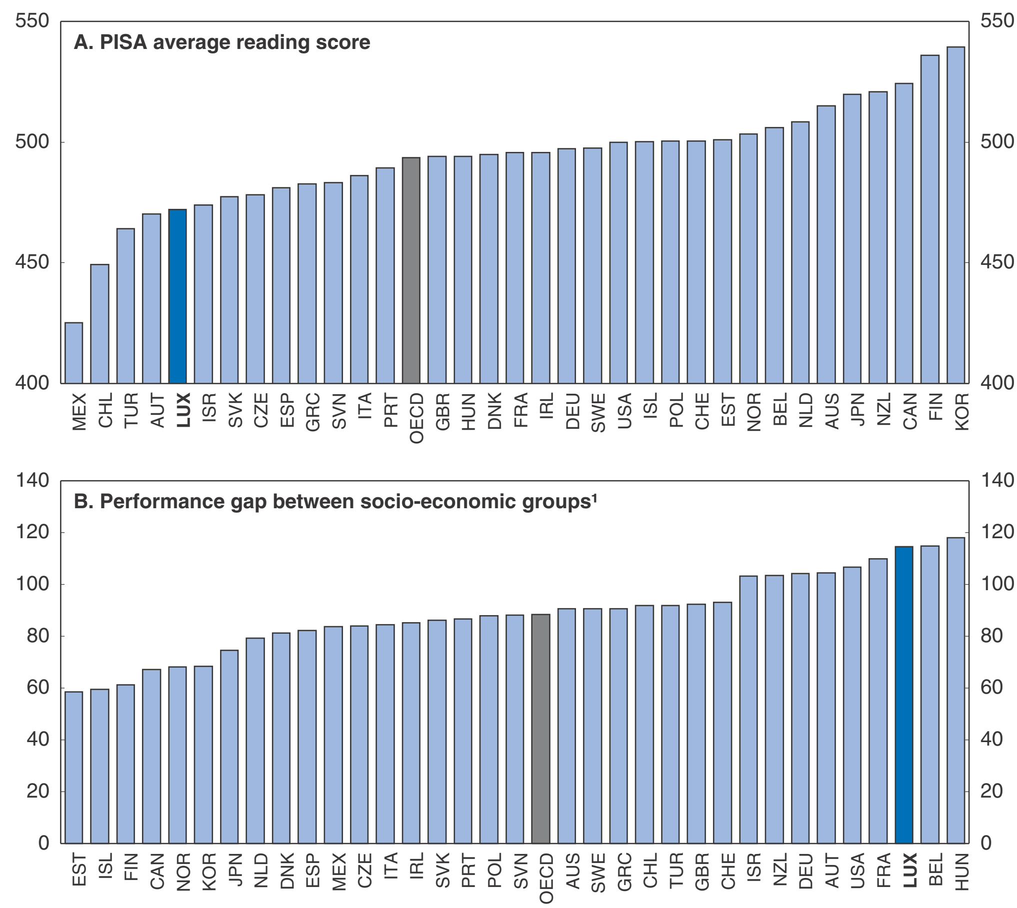
The education system performs poorly, despite a very high level of education spending (OECD, 2011c). The results of the 2009 Programme for International Student Assessment (PISA) show that student's secondary school average performance stands below the OECD average, and it has deteriorated compared to the 2006 evaluation. This weak performance is out of line with the high level of income it is required to sustain in

Luxembourg (Figure 6). Moreover, education outcomes are unevenly distributed, and there is a high rate of early school leavers by international standards. In particular, a large share of disadvantaged pupils attains only a low level of literacy. These weak outcomes at the lower end of the distribution contribute to the weak overall performance of the education system. A usually strong link between parental background and education achievement is one of the key factors that explain these outcomes and low social mobility. Many of these issues were discussed in the 2006 *Economic Survey of Luxembourg* (OECD, 2006), which included a chapter on improving education achievements and attainment.

Much of the inequality in educational outcomes in Luxembourg is due to the very wide socio-economic disparities among students, with over 40% of pupils coming from immigrant backgrounds. Most at risk are those who arrived recently and who have non-native speaking and low-educated parents. Language issues are a major obstacle to better integration (OECD, 2012d). Luxembourg is a trilingual country with Luxembourgish taught in pre-primary school, German the language of instruction in primary and vocational schools, and French used in the general secondary track. More extensive

Figure 6. **Educational achievement**

2009



1. Difference in performance on the reading scale by the top and bottom quartiles of the national quarters of the PISA index of economic, social and cultural status (ESCS).

Source: OECD (2010), PISA 2009 Results: Overcoming Social Background – Equity in Learning Opportunities and Outcomes (Volume II).

StatLink http://dx.doi.org/10.1787/888932749068

language support is needed to provide all students with the same opportunities in the education system. A greater participation of the currently under-represented immigrant's children in early childhood education could help to alleviate language problems. While the recruitment needs have been boosted by the strong migration flow, accepting teachers who do not command the three languages, when feasible, would not only help to keep high recruitment standards, but also make it easier for immigrant pupils to identify themselves with their teachers.

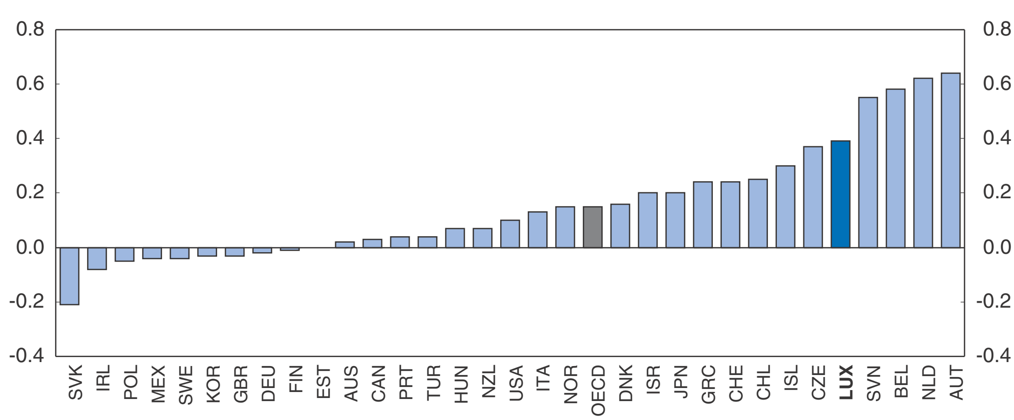
Given the diverse student population, the education system does little to counteract the initial disparities between children in terms of the allocation of resources and other policies. At around EUR 15 000 per student, spending is more than double the OECD average. However, these resources appear to be concentrated on schools where pupils are drawn from relatively advantaged backgrounds (Figure 7). The 2009 reform of pre-primary and primary schools will progressively allocate funds to municipalities according to a set of socio-economic indicators. This is a welcome initiative that should be further extended to secondary education. In addition, the relatively low autonomy of schools and the weakness of monitoring do not help to ensure that resources are used in the best way within each school.

The school tracking paths start as early as the age of 12, with little opportunity to switch to a different track at a later stage (Ministry of Education). These systems tend to lock in career choices at an early stage and reduce social mobility, as students from more advantaged socio-economic backgrounds are disproportionately more likely to be tracked into the general rather than vocational tracks. There is also evidence that everything else equal, pupils tracked in vocational tracks face a lower probability of passing to higher education (*e.g.* Van Elk *et al.,* 2009).

The share such pupils who repeat a grade is high in Luxembourg, which is likely to restrict their education level. Such high repetition rates are likely to hurt particularly badly disadvantaged students as the less informed parents are less likely to avoid it. The competence assessment and two-year learning cycles introduced in the 2009 reform aim at reduced repetition rates and should be extended. Overall, these weaknesses in educational

Figure 7. **Socio-economically advantaged students attend schools with higher level teachers**

Correlation between school mean socio-economic background and percentage of teachers with largely theory-based university-level degree among all full-time teachers



Source: OECD (2010), *PISA 2009 Results: Overcoming Social Background – Equity in Learning Opportunities and Outcomes* (Volume II).

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performance are reflected in relatively high youth unemployment rates, which are three times more than the overall average in Luxembourg. Policies that reduce school drop-out rates should be developed to ensure that youth leaves education with recognised qualifications.

A major reform of primary education began in 2009, aimed at improving working practices within schools, increasing specialist staff, avoiding grade repetition through moving to two-year cycles, adopting a competency-based approach and raising the quality of education through better performance evaluation mechanisms for schools. The first evaluation of these reforms is currently underway. Proposals to apply a similar approach in secondary education faced the opposition of teachers and were dropped in early 2012. These proposals would have included measures to increase the efficiency and quality of schools, and enhanced support for learning that could have avoided grade repetition. Less ambitious measures have now been proposed that would lead to the introduction of assessment by coursework, more gradual subject specialisation and some easing of language requirements. Greater efforts, such as those removing early tracking and giving more autonomy to schools, should be made. This would have a double-dividend in terms of raising the performance of the system as a whole and improving social cohesion.

Box 4. **Main recommendations to improve social cohesion with education outcomes**

- Improve targeting of education resources to schools with disadvantaged students. Increase resources available for language support and remedial classes.
- Push the planned reform of secondary education, aiming at reducing grade repetition, delaying institutional tracking from the age of 12 until 16, strengthening the autonomy and local management capacity of schools, and improving the monitoring of education quality.
- Increase enrolment in child care and early childhood education and target support at children from low-income and/or foreign-language families.

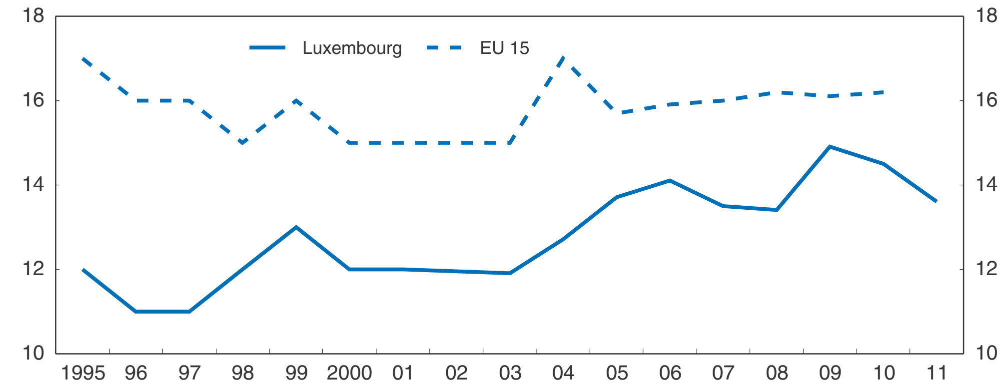
Social outcomes could be improved by tackling unemployment traps and better targeting of social support

There is a strong emphasis on social cohesion in Luxembourg, which faces headwinds from growing disparities in labour market incomes. Differences in market incomes are above the OECD average. The rapid expansion of the relatively high-wage large financial sector, and fast growth of highly unevenly distributed capital income are likely to have contributed to rising inequality of market income. The distribution of disposable incomes – taking into account the effect of transfers and taxes – is narrower than the OECD average and close to that in the neighbouring countries. However, the gap between top and low incomes has risen since the 1980s. While high income levels imply low levels of absolute poverty, relative poverty remains relevant and this has been rising over the past twenty years (Figure 8). The groups most vulnerable to relative poverty on this definition are single parent families, people with low education levels and immigrants.

Although extensive social transfers and the progressive tax system play key roles in narrowing the wide differences in market incomes and reducing relative poverty, their effectiveness in achieving low relative poverty rates appears to be less than in some other countries. Luxembourg ranks sixth among OECD countries in terms of social expenditure as a share of GNI. The Luxembourg social system is comprehensive and includes insurance-based retirement pensions, unemployment benefits, and transfer schemes such as family benefits, disability benefits, as well as a minimum guaranteed income (*revenue minimum garanti*, RMG). These help to explain why the reduction of inequality before and after taxes and transfers is large (Figure 9). However, in terms of relative poverty rates, Luxembourg performs less well than some high-spending Nordic countries such as Denmark and Sweden.

Figure 8. **Relative poverty is drifting up**

Relative poverty rates[1]

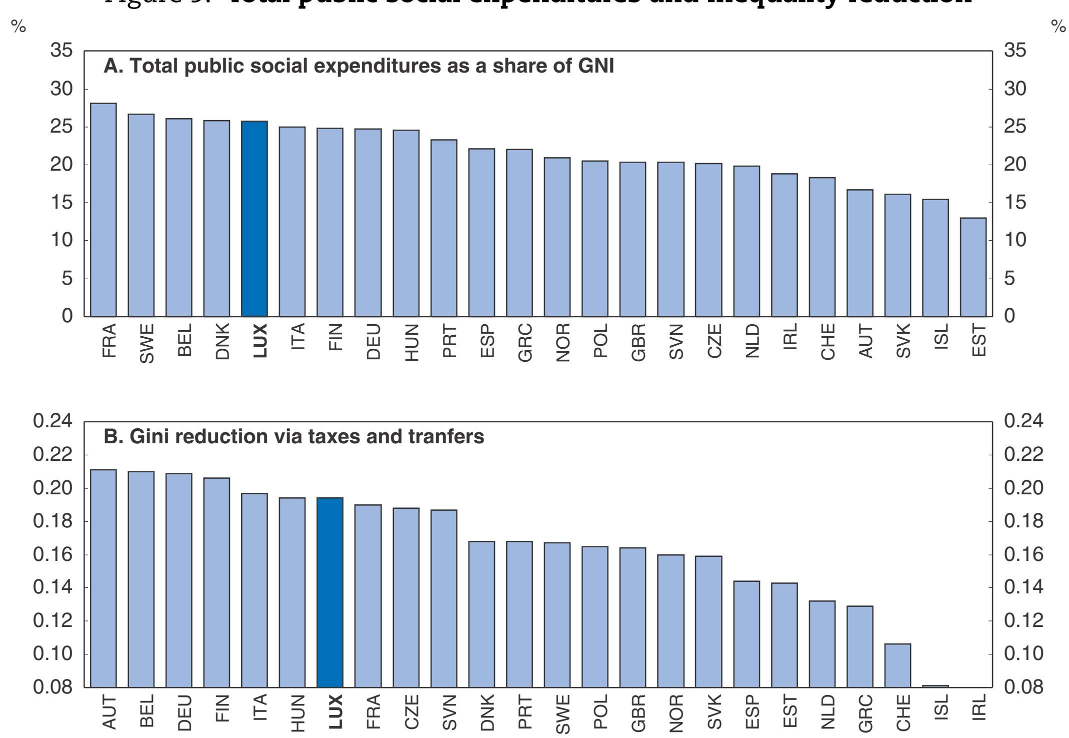


1. Relative poverty rate is the share of the population whose disposable income is below 60% of median income of Luxembourg equivalised with respect to household composition.

Source: Eurostat and STATEC.

StatLink http://dx.doi.org/10.1787/888932749106

Figure 9. **Total public social expenditures and inequality reduction**



Source: Eurostat and OECD, Income distribution – *Inequality Database*.

StatLink http://dx.doi.org/10.1787/888932749125

Strengthening social cohesion touches many interrelated policy areas. This ranges from ensuring the sustainability of the financial sector that makes the welfare state affordable to improving the design of taxes, nature and affordability of cash and in-kind benefits, education and employment policies. Relative poverty is best addressed by getting people to jobs, which requires training and activation policies, while the social safety net needs to ensure that basic needs of vulnerable groups are met with efficient and affordable transfers that do not excessively penalise work incentives. Therefore, an interrelated package of reforms is needed that encompass education policies, social transfers, tax design, labour market regulation, activation policies and training.

The effectiveness and sustainability of policies to enhance social cohesion could be improved by better targeting of some forms of support. On the transfer side, there is a strong reliance on universal payments, notably with respect to support for families. This means that high costs are being incurred to support households that are already wealthy, while some with greater needs, especially lone parent families, find themselves with relatively low incomes. While the use of universal payments avoids adding to marginal effective tax rates as benefits are withdrawn, means-tested benefits can be designed to avoid creating poverty traps and minimise the risk of distortions by only gradually withdrawing support as market incomes increase.

Social housing supports are also poorly targeted because of the limited availability of social housing and low rents charged to existing tenants whose situation has improved. At the same time, the housing transfer provided to poor households who cannot get social housing accommodation is low compared with market rents. High pension benefits ensure that pensioner relative poverty is very low. However, this creates considerable pressure on the ability to finance other social programmes.

On the taxation side, while marginal tax rates are progressive the extensive system of income tax expenditures undermines the tax base and is likely to alter progressivity. In particular, the mortgage interest tax rebate benefits richer than average home owners. In addition, supporting housing demand with tax rebates while the supply is rigid also has undesirable side effects on the level of property prices. Tax rebates for capital gains also benefit the rich disproportionally as capital income is concentrated in the higher end of the income distribution. Among these rebates, the life insurance tax rebate is also associated with important deadweight effects (*i.e.* money would have been saved on life insurance anyway). In the same vein, the low effective rate of property taxation creates an advantage for wealthier households, who are more likely to be home owners and live in costlier housing (STATEC, 2011).

There is also a substantial room for improvement to better target in-kind benefits. Good examples are social housing and higher education. As regards social housing, no specific income threshold is specified and rents are below market prices even for some who earn more than the median income. Replacing the existing scheme by a means tested rent support would increase the fairness of housing policy. In higher education, as the share of students from advantaged socio-economic backgrounds is relatively important, the large share of public spending of higher education tends to benefit wealthier students disproportionally. Better targeting can be achieved through a system of fees supported by a means-tested contingent loan system and grants to needy students.

While many schemes are poorly targeted, the RMG, by contrast, is so strongly targeted that it reduces work incentives, running counter to its social objectives. While the RMG boosts the income of those who are out of work, it implies an effective marginal tax for working of 100% over a wide range of labour incomes. Combined with strong competition from cross-border workers and other weaknesses in labour market policies, this creates an "inactivity trap" that easily leaves people dependent on social benefits. The picture in terms of incentives is even worse when other additional benefits are included in the reference income to determine the RMG, such as the mothers' childcare allowance. The work incentives issue is particularly pronounced for the youngest and the oldest, whose participation rates are low and who benefit from generous unemployment schemes. There is a potential "win-win" for both social cohesion and increasing labour supply in moving to a system of larger and better designed in-work benefits that encourage low skilled workers to be in jobs. Such a reform should be designed to increase the net earnings of working more for those with low market earnings potential, while continuing to reinforce activation policies and enhancing training.

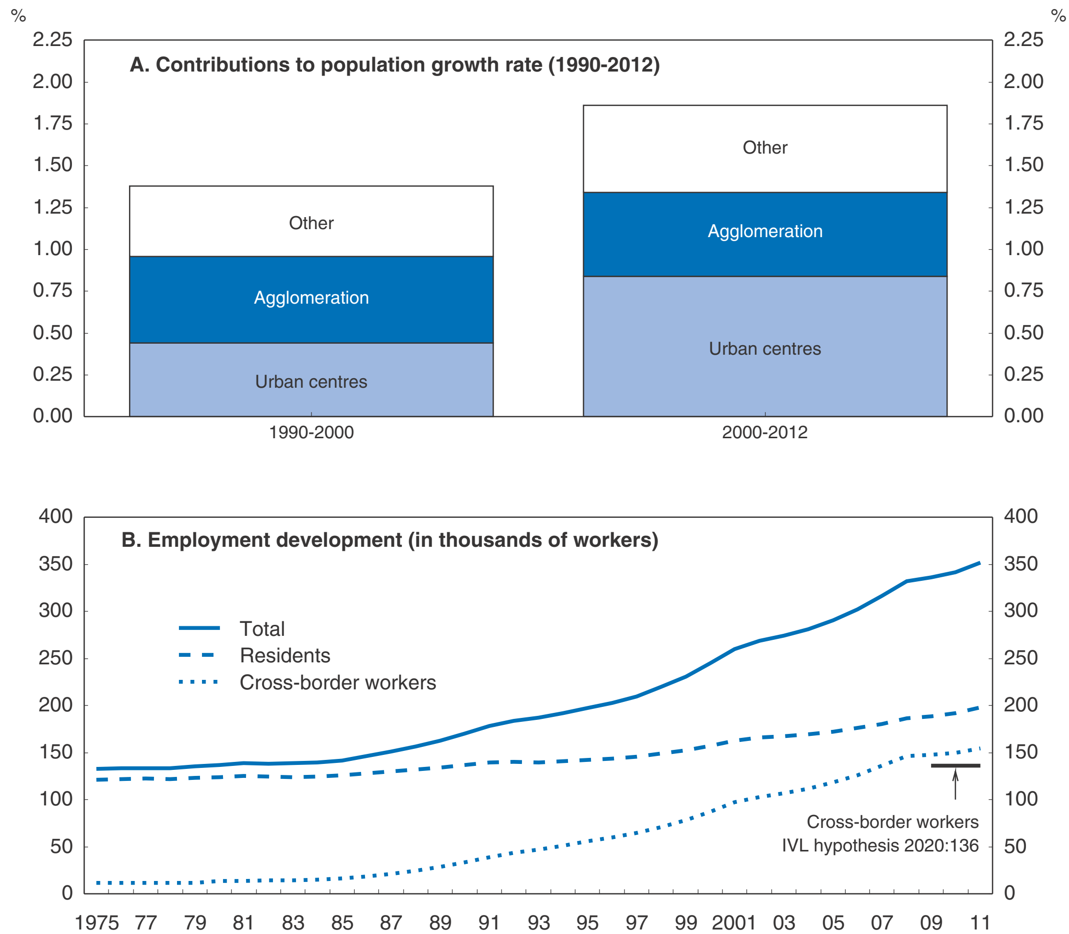
Box 5. **Main recommendations on social cohesion and the transfer system**

- Consider greater targeting of social transfers to increase their effectiveness in reducing relative poverty, while limiting their overall cost, and tapering benefits to minimise the impact on work incentives. These measures should aim particularly to help single parent families.
- Improve the design of the minimum income guarantee (RMG) to avoid situations in which additional work does not provide additional income, while enhancing activation policies and training.
- Eliminate tax expenditures that are inefficient and regressive, such as tax rebates for mortgage payments and capital income.
- Social housing support should shift away from the construction of new subsidised housing towards a system of adequate rent support for low income households in private accommodation. Rents should be higher in social housing for tenants whose income is above social minima.
- Reform the financing of higher education to improve its distributional impact, through a system of fees supported by a means-tested contingent loan system and grants to needy students.

More sustainable and greener growth

Luxembourg's growth and development into a regional centre has brought substantial environmental pressures. Rapid population growth has contributed to urban sprawl. A substantial share of the population continues to settle outside urban centres, although the contribution of these centres to overall population growth has increased (Figure 10, Panel A.). Commuter traffic, which is dominated by cars, has increased fast as the number of cross border workers has grown and urban sprawl has continued (Figure 10, Panel B.). This, together with fuel sales to non-residents owing to comparatively low taxes, has contributed to Luxembourg's high per capita CO_2 emissions, compared to other OECD countries, and very large adjustment needs to meet EU 2020 targets (Figure 11). The share of the country that is built-up has more than doubled over the last twenty years. As

Figure 10. **Population and employment developments**[1]



1. There are 16 urban communes classified as a priority for urban development (Urban centres); 27 suburban communes linked to these 16 urban communes (Agglomeration) and finally, 63 rural communes classified as not being a priority for urban development (Other).

Source: STATEC and CEPS/INSTEAD – Geography and Development Department.

StatLink http://dx.doi.org/10.1787/888932749144

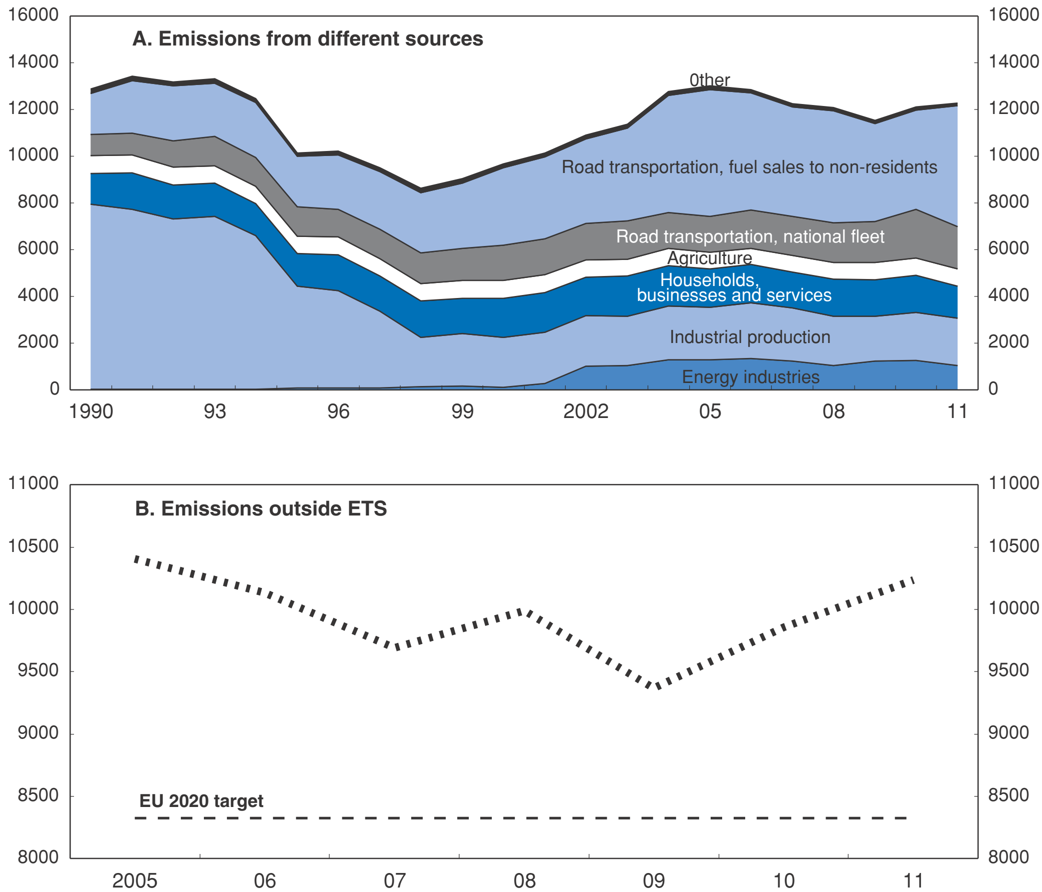
a result, sealing (that is, rendering the soil impermeable as a result of paving and other construction work), is substantial given Luxembourg's population density (Figure 12), endangering biodiversity and contributing to floods. Intensive traffic dominated by the car also leads to substantial congestion and local air pollution.

While Luxembourg's development towards a service economy and technological changes in the steel industry led to sharp reductions in greenhouse gas emissions from industrial processes and combustion during the 1990s, these have been largely undone by strong emission increases owing to fuel sales to non-residents and – to a lesser extent – the local fleet. Turning around these trends will require more appropriate pricing of externalities associated with private transport and better urban planning and housing policies.

Low fuel taxes compared with neighbouring countries contributes to high transport fuel sales to non-residents in Luxembourg. As a result, measured per capita CO_2 emissions are high. While some emissions are simply diverted from neighbouring countries to Luxembourg, as cross-border commuters fill their tanks on their way to work, there are probably additional

Figure 11. **Greenhouse gas emissions**[1, 2]

In Gg (1000 tonnes) of CO_2 equivalent



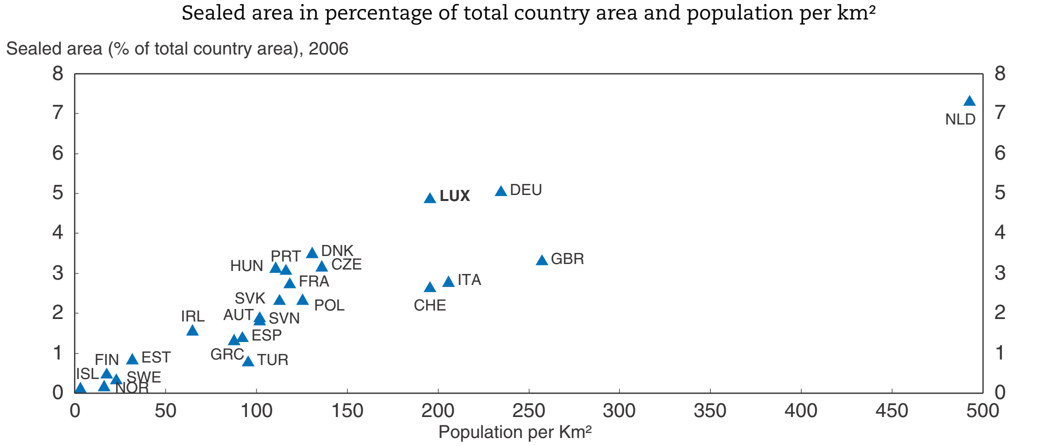
1. EU 2020 targets now concern emissions outside the EU ETS only. Therefore the panel B also shows emissions outside the ETS for those years where the ETS scheme was in place.
2. Data referring to 2011 are provisional.

Source: Ministry of Sustainable Development and Infrastructure, Environment Department.

StatLink http://dx.doi.org/10.1787/888932749163

Figure 12. **Sealed surface area and population density across different countries**[1]

Sealed area in percentage of total country area and population per km²



1. Sealing refers to a change in the nature of soil, mainly through construction works, which renders it impermeable.

Source: European Environment Agency and the World Bank.

StatLink http://dx.doi.org/10.1787/888932749182

emissions as a result of extra trips and detours taken exclusively to exploit fuel price differences, notably by lorry drivers passing along the region's motorways. The low tax rates put downward pressure on the effective price throughout the region. A careful analysis of the extent of transport fuel sales to non-residents and of how this would react to tax changes would help the authorities understand the extent to which this phenomenon leads to extra emissions and how government revenues would be affected by increasing fuel taxes.

Luxembourg should therefore gradually increase its taxes on diesel and gasoline to match the level in neighbouring countries. The tax on diesel in particular should continue to increase, as it is much lower than the tax on gasoline, although local externalities associated with diesel imply higher social costs, mainly owing to more severe pollution. In fact, once the costs of local externalities, including pollution, congestion and accidents, are deducted from the diesel excise duty in Luxembourg, it implies a negative carbon price (see Chapter 2 for further details). Luxembourg should also co-operate to help pass the European fuel tax directive, which would impose minimum gasoline and diesel taxes. Higher fuel taxes would help reduce CO_2 emissions and pollution associated with traffic. In addition this could help reduce both NO_2 and ground-level ozone concentrations, which are still frequently in excess of limit-values in some areas according to government data, despite improvements.

While fuel taxes can approximate various externalities, it is more efficient to price externalities as directly as possible. Given that congestion related to extensive commuter traffic is a concern in Luxembourg, the government should consider a congestion price system to give incentives to drive off peak hours, if possible, or switch to public transport, walking or bicycling. Bilateral agreements with neighbouring countries may be needed to enforce congestion charges in a non-discriminatory way on cross-border commuters. An alternative would be to raise congestion-related parking charges that are higher around peak hours.

Increases in prices for car transport, whether through higher fuel prices and/or congestion and parking charges, will only have the desired effect if the government provides citizens with an alternative. Extensive infrastructure investments and more compact urban development will be necessary to promote public transport, and reduce emissions, pollution and congestion. Today, the share of private cars in total motorised transport is comparatively large, approximately 85.5%, and there is considerable congestion in Luxembourg City and the main motorways, in particular during peak hours. The government targets a share of public transport in total motorised transport of 25% by 2020, almost double the level observed over the past decade. It also aims to increase the share of non-motorised transport in total trips significantly. Substantial investments in public transport infrastructure are being made and, in fact, they are necessary to reach such ambitious targets. They include new train connections to bordering regions and a tram in Luxembourg City that would connect new hubs for commuters outside the centre. The government should continue to strengthen co-operation with neighbouring countries to build and operate public transport, including by the exchange of traffic data, coordination of timetables, harmonisation of fares and the wider introduction of mixed travel passes.

To address urban sprawl and limit commuting, the 2004 integrated national concept for transport and territorial development (IVL) aimed to promote more compact development concentrated in a few urban centres, well connected to public transport. A related aim is to induce a larger share of the growing workforce to settle in the country rather than across the border. However, these plans are seriously off track: the population has increased more than foreseen; and the number of cross-border commuters targeted for 2020 in the IVL was surpassed in 2010. Although the contribution to population growth of urban centres is now larger, the share of citizens settling in areas outside urban centres and their agglomerations continues to be substantial. Moreover, areas zoned for potential development are smallest in priority areas for development (Ministry of the Interior, 2008).

The spatial planning law of 2011 is currently in the final stage of revision in parliament and four legally-binding sectoral plans for housing, landscape, transport and economic activity zones that underpin the IVL are now being finalised. Policy instruments to ensure a better coordination between communal and national planning policies have only recently been introduced or are still being developed, such as the requirement for municipalities to develop new general development plans (PAG) subject to central government approval. Financial incentives to mobilise building land and provide housing for more citizens have recently been introduced, with higher payments for municipalities that are a priority for further development in the IVL. There are plans to impose deadlines for developing land that is zoned for construction and withdraw the permit if deadlines are not met. This could also help counteract land hoarding. The government should implement quickly all the necessary instruments, review their effectiveness and adjust policies, if needed.

Urban sprawl and settling across the border is related to high house prices, especially in Luxembourg City, where they are much higher than in more rural areas. The price difference with adjacent regions in neighbouring countries is even larger. This is due in part to barriers to housing supply throughout the country, which drives up prices everywhere and particularly so in areas close to workplaces in and around Luxembourg City. The number of completed housing units has been below needs, as estimated by the government, in almost every year over the past two decades, except 2008 and 2009. This is in part related to cumbersome land planning and construction permit procedures and low property taxes, which favour land hoarding (OECD 2007).

The government has recently simplified land planning procedures, set a time limit on finalising PAGs and there is a five year review of construction permit procedures. A number of additional measures could be taken, including improving planning procedures further, updating land values as a basis for property taxes, which are currently based on 1941 values, and imposing surtaxes on empty houses and undeveloped land zoned as building areas across all municipalities that are a priority for further development in the IVL. Given the importance of competition in the residential construction sector (Barker, 2004) and the small size of the Luxembourg market, a review of the functioning of competition in this sector would be warranted. This could be conducted by the competition authority. The government has plans to establish an agency that would develop social housing and this can be important contribution to making supply more flexible.

Current plans to reduce emissions include ambitious energy efficiency gains in the housing sector. Energy efficiency standards are strict for new buildings and there is financial support for retro-fitting houses. However, some tax exemptions risk counteracting these efforts, including reduced VAT rates for solid mineral fuel, liquefied petroleum gas, methane, natural gas and electricity, and a zero excise duty rate on coal and on diesel used in agriculture. These tax exemptions should be removed to ensure policy consistency and provide incentives for take-up of financial help for retrofitting houses. To green new construction and increase the efficiency of public spending, the government should consider targeting its very generous subsidies for building or acquiring new homes to building projects that contribute to environmental objectives, in terms of compactness, construction materials and alignment with the IVL and the sectoral plan for housing. Redirecting some of the public financial support currently devoted to owner-occupied housing to housing for rent could help people to live closer to their workplace and reduce commuting needs, as well as increase residential mobility.

Water supply infrastructures need to be upgraded by means of additional investments to accommodate rising use in the household sector, related to fast increases in population and commuters, and to ensure that Luxembourg lives up to its high level of development. At least 70% of surface water is likely to fall short of the EU's 2015 targets for chemical and biological quality as determined under the EU Water Framework Directive. With regard to drinking water, sources have not yet been protected, *e.g.* by delineating areas where the use of pesticides is regulated or banned altogether, although there has been a legal obligation to do so dating back more than 15 years. By the standards of the Groundwater Directive, two out of five ground water bodies are considered to be in poor qualitative status regarding nitrates and pesticides, and some show clear signs of deterioration (EEA, 2010).

While 95% of the population is connected to a waste water treatment plant, which is high in international comparison, only 36% are connected to a tertiary treatment station, which further improves water quality after secondary treatment (removal of organic parts of waste through bacteria), *e.g.* through nutrient removal. In October of 2011, the European Commission referred Luxembourg to the European Court of Justice for poor treatment of urban waste water, as several sewage treatment plants in urban areas do not yet comply with EU legislation, including in the capital.

The government should quickly finalise the ongoing delimitation of groundwater protection areas and upgrade or build improved sewage systems. The government's efforts to merge Luxembourg's exceptionally small municipalities, which have a high degree of autonomy, could also contribute to better coordination of both water management and territorial planning. The number of municipalities has already been reduced from 116 to 106 and the government would like to reduce it further to 80. Given the small size of the country, further reductions may be warranted.

Box 6. **Main recommendations on green growth and environmental sustainability**

- Continue substantial investment in public transport to offer an alternative to the automobile. To reduce Luxembourg's carbon emissions, increase taxes on petrol and diesel by gradually eliminating the price differential with neighbouring countries. Consider introducing a system of congestion charges. Further enhance co-operation with adjacent regions to increase the capacity of the public transport system.
- Speed up procedures for granting construction permits. Raise property taxes by updating property values used as a tax base. Widen the application of the surtax on vacant houses and land applied in some communities to other areas. Move forward with plans to impose deadlines for starting and finalising development on land that is zoned as a construction area.
- Ensure that the four primary sectoral plans are implemented, including through development of new communal general development plans and the use of the new local housing policy instruments.
- Target subsidies for building a home based on social and ecological criteria.
- Remove environmentally harmful tax subsidies, such as reduced VAT rates on solid mineral fuels, natural and liquefied petroleum and electricity. Introduce congestion charges and parking prices.

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ANNEX A.1

Progress in structural reform

This annex summarises recommendations made in previous *Surveys* and action taken since the last *Survey* was finalised in May 2010.

Recommendations	Action taken since the previous Survey (May 2010)
A. Public sector efficiency	
Modernise the organisation of the public sector to increase the emphasis on outputs rather than inputs through a system of performance budgeting with greater local discretion and effective central monitoring.	No action taken.
Modernise human resource management with performance-based advancements and pay, and greater openness in recruitment.	The reform of the civil service introduces the concept of management by objectives as well as an appraisal system that allows to identify and review the civil servants' professional and interpersonal skills. The results of the appraisal can be linked to career advancements and pay.
Large investment projects would benefit from a cost-benefit analysis.	No action taken.
Implement the law to generalise access to EU nationals to recruitment to the public service with a view to widening the pool of talent as far as possible.	The bill of 17 December 2010 introduced the possibility of waiving up to two of the three required languages for highly specialised candidates. Furthermore, the reform of the civil service foresees the organization of a special exam for trainees who don't speak all of the three required languages. However, those candidates are required upgrade their language skills during their training period in order to obtain the status of civil servant.
Raise the efficiency of the health system by strengthening the control of costs, empowering hospital managers, improving the flow of information and making use of health facilities in neighbouring countries.	A budget ceiling has been put in place for each hospital, improving the incentives to manage costs.
B. Financial stability	
Reduce the pay-out time of the deposit insurance scheme to a few days. Proposals to fund the scheme on an ex ante basis using risk-based premia should be implemented.	No action taken. Pending new EU directive.
Strengthen co-operation between the CSSF and the BCL through the creation of institutional arrangements clearly setting out the responsibilities and requirements for the two institutions. Consideration would be given to creating a single integrated financial supervisor by merging the CSSF and the central bank.	No action taken although a memorandum of understanding has been pending.
Clarify the requirements on custodian banks. Custodial institutions should be under separate ownership from asset management activities.	An organic separation between the fund management function and the depositary bank function is now generally applicable to all regulated investment funds in Luxembourg.
C. Market regulation	
Encourage competition by removing unnecessary administrative burdens on starts-ups, licensing requirements and price controls. For professional services, remove restrictions on advertising and make co-operation between professions easier. Remove minimum or reference prices. For the legal profession, eliminate the cap on the number of notaries, establish an independent regulator and introduce a special procedure without the need for legal representation for small claims. Remove the restriction on the number of pharmacies and allow pharmacists to offer generic medicines as substitutes for prescribed drugs, as well as allowing the sale of some medicinal drugs by other retailers. For the retail trade, make shop opening hours more flexible. When the competition authority has sufficient capacity, remove the price ceiling for motor fuel retailing. Remove restrictive regulations fixing the number of taxis and their ability to compete.	Implementation of the EU Services Directive has led to some changes in market regulation. For retail trade and craft, the legislation about shop opening hours has been partially liberalized. However, no action has been taken with respect to other specific recommendations.

Recommendations	Action taken since the previous Survey (May 2010)
D. Labour	
Reform the system of wage setting. As a first step, wages should be indexed to core rather than headline prices. Ultimately, the system of legislated automatic wage indexation should be ended to ensure that wages remain competitive and allow necessary adjustments in relative wages.	Wage indexation remains, but it has been temporarily modulated to annual increments of no more than 2.5% in 2012, 2013 and 2014.
Enhance the effectiveness of the statutory minimum wage by ensuring that the focus in setting it is the economic impact.	No action taken.
Improve the public employment service and activation policies by: rationalising placement services; improving accountability of local employment centres; earlier interventions for jobseekers at risk of becoming long-term unemployed; ensuring that all RMG recipients with the potential to work are offered integration contracts; and raising resources available to ADEM.	The ADEM has received additional resources and is being restructured. The law reforming it has been voted on the 18th of January 2012 and the IT system has been upgraded.
Comprehensively review existing active labour market programmes. Reallocate funding from all programmes that are not cost-effective to support stronger activation policies.	The ALMP's for young jobseekers (CIE, CAE and CIE-EP) and vocational training for jobseekers have been analysed by an independent research institute in order to improve them.
Phase down unemployment benefit replacement rates for workers during the course of the insured period and further tighten young people's eligibility for unemployment insurance.	No action taken.
E. Housing	
Encourage housing supply through simplification of construction authorisation, removal of tax incentives for property hoarding, and the creation of a public land agency. Consider changes to the tax system to reduce the bias in favour of housing.	Currently, the Housing Ministry is elaborating a legal draft project reforming the law of 25th February 1979 on housing aids (e.g. creation of a "Guichet unique des aides au logement durable"). With the law of 28th July, 2011 modifying the communal land use legislation, there has been a simplification and reduction of the administrative procedures.
F. Green growth and environmental sustainability	
Continue investment and further enhance co-operation with adjacent regions to increase the capacity of the public transport system.	Investments are on-going. After elaboration in 2009, together with the French authorities in Lorraine, of a cross-border mobility scheme called SMOT to improve the transport connections with Lorraine, precise actions and measures concerning rail infrastructure, bus connections and non-motorised transport are implemented. In order to improve cross-border mobility with all neighbouring countries, a similar programme is being prepared with Germany and Belgium.

Chapter 1

Strengthening social cohesion: Making efficiency and equity go hand in hand

Luxembourg is a rich and fast-growing country. However, inequality of disposable incomes has trended up modestly over the past decades and relative poverty has risen reflecting mainly the rapid growth of high incomes. The relatively high inequality of market incomes is substantially reduced by large social transfers, but the risk of relative poverty still affects the most vulnerable, such as the young, the less educated, single parents and migrants. At the same time the generous transfer systems tend to reduce work incentives. There is significant room for improvement in the design of the tax and transfer system to enhance work incentives and improve targeting, particularly for the less skilled workers. Reforms that tackle poverty traps would both reduce inequality and improve the labour supply of residents. Strong activation policies are important in getting people to jobs. Job opportunities would also be enhanced by improving education outcomes for pupils from low socio-economic backgrounds and for second-generation immigrants. Reducing high repetition rates and better targeting education spending to schools with high shares of vulnerable students would help improve outcomes.

The high growth of Luxembourg over the last decades has not been equally shared across the population, with the most vulnerable lagging behind. As social cohesion is an important value in the Luxembourg society, the trend of rising inequality despite overall high incomes is of concern for its citizens. To preserve social cohesion, a win-win package of interconnected policies can both strengthen growth prospects and reduce income inequality. This includes activation policies to find employment for the vulnerable groups, education policies that increase work and the market income prospects of the less skilled, tax and transfer that are well targeted, while preserving sufficient work incentives. This chapter analyses the sources and trends of inequality and discusses these win-win policies to get people to jobs while ensuring a basic social safety net. The first part describes the sources of the rise in disposable income inequalities, highlighting the role of widening labour income inequalities. The second part investigates the role of taxes, cash transfers and some of the in-kind transfers to reduce the market income inequalities. The third part examines the determinants of inequalities in education outcomes.

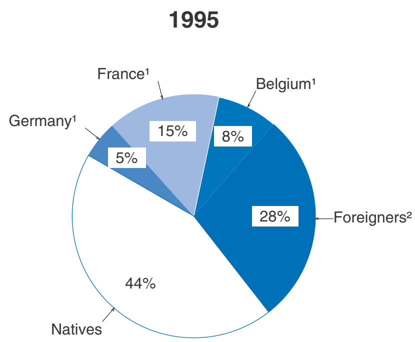
Inequality has risen despite high taxes and transfers

Luxembourg, the richest country in the OECD, puts great value on social cohesion. Growth over the past 30 years has been more than 2 percentage points above the euro area average, and net wealth of households is estimated to have reached more than EUR 700 000 per household in 2010-11 (Mathä *et al.*, 2012). While market income and wealth are quite unevenly distributed, social cohesion in Luxembourg is ensured by its own model of fair sharing of incomes in an environment of consensual decision making. This model is appreciated: 73% of people say they trust their political institutions, which is one of the highest rates in the OECD (OECD, 2011a).

Nevertheless, both disposable income inequality and relative poverty have been on the rise despite the high share of financial transfers in GNI by OECD standards. This suggests that there is room for improvement in the design of policies to make sure that everybody benefits from growth on a fair and sustainable basis. In addition current policies can blunt work incentives and are not always well targeted to the neediest. While those with no income at all benefit from generous transfers, low wage earners receive relatively little. At the same time, those at the higher end of the income distribution benefit from non targeted transfers (such as family allowances) and regressive transfers (such as tax rebates). Rebalancing transfers from high income earners to low wage earners would not only reduce inequality, but also make it more worthwhile to participate in the labour market.

Apart from the lower skilled, poverty tends to be concentrated on the immigrant resident population. As a rich and small open economy, Luxembourg has a high rate of inward migration. The share of migrants among the resident population grew continuously over the past 30 years to reach 43% in 2011. Within the foreign population, the Portuguese community represents more than one third, with closer European countries such as France, Italy, Belgium and Germany also highly represented. Among these diverse populations, children face greater difficulties at school. There is room for improvement in the education system to tackle these difficulties at their root. On top of this immigrant population, cross-border workers, mostly from France, account for more than 40% of employment (Figure 1.1). This chapter will discuss social cohesion of the resident population, with particular consideration granted to groups facing larger difficulties.

Figure 1.1. **Employees in the economy by origins**



1. Cross-border workers.
2. Foreigners resident.
Source: IGSS.

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The gap between the top and lower decile of disposable income has increased

There has been a steady trend increase in overall inequality in Luxembourg over recent decades. The headline Gini coefficient for the whole population reveals a moderate increase of inequality since the mid-1980s, at a pace faster than the OECD average (Box 1.1). The increase in top incomes is above country average, while the increase in low incomes, still above the OECD average, is below the Luxembourg average growth rate. While most income inequality measures point to a moderate deterioration since the mid-1980s, it is striking that the lowest decile of the population is far from benefiting from the average growth trend of the country. The gap between the poorest and other groups (whether one compares the lowest decile to the highest decile or to the total population) increased much faster than in the OECD on average since mid-1980s (Figure 1.2).

Box 1.1. **Indicators to measure inequality and poverty in Luxembourg**

- Various inequality indicators show that although disposable income* inequality in Luxembourg is below the OECD average, inequality has grown since the mid-1980s. In a ranking by Gini coefficient (most equal first), Luxembourg ranks eleventh among the 34 OECD countries (late-2000s figures). On average, people within the top quintile earn 4.2 times more than those within the bottom quintile, which is close to that for neighbouring countries (France, Germany), and below the OECD average. All these indicators converge to show that inequality has increased since the mid-1980s in Luxembourg. In particular, the Gini coefficient increased by 4.2%, substantially more than the OECD average (2.6%). However, that rise appears to be less sharp if one puts more weight on the lower-end of the income distribution, as the interdecile ratio rose by 0.5% in Luxembourg versus the 0.4% OECD average rate.

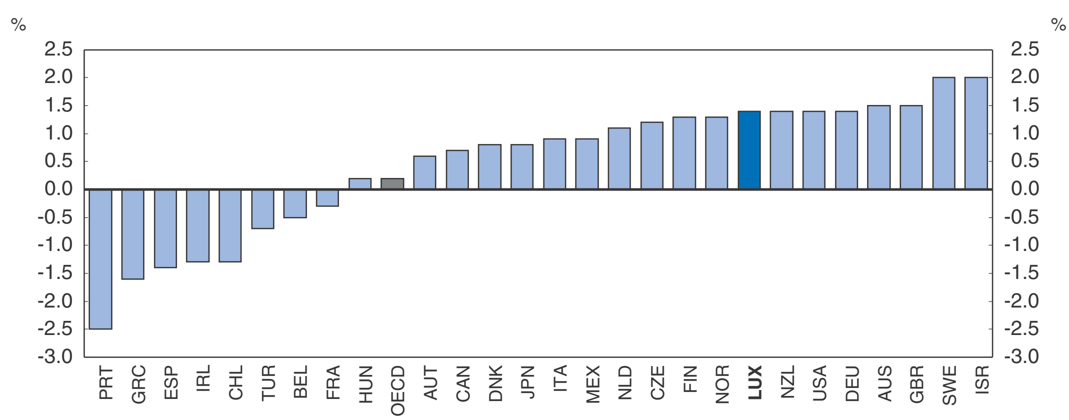
* Disposable income refers to household disposable income adjusted for the size and the composition of the household. It thus takes into effect both the financial transfers between and within households. In-kind benefits that present significant measurement issues at household level are ignored in these headline indicators. The resident population is considered to compute the inequality indicator, *i.e.* including migrants but excluding cross-border workers.

Box 1.1. **Indicators to measure inequality and poverty in Luxembourg** *(cont.)*

- Poverty can be measured as absolute or relative. Relative poverty compares the income of the poorest to the median income of the population. Absolute poverty is the share of people below an international poverty threshold defined in purchasing power parity terms (*e.g.* Smeeding (1997) counts the number of people living with less than USD 14 per day in terms of a 1997 base year at the world scale). Absolute poverty is very low in Luxembourg by any standards, given that the level of income is very high. The relative poverty indicator is a very different concept that aims at capturing relative deprivation (following the seminal work of Runciman, 1966), considering that the poor are those who cannot meet the convention of minimum needs. In this perspective, the minimum needs increase with the growth of median income, and hence are supposed to be high in Luxembourg. In addition, this indicator is comparable between countries even if the level of prices is high in Luxembourg relative to the euro area. The poverty threshold considered for 2011 is EUR 1 627 per month or 60% of the median disposable income, following Eurostat standards. According to this standard, the poverty rate is 13.6% in 2011, a level that is not far from the European Union average.

Figure 1.2. **The gap between top and low incomes is widening**[1]

Average annual growth rates of the difference between top and bottom deciles since mid-1980s



1. Income refers to disposable household income, corrected for household size and deflated by the consumer price index (CPI). Average annual changes are calculated over the period from 1985 to 2008, with a number of exceptions: 1983 was the earliest year for Austria, Belgium, and Sweden; 1984 for France, Italy, Mexico, Turkey and the United States; 1986 for Finland, Luxembourg, and Norway; 1987 for Ireland; 1988 for Greece; 1991 for Hungary; 1992 for the Czech Republic; 1995 for Australia and Portugal and 1996 for Chile. The latest year for Chile was 2009; for Denmark, Hungary, and Turkey it was 2007; and for Japan, 2006. Changes exclude the years 2000 to 2004 for Austria, Belgium, Ireland, Portugal and Spain for which surveys were not comparable.

Source: OECD, *Household Income Distribution and Poverty Database.*

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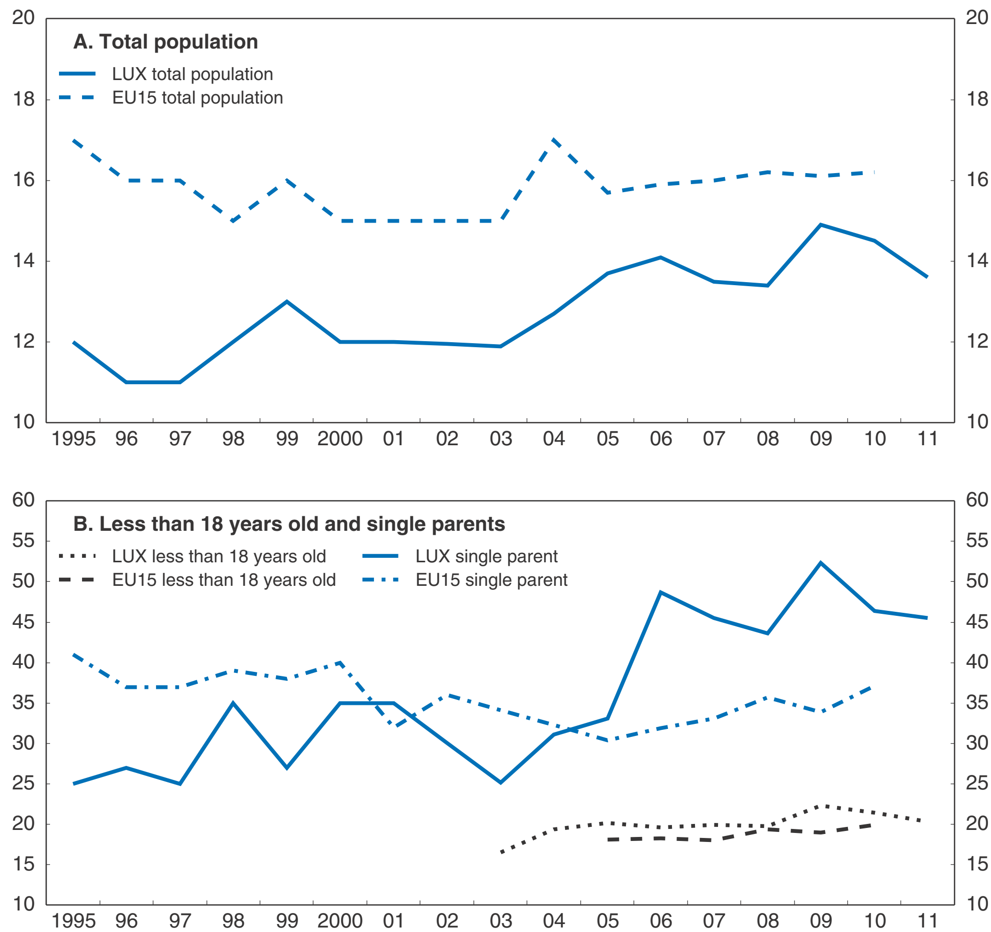
Relative poverty is also increasing

Relative poverty rates, defined as the share of individuals who earn less than 60% of median income (see Box 1) has risen from 12% in 1995 to 14% in 2011, close to the European average (Figure 1.3, Panel A). While the relative poverty rate for the whole population remains below the European average, the young and single parent families are particularly vulnerable. For these two categories, relative poverty, which has substantially increased, is higher than European average (Figure 1.3, Panel B). People who did not reach an upper secondary level of education also face high relative poverty risks (relative poverty at 21%

Figure 1.3. **Relative poverty has been rising**[1]

Relative poverty rate (cut-off point: 60% of median equalised income after social transfers)



1. In-kind benefits are not included in the computation of poverty rates.

Source: Eurostat.

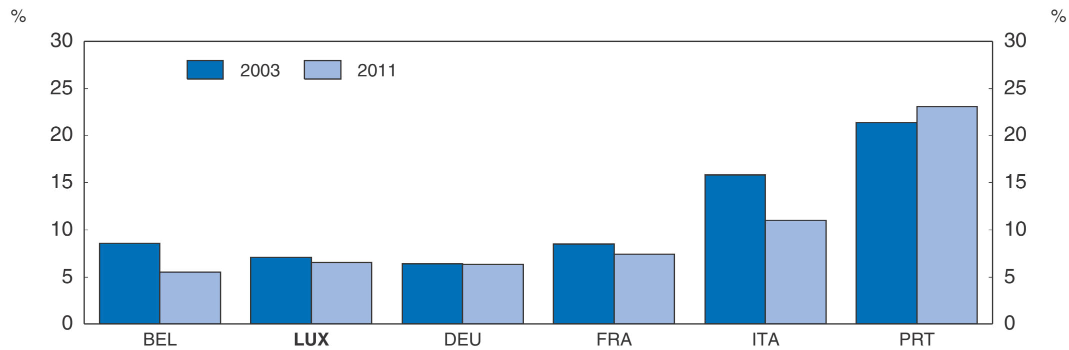
StatLink http://dx.doi.org/10.1787/888932749239

in 2011), roughly in line with the European average. Among residents, relative poverty rates also hinge on nationality: the Portuguese community and, to a lesser extent, the Italian community have the highest relative poverty rates (Figure 1.4). This is likely to be at least partly due to differences in education levels. By contrast, women and elderly are not particularly at risk of relative poverty in Luxembourg. The old age population benefits from the high level of minimum pensions, while the progressivity of the pension system is more moderate than in the OECD on average (Joumard *et al.*, 2012).

Both market income inequality and its redistribution are high by OECD standards

Market income inequality is slightly higher than the OECD average, reflecting a high share of the financial sector among the income earners. The financial intermediation activity represented 11% of total employment in Luxembourg in 2010, which is well above the euro area average of 3%. This has led to an important dispersion of income: a one percent rise of the share of the financial sector among the working population increases

Figure 1.4. **Relative poverty rates depend on citizenship**[1]



1. Relative poverty rate, threshold set at 60% of median income (EUR 1 627 per month). Income is adjusted for family size.

Source: STATEC.

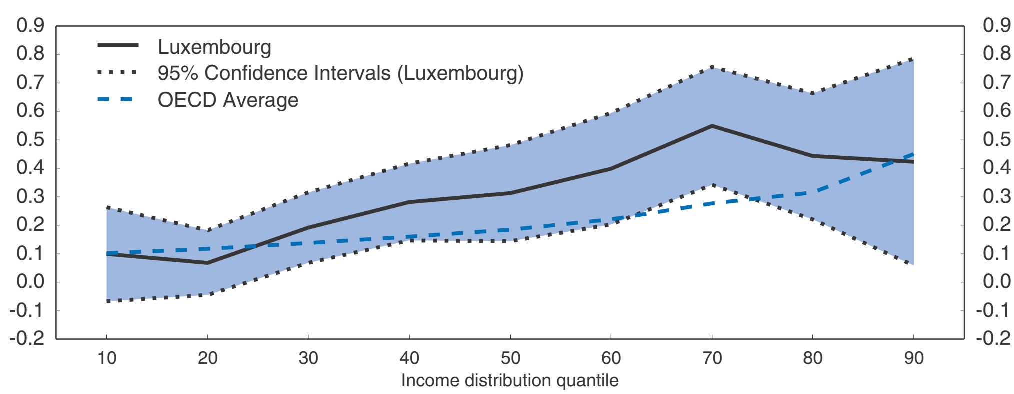
StatLink http://dx.doi.org/10.1787/888932749258

the interdecile gap by 0.3% in Luxembourg as in many OECD countries (Figure 1.5). In addition, the distribution of wealth, which is much more uneven than income, leads to a high inequality of capital income: it amounts to 6% of gross income among households of the highest decile, compared to 1.5% among households of the lowest decile (STATEC, 2011). While this fact is common to other countries (Fredriksen, 2012), the high level of wealth in Luxembourg increases its importance there. Other noticeable drivers of earnings inequality are education inequality, part-time work, temporary contracts and self employment, in Luxembourg as in most other OECD countries (Fournier and Koske, 2012).

Market income inequality has been reduced by rising employment rates. To get a full picture of the overall market income inequality, people outside the working population need to be included. They typically have few alternative sources of income, and hence a

Figure 1.5. **An increase of the size of the financial sector increases inequality**

Percentage income gain associated with the increase of the share of the financial sector in employment by one percent[1]



1. For instance, a 1 percentage point increase in the share of workers in the financial sector in Luxembourg increases the 10th quantile of income distribution by 0.1%, while it increases the 90th quantile of income distribution by 0.4%. Overall, a rising curve means that an increase in the share of the financial sector pushes income inequality up. The shaded area represents the 95% confidence interval.

Source: Based on Fournier and Koske, 2012.

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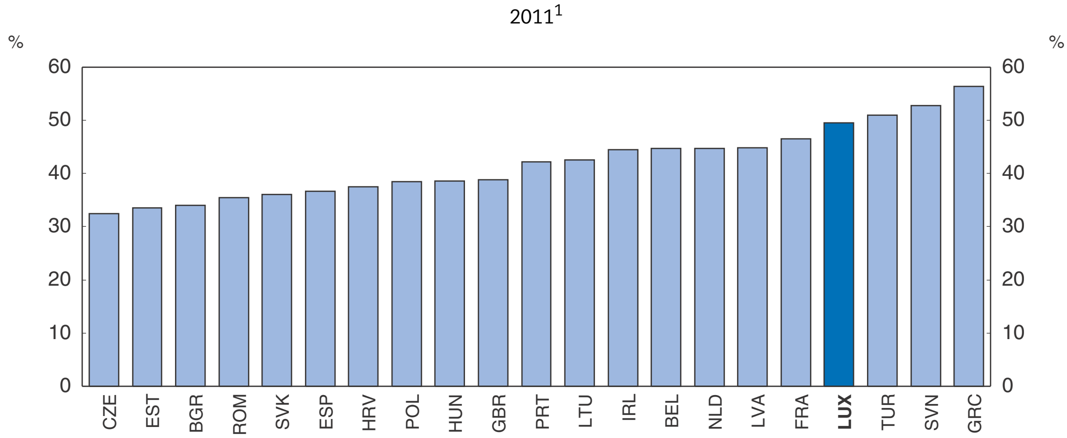
lower employment rate is associated with a higher market income inequality in most OECD countries (Hoeller *et al.*, 2012). Between 1985 and 2004, the employment rate as a share of the total working age population increased by 0.17% per year, which is one of the largest improvements within the OECD (OECD, 2011b), albeit from a low level. At the same time, market income inequality among the sole working population increased by less (0.12% per year). The first effect dominates: the inequality of labour income among the whole working age population decreased between 1985 and 2004.

The minimum wage is relatively high as a share of average wages in Luxembourg compared to other European countries (Figure 1.6). This suggests that reforming the setting of the minimum wage could improve labour market participation. If the minimum wage is above the wage level that would prevail in a perfectly competitive labour market, allowing the minimum wage rise less fast than average wages could increase employment (Bassanini and Duval, 2006). This could be achieved by setting up an independent council to advise on the minimum wage or by not allowing the minimum wage to rise as rapidly as average wages, as suggested in the 2010 *Economic Survey of Luxembourg* (OECD, 2010a). However, this is likely to increase the dispersion of wages among the working population (Checchi and Garcia-Penalosa, 2008, Koske *et al.*, 2012). Overall, the effect of a high minimum wage on income inequality remains ambiguous, while its effect on labour participation and growth is negative.

Figure 1.6. **The minimum wage as a percentage of average monthly earnings**

2011[1]



1. For Belgium, France, the Netherlands and Turkey, the data refer to 2010.

Source: Eurostat.

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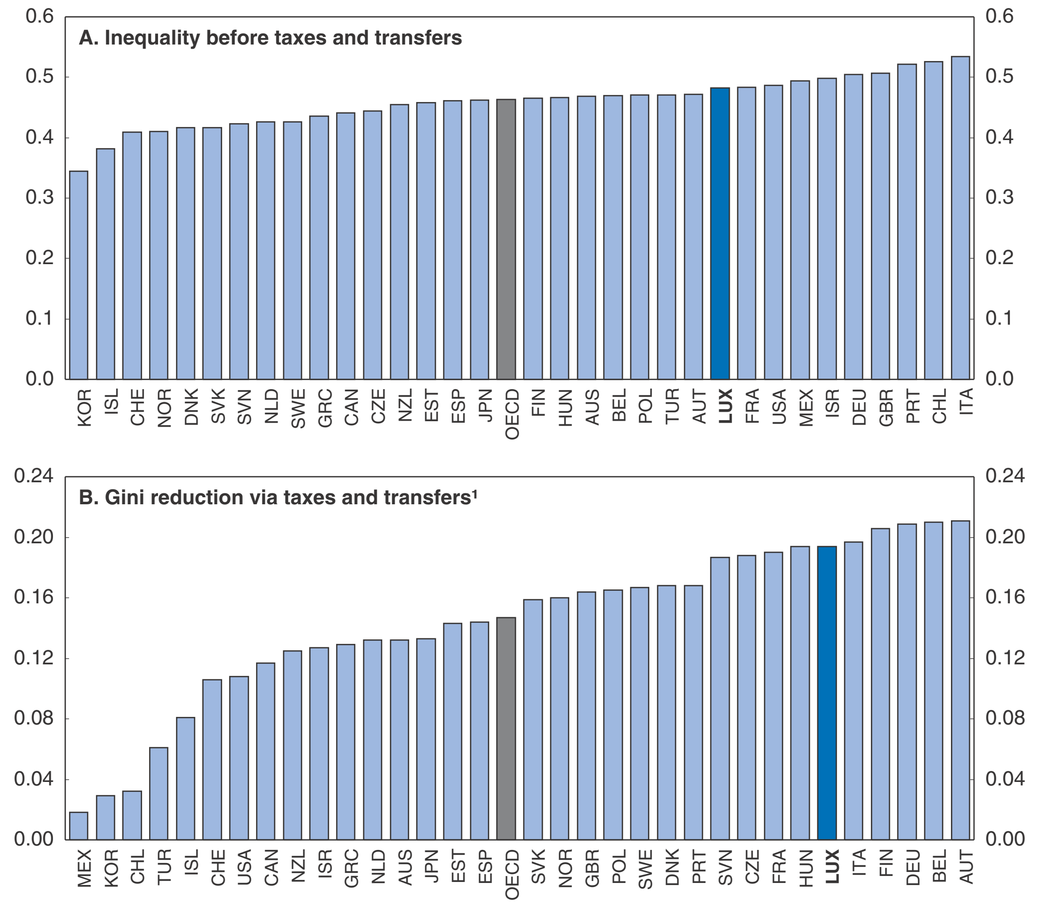
Substantial market income inequality is reduced by large taxes and transfers. The substantial gap between labour market income and disposable income, by nature, reflects the important role of financial redistribution in Luxembourg. Luxembourg ranks 6th among OECD countries in terms of social expenditure to GNI. The progressive tax system also contributes to redistribution. Overall, Luxembourg ranks rather high among OECD countries in terms of the reduction of the Gini coefficient before and after taxes and transfers (Figure 1.7).

However, in terms of relative poverty rates, Luxembourg is not far from the European Union average (Figure 1.8). Nordic countries such as Denmark or Sweden, which spend a comparable share of national income on transfers, yet reach lower relative

Figure 1.7. **Redistribution substantially reduces income inequalities**

Gini coefficient



1. For the panel B, the Gini reduction is derived as the level difference between the Gini coefficient before taxes and transfers and the Gini coefficient after taxes and transfers.

Source: OECD, Social and Welfare Statistics – *Income Distribution and Inequality Database.*

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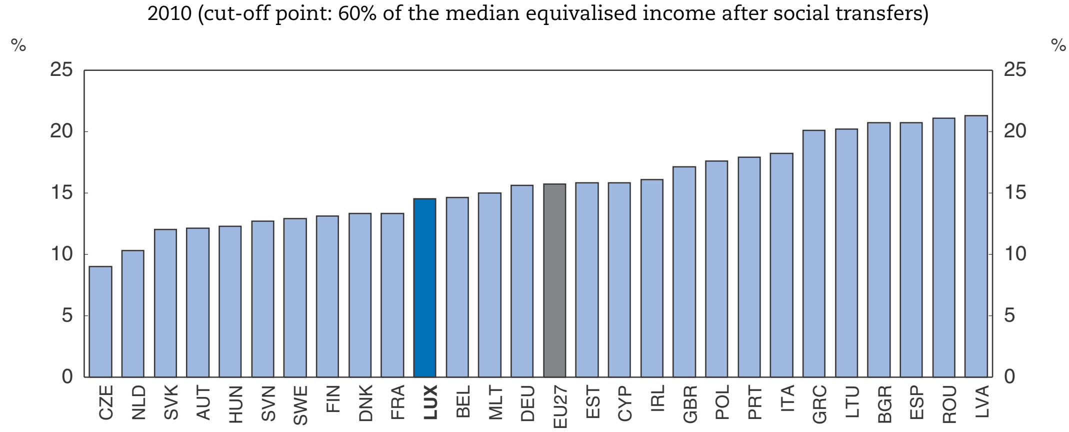
Figure 1.8. **Relative poverty rate is close to the European Union average**[1]

2010 (cut-off point: 60% of the median equivalised income after social transfers)



1. While 2010 data are shown here for sake of comparability, 2011 poverty data shows an improvement in Luxembourg, the poverty rate decreasing from 14.5% to 13.6%.

Source: Eurostat, *Income and living conditions Database.*

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poverty rates. Rather than the reduction of inequality *per se*, it is indeed the actual inequality, taking into account not only the government intervention but also the behaviour of the population, that really matters for standards of living. In particular, the poverty rate before taxes and transfers in Luxembourg is higher than the European average, suggesting that a sound transfer system should also provide incentives to work for the lowest skilled to increase their labour market income.

The large transfer system is poorly targeted

Most of transfers and tax rebates could be better targeted

The overall redistributive performance of the transfer system is dominated by the features of the largest programmes such as pensions, survivor's benefits or family allowances. These schemes are designed mainly to tackle specific social issues and are not primarily designed for redistribution purposes (Table 1.1 and Box 1.2). As a result, the progressivity of cash transfers is rather low in international comparison (Figure 1.9).

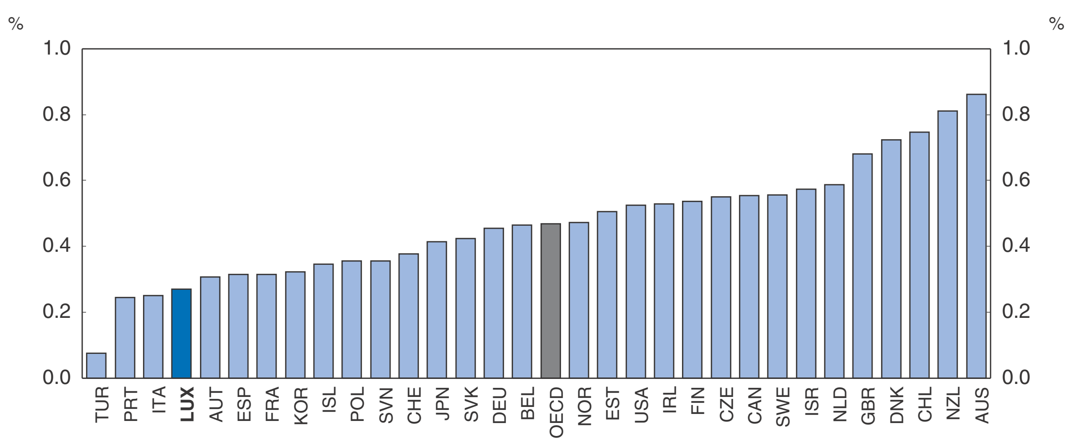
Table 1.1. **Cash transfers**

As a share of GNI, 2007

Benefits	Luxembourg	OECD average
Old age	6.0	6.2
Survivors	2.1	1.0
Incapacity related	2.3	1.9
Family	3.3	1.3
of which: RMG	0.5	
Unemployment	1.1	0.8
Other social policy areas	0.4	0.3
Total	15.2	11.3

Source: *OECD National Accounts Database* and Government of Luxembourg.

Figure 1.9. **The progressivity index of cash transfers is low**[1]



1. The progressivity index of cash transfer is the Kakwani index. A progressive index means that the cash transfers as a share of individual income is higher at the lower end of the income distribution. See Journard *et al.* (2012) for more details. While the whole population is considered here, the broad picture still holds with the working age population only.

Source: OECD, Journard *et al.* (2012).

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Box 1.2. **Overview of the welfare system**

The Luxembourg social system has a number of pillars. These include the insurance-based pension and unemployment benefit systems, which cover both resident and cross-border workers. While these are contingency-based and not aimed primarily at redistributing income, their effects in this regard are not altogether neutral. A second element is pure transfers, such as family and disabled allowances, and the minimum guaranteed income. These schemes are only for residents. The third element is in-kind benefits, notably access to health care and education.

The **pension** scheme is a pay-as-you-go system that redistributes income between generations. It redistributes little within generations (OECD, 2011c), but relative poverty is low among the older population. While the system is rather generous, its size remains contained today because the dependency is relatively low thanks to the inflows of cross-border workers. Nevertheless, survivors' benefits represent 2% of gross national income, which is twice as much as the OECD average.

Unemployment benefits are characterised by a very high replacement rate (from 80% to 85% of previous income, capped at 2.5 times the minimum wage), and it can be available to young people without work history. When this unemployment insurance expires after 12 months, recipients may switch to the minimum income scheme (*revenu minimum garanti*, RMG). Unemployment benefits are particularly generous for the youngest and the oldest among the working population. The young who have graduated can earn them even without a work history and the oldest workers benefit from extended benefits.

Family allowance is the most generous among OECD countries, designed to reduce the child related costs and support the birth rate. Most benefits are not means tested. The government provides a birth allowance (EUR 1 740.09) for all women and a maternity allowance (EUR 194.02 per week) for women who do not benefit from maternity leave. A monthly child allowance (EUR 185.60 for the first child, EUR 440.72 for a group of 2 children and around EUR 802.74 for a group of 3 children) is provided for all children below 18 years, resp. continued up to 27 years in case of secondary studies. This allowance is increased by EUR 16.17 for children older than 6 and by EUR 48.52 for children older than 12. From 2008, each tax-paying family receiving a family allowance – as well as families with an income below the taxation threshold – are entitled to the so-called "boni pour enfants" (child bonus). The amount payable is EUR 76.88 per child per month, along with family allowance. Family allowances for a family with two children older than 12 sum up to EUR 691.51 per month. Childcare service vouchers are provided for children aged below 12 according to an income scale taking into account of the income situation of the recipients, a system which enables a targeted approach towards households with a low income situation. Children in households benefitting from RMG or identified by the municipality as being at risk of poverty are entitled, respectively, to 25 and 15 gratuity hours of care per week and to 35 and 45 supplementary hours per week at low tariff of EUR 0.50 per hour.

The **minimum guaranteed income** (*revenu minimum garanti*, RMG, 0.5% of the Gross National Income) is designed to ensure to all residents* a universal minimum income that is regarded as a vital necessity. This subsidy, one of the most generous among OECD countries in relative terms, is given to residents aged above 25, the amount depending on household income. Single households with no income are entitled to EUR 1 283.24 per month, with an additional EUR 641 for a second adult and EUR 116.66 for

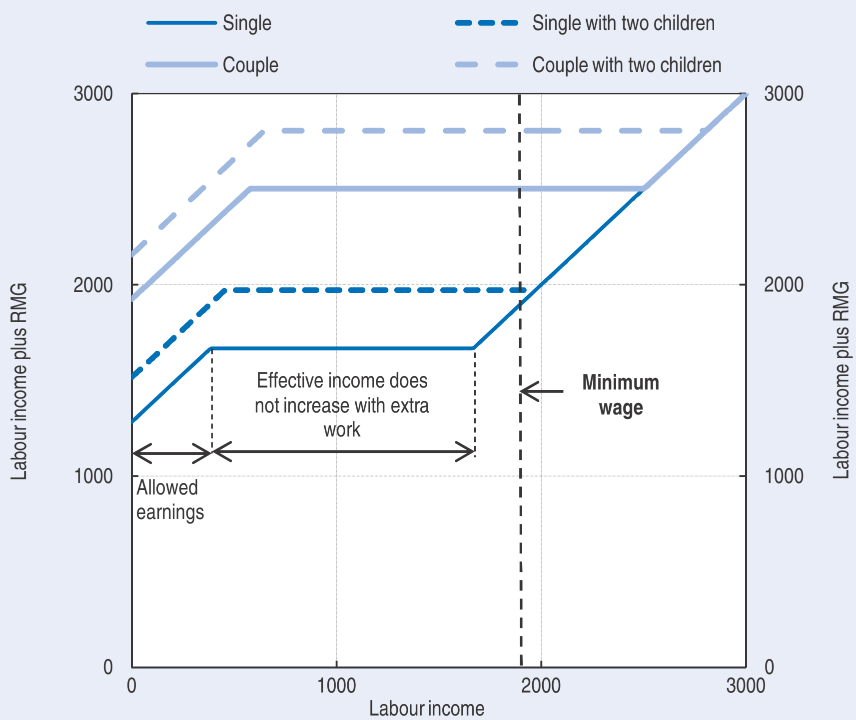
* The RMG is granted to a resident foreigner so long as he has lived in Luxembourg for at least five years during the last 20 years, or at least 3 months if one member of the family in an EU citizen.

Box 1.2. **Overview of the welfare system** *(cont.)*

each child. A rental allowance (maximum EUR 123.95 per month) adds on top of the RMG if rent is due for an occupied flat. Work earnings are not taken into account up to 30% of the RMG (Figure 1.10, rising part of the line on the left hand-side). By contrast, when earnings exceed 30% of the RMG (and below 130% of the RMG), each euro earned is subtracted from the allowance, so that the additional income from extra work is reduced to zero (Figure 1.10, flat part of the line). Any capital income is subtracted from the subsidy, starting with the first euro earned. Furthermore, the wealth of the household, converted into its equivalent life annuity, is also added on top of household income to assess total eligibility.

Figure 1.10. **The RMG reduces the incentive to work**

Gross income, household with neither capital income nor wealth (October 2011 scale)



Source: *Fond National de Solidarité*, OECD estimates.

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The RMG is divided into two schemes: an “insertion allowance” and a “complementary allowance”. The individual insertion allowance is linked with labour activation such as training or community work. The complementary allowance, aiming at compensating the difference between the statutory limit of the RMG and the sum of the household resources, is granted also to those who cannot take part in such activities. Roughly 7 out of 10 adult RMG beneficiaries are exempted from activation policy, either because they are already in full-time training, or because they take care of dependents (their children in most cases), they are too old or they cannot work for medical or social motives. Among those who are not exempted, 63% of beneficiaries are taking part in labour activation activities (SNAS, 2012), and the unmotivated refusal of labour activation may lead to the withdrawal of the allowance. Furthermore, to facilitate activation measures and promote labour market participation of (lone) parents, the childcare service voucher (*chèque service accueil*) provides discounted access to childcare facilities to RMG beneficiaries among others (They benefit from 25 hours for care per week that are free of charge and reduced tariffs, for those hours of care exceeding 25 hours per week).

Box 1.2. **Overview of the welfare system** *(cont.)*

Parents who take care of their children during early childhood are entitled to an education allowance that amounts to EUR 485.01 if they do not work, or EUR 242.51 if they work part-time. This benefit, which may come on top of the RMG, substantially reduces the size of allowed labour earnings.

Other benefits include a gross disabled allowance equal to the RMG allowance. A dependency insurance is granted to those who cannot carry out "activities of daily living" on their own. Overall, incapacity-related spending is much higher than the OECD average but slightly below that in Nordic countries.

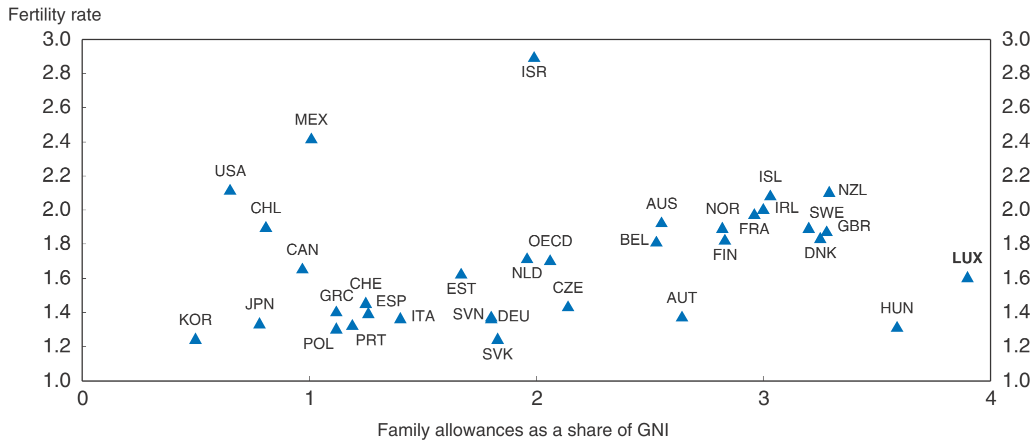
In Luxembourg, children are legally entitled to receive family allowances, which explains why parental income is not taken into consideration in the legal attribution and determination of family allowances. It is the child's personal right related to its place of residence that matters. As a result, these family allowances, that are large by OECD standards, are universal benefits. Such a design, which is more expensive and less redistributive than means-tested allowances, is also not optimal in terms of fertility incentives. Although some analysis suggests that financial incentives can have an impact on fertility, the effect is rather small (Gauthier and Hatzius, 1997) and fades with the level of income (Cohen, 2007). In addition, there is no correlation across OECD countries between the size of family allowances and the fertility rate (Figure 1.11).

Successive reforms, such as the introduction of a child bonus (*boni pour enfant)* in 2008, have tackled the anti-redistributive feature of the system by making the family allowances independent of income. Still, as the size of the family allowances is high relative to the overall size of the tax and transfer system, the family allowance benefits largely to the higher end of the income distribution, with no clear impact on fertility. As a result, the tax wedge, that encompasses all taxes and transfers that contribute to the gap between the labour cost to the employer and disposable income, is much smaller for those who have children. For instance, the difference between a single person's tax wedge and the tax wedge for a family with two children is the largest among OECD countries. All this suggests that there is room for reducing family allowances for those who need it least, giving space to provide more for poor single parent families. Furthermore, the design of a better targeted allowance matters: the reduction of the allowance with rising income should be smooth so as to avoid sharp threshold effects to ensure that improved targeting does not substantially increase marginal tax rates.

Higher but more targeted benefits could be financed by removing poorly targeted tax expenditures that alter the progressivity of the income tax (Joumard *et al.*, 2012). These include tax benefits that encourage home ownership (mortgage interest rate and low taxes on principal residence capital gains), which in addition have undesirable side effects on raising housing prices. As property wealth is higher among high income earners (Figure 1.12), such a scheme benefits the rich disproportionally. Life-insurance tax rebates are also likely to benefit more the rich which, on average, save more. Therefore, the relatively low tax rate of long term capital gains is likely to have a large regressive impact, as capital gains represents a large share of top incomes earnings in Luxembourg (STATEC, 2011) as in most other OECD countries (Hoeller, 2012). Other tax expenditures have also undesirable side effects, such as the deductibility of commuting costs that encourages

Figure 1.11. **Large family allowances have a weak correlation with fertility**

2007



Source: OECD, *Social expenditure Database* and the World Bank.

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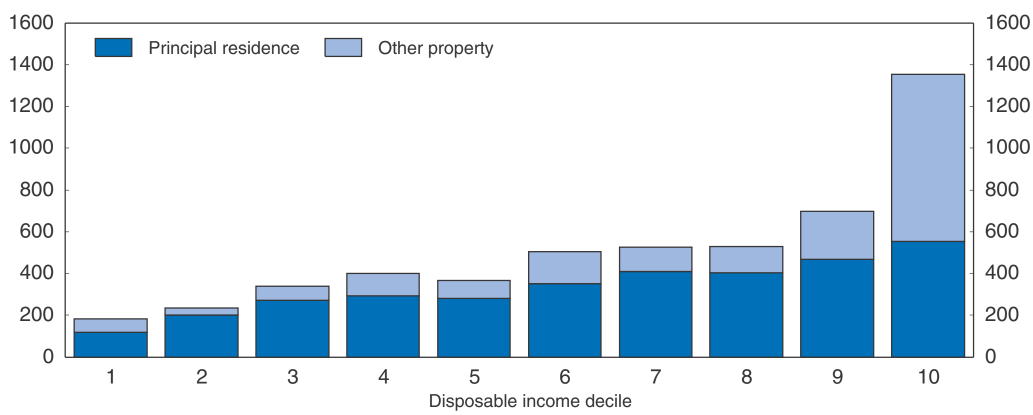
Figure 1.12. **Property wealth and disposable income**[1]

2007 wealth in thousands of euros



1. According to 2010/2011 data from the survey 2010/2011 (BCL, 2012), the mean value of the principal residence ownership more than triples from the first to the fourth income quantile (from EUR 207 000 to EUR 748 000), suggesting the link between income and property wealth may have even strengthened in the recent years.

Source: Institut national de la statistique et des études économiques (STATEC) (2011), Cahier Économique, Rapport Travail et Cohésion Sociale 2011 (based on the Luxembourg Wealth Study).

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urban sprawl. As a result, the effective marginal tax rate among the top ten percent of earners, as approximately inferred from the EU-SILC survey, is much smaller than the nominal top marginal tax rate. Estimates from the EU-SILC survey also suggest that the rate is close to the effective marginal tax rate among the decile immediately below. Reviewing, simplifying and reducing all these tax expenditures would not only increase the progressivity of the income tax, but foster the efficiency of a system that has become very complex.

Housing policy does little to reduce housing shortage as the supply side is rigid

Public housing policy is not very well targeted and appears not to solve the housing shortage problem (Box 1.3). Rental applications are more numerous than available dwellings: more than 1 200 applicants are queuing in the *Fonds du Logement* waiting list, which is long relative to turnover. Admission criteria are flexible at the cost of lower transparency and waiting time may vary across applicants as matching hinges on households' specific needs. This raises a fairness issue as those who have had the chance to get public housing have a significant advantage over those who have not. Households that are not poor may benefit from this scheme, as the rents rise little with income. Raising rents for those who are close to or above the median income would encourage such renters to switch to the private housing market, and hence free housing for those who need it most. Better targeting of housing subsidies can, on the other hand, have negative side effects on work incentives. As the rent increases with income, this scheme raises the effective marginal tax rate. All in all, providing well designed means tested cash transfers disregarding the use of funds, rather than subsidising housing, would make the system simpler and less distortive.

Furthermore, housing rent subsidies, which 14 000 households receive, cannot reach their goal to make housing more affordable as they tend to push house prices up when housing supply is rigid. Even if the current level of construction of new dwellings is rising, substantial barriers remain for increasing supply, many of them being policy-induced (As discussed in the 2010 *Economic Survey of Luxembourg*, OECD, 2010a). When supply is rigid, support of demand does not change the affordability of housing as the subsidy is fully transmitted into rent prices. In other words, that means that the subsidies are actually redirected toward landlords, as evidenced in the empirical literature (see Fack (2005) for the case of rent subsidies in France).

Box 1.3. **Social housing: attribution and rent computation**

Public housing is granted by the *Fond du Logement* or by other public bodies, such as municipalities. Attribution and rent computation are set by the implementing regulation of the 1979 law on social housing as updated in 2009.

Candidates provide relevant information about their income, dwelling and the composition of the household without a specific income threshold. This information is supplemented by an interview and a visit in the current dwelling of the applicant. Attribution depends on vacancies matching the household composition. For each vacancy, priority depends on the current dwelling of the applicant: first served are those who have no dwelling in the near future and those who live in substandard dwellings.[1]

The rent is the sum of two components. One is linked to the size of the dwelling and a second linked to income after taxes and transfers. The first component is 86 cents per square meter and per month, which is very small in a country where rents average more than 16 EUR per square meter.[2] The second component is 6% of income of a candidate who earns the RMG, or EUR 83 per month, and it increases steadily with income and decreases with the size of the household. To take a break-even example, a couple with 2 children with a net income of EUR 5 000, or roughly twice the median income, would pay a rent close to the average market price for an 80 square meter flat. Children's earnings are not fully taken into account in the calculations to reduce the disincentive to enter the job market. For retirees and the disabled, the computation puts a higher weight on the size of the apartment, weakening the link between the rent and the level of income.

1. Prior to 2009, this rule was tighter: only the four applicants with the lowest income per consumption units could be considered.
2. The examples are built on 2011 indexes and prices.

Public higher education spending is not targeted to disadvantaged families

The high share of public funding of higher education is not means tested even though the share of students from advantaged socio-economic backgrounds is relatively high. For instance, the University of Luxembourg is free for residents and charged EUR 200 per semester in 2011 for non-Luxembourg students, which is much lower than the cost. Although higher tuitions may discourage students from poor families from attending, evidence suggests that the link between socio economic background and access to higher education is primarily determined by cognitive development in early childhood and the foundation laid during school (Carneiro and Heckman, 2003). Furthermore, negative effect of tuition fees on participation can be fully offset through improvements in the financial support for students (Heller, 1999; OECD, 2008). Reforming the financing of higher education by a system of fees supported by loans and grants to needy students would help achieve redistribution goals. Loan repayments could be linked to future incomes, as occurs in Australia.

Insufficient work incentives within the minimum income scheme

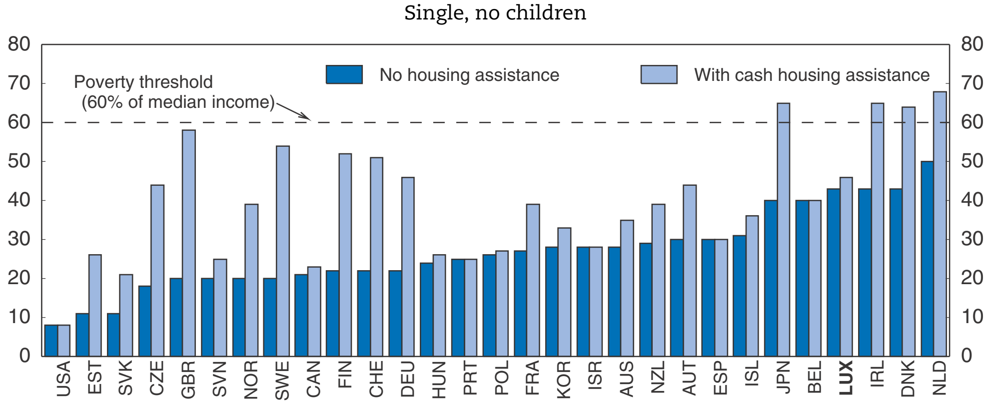
If most transfers are poorly targeted, the minimum income scheme, which represents roughly 3% of overall transfers, is well targeted to tackle extreme poverty, but at the cost of sharply reducing work incentives (Box 1.2). This gives to those who have no or little income a relatively high subsistence benefit (Figure 1.13). However, the allowance remains below the poverty threshold and the beneficiaries could be better included within society if they were to go back to work.

The design of the Minimum income scheme (Revenu Minimum Garanti, RMG) implies a high marginal tax rate for the poorest (Box 1.2). In particular, there are cases in which the marginal tax rate is equal to 100%, meaning that working one hour more ultimately yields nothing. The RMG should be reformed to reduce this effective marginal tax rate (*e.g.* like the introduction of the *Revenu de Solidarité Active* – RSA – in France, see Box 1.4). With a

Figure 1.13. **Income levels provided by cash minimum-income benefits**[1]

Net income value in percent of median household income, 2010

Single, no children



1. Median net household incomes are for a year around 2008, expressed in 2010 prices and are before housing costs (or other forms of "committed" expenditure). Results are shown on an equivalised basis (equivalence scale is the square root of household size) and account for all relevant cash benefits (social assistance, family benefits, housing-related cash support as indicated). US figures include the value of SNAP ("food stamps"), a near-cash benefit. The cash housing assistance indicates the range of benefit levels in countries where they depend on actual housing expenditure. The bottom end shows the situation where no housing costs are claimed while the top end represents cash benefits for someone in privately-rented accommodation with rent plus other charges amounting to 20% of average gross full-time wages.

Source: OECD, *Income distribution Database*.

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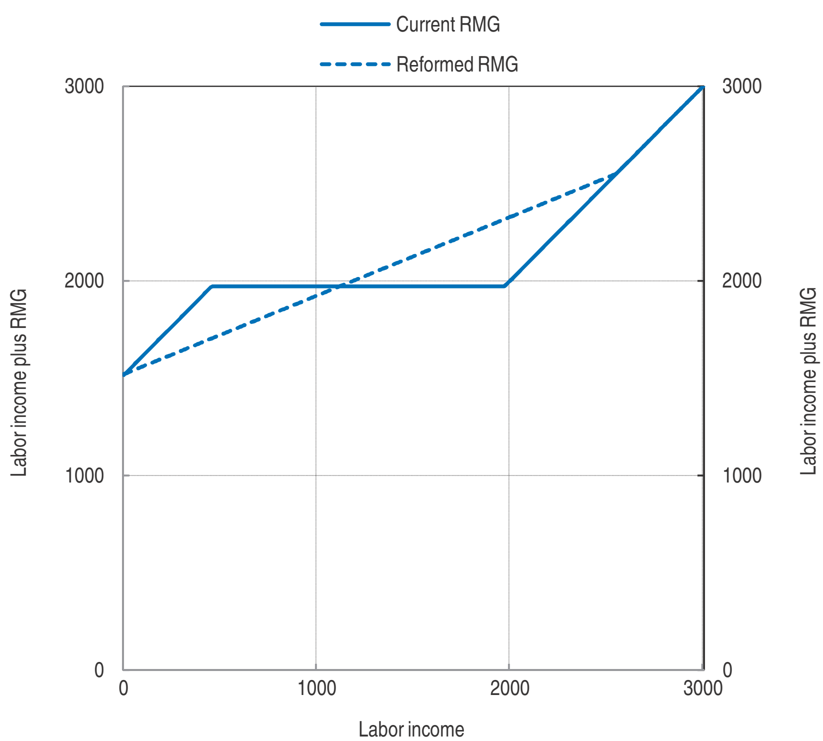
Box 1.4. **What can be learnt from the introduction of the RSA in France?**

Both the current RMG in Luxembourg and the former *Revenu Minimum d'Insertion* (RMI) in France were characterized by 100% effective marginal tax rates for certain cases. While the optimal marginal tax rate should be set in line with marginal productivity (Bourguignon, 2001), the 100% rate must be too high since it suppresses yields from any relatively small additional amount of work. Marginal tax rates that deter work were sharply reduced when the RMI was replaced by the *Revenu de Solidarité Active* (RSA): the amount of the transfer now fades out smoothly as the income increases, so that the marginal tax rate is 38%.

Such a reform has two effects that are likely to reduce poverty. First, poverty is reduced though a mechanical effect: the working poor add to their market income an in-work benefit. Second, as work rewards more, it can increase the share of beneficiaries who increase their work (or who declare underground activities). However, the behavioral effect has been small at best (Bourguignon, 2011), and was much smaller than the effect of the macroeconomic crisis that happened at the same moment. The complexity of a system that combines two benefits called "RSA socle" and "RSA d'activité", the existence of other means tested benefits that may also discourage work and the weakness of activation policies are explanations of this small behavioral effect.

similar reform in Luxembourg, the RMG transfer would decrease more smoothly with labour income (Figure 1.14). Such a broad reform is consistent with the recommendation of the 2010 *Economic Survey of Luxembourg* to include a larger system of in-work benefits (OECD, 2010a). This can enhance welfare (Immervoll *et al.*, 2005) and could be financed by a reduction of tax expenditures for high income earners.

Figure 1.14. **Smoothing the RMG scheme**



Source: Fond National de Solidarité and OECD estimates.

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Reforming the RMG can be done at a reasonable cost. A simulation on individual data suggests that replacing the current share of allowed earnings by an amount of allowed earnings that represent 40% of labour earnings, with no ceiling, would increase the overall cost of the RMG scheme by only about 0.05% of GNI if one assumes for simplicity that work behaviour does not change. Assuming further that 5% of those who do not work switch to a minimum wage job, the reform is approximately cost neutral. However, such a reform would imply a loss of net income for singles with two children who earn less than EUR 1 000 per month. Therefore, a combination of a raising the RMG by 16% for those who have no other earnings, and setting a 40% rate for allowed earnings, would ensure that no one looses from the reform. This would increase the overall cost of the RMG scheme by roughly 30% (or 0.15% of GNI), assuming again that 5% of those who do not work at all find a minimum wage income. On top of that, financial support for single parent families could be further enhanced to target transfers toward those who need it most.

A reform of the RMG could be combined with a simplification of various miscellaneous benefits and reforming active labour market policies (ALMPs) to make the whole system simpler and more efficient in enhancing work incentives and opportunities. A good example of such a general reform is the introduction of the Universal Credit in the United Kingdom that replaces a patchwork of transfers with a more universal benefit while at the same time ensuring that effective marginal tax rates do not deter work.

ALMPs are sizeable in Luxembourg, but there has been “no systematic favourable impact” (Grubb, 2007) and there is too little early intervention before unemployment risks become entrenched, as discussed in the 2010 *Economic Survey of Luxembourg* (OECD, 2010a). The ongoing assessment of ALMPs should be used to scrap inefficient schemes and to further develop good practices. This is important, as many recipient of the RMG can face strong difficulties to compete in the private labour market. For instance, programmes like “Affectation Temporaire Indemnisée” that subsidise firms temporarily employing former RMG recipients can have ambiguous effects: it may prevent firms from hiring those who do not fulfil the criteria, pushing some low skilled workers outside the labour market. Priority could rather be given to other existing programmes that increase employability, such as training programmes. The programme “aide au réemploi”, could also be encompassed in the new reform. Employees who accept a new job with a lower wage earn 90% of the previous wage during 4 years, whatever the employer pays 90% or half of the previous wage. There is thus an incentive for firms to pays wages as low as possible to maximise the burden supported by the government. This side effect has to be addressed.

The income tax adds further disincentive to work for second earners, because it is a progressive tax built on the sum of earnings of a couple. Second earners thus face a higher marginal tax rate. This marginal tax rate further increases with the income of their spouse, albeit it is mitigated by an earned income allowance of EUR 4 500 where both spouses have earned income and are taxed jointly. Kleven, Kreiner, and Saez (2009) find that in some circumstances, having a lower marginal tax rate for second earners (relative to the tax rate they would face if they were a single person) can raise work incentives. This suggests that removing the joint-taxation would further increase labour participation and hence reduce individual labour income inequality.

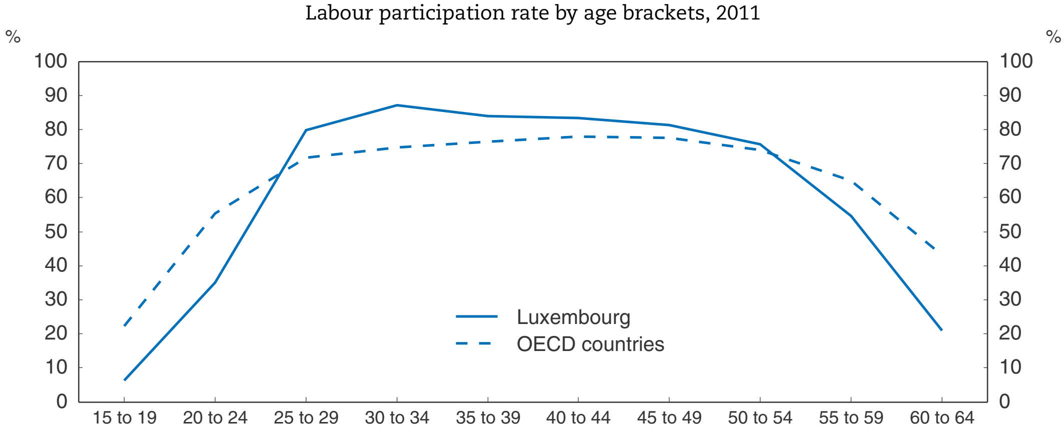
However, the effect of removing joint taxation on household disposable income is ambiguous. Stay-at-home spouse situations are very diverse. Some of them belong to poor households while others benefit from large transfers within the household, depending on the income of the first earner. Removing the joint taxation can thus increase labour participation for second earners that are poor, but also for those that are better off (the latter would otherwise decide not to work because of the high level of income of the spouse). At a minimum, such a change would reduce within household inequality while boosting activity via a higher labour participation.

Better work incentives are also important for the youngest and the oldest, whose participation rates are low (Figure 1.15). For younger and older workers, unemployment benefits are particularly generous. Young people can benefit from unemployment benefits 26 weeks after they have completed their education in most cases. These unemployment benefits for the young are poorly targeted, as benefits are granted whatever their parents' income, and hence disregarding intra-family transfers or the fact that they may live at their parents'. For the unemployed older than 55, a longer extension of the benefit period than for other workers is likely to trap this population outside employment.

Incapacity related spending is high (Figure 1.16), but its size in terms of share of GNI declined recently. This decrease comes from stricter eligibility criteria (OECD, 2009) to better target those who really need it. However, the substitution between unemployment benefits and incapacity benefits is high in Luxembourg, as in most OECD countries (OECD, 2009), highlighting the particular care that is needed to help those who lose these benefits to enter the labour market.

Figure 1.15. **Participation rates are low for the youngest and the oldest**

Labour participation rate by age brackets, 2011



Source: *OECD Employment Outlook Database.*

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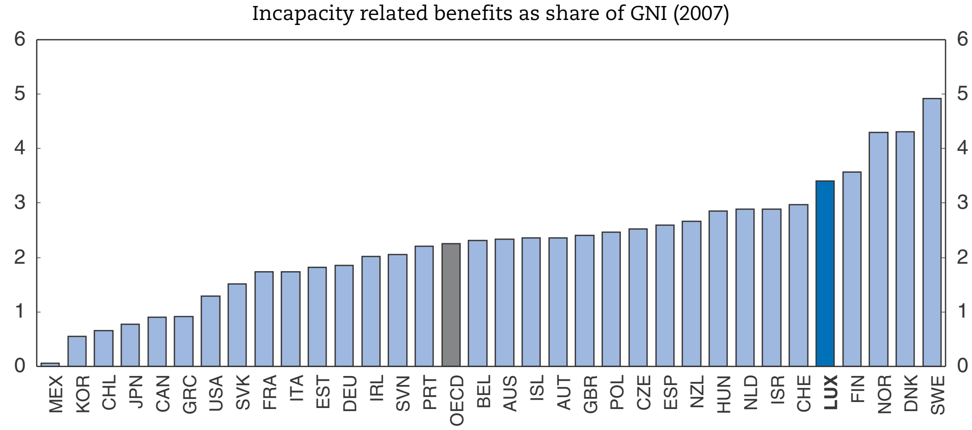
Figure 1.16. **Incapacity related benefits are high**

Incapacity related benefits as share of GNI (2007)



Source: *OECD Social Expenditure Database.*

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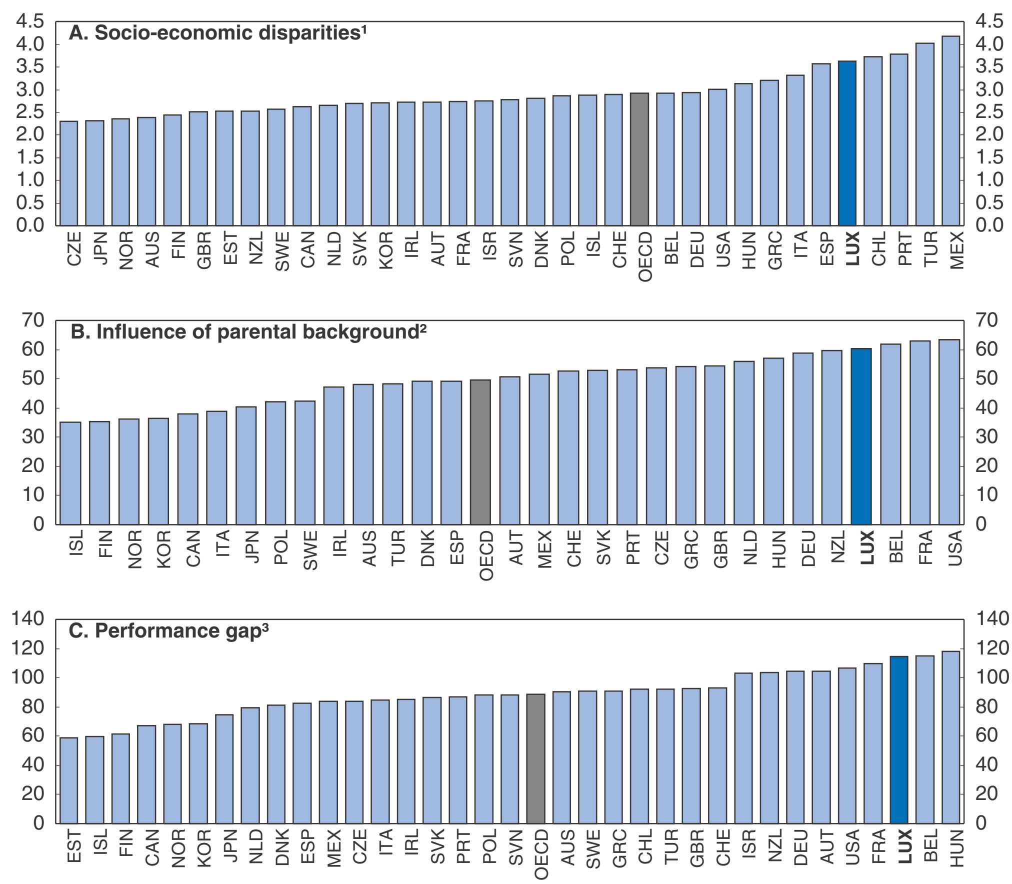
The underperforming education system does little to address inequality

A well-performing education system improves labour market outcomes, reduces income inequalities, and promotes social cohesion. Luxembourg ranks 34 out of 36 countries in terms of years in education and 29 out of 36 countries in terms of students' skills according to the Better Life Index (OECD, 2011a). Education outcomes are unevenly distributed and about a quarter of students lack basic literacy skills, as measured at the age of 15. Socio-economic inequality among students is one of the highest in the OECD, well-above neighbouring countries and second only to Portugal within Europe (Figure 1.17, Panel A). The existing income disparities are reinforced by the poor labour market outcomes faced by the low-skilled, with three times higher unemployment and about half the earnings of the high skilled. Strengthening education outcomes with a particular focus on the most vulnerable groups would improve social cohesion, and promote stronger civic and social engagement. Moreover, higher education levels enhance well-being through higher living standards, better health and more opportunities for social relations (OECD, 2010b).

Figure 1.17. **Socio-economic background and education performance**



1. Difference between 95th and 5th percentile of the PISA index of economic, social and cultural status (ESCS Index).
2. Relationship between student performance in science and socio-economic background taking cross-country distributional differences into account.
3. Difference in performance on the reading scale by the top and the bottom quartiles of the national quarters of the ESCS index.

Source: OECD (2010), PISA 2009 Results: Overcoming Social Background: Equity in Learning Opportunities and Outcomes (Volume II), Causa, O. and C. Chapuis (2009), Equity in Student Achievement Across OECD Countries: An Investigation of the Role of Policies.

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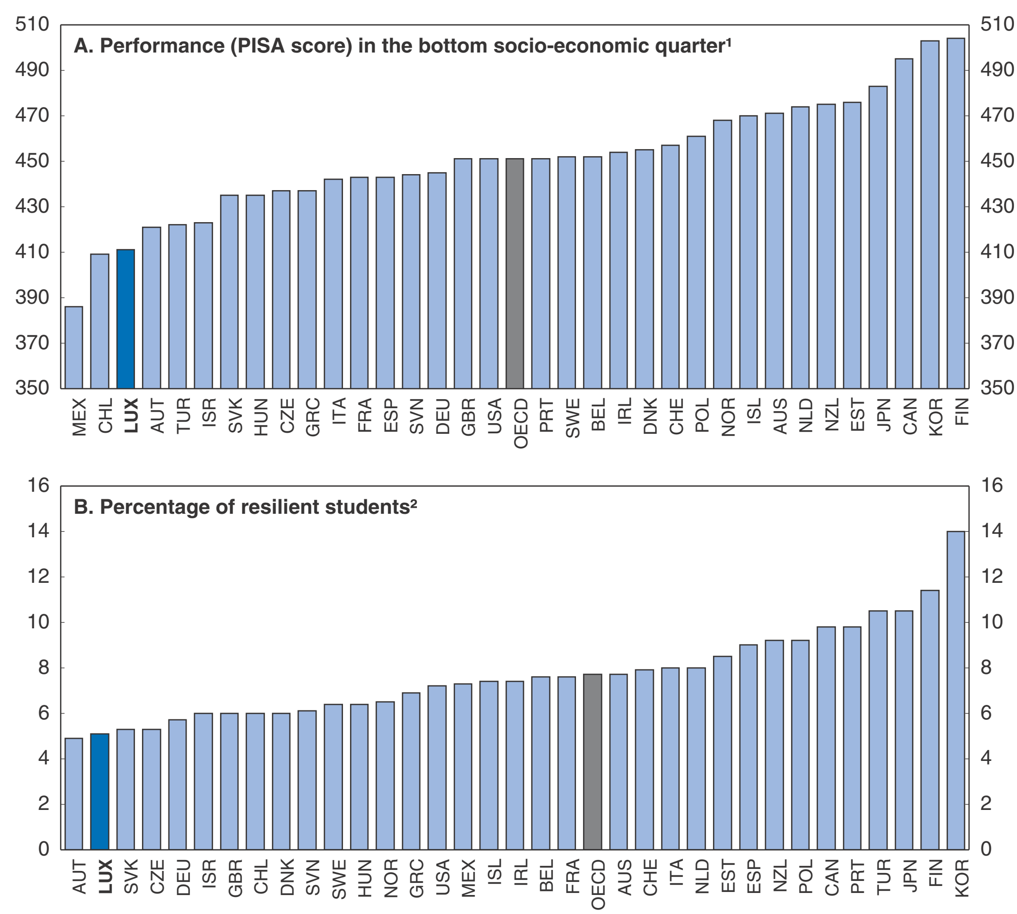
Parental background and educational performance are strongly linked in Luxembourg (Figure 1.17, Panel B). Indeed, the performance gap faced by students in the bottom socio-economic quarter, compared to those in the top, is equivalent to almost three years of schooling. This gap is one of the highest among the OECD countries (Figure 1.17, Panel C), and it is of particular concern, as Luxembourg has a relatively high share of disadvantaged students, almost twice the rate registered in some neighbouring countries such as Belgium or Germany. As a result, educational persistence across generations is high, only surpassed by a few countries in peripheral Europe, thereby contributing to the rather limited intergenerational social mobility (OECD, 2010c).

However, a number of countries with similar or higher proportions of disadvantaged students have succeeded in not letting them fall behind, hence achieving a better performance. For example, in Portugal or Poland pupils from the bottom socioeconomic levels perform better than their counterparts in Luxembourg, as indicated by reading scores that are better by the equivalent of an additional year of schooling (Figure 1.18,

Figure 1.18. **Disadvantaged students are particularly vulnerable in Luxembourg**



1. Performance refers to the reading scale. Socio-economic background is measured through the PISA index of economic, social and cultural status (ESCS).
2. A student is classified as resilient if he or she is in the bottom quarter of the ESCS in the country of assessment and performs in the top quarter of students from all countries after accounting for socio-economic background.

Source: OECD (2010), *PISA 2009 Results: Overcoming Social Background: Equity in Learning Opportunities and Outcomes* (Volume II).

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Panel A). In particular, the education system in Luxembourg exhibits very low levels of resilience, namely the proportion of disadvantaged students that performs better than predicted by their socio-economic background (Figure 1.18, Panel B).

The large immigrant community tends to fall behind

Performance is influenced by the heterogeneity of the population. Students with an immigrant background account for over 40% of pupils. Their proportion declines as the educational level advances: the share stands at around 50% in pre-primary and primary education, but falls to below 20% in the general secondary track, which leads to tertiary education. Students with immigrant backgrounds have a poorer performance than natives, a gap that is wide by international standards. The results are largely explained by student's socio-economic characteristics. Foreigners are 60% more likely than natives to hold at best lower secondary education, and their median income is half of that enjoyed by Luxembourgers. Indeed, controlling for socio-economic background reduces the performance disparities between immigrant and native students, pushing the score difference below OECD levels (OECD, 2012a).

Mother tongue and country of origin are important determinants of immigrant student's performance, especially for newer entrants. Immigrants of French origin perform better, as they tend to enjoy a higher socio-economic status, and French is the instruction language in general secondary education. By contrast, students from former Yugoslavia, who are many in Luxembourg, face stronger headwinds, as they need both to overcome the language barrier and to adapt to higher educational standards. The average difference in performance with respect to Luxembourg amounts to the equivalent of one school year. However, alternative host countries for students from former Yugoslavia, such as Austria, Denmark, Germany or Switzerland with potentially fewer languages of instruction, succeed better to reduce these headwinds. In Luxembourg, institutional arrangements to facilitate adaptation should be improved. For instance Luxembourg should increase the share of immigrant students who attend language remedial classes, which is low by international standards (OECD, 2012a). The level of language command is a key issue, as there is a rather large difference in learning achievements between native students whose mother tongue is the language of instruction, and first-generation immigrants who speak a different language at home. This finding is quite robust: even when considering children with similar socio-economic backgrounds, the learning achievements depend on the mother tongue.

The trilingual system does not provide enough language support for vulnerable groups

The importance of mother tongue is not surprising, as Luxembourg is a trilingual country, where the instruction language depends on the educational level. Luxembourgish is taught in pre-primary school, where language support is very scarce (Ministre de l'Éducation nationale et de la Formation professionnelle, 2012a). The language of instruction in primary education is German, in which almost one third of immigrant students have limited proficiency. Although less than 5% of them go through a preparatory phase, they get full immersion with two hours per week of language support, which increases to three to nine hours per week in lower secondary school. In upper-secondary school those students enrolled in vocational training continue using German and French is used in the general secondary track. Despite the complexity of the system, the share of first-generation immigrant students attending language remedial classes is one of the lowest in the OECD, 6% compared to the average 16% (OECD, 2012a). Better language skills could not only raise education outcomes, but also have spill-over effects as it would enhance full participation in society and avoid discrimination, also providing better opportunities to access the labour market.

The educational reform approved in February 2009 includes measures to improve language support. In the early and pre-school level classes that have a high proportion of Portuguese children, who represent over half of foreign students, a Portuguese-speaking person may be called upon to collaborate in the class on a regular basis for a certain number of hours per week. Immigrant pupils who speak neither French nor German are not granted help in the general secondary education, which is reserved to pupils who have very good knowledge of both. However, they do get support in technical secondary education, as integration classes exist for students who have little or no proficiency of the languages, but who have acquired a good academic level in their native country. They receive language support in French and German, and may get assistance from intercultural mediators. While similar measures would be welcomed in general secondary education, the project of reforming secondary education is still at a preliminary stage.

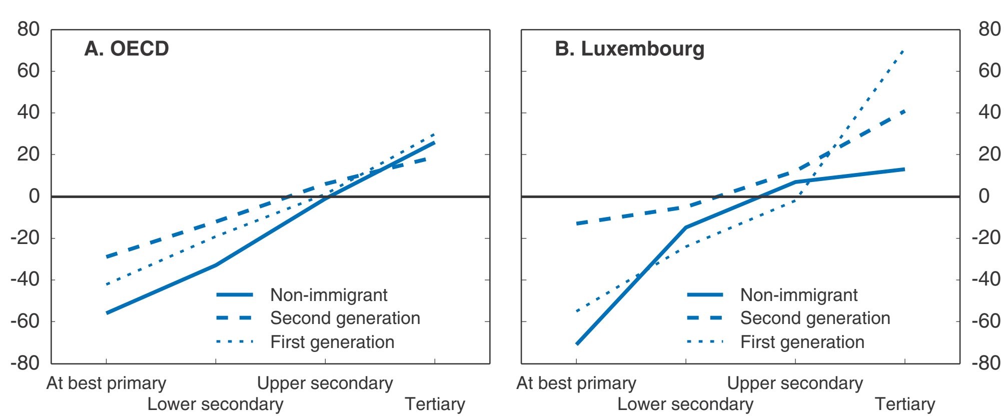
Remedial classes are too few

In the same vein, parental educational attainment is related to their childrens' learning outcomes. In Luxembourg, many immigrant mothers hold significantly less than compulsory education levels, with more than 30% having at best primary education, which is very low in international comparison. This is important as the link between performance and maternal education is especially strong at low levels of education (Figure 1.19). Targeted support should be reinforced for immigrant students, as parental support may not suffice given the additional challenges they face to adapt to a new educational system and possibly to an unfamiliar language of instruction.

The new primary education reform introduced support courses for students with academic difficulties. These support courses represent 5% of the total number of hours taught, and teachers have room for decisions on their modalities. While such discretion is

Figure 1.19. **Average reading performance across mother's education**

Score difference with respect to the average of each group



Source: OECD, Untapped skills: realising the potential of immigrant students (2012).

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welcome to match courses with local needs, sufficient monitoring should be ensured so as to promote good practices in terms of content, group size, duration and time during the day.

Another policy measure that helps to bridge the performance gap between native and immigrant students is early education, which not only improves overall learning performance, but also yields higher benefits for immigrant students as it increases exposure to the language of instruction. Moreover, evidence suggests that early development of competencies is likely to make future investment in skills more effective (OECD 2010b, Chetty *et al.*, 2011). In Luxembourg compulsory education starts at the age of 4, which is rather early by international standards. Children aged 3 may attend early childhood education, whose enrolment rates have been rising steadily to 80%. This has greatly benefited from the recent educational reform, which obliges municipalities to offer early education, although attendance remains non-mandatory for children.

For children aged under 3, crèches are available upon payment, and fees usually depend on parental income. Additionally, tax rebates may also be granted, including for costs pertaining to childcare in crèches, day care centres and recognised collective nurseries. A desirable side effect of these schemes is that they are likely to reduce the gender gap by fostering female participation and reducing the occurrence or length of career breaks.

Resources are not targeted to more socio-economically disadvantaged school

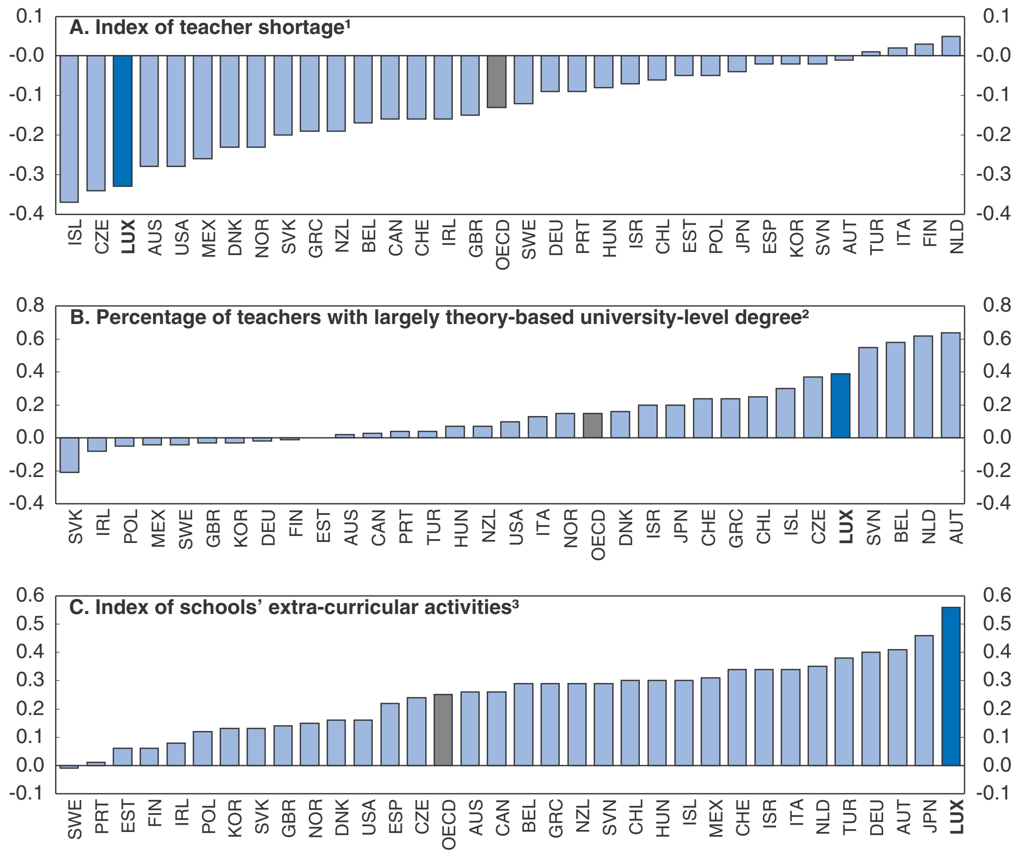
Education spending per student stands at around EUR 15 000 per student, the highest in the OECD and more than double the average. However, socio-economically advantaged schools tend to have more educational resources than schools with more students from disadvantaged backgrounds. In fact, there are strong relationships between schools' socio-economic profile and resources, as measured in terms of teacher shortages, extracurricular activities and teachers with university level degree (Figure 1.20). The performance of schools in more advantaged areas tends to be better (Figure 1.21).

Fairer access to educational resources should be ensured, regardless of the student's individual characteristics. The 2009 reform of pre-primary and primary school to tackle these issues by allocating funds to municipalities according to a set of socio-economic indicators, with the allocation designed to favour disadvantaged students. This measure is being introduced progressively over a 10-year period, starting in September 2010. This is a welcome initiative, and should be further extended to cover secondary education.

Moreover, teacher shortages could be alleviated by loosening the language command requirements in the recruitment of teachers. Fluency in the three official languages is required, but most of the otherwise well qualified foreign candidates cannot fulfil this requirement. This can create recruitment pressures as the pool of teachers from Luxembourg is relatively small. For instance, there were 240 vacancies for primary education in 2012, compared to 116 graduates from the Bachelor's in Educational Sciences (the teachers' training degree) in 2011. Accepting teachers who do not command the three languages in fields for which this is not needed in practice would help to meet hiring needs while keeping the high recruitment standards. Furthermore, there may be a positive side effect for immigrant pupils who are not trilingual: they would find it easier to identify themselves with their teachers.

Figure 1.20. **Socio-economically advantaged students attend schools with more resources**

Correlation between the schools' average socio-economic background and selected indicators



1. Derived from four items measuring school principals' perceptions of potential factors hindering instruction at their school. Higher values indicate higher teacher shortage at a school.
2. Among all full-time teachers. Theory-based university-level degree refers to ISCED 5A degrees.
3. Higher values indicate more activities.

Source: OECD (2010), *PISA 2009 Results: Overcoming Social Background: Equity in Learning Opportunities and Outcomes* (Volume II).

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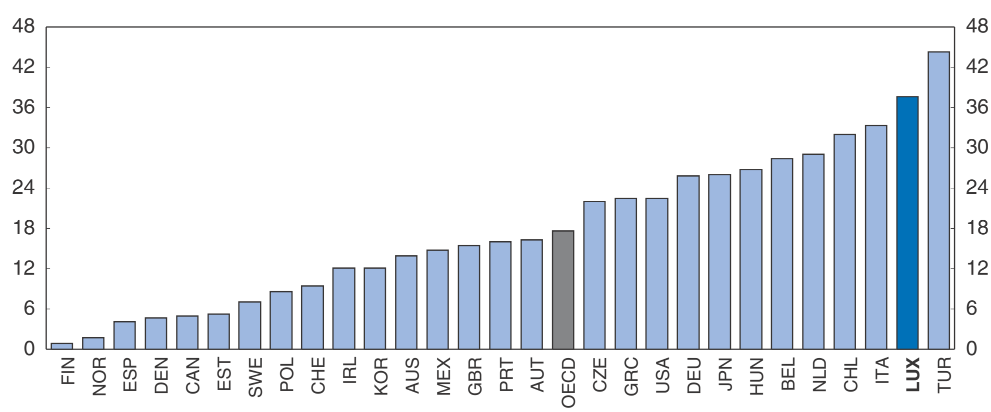
Figure 1.21. **The performance of schools in more advantaged areas tends to be better**[1]



1. Percentage of the learning variance explained by the correlation between resources on one side and the socio-economic and demographic background of students and schools on the other side.

Source: OECD, *PISA 2009 Results: What makes a school successful?*

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School choice can contribute to mitigate or widen socio-economic differences in students' intakes between schools. At the primary level, assignment to schools is based on geographical criteria. One way to promote a better social mix and balance the social composition of school neighborhoods is through urban planning policies that encourage greater diversity of housing types by price range and tenure. This matters for performance, as attendance in a disadvantaged school has a strong adverse impact on reading performance (OECD, 2012b). From secondary education onwards, Luxembourg offers school choice. Policies should be implemented to ensure that disadvantaged students are attractive to high quality schools. This includes providing financial incentives, and increasing the information available to all parents about schools, specifically to those who send their children to low performing schools.

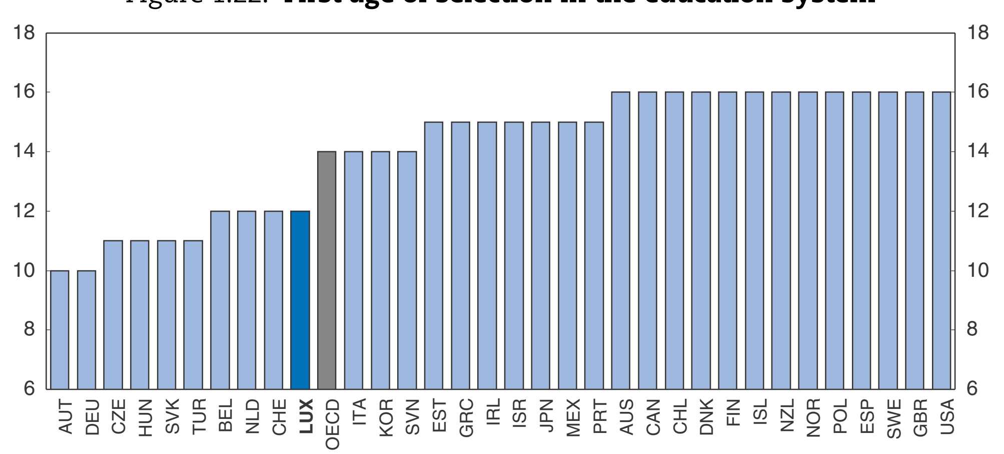
Early tracking exacerbates inequality

Tracking into different educational programmes takes place at the age of 12, which is considered as early by OECD standards (Figure 1.22). Early selection into different institutional tracks is associated with larger socio-economic inequalities in learning opportunities without being associated with better overall performance. Students from disadvantaged backgrounds are more likely to be assigned to the least academically oriented tracks. There is empirical evidence that early tracking may have a negative impact on participation in higher education, even when taking into account the selection bias (*e.g.* van Elk *et al.*, 2009). In fact, Luxembourg is the OECD country where school policies for selecting and grouping students and schools' socio-economic and demographic background have the greatest impact in explaining performance between schools (OECD, 2010d). To improve equity, tracking should be delayed to a later age. The negative effects of selection can be lessened by increasing flexibility to change tracks and providing high quality instruction and a challenging curriculum in all the different groups (OECD, 2012b).

Low graduation rates affect more the disadvantaged

The educational system also has high repetition rates, which delays the age of graduation and may discourage some students from completing their studies. Luxembourg registers one of the lowest proportion of students who complete their education in the

Figure 1.22. **First age of selection in the education system**



Source: OECD (2010), *PISA 2009 Results: What Makes a School Successful? – Resources, Policies and Practices* (Volume IV) and Ministry of National Education and Vocational Training of Luxembourg.

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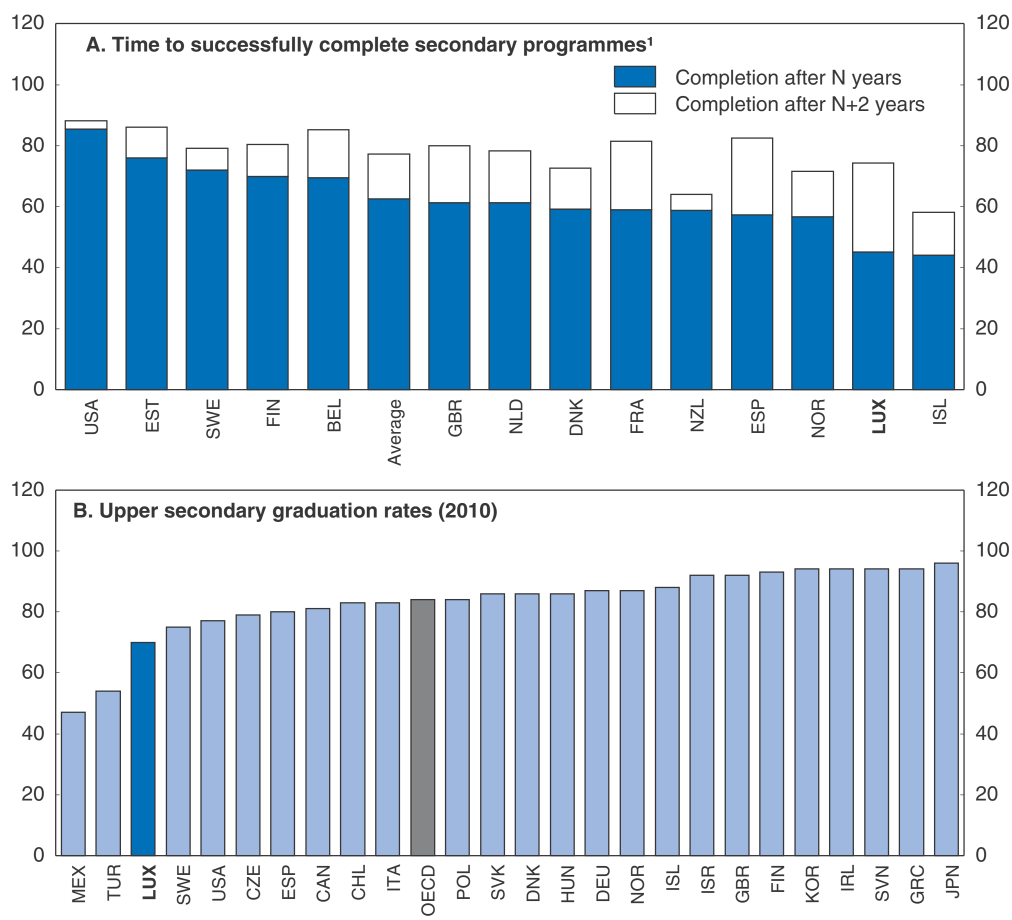
stipulated time (OECD, 2012c), and 30% of graduates need two additional years to complete their studies (Figure 1.23, Panel A). The 2009 educational reform aims at reducing repetition rates by evaluating the competences acquired by students every two years (learning cycle), rather than annually (academic year). The grading system has changed and is now based on this competence assessment. There is some evidence that repetition rates in primary education have begun to decrease since the implementation of the reform (MENFP, 2012c). This is a welcomed initiative and should be extended to secondary education.

The longer than expected time needed to complete a programme may also discourage students and feed into low graduation rates, which are well below the OECD average (Figure 1.23, Panel B). There are differences across educational tracks: in general secondary graduation rates are above the OECD average, but in vocational secondary, which concentrates a high share of immigrants, rates are sub-par. Moreover, the percentage of students that do not succeed in obtaining a diploma is twice as high for foreigners as for Luxembourgers (MENFP, 2012c).

Figure 1.23. **Time to complete upper secondary programmes and graduation rates**



1. N represents the theoretical duration of the programme. For France, N+2 refers to N+3.

Source: OECD, *Education at a Glance 2012*.

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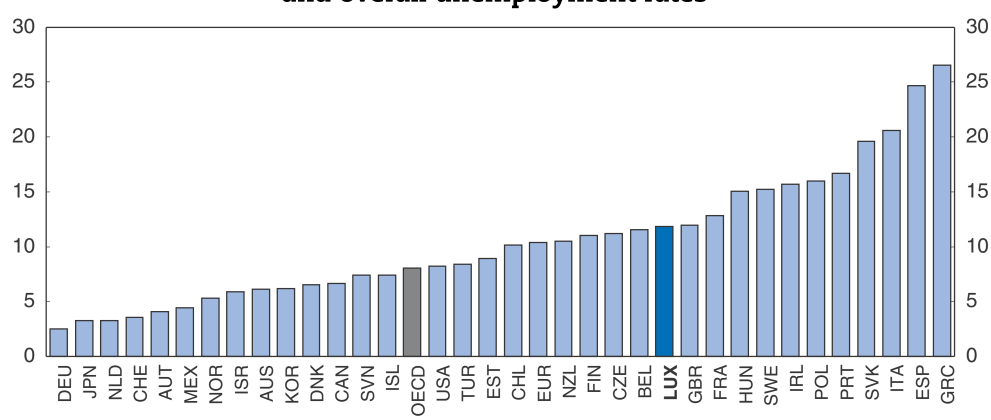
Uneven educational outcomes also affect transition to the labour market

Although Luxembourg features one of the lowest unemployment rates in the OECD, its relative performance is poorer in terms of youth unemployment. The sizeable differential between youth and overall unemployment may be related to the relatively high share of school drop-outs, as one in six students on average drops out of the education system before finishing upper secondary (Figure 1.24). Leaving school this early means that students have acquired low skills, which will expose them to higher risk of unemployment and lower earnings. Moreover, young people who struggle to enter the labour force after leaving school can face negative long-term consequences on a number of other outcomes, including happiness, job satisfaction and health. In Luxembourg the proportion of young people most at risk (low-educated who are not in employment, education or training) exceeds the OECD average, and immigrants are over-represented among this group (OECD, 2012d). It should be ensured that school drop-outs remain engaged in, or re-connect with, education through the completion of an upper secondary diploma or its equivalent, preferably with an on-the-job training.

Figure 1.24. **Percentage-point difference between youth and overall unemployment rates**[1]



1. Youth refers to persons aged between 15 and 24 years old.

Source: OECD, *Labour Force Statistics Database*.

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Box 1.5. **Recommendations on social inclusion and inequality**

- Consider greater targeting of social transfers to increase their effectiveness in reducing relative poverty, while limiting their overall cost, and tapering benefits to minimise the impact on work incentives. These measures should aim particularly to help single parent families.
- Improve the design of the minimum income guarantee (RMG) to avoid situations in which additional work does not provide additional income, while enhancing activation policies and training.
- Eliminate tax expenditures that are inefficient and regressive, such as tax rebates for mortgage payments and capital income.
- Social housing support should shift away from the construction of new subsidised housing towards a system of adequate rent support for low income households in private accommodation. Rents should be higher in social housing for tenants whose income is above social minima.

Box 1.5. **Recommendations on social inclusion and inequality** *(cont.)*

- Reform the financing of higher education to improve its distributional impact, through a system of fees supported by a means-tested contingent loan system and grants to needy students.
- Improve targeting of education resources to schools with disadvantaged students. Increase resources available for language support and remedial classes.
- Push the planned reform of secondary education, aiming at reducing grade repetition, delaying institutional tracking from the age of 12 until 16, strengthening the autonomy and local management capacity of schools, and improving the monitoring of education quality.
- Increase enrolment in child care and early childhood education and target support at children from low-income and/or foreign-language families.
- Ensure that disadvantaged students are attractive to high quality schools. This includes providing financial incentives, and increasing the information available to all parents about schools
- Enhance quality of teaching by providing additional remuneration for higher qualifications, rewards for outstanding performance in teaching, and allowing the recruitment of teachers who do not master the three official languages for those fields where this is not needed in practice.
- To facilitate the transition from school to work, ensure that youth leave education with recognised qualifications. Increase opportunities to combine study and work.

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Chapter 2

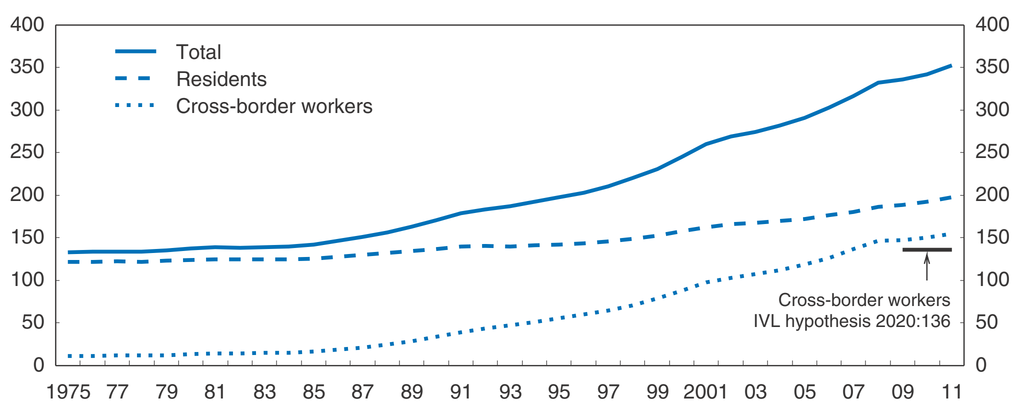
Greening growth

With strong economic growth overall and an increasingly important role as a regional economic centre, Luxembourg is experiencing mounting environmental pressures. This is mainly a result of a growing population and a rapid increase in transport, which is dominated by the car, as the number of workers commuting within Luxembourg and from across the border has risen rapidly. Ensuing environmental pressures are sizable, including through CO2 emissions, air pollution and land use changes. Large-scale commuting, combined with low fuel taxes compared to neighbouring countries, has entailed rapid increases in greenhouse gas emissions, which are higher in Luxembourg in per capita terms than almost anywhere else in the OECD. Sound housing policies, urban and transport planning to limit urban sprawl and to promote public transport, and measures to better internalise environmental externalities will be needed to ensure that Luxembourg's economic growth is compatible with environmental and economic sustainability and the well-being of its population.

Luxembourg has rapidly reinforced in its position as an economic centre

Abstracting from the recent recession Luxembourg has experienced strong growth over the past twenty years, averaging close to 4% annually. Luxembourg City has reinforced its position as a regional economic centre. The country's population has grown strongly, from 385 000 in 1990 to 511 000 in 2010, mainly as a result of immigration. Employment growth, which is concentrated in Luxembourg City, has grown even faster, leading to an important increase in commuter traffic, a large share of which comes from across the border (Figure 2.1)

Figure 2.1. **Employment developments: residents and cross-border workers**
In thousands of workers



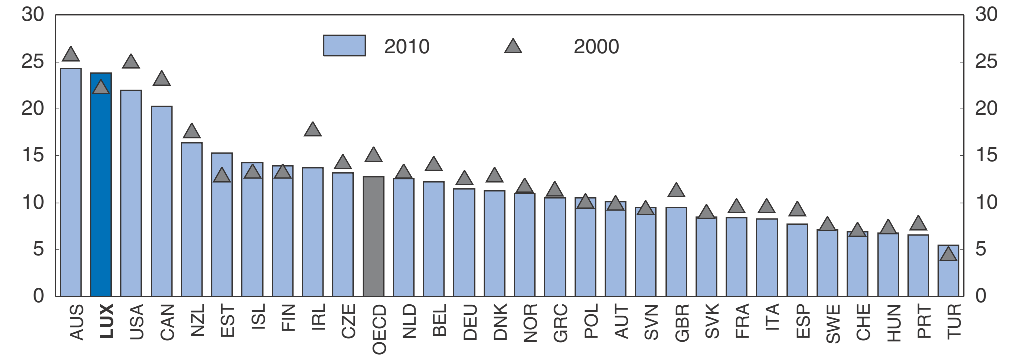
Source: STATEC

StatLink http://dx.doi.org/10.1787/888932749657

Luxembourg's impressive development into a transborder regional economic centre has not come without environmental pressures. Commuter traffic has increased significantly, the largest share being due to the car. This has lead to congestion, local air pollution and considerable CO_2 emissions. Luxembourg's per capita greenhouse gas emissions are high in international comparison (Figure 2.2) and adjustment requirements to meet EU 2020 targets for emissions outside the EU ETS system are large (Figure 2.3, B). While Luxembourg's development towards a service economy and technological changes in the steel industry had led to sharp reductions in greenhouse gas emissions from industrial processes and combustion during the 1990s, these have been largely undone by strong emission increases owing to fuel sales to non-residents and – to a lesser extent – the local fleet (Figure 2.3, A). The building of a single combined heat-power generation plant with a installed electricity capacity of 350 Mega Watt, together with the development of

Figure 2.2. **GHG emissions per capita, OECD countries 2000 and 2010**[1, 2]

Tonnes of GHG emitted per capita



1. OECD area excludes Chile, Israel, Mexico and Korea.
2. Gross direct emissions excluding emissions or removals from land-use change and forestry (LULUCF).

Source: OECD, *National Accounts Database*, *Environment (Air and Climate) Database* and OECD calculations.

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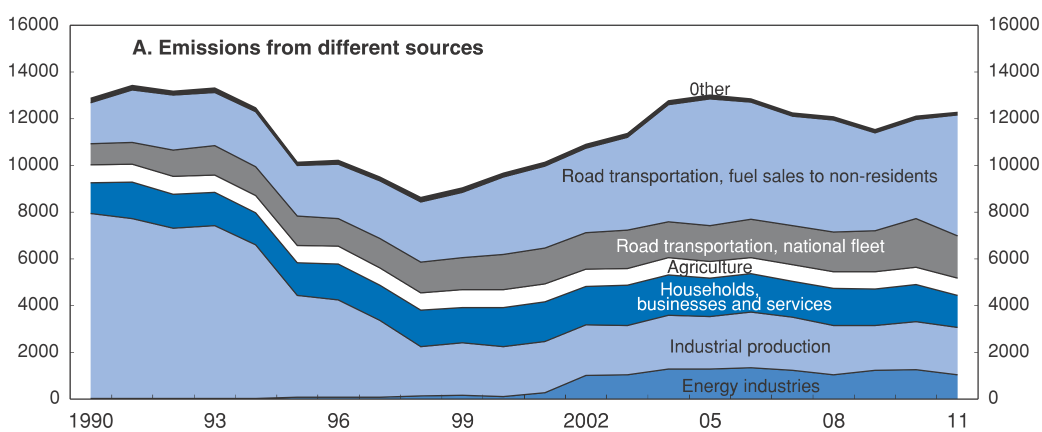
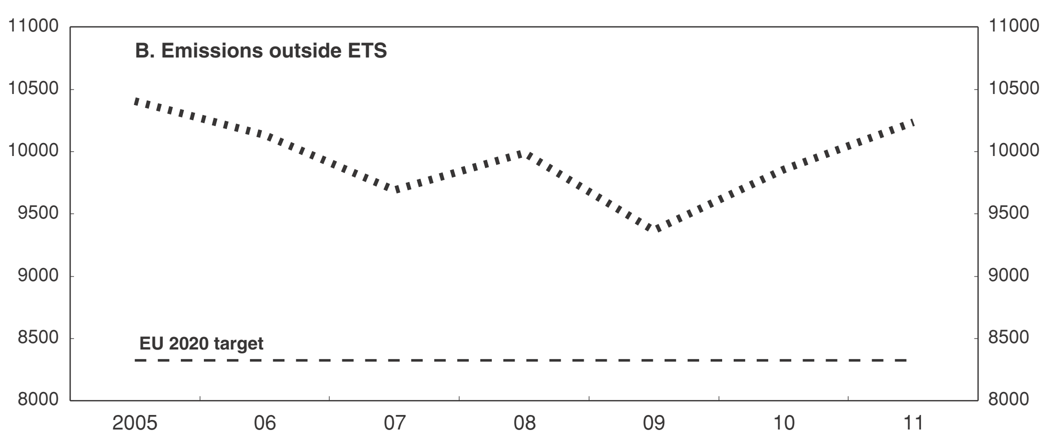
Figure 2.3. **Greenhouse gas emissions**[1, 2]

In Gg (1 000 tonnes) of CO_2 equivalent





1. EU 2020 targets now concern emissions outside the EU ETS only. Therefore the panel B shows emissions outside the ETS for those years where the ETS scheme was in place.
2. Data referring to 2011 are provisional.

Source: Ministry of Sustainable Development and Infrastructure, Environment Department.

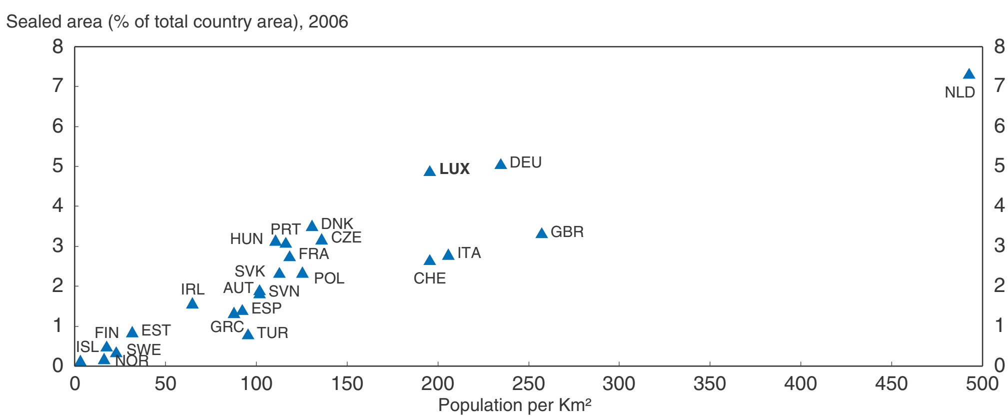
StatLink http://dx.doi.org/10.1787/888932749695

smaller co-generation plants, led to emissions from the energy sector in the 2000s, which had been nil before, as Luxembourg had depended on imported electricity only. Turning around trends in the transport sector will be essential for Luxembourg to reach its Kyoto target in a cost-efficient way. Given the scale of the rise in fuel sales to non-residents, it is hardly conceivable that other sectors could make up for this through sufficient emission reductions at reasonable costs.

Employment and population growth in Luxembourg have been accompanied by urban sprawl, which has also favoured car traffic and led to considerable land use changes. The share of the built-up area has more than doubled over the last twenty years and the share of Luxembourg's area covered by the transport network has increased by 30%. This has entailed important increases in sealing (impermeable soil due to changes related to construction works). This has already started to cause an increased incidence of floods and it poses threats to biodiversity (Schulz and Chilla, 2011). The share of sealed surface area in Luxembourg is important compared to other countries with similar or higher population density (Figure 2.4),

Figure 2.4. **Sealed surface area and population density across different countries**[1]

Sealed area in percentage of total country area and population per km²



1. Sealing refers to a change in the nature of soil, mainly through construction works, which renders it impermeable.
Source: European Environment Agency and the World Bank.

StatLink http://dx.doi.org/10.1787/888932749714

Since urban sprawl and road transport are the main causes of environmental pressures associated with Luxembourg's economic growth, this chapter focuses on these two issues. The first part discusses policies to improve pricing systems for road traffic and the ensuing externalities. This is important because the recent growth in greenhouse gas emissions ascribed to Luxembourg in recent years is a result of a strong trend increase in commuting dominated by the car, notwithstanding efforts to promote public transport, walking and bicycling, as well as fuel sales to non-residents related to Luxembourg's comparatively low taxes on petrol and diesel. The second part discusses urban planning and housing policies, given their potential role in promoting denser settlements with shorter commutes, favouring walking and bicycling and better connections to public transport.

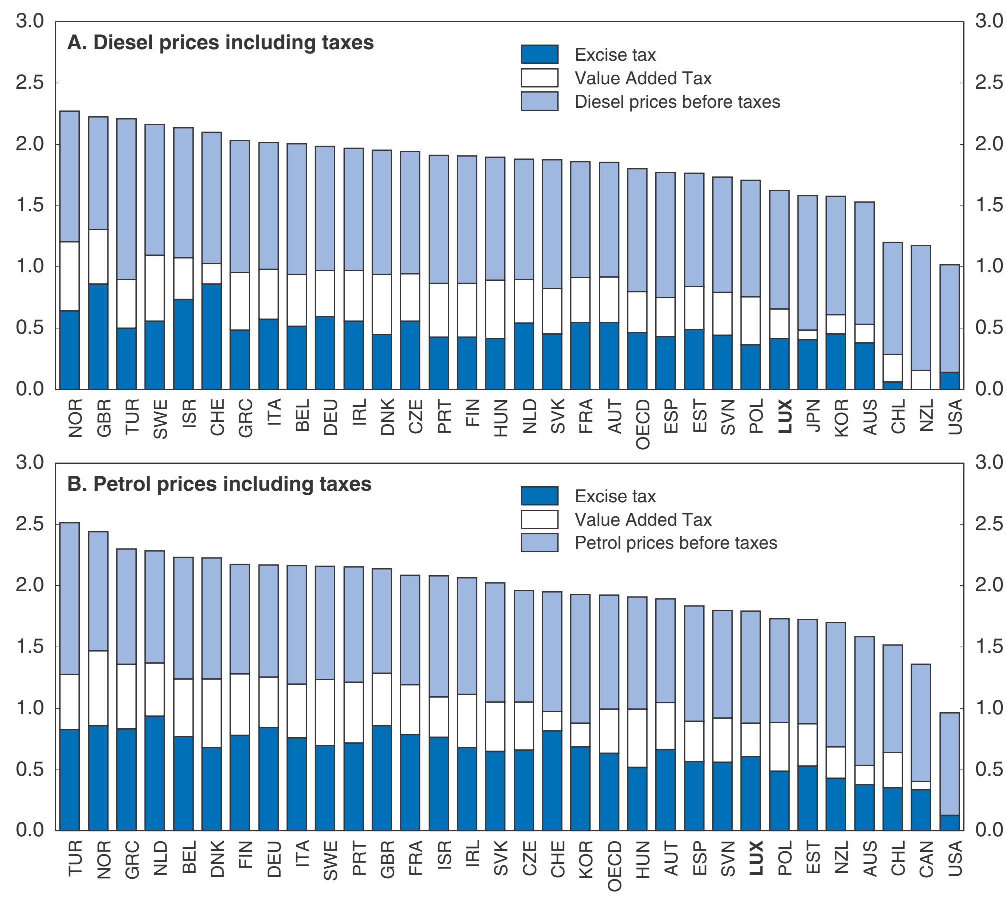
Transport investment and pricing

Fuel taxes are among lowest in Europe generating high fuel sales to non-residents

The largest part of the increase in emissions in recent years is due to automobile traffic. A large share is owing to fuel sales to non-residents, accounting for an extraordinary 70% of all fuel sales within the country (see Figure 2.3). This is mainly related to Luxembourg's relatively low fuel taxes, which weaken incentives to use public transport, induce commuters to fill their tanks in Luxembourg and create strong incentives for both private car owners in the region and drivers of heavy vehicles in transit to take a detour to also fill up their tanks in Luxembourg (Figure 2.5). While some of this simply replaces emissions that would have been ascribed to neighbouring countries had drivers bought their fuel

Figure 2.5. **Diesel and petrol prices and taxes across OECD countries**[1, 2, 3]

Total Price (US dollars per litre), 2011



1. Diesel prices: for Estonia, data refer to 2005-11. For Israel, data refer to 2001-10. For Slovenia, data refer to 2005-11. Petrol prices: for Australia, data refer to 2006-11. For Canada, data refer to 2002-10. For Estonia, data refer to 2005-11. For Israel, data refer to 2000-10. For Slovenia, data refer to 2005-11.
2. Automotive diesel and premium unleaded 95 prices.
3. OECD refers to OECD average.

Source: OECD, *Energy Database* (IEA data).

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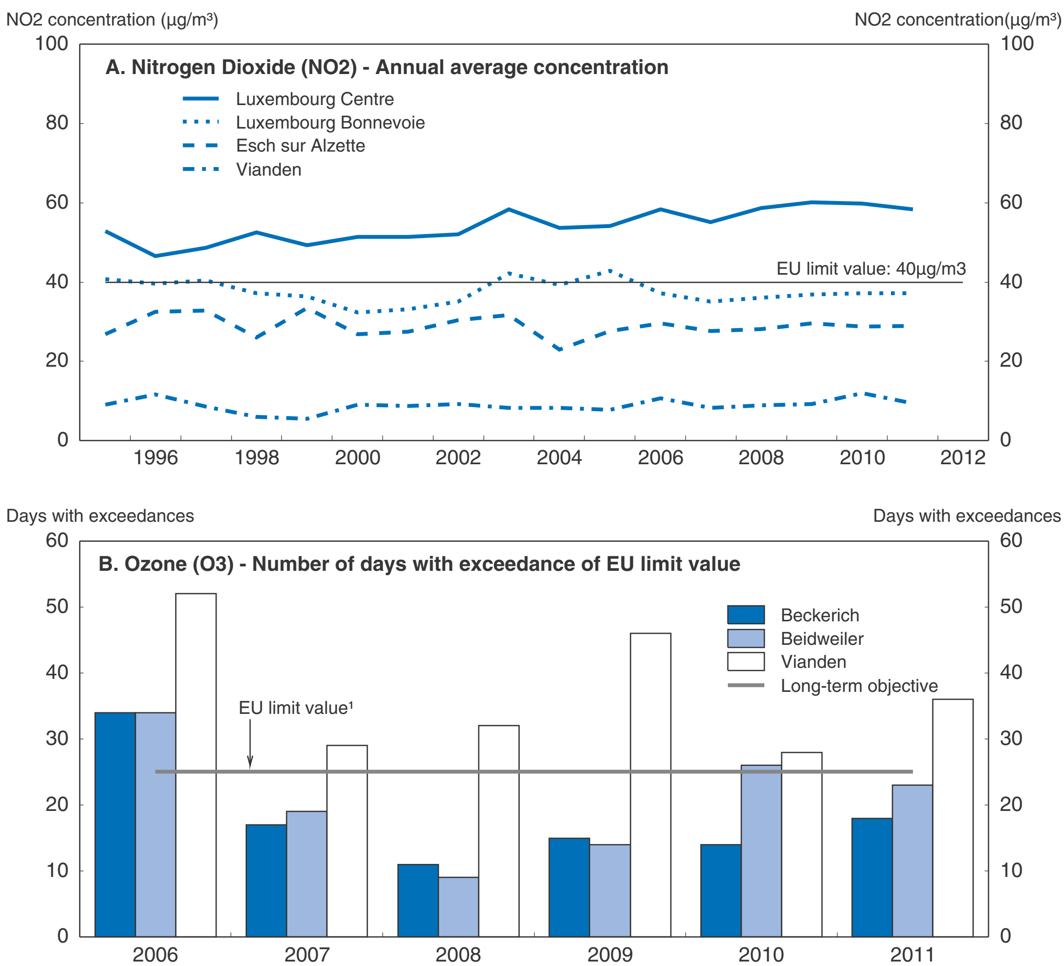
there, there are probably additional emissions due to extra trips and detours taken to buy fuel in Luxembourg. Related to sometimes heavy traffic NO_2 concentrations in some areas continue to exceed limit values defined by the EU to limit adverse health effects, as do ground-level ozone concentrations, notwithstanding improvements (Figure 2.6).

In part owing to cheap fuels, the share of cars in trips to work is significant in Luxembourg. 86% of commuters from neighbouring countries use mainly the car to get to their workplace, down from 91% in 2007 (Schmitz and Gerber, 2011). The number of cars per inhabitant is high in Luxembourg compared to other European countries (Figure 2.7). The share of the car in trips to work is also high compared to other regional centres in Europe, more akin to urban centres in North America, and the share of walking and bicycling is low (Figure 2.8).

Figure 2.6. **NO_2 and ground-level ozone concentrations in Luxembourg**



1. The EU limit value requires that the daily maximum of eight-hour moving average should not exceed 120µg/m^3 more than 25 days a year. This is intended to limit negative health effects.

Source: Ministry of Sustainable Development and Infrastructure, Environment Administration.

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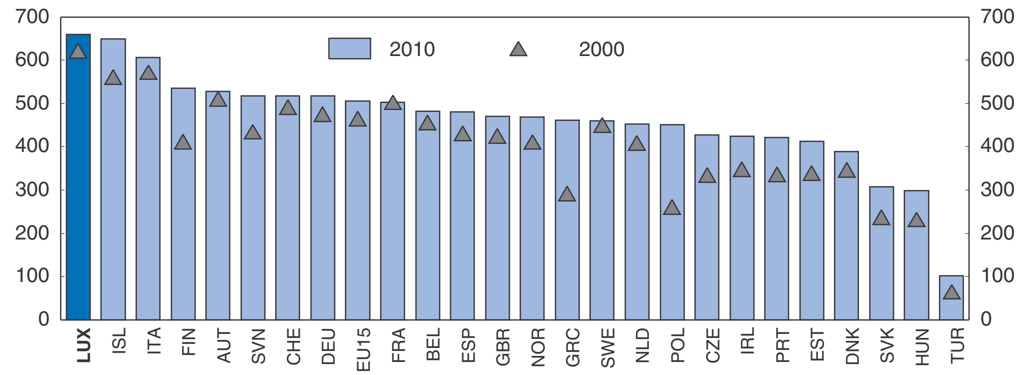
Figure 2.7. **Cars per person across OECD countries**[1]

Number of passenger cars per 1000 inhabitants



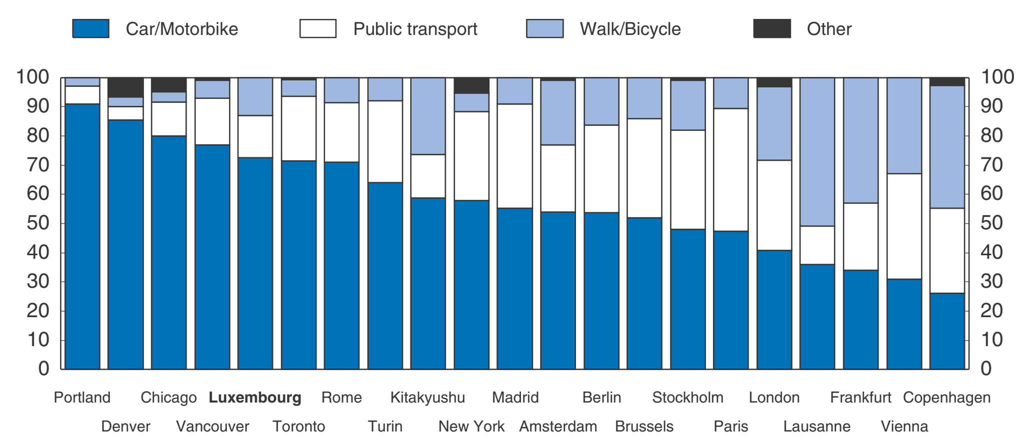
1. Passenger car stock at end of year n has been divided by the population on 1 January of year n+1.

Source: European Commission/Eurostat, Transport in Figures 2012.

StatLink *http://dx.doi.org/10.1787/888932749771*

Figure 2.8. **Modal split of trips to work – different economic centres**

In percentage



Source: For Brussels, Federale Diagnostiek Woon-Werkverkeer (2008); for Frankfurt, Sonderauswertung zur Verkehrserhebung, Mobilität in Städten – SrV 2008' Städtevergleich Dresden (2009); for Lausanne,City of Lausanne (2001); for Turin, Commune of Turin (2011); for Vienna, Yearly questionnaire of households by Wiener Linien, (*www.nachhaltigkeit.wienerstadtwerke.at/de/daseinsvorsorge/oepnv/modal-split.html* from 8.7.2011); for Luxenbourg, Ministère du Développement durable et des Infrastructures (2009); for Melbourne, Victoria State Government (2007); Toronto and Vancouver, Statistics Canada (2006); for Copenhagen, Berlin, Rome, Amsterdam, Madrid and Stockholm, Eurostat (2003-06); for Paris, Insee – Enquête Nationale Transport (2008); for Kitakyushu, Person Trip Survey (2005); for Chicago, Denver, Los Angeles, New York and San Francisco, American Community Survey (2005-09); for Portland, American Community Survey (2009) and for London, Department for Transport (2008-09).

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Fuel taxes do not cover environmental costs

It is Luxembourg's declared goal, formulated in its national sustainability strategy, to gradually raise taxes on fuels, while taking into account the effects on its budget. Some studies suggest that around 10% of government revenues may be due to fuel sales to non-residents, as people who fill their tanks in Luxembourg also tend to buy tobacco and other goods that are more lightly taxed than in neighbouring countries (Thoene, 2008). Transport fuel sales to non-residents concerns cross-border commuters who choose to fill their tanks on their way to work rather than at home, residents of neighbouring countries who make extra trips to Luxembourg to buy fuel and drivers of trucks in transit who often fill their tanks exclusively in Luxembourg. A share of these groups might move to buy fuel elsewhere when Luxembourg increases fuel taxation. However, reliable studies that assess the elasticities of fuel demand in Luxembourg are rare. There is one study, which tries to assess possible effects on fuel demand and government revenues of higher fuel taxes based on a simulation model with alternative assumptions concerning the demand elasticity with respect to fuel price differences with neighbouring countries (Thoene, 2008). The model suggests that even when assuming relatively high elasticities, there is a range of price increases that would not reduce government revenues, while leading to lower fuel demand. Yet, a price increase of 10 cents for diesel, which would be needed to roughly match excise taxes in neighbouring countries, is estimated to reduce associated government revenues by almost 50%. However, the study is based on relatively weak data on truck transit transport and trips to Luxembourg by drivers from neighbouring countries. Luxembourg should work to gather better data on these issues and build on this study to obtain reliable information about possible revenue effects of higher fuel taxes. This would be important information to understand to which extent revenue losses would need to be replaced through spending cuts or tax increases elsewhere, when fuel tax rates are gradually increased to those prevailing in neighbouring countries.

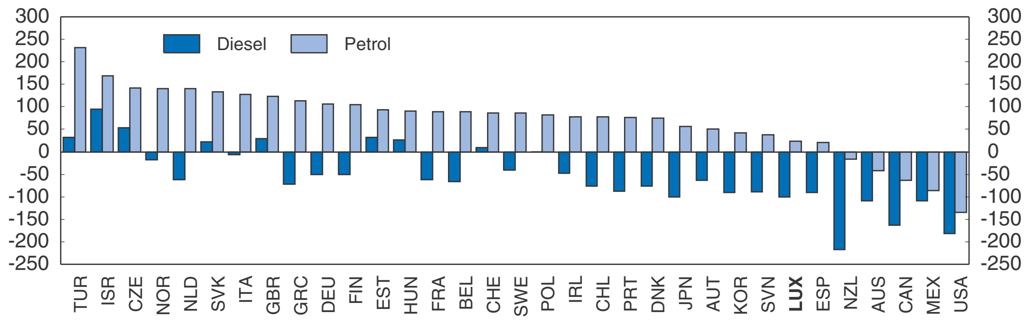
It would also be good to develop a better understanding of the extra emissions caused in the region through detours and extra trips taken by non-residents, including drivers of heavy vehicles, to fill their tanks in Luxembourg. These extra trips as a result of tax competition run counter to joint efforts with European partners to limit GHG emissions and air pollution and they contribute to congestion and pollution in Luxembourg. The government should consider commissioning a study of the benefits of higher fuel prices in terms of reduced congestion and pollution and lower greenhouse gas emissions, perhaps jointly with the European Union and neighbouring countries.

The European Fuel Tax Directive seeks to set minimum taxes for petrol and diesel, ensuring that different fuels would be taxed in line with their carbon content. This would imply that minimum tax rates for diesel would increase to EUR 0.393 per litre by 2018, well above Luxembourg's current rate of EUR 0.32 per litre. Luxembourg should collaborate in this process to help avoid harmful tax competition in Europe and ensure that tax minima are sufficiently high to allow every member country to adequately price externalities related to fuel use. A thorough study assessing the costs and benefits of higher road prices would help shed light on this issue. More generally, this should also go for other issues, such as health hazards associated with tobacco.

Independently of the European directive, there is a strong case for Luxembourg to review its fuel taxation. Diesel is taxed much more lightly than petrol, although it has higher carbon content and it generates more pronounced local externalities, in particular health-threatening pollution. In fact, the carbon price implicit in diesel taxation is negative after deducting estimated costs of local externalities from the tax to take into account that fuel prices approximate other externalities in addition to CO_2 emissions (Figure 2.9). More generally, implicit carbon prices generated by taxation differ widely across different fuels and electricity (Table 2.1). This means that carbon emission mitigation is not being pursued at least cost. Luxembourg should bring carbon prices more in line across different sources to price externalities more efficiently. This will require a higher tax on diesel.

Figure 2.9. **Implicit diesel and petrol prices after adjusting for externalities**[1, 2]

EUR/tonne of CO_2, 2012Q1



1. The implicit carbon price for diesel and gasoline is obtained by substracting the external costs of negative externalities from the carbon price implied by excise tax. The implied carbon price is computed by converting the excise tax per litre to a tax per ton of CO_2 after deducting the estimated cost of a range of externalities associated with burning fuel. The conversion is done based on a CO_2 content of 2.7 kg of CO_2 per litre of diesel (light fuel oil for households and industry), and of 2.24 kg of CO_2 for petrol (premium unleaded for households). The external cost contains air pollution, noise, accidents and congestion. The estimates are taken from Persson and Song (2010, "The Land Transport Sector: Policy and Performance", *OECD Economics Department Working Paper*, No. 817, Table 5.9) for noise pollution, accidents and congestion. The cost estimate for air pollution for Germany published in CE DELFT (2008, handbook on Estimation of External Costs in the Transport Sector) is used for all countries.
2. Data refers to 2010 Q4 on diesel for Canada and diesel and petrol for the USA.

Source: OECD calculations.

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Luxembourg has a reduced VAT rate for solid mineral fuel (12% as opposed to the standard 15%) and for natural and liquefied petroleum gas and electricity (6%). Moreover, the sale of coal is subject to a zero excise tax rate, as is the sale of diesel used in agriculture. Luxembourg plans to achieve large-scale emission reductions through higher energy efficiency standards for new buildings and financial help for retrofitting the existing housing stock. Pricing externalities associated with domestic energy use will be essential to create incentives for households to take up financial help for retro-fitting and it would also contribute to the cost efficiency of these measures. These tax rebates should therefore be reconsidered to price fuel use more in line with its externalities. The extra revenues could contribute to compensating potentially lower fuel tax revenues that Luxembourg may have to accept to end fuel tax competition with neighbouring countries and price externalities related to transport fuel use.

The share of public transport remains modest

Luxembourg plans a number of new infrastructure projects to promote public transport and limit congestion. A new railway is planned between Luxembourg and Bettembourg and the Luxembourg-Pétange line will be extended to double the rail track. In Luxembourg City, new hubs will be built at the periphery and outside the centre to relieve the central station and Hamilius, the central exchange hub for buses. The new hubs will be linked by a tram and tangential buses so that people can go directly to workplaces in the periphery without going through the centre. This would be a welcome shift from star-like transport system to a network, with the potential to shorten travel times and reduce congestion. The tram will replace buses in central areas, nearly tripling capacity, to reduce traffic jams and pollution. The transport plan also includes new road infrastructure

Table 2.1. **Implicit carbon prices across different fuels**

Euros/tonne, 2012:q1

	Petrol	Diesel	D/Petrol	LPG	Natural gas		Electricity		Light fuel oil		Coal
					HH	IND	HH	IND	HH	IND	
Norway	318	202	0.64	–	–	–	858	0	76	76	–
Netherlands	318	156	0.49	53	85	9	11	17	93	93	–
Italy	304	213	0.70	84	–	–	92	126	144	144	0
United Kingdom	300	249	0.83		0	3	0	6	48	48	2
Greece	289	147	0.51	–	28	28	12	16	21	147	–
Germany	283	168	0.60	52	–	–	140	–	22	22	0
Finland	281	168	0.60	–	41	41	71	29	57	57	17
Turkey	275	143	0.52	127	0	5	14	-22	116	–	0
Belgium	265	153	0.58	0	9	3	71	52	7	7	0
France	265	158	0.60	34	6	7	250	156	20	20	0
Switzerland	263	230	0.87		29	29	588	588	30	30	9
Sweden	262	179	0.69		149	45	1 946	36	159	48	–
Israel	258	205	0.80	–	–	–	0	0	205	–	1
Ireland	254	171	0.68	–	14	14	0	0	32	17	0
Portugal	252	131	0.52	37	0	0	0	0	105	–	0
Denmark	251	143	0.57	–	0	–	171	11	124	21	18
Japan	232	118	0.51	54	–	0	8	8	7	7	2
Austria	227	156	0.69	–	30	–	110	105	39	39	16
Slovak Republic	222	132	0.59	52	0	7	0	0	–	0	–
Czech Republic	221	156	0.71	49	0	6	2	2	9	9	2
Korea	217	128	0.59	85	22	22	–	–	25	25	–
Slovenia	214	130	0.61	47	23	23	26	22	49	49	–
Luxembourg	199	118	0.59	31	–	–	–	–	4	8	0
Spain	196	128	0.65	18	0	0	0	0	31	31	–
Estonia	183	141	0.77	40	11	5	11	10	40	40	–
Hungary	179	137	0.76	50	0	5	0	2	–	–	0
Poland	170	109	0.64	62	0	0	5	5	20	20	0
Chile	165	33	0.20	0	0	–	0	0	-7	–	–
New Zealand	159	1	0.01	–	6	6	0	0	–	0	–
Australia	132	110	0.83	11	–	–	–	–	–	–	–
Canada	111	55	0.49	–	0	0	–	–	16	10	–
United States	40	37	0.92		–	–	–	–	–	–	0
Mexico	0	0	–		0	0	0	0	0	0	0

1. The implied carbon price is computed as the amount of the tax levied per litre times the amount (litres) of fuel that needs to be burnt to reach a CO_2 emission of one tonne of CO_2eq. One litre of diesel (light fuel oil for households and industry), petrol and LPG (liquefied petroleum gas) is assumed to produce respectively 2.7, 2.24 and 1.7 kg of CO_2. It is assumed that 4 535 269 kcal of natural gas generates 1 tonne of CO_2 and that burning 1 kg of coal generates 2.93 kg of CO_2. HH and IND refer to households and industry, respectively.
2. Data refers to 2010 Q4 on diesel for Canada and diesel and petrol for the USA.

Source: OECD calculations based on data obtained from International Energy Agency (2011), *Energy Prices and Taxes*, Paris.

projects. Given that the intention is to favour public transport, there may be a case for focusing on extending the public transport infrastructure instead.

Luxembourg has ambitious plans to increase the share of public transport and walking and cycling in total trips. Higher prices for individual road transport along with extensive investments in public transport will be needed to reach these goals. The government plans to increase the share of public transport in motorised transport from 12% in 2002 to 25% by 2020. Improvements in the quantity and quality of public transport offered have led to a substantial increase in its use in recent years. However, given the dynamic development of population and employment in Luxembourg car traffic has risen at the same time. This is why the share of public transport has increased only little. The use of public transport at the national level has experienced a rather moderate shift from 16% towards 17.8% in 2009 whereas the use of public transport of cross-border workers has risen more strongly from 9% in 2007 to 14% in 2010. However, these data are based on a rather small sample of surveyed households. The last comprehensive household survey dates back to 1995. To obtain more reliable up-to-date mobility data it would be good to conduct another household survey. Luxembourg is a leader in short trips of below 5 km made by car (more than 70% compared to 5% in the Netherlands and 30% in Denmark) rather than walking or bicycling, suggesting that the full costs of taking the car are not sufficiently internalised. Only 13% of trips in Luxembourg are made by bike or by foot, although 40% of trips are shorter than 3 kilometres. Luxembourg wants to double the share of walking and biking to 25% by 2020.

Luxembourg should also continue to improve co-ordination with adjacent regions to promote public transport. This process has been complicated by the large number of actors in the region and difficulties in deciding on cross-border burden-sharing. Nevertheless, Luxembourg has provided financial support to extend public transport beyond its borders. There are some unified ticketing systems and a few rail and bus lines operate into neighbouring regions with full or partial financial support from Luxembourg. Making technical and commercial co-operation with neighbouring regions more effective remains a priority, including the exchange of traffic data, coordination of timetables, harmonisation of fares and the wider introduction of mixed travel passes. Luxembourg has elaborated a cross-border mobility scheme called SMOT with the region Lorraine in France and is currently preparing similar schemes with the neighbouring German Länder of Saarland Rhineland-Palatinate and with Wallonia in Belgium.

Congestion pricing is not used

Higher road prices, including congestion pricing and charges for parking, would help Luxembourg achieve the desired modal split – the share of different transport modes in total trips – and internalise road traffic externalities. A study by the European Forum of Transport Ministers on road pricing in a number of European cities concluded that taking into account all costs, including those related to the use of infrastructure, congestion and pollution, would require much higher prices for road traffic in urban areas. Road prices for small petrol cars would have to increase by 100% and more, depending on the city, in peak periods compared to 2000 prices. Addressing externalities effectively would require congestion pricing in addition to taxing fuels and charging for parking (ECMT, 2003).

Road prices that take into account the costs of infrastructure use and externalities could lead to a decrease of passenger kilometres travelled by car by 15-30%, according to this study, while passenger kilometres travelled by bus or metro would increase substantially. Air pollution and CO_2 emissions would be reduced by up to 50% and the traffic speed during rush hours would increase by 10%. It should be noted that while fuel taxes can be a good approximation to CO_2 emissions and pollution, they cannot be differentiated to provide incentives to reduce congestion, noise and accident costs. Therefore, an ideal road pricing system would combine fuel taxes with other charges, such as congestion prices and tariffs for parking.

Levels of congestion on the main road transport corridors in Luxembourg are high and there are severe bottlenecks at the entrance to urban areas, notably in Luxembourg City. This results in unsafe driving conditions and noise in addition to high levels of emissions and local air pollution. Introducing a system of congestion charging around Luxembourg

City and congested road bottlenecks would induce a shift towards public transport or sharing of car journeys. By charging for each trip, this policy solution would help to align the private costs of undertaking a journey with the congestion externality exerted on other road users. The government should consider the experience of similar schemes in London and Singapore. Such a scheme should be introduced in a non-discriminatory way for both residents and those living in other countries, which may require bilateral agreements with neighbouring countries to enforce the system on drivers with a foreign licence plate.

Increasing parking prices or differentiating them in line with scarcities is likely to be more efficient than Luxembourg's current system of restricting the number of parking places in Luxembourg City. To encourage the use of public transport for trips to work and an engagement of employers to facilitate this, Luxembourg has currently opted to limit the number of parking spaces that can be provided in new office developments. However, this is likely to bring about only very gradual changes. While reducing the number of parking places increases the private costs of car trips through longer search times for a parking place, it can also result in increased cruising for a spot. The associated external costs in terms of CO_2 emissions, pollution and congestion can be substantial (Shoup, 2011a). Another option would be to increase parking fees for all parking places or to differentiate them over time, thus helping to manage demand, so that cruising for parking places along with the associated externalities is reduced. Such a system has recently been introduced in San Francisco and other cities in the US for curbside parking. Parking prices are adjusted to maintain one or two parking places free on each block, thus ensuring that drivers find a parking place relatively rapidly (Shoup, 2011b). The government should consider whether such a system could contribute to a more efficient management of parking slots in Luxembourg City and other urban centres.

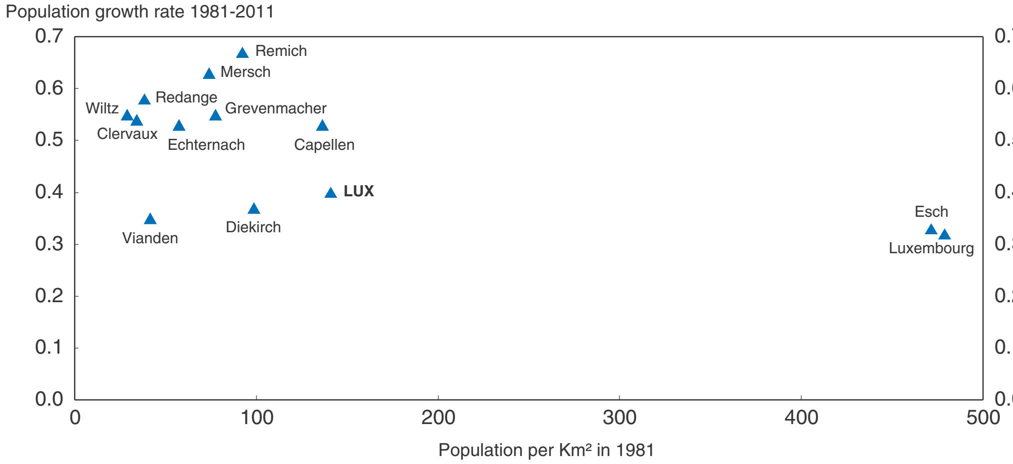
Urban planning and housing policies to control urban sprawl

Urban sprawl is significant in Luxembourg. Low population density areas have experienced much faster population growth rates than urban areas over the past 30 years, as many families have used their high and rising incomes to live in a detached house (Figure 2.10). The housing stock offers a large amount of square metres per person compared to other European countries (Figure 2.11) and the share of homeownership is relatively high (Figure 2.12). At the same time, employment growth is concentrated in the centre-south around Luxembourg City. The ratio of jobs to residents in to the labour force in Luxembourg City is 3.8:1. This compares to 1.4:1 in Frankfurt, another city that is well-known for its high share of commuters. This has led to a considerable increase in commuting within the country, with the share of commuters increasing substantially in all regions, apart from Luxembourg City (Figure 2.13). Low-density territorial development leads to more important soil sealing than necessary and it encourages the use of the car.

Plans to reduce urban sprawl are behind target

Luxembourg's national concept for transport and territorial development (IVL) of 2004 seeks to address urban sprawl by proposing a denser territorial development around a few urban centres, some of which are underdeveloped now, such as the South, although they are well-equipped with public services and well-connected with public transport. The outskirts of Luxembourg City are now largely urbanised, but there is scope for further densification. This development would mark a turning point compared with previous trends.

Figure 2.10. **Population density per km² in 1981 and population growth between 1981 and 2011**

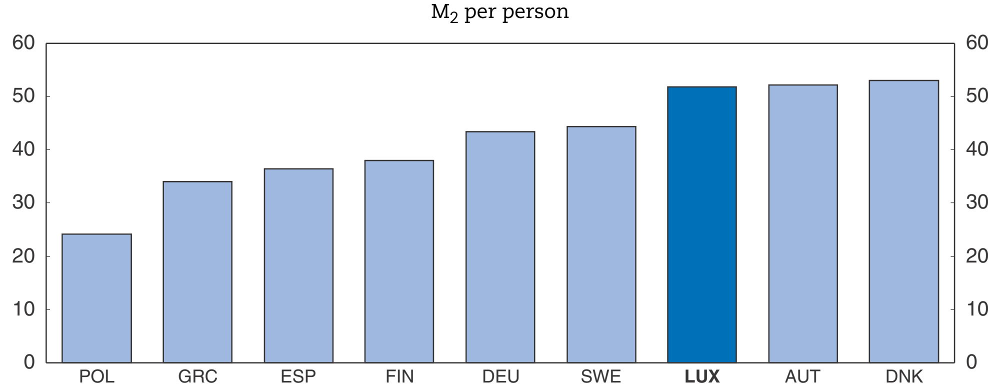


Source: STATEC.

StatLink http://dx.doi.org/10.1787/888932749828

Figure 2.11. **Housing area available per person across different countries**[1]

M_2 per person



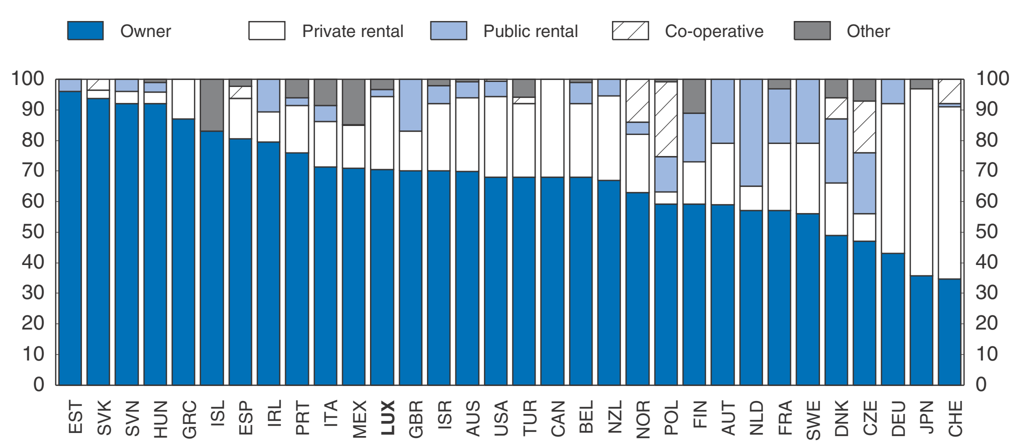
1. Data refer to the period 2007-09 for Poland, Greece, Finland, Germany, Sweden, Luxembourg (Grand Duchy) and Austria. Data refer to the period 2003-06 for Spain and Denmark.

Source: Eurostat.

StatLink http://dx.doi.org/10.1787/888932749847

Figure 2.12. **Share of home ownership across different countries (2009)**

Per cent of dwelling stock



Source: Calculations based on OECD Housing Market questionnaire.

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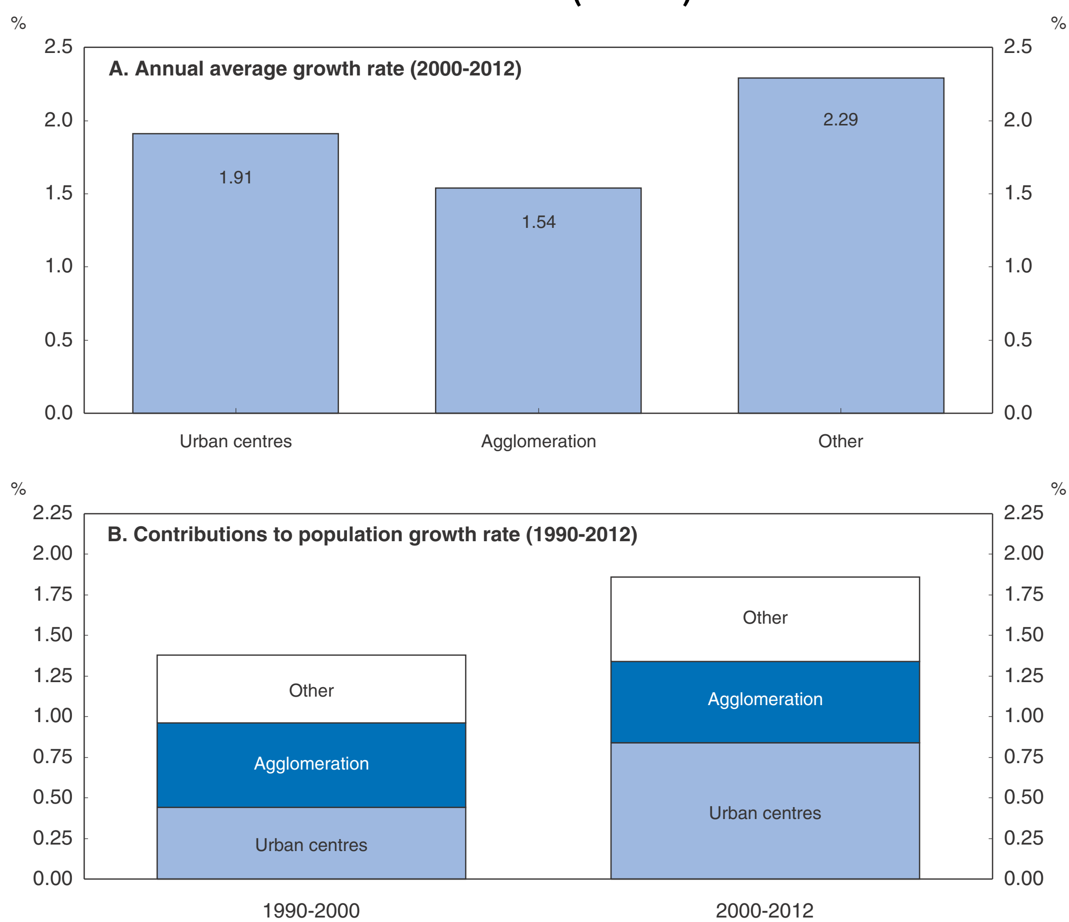
The IVL sets out two scenarios, one where trends of a rapidly increasing share of cross-border commuters would continue, with 75% of new jobs filled by this group: and a second one, where Luxembourg would fill more jobs with workers who settle within the country. Only 40% of new jobs would be filled by cross-border commuters in this scenario. This has become the government's target, as reaching it would be the only realistic chance to realise its ambitious objectives to raise the share of public transport and walking and cycling in total trips.

However, Luxembourg's plans to increase public transport and to achieve more compact territorial development are behind target. The population has increased more than foreseen, the number of cross-border commuters targeted for 2020 in the IVL was already surpassed in 2010 (see Figure 2.1), and although the urban areas, that the government hoped to develop, are catching up, the share of citizens settling in areas away from those centres continues to be substantial (Figure 2.13). Potential development areas are smallest in urban areas that the IVL plans to develop (Ministry of the Interior, 2008), suggesting that significant action is needed to implement the national concept for transport and territorial development.

Figure 2.13. **Population growth in priority areas for urban development and elsewhere (2000-12)**[1]



1. There are 16 urban communes classified as a priority for urban development (Urban centres); 27 suburban communes linked to these 16 urban communes (Agglomeration) and finally, 63 rural communes classified as not being a priority for urban development (Other).

Source: CEPS/INSTEAD – Geography and Development Department, and STATEC.

StatLink http://dx.doi.org/10.1787/888932749885

Although the targets formulated in the IVL have been missed, as population growth and the share of workers settling across the border has been stronger than foreseen, the broad conceptual issues outlined in the IVL are still relevant. Policies to ensure better coordination between communal and national planning policies have only recently been introduced or are still being developed, but the government is now close to passing laws that would help put the plans outlined in the IVL into practice. The spatial planning law of 2011 is currently in the final stage of revision and legally binding primary sectoral plans for housing, landscape, transport and on economic activity zones are almost finalised. They will enter the legal procedure by the beginning of 2013 (Box 2.1). This will underpin the IVL with legally binding instruments, making it easier to implement the government's plans. Municipalities, which are effectively the only subcentral government level in Luxembourg, are very small and have traditionally had a lot of autonomy, making it difficult to coordinate territorial planning across the country. They are now required, by a law passed in 2004, to develop new general development plans (PAG), which have to be authorised by

Box 2.1. **Spatial Planning Reforms**

The Spatial Planning Law of 21 May 1999 is currently in the final stage of revision. The objective is to develop legal instruments to better implement spatial planning policies. Consultation procedures related to land zoning will be simplified and sped up, by allowing simultaneous consultation with several bodies. The right of first refusal for the state will be extended and the expropriation law will be modified, so as to limit possibilities for speculation, by fixing the price applicable to any real estate that might be expropriated in the future at a date preceding the finalisation of sectoral plans underpinning the law. Future adjustments will be limited to increases in the general consumer price index. Four primary sectoral plans will enter the legal procedure by the beginning of 2013. These plans will implement the political objectives of the master programme for territorial planning and the IVL with legally binding instruments. They also seek to improve the co-ordination of territorial planning throughout the country.

Primary sectoral plan for Housing (plan directeur sectoriel Logement PSL)

The main objective of the PSL is to foster the construction of housing with a focus on development in urban centres that are well connected to public transport and other public services. The PSL defines the scope for growth in the number of housing units, which is higher in urban municipalities than in municipalities with a more rural character. Depending on its category minimum and maximum housing densities are then defined for each municipality. The main implementation instruments are the general development plans (PAG) and the specific development plans (PAP). All municipalities will have to define priority areas for urbanisation, in order to avoid unorganized local development. Moreover, the PSL reserves around 500 hectares of land to be acquired by the government in order to develop large-scale housing projects in line with ecological and social criteria to limit the shortage of affordable housing. Up to 44 000 inhabitants should benefit from new housing that will be developed within these projects.

Primary sectoral plan for Transport (plan directeur sectoriel Transports PST)

The primary sectoral plan for transport describes the transport policy projects and measures that require a regulatory framework. It defines legal instruments to introduce a parking management system for all urban areas and to promote cycling and walking. It also reserves land for new transport infrastructures. It sets priorities for key infrastructural transport projects, with a special focus on public transport.

Box 2.1. **Spatial Planning Reforms** *(cont.)*

Primary sectoral plan on economic activity zones (plan directeur sectoriel Zones d'activités économiques PSZAE)

The main objective of the PSZAE is to shape economic development while taking into account territorial development objectives. The plan reserves around 550 additional hectares, mainly for the development of crafts and industrial activities until 2030. The PSZAE defines regional and national economic activity zones with a focus on extending existing ones; mandates municipalities to reclassify certain areas, which are not suitable for economic development; and imposes strict ecological criteria and requirements in line with the national territorial planning objectives for new economic area zones.

Primary sectoral plan for Landscape (plan directeur sectoriel Paysages PSP)

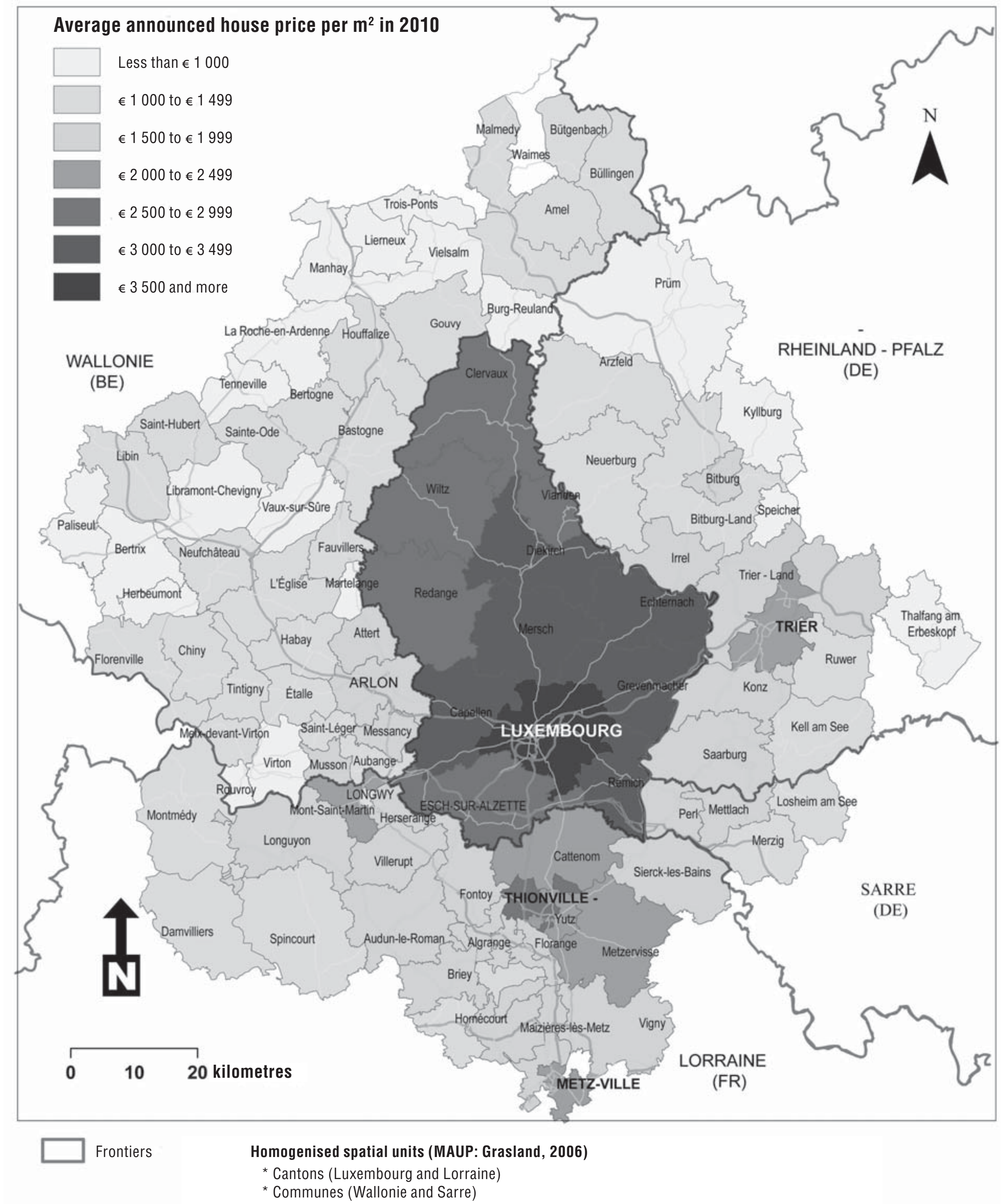
The PSP provides a framework for landscape management and planning to safeguard the quality of life, landscapes and ecosystems. The plan defines conservation areas, guides the development of rural landscapes and defines green belts between major urban areas to limit urban sprawl.

the central government, but deadlines for developing these plans have recently been postponed to 2015. The law was reformed in 2011 to simplify authorisation procedures and thus accelerate the process to a maximum of two years. The Housing Pact of 2008 introduced financial incentives for municipalities to mobilise land for building with higher payments for urban areas considered a priority for further development in the IVL. However, the share of these payments in overall transfers to municipalities is small and it thus remains to be seen how effective these payments will be in aligning communal and national territorial planning (Becker and Hesse, 2010). Moreover, the payments are tied to population growth, rather than more concrete criteria connected with the government's desire to build more compact cities. This approach may have to be reviewed.

The Housing Pact also provided municipalities with some new housing policy instruments. This includes the right of first refusal that is the right for the municipality to buy any property that is on sale, although it remains more limited than in neighbouring countries. There are also some fiscal and administrative measures, including the possibility to levy surtaxes on empty housing and on land whose owner could have obtained a construction license for several years, but chose not to engage in any development. This could help promote greater flexibility of land and housing supply in urban areas, thus increasing densification. The government should monitor whether the new instruments for communal planning and housing policies help to foster territorial development which is more in line with the IVL. If needed, it should take further measures. Merging Luxemburg's exceptionally small municipalities, which have a high degree of autonomy, could also contribute to better coordination of territorial planning, of water management, which is discussed below, and other policy areas. The number of municipalities has already been reduced from 116 to 106 and the government hopes to reduce it further to 80.

The trends towards urban sprawl and increases in cross-border commuting are related to house prices in Luxembourg, as workers find it too expensive to settle close to their job. Housing in Luxembourg City is among the most expensive of European cities and residential property prices increased rapidly until 2009. They are somewhat lower within Luxembourg further away from the centre and much lower right across the border (Figures 2.14 and 2.15).

Figure 2.14. **Map of Luxembourg with neighbouring regions indicating average prices**



Note: Data sources for Luxembourg: Observatoire de l'habitat – Ministère du logement 2010. For the selected regions of Belgium, France and Germany, data were collected from real estate agencies websites (Athome, Immotop, etc.)

Source: Diop, L (2011), "Luxembourg: les marchés fonciers et immobiliers transfrontaliers à l'épreuve de la métropolisation", CEPS-INSTEAD *Working Paper*, No. 2011-48.

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Table 2.2. **Average price for an apartment per m²**
(2007-09)

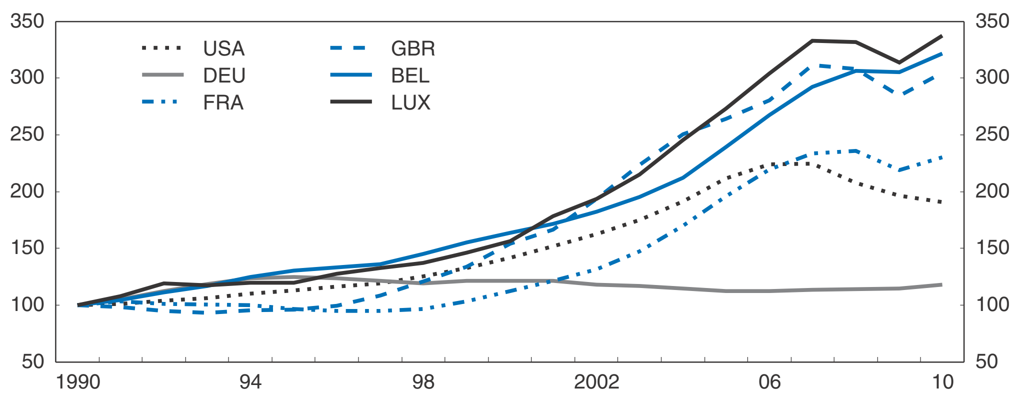
In euros

Amsterdam	1921
Barcelona	5 268
Berlin	1 550
Frankfurt	2 150
Geneva	8 294
Hamburg	1930
London	4 486
Luxembourg City	4 412
Milan	2 715
Stockholm	3 341

Note: Data for Amsterdam, London and Milan refer to 2003-06.
Source: Eurostat, *Urban Audit Indicators Database*.

Figure 2.15. **Residential property prices in Luxembourg and other countries**

Price index (1990 = 100)



Source: OECD, *Analytical Database* and the European Central Bank – Prices, output, demand and labour markets – Residential property price indicators.

StatLink http://dx.doi.org/10.1787/888932749923

The housing market is affected by inflexible supply

House price developments have been driven by insufficient flexibility in supply. According to official projections around 3 400 of new housing units would need to be built each year to keep up with growing demand (Ministry of Housing, 2009). In reality, supply has fallen short of this target for the last twenty years with an annual average of 2 600 housing units constructed. Only in 2008 and 2009 was the target surpassed. This suggests that measures are needed to promote the flexibility of supply.

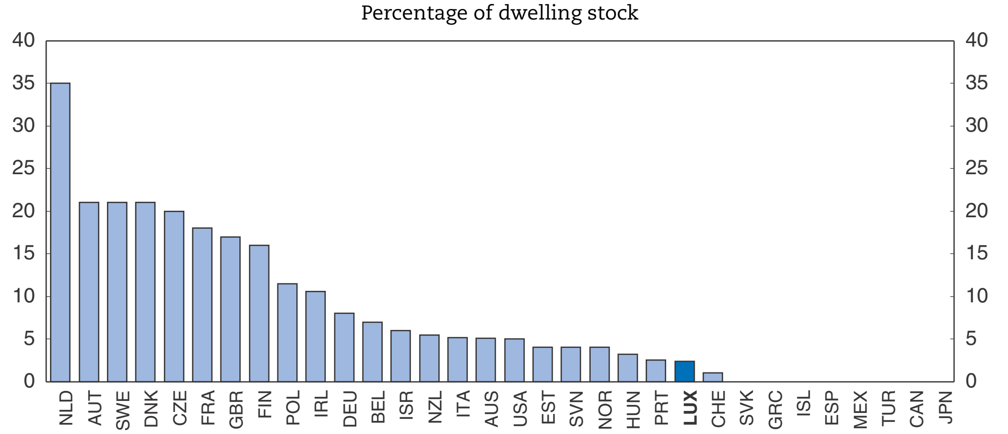
The supply of land and housing is constrained by a number of policies. Cumbersome regulations and exceptionally low property taxation encourage land hoarding when further price increases are expected. Administrative procedures related to building authorisation cover multiple administrative fields and require complex coordination among different actors, thus often delaying permissions to build. Housing policy has been further complicated by the fact that the right of expropriation has been blocked since 2003 and the right of first refusal has only been introduced with the Housing Pact law at the end of 2008. However, through the revision of the spatial planning law of 1999 the government hopes to narrow real estate speculation in the planning process significantly and to make expropriation easier.

The government has taken steps to promote more flexible supply. It has recently simplified land planning procedures and set a time limit on finalising PAGs. There is also a five year review of construction permit procedures. The government should consider speeding the review and move swiftly to simplify procedures. It should move to increase property taxes by updating land and building values. Taxes are now based on values of 1941. At a minimum, undeveloped land that is zoned as a building area should be taxed like developed land, rather than – much more lightly – like agricultural and forest areas, as it is today. The government has recently introduced the possibility for municipalities to surtax vacant land and buildings, which is being taken up in one municipality, Esch. Other municipalities are considering it. The government should review results and consider applying such a tax in all those municipalities, which are a priority for urban development in the IVL. The government is also considering deadlines to start development, after buying land that is zoned for construction. If developers fail to meet this deadline the permission to build on this land can be withdrawn. This can be a good alternative to counteract land-hoarding. Given the importance of having competition in the residential construction sector (Barker, 2004) and the small size of the Luxembourg market, a review of the functioning of competition in this sector would be warranted. Concentration rates in the construction sector are very high (Ecorys, 2008), with the four largest firms accounting for at least 75% of turnover in onsite construction and manufacturing of construction materials, and the market share of foreign firms was below 10%, ten years ago, when this issue was last explored (Commission du Bâtiment, 2004). A study that updates this analysis should be conducted by the competition authority.

Policies favour owner occupation of housing over renting, and applying more neutral policies might promote supply of affordable housing and promote residential mobility. The share of owner-occupied housing is large in Luxembourg compared to neighbouring countries (see Figure 2.12). At the same time, it is easier for tenants than for homeowners to move closer to work when they change jobs, and thus a better supply of apartments for rent might be conducive to shorter trips, favouring walking and cycling. While tax relief for owner-occupied housing is not high in international comparison (Andrews *et al.*, 2011), there are a range of subsidies for building or renovating owner-occupied housing, including interest subsidies, a bonus for construction or renovation, a subsidy for registration fees and a generous reimbursement of VAT for constructing or renovating housing property. In contrast, the share of social housing is low in international comparison (Figure 2.16).

Figure 2.16. **Share of social housing across OECD countries (2009)**

Percentage of dwelling stock



Source: Calculations based on OECD Housing Market questionnaire.

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Unlike in other OECD countries, very few citizens receive cash allowances to subsidise theirs rents (Andrews *et al.*, 2011).

The government should review the generous subsidies to acquire, build or renovate housing and consider better targeting to promote its objectives. Only few subsidies are targeted to lower-income households and none are tied to Luxembourg's objectives to promote the density of territorial development or other ecological objectives. Subsidies should be reviewed, not least in light of the danger that, in conjunction with relatively inflexible supply of building land, they might simply be capitalized in higher prices. The government should consider targeting subsidies to ecological criteria, such as the compactness of new buildings, whether their position is in line with IVL objectives and the ecological quality of building materials. Subsidies could also be tied to social objectives, such as projects that would offer affordable housing for rent. More targeted support would free resources that the government could use for a more active role in social housing, which would help to enhance the supply of affordable dwellings. In fact, the government envisages using its right of first refusal to buy land to be established through the revision of spatial planning law. This land will be used to develop major housing projects in line with the primary sectoral plan for housing. More balanced support for owner-occupied housing and housing for rent could also enhance residential mobility, making it easier for citizens to move closer to their jobs and reducing the need to commute by car.

Water infrastructure and management

Overall, the water use in households, industry and agriculture is low compared to other developed countries, reflecting the low use in agriculture. There is little loss through leakage as many of the water supply systems have been upgraded over the last 10 years and the demand for water from industry has decreased with the improvement of industrial processes, notably in the metallurgy sector. However, household consumption has increased by 1.35% per year over the last 15 years, reflecting the country's strong demographic growth and the steady increase in cross-border workers (EAA, 2010).

Water management and infrastructure will have to improve to reflect Luxembourg's high level of development. At least 70% of surface water is likely to fall short of the EU's 2015 targets for chemical and biological quality as determined under the EU Water Framework Directive (EEA, 2015). While the pollution level in watercourses has decreased slightly in recent years, 39% of watercourses are still heavily polluted and 54% are moderately polluted. With regard to drinking water, sources have not yet been protected through regulation of pesticide and nutrient use in their surroundings, although there has been a legal obligation to do so dating back more than 15 years. By the standards of the EU Ground Water Directive, two of five ground water bodies are considered to be in poor qualitative status regarding nitrates and pesticides, and some show clear signs of deterioration. While 95% of the population is connected to a waste water treatment plant, which is high in international comparison, only 36% are connected to a tertiary treatment station, which would improve water quality *e.g.* through nutrient removal. This compares to more than 90% in Germany, even though the entire country is classified as a sensitive area under the EU Urban Waste Water Treatment Directive. Combined sewage and rainwater interceptors can pose problems when heavy rainfalls cause overflows and untreated sewage flows into rivers or lakes. A dual-channel system to separate rainwater, which can re-infiltrate the water table naturally, and sewage requiring purification is still not in place, except in the cities of Luxembourg and Esch-sur-Alzette and in new housing developments.

In October of 2011 the European Commission referred Luxembourg back to the European Court of Justice for poor treatment of urban waste water. The Court had previously ruled in November 2006 that Luxembourg was failing in its obligation to treat and dispose of urban waste water in an adequate manner. Several sewage treatment plants do not yet comply with EU legislation, including in the capital.

The government has taken some steps to tackle these issues. Financial assistance to the municipalities from the Water Management Fund has been doubled to help them cover 90% of investments in sewerage and sewage treatment. The government passed a Water Act in 2008 to transpose the EU Water Framework Directive and Floods Directive into national law. The law introduces the principle of full cost recovery for drinking water and urban sewage treatment. In addition to water supply and sanitation service charges, which are levied by the service providers, the law introduces an abstraction tax and a pollution tax. The resulting income goes to the Water Management Fund. The abstraction tax is levied on anyone who draws surface water or groundwater and is based on the volume of water drawn. The discharge of waste water into surface or underground water sources is subject to a pollution tax. The tax is proportionate to the units of pollutant load in the water discharged. Delimitations of ground water protection zones are now about to be established. Technical studies have started in 75% of the catchment areas and a by-law has been passed in May 2012, detailing the measures that are needed to protect groundwater. Measures to construct or upgrade sewage systems that do not comply with EU standards have been completed in some cases. They are ongoing or planned in others. Dual-channel systems are mandatory in new building areas. The government plans to upgrade existing single-channel systems with retention basins and other infrastructure to limit pollution due to combined sewage overflows. The government should quickly delimitate ground water protection zones and finalise the necessary upgrades of sewage infrastructure.

Box 2.2. **Recommendations to promote greener growth**

- Continue substantial investment in public transport to offer an alternative to the automobile. To reduce Luxembourg's carbon emissions, increase taxes on petrol and diesel by gradually eliminating the price differential with neighbouring countries. Consider introducing a system of congestion charges. Further enhance co-operation with adjacent regions to increase the capacity of the public transport system.
- Speed up procedures for granting construction permits. Raise property taxes by updating property values used as a tax base. Widen the application of the surtax on vacant houses and land applied in some municipalities to other areas. Move forward with plans to impose deadlines for starting and finalising development on land that is zoned as a construction area.
- Ensure that the four primary sectoral plans are implemented, including through development of new communal general development plans and the use of the new local housing policy instruments.
- Target subsidies for building a home based on social and ecological criteria.
- Remove environmentally harmful tax subsidies, such as reduced VAT rates on solid mineral fuels, natural and liquefied petroleum and electricity. Introduce congestion charges and parking prices.
- Delimitate water protection zones swiftly and upgrade sewage system infrastructure to improve water quality.

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